Ministry of Petroleum and Natural Gas

Government of India



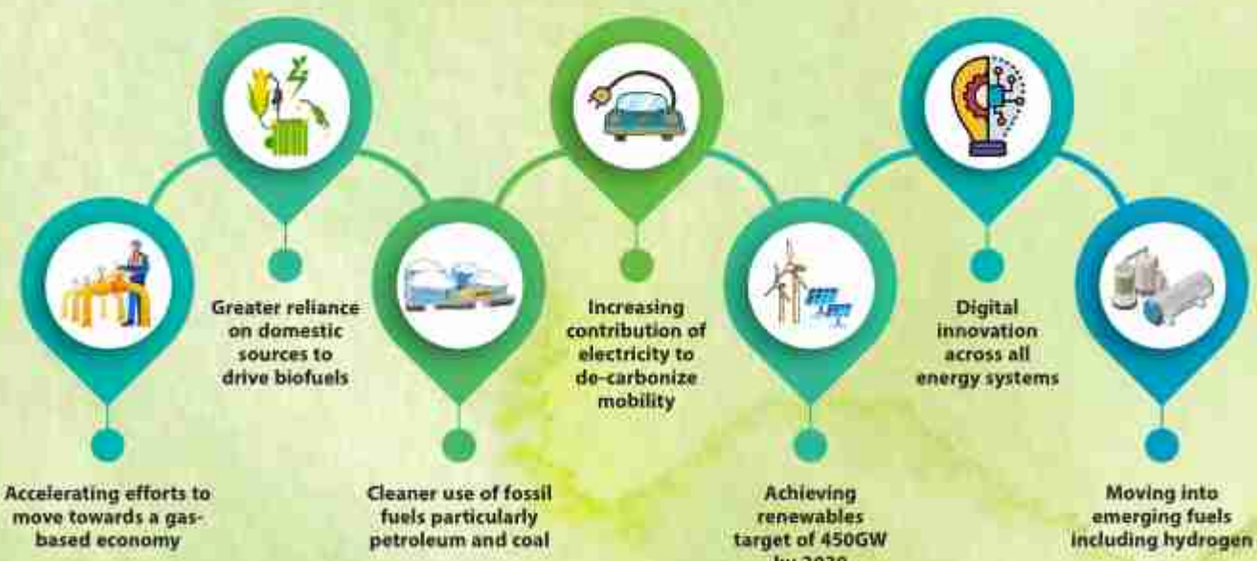
Growth
Collaboration
Transition

Annual Report
2023-24

India is emphasizing the development of environmentally conscious energy sources to enhance our energy mix. We are not just meeting our needs but are also determining the global direction



THE SEVEN KEY DRIVERS OF INDIA'S ENERGY STRATEGY





CONTENTS

Chapter 1: Introduction	7
Chapter 2: Exploration & Production	35
Chapter 3: Pipeline and Natural Gas	61
Chapter 4: Refinery	67
Chapter 5: Marketing & Distribution	79
Chapter 6: International Cooperation & Engagement	87
Chapter 7: Development of North-Eastern Region	109
Chapter 8: R&D and New Technology	119
Chapter 9: Bio-Fuels	153
Chapter 10: Sustainability & Net Zero Initiatives	159
Chapter 11: Pricing Policy on Sensitive Petroleum Products	195
Chapter 12: Welfare of Scheduled Castes, Scheduled Tribes, other Backward Classes and Divyangjan	199
Chapter 13: Welfare, Development and Empowerment of Women	203
Chapter 14: Undertakings / Organizations	207
Chapter 15: Integrated Finance Division	305
Chapter 16: General	313
Chapter 17: Compliance to Cyber Security Guidelines	319
Chapter 18: Appendix	323

Organization Structure Overview

1.1. Shri Hardeep S. Puri holds the charge of Minister for Petroleum & Natural Gas with effect from 11th of June, 2024.

1.2. Shri Suresh Gopi holds the charge of Minister of State for Petroleum & Natural Gas with effect from 11th of June, 2024.

1.3. Shri Pankaj Jain, IAS (AM:1990), holds the charge of Secretary in the Ministry of Petroleum & Natural Gas with effect from 30th of December, 2021.

1.4. Shri Praveen Mal Khanooja, IA&AS:1994, holds the charge of Additional Secretary in the Ministry of Petroleum and Natural Gas with effect from 12th of August, 2022.

1.5. Ms. Kamini Chauhan Ratan, IAS (UP:1997), holds the charge of Additional Secretary & Financial Advisor in the Ministry of Petroleum & Natural Gas with effect from 22nd of November, 2022.

1.6. Ms. Sujata Sharma, IAS (AP:2006), continues to hold the charge of Joint Secretary in the Ministry of Petroleum & Natural Gas with effect from 12th of December, 2022.

1.7. Shri Asheesh Joshi, IAS (UD:2006), holds the charge of Joint Secretary in the Ministry of Petroleum & Natural Gas with effect from 19th of July, 2023.

1.8. Ms. Esha Srivastava, IFS:2004, holds the charge of Joint Secretary in the Ministry of Petroleum & Natural Gas with effect from 8th of January, 2024.

1.9. Shri Rohit Mathur, CSS, continues to hold the charge of Joint Secretary (in-situ) in the Ministry of Petroleum & Natural Gas with effect from 17th of January, 2020.

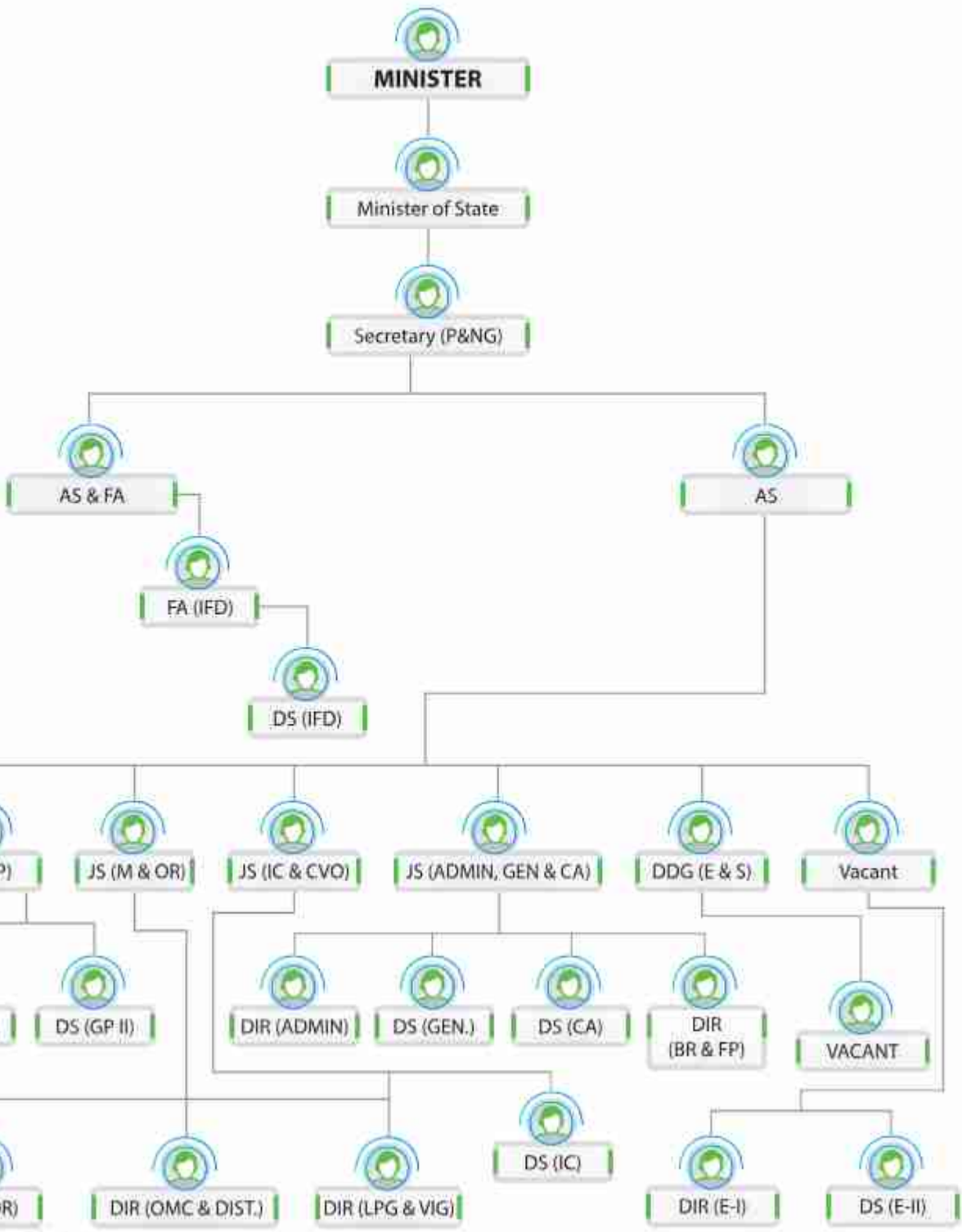
1.10. Shri Dheeraj Kumar Ojha, ISS:1999, continues to hold the charge of Deputy Director General in the Ministry of Petroleum & Natural Gas with effect from 10th of December, 2021.

1.11. Shri Rajinder Kumar, IES:2003, continues to hold the charge of Economic Adviser in the Ministry of Petroleum and Natural Gas with effect from 11th of March, 2022.

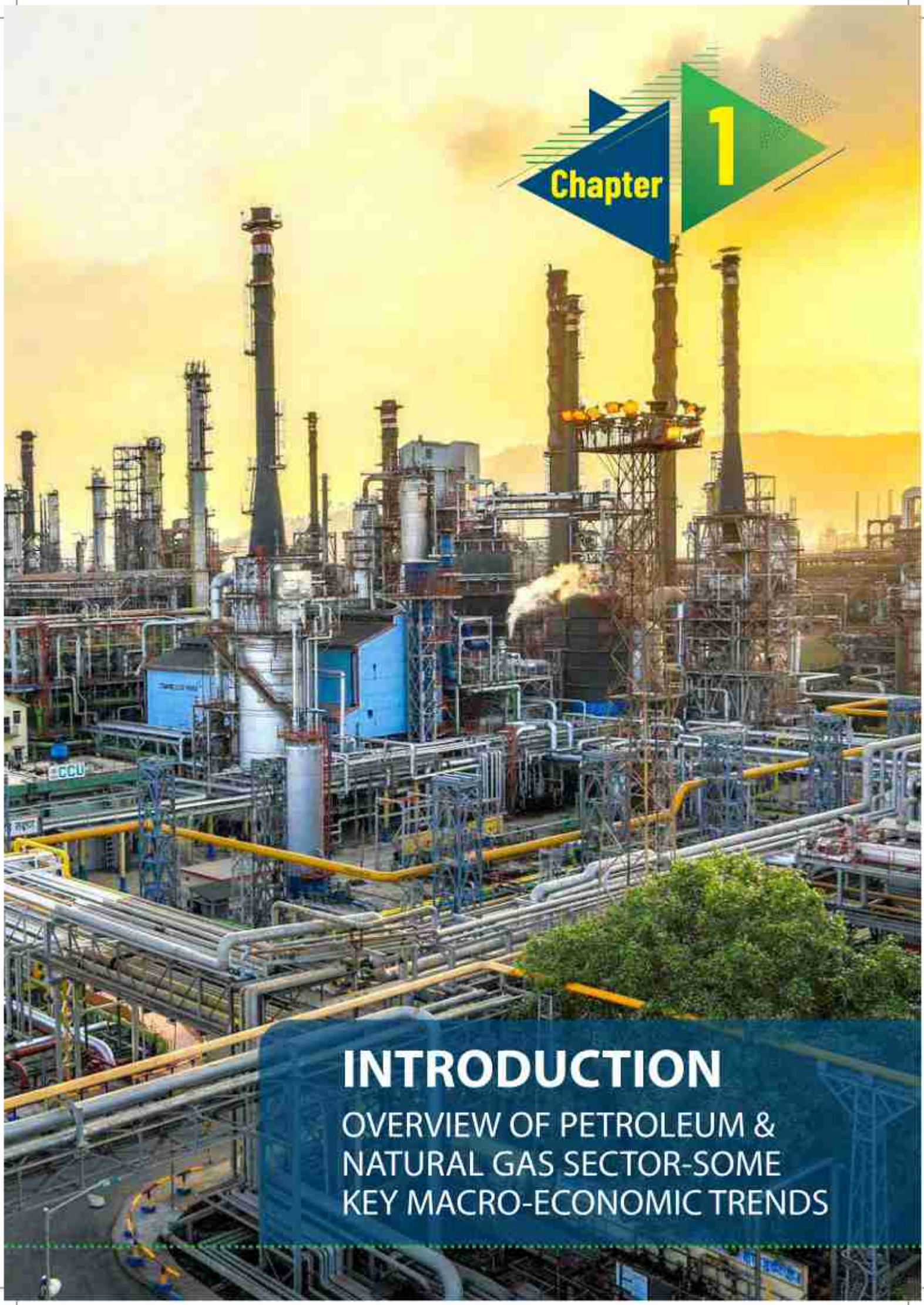
In line with the guidelines laid down by Hon'ble Supreme Court in the Case of Vishakha & Ors. Vs. State of Rajasthan & Ors. and orders issued by Department of Personnel & Training/Ministry of Women & Child Development, an Internal Complaints Committee (Women Cell) has been re-constituted in the Ministry for prevention and redressal of complaints of sexual harassment of working women. Presently, Ms. Sujata Sharma, Joint Secretary in the Ministry of Petroleum and Natural Gas, is the Chairperson of the Committee with four other members (including one member from NGO).



Organizational Chart of the Ministry of Petroleum & Natural Gas







INTRODUCTION

OVERVIEW OF PETROLEUM & NATURAL GAS SECTOR-SOME KEY MACRO-ECONOMIC TRENDS

1 Introduction

1.1. Performance of Petroleum & Natural Gas Sector-Some Key Macro-Economic Trends

Energy is the mainstay of socio-economic growth and development for a nation like India which is currently the third largest primary energy consumer while its per-capita energy consumption is only a third of the global average. The Oil & Gas sector is among the eight core industries in India and plays a major role in influencing decision making for all the other important sections of the economy. It has been assessed by various entities that the major factors contributing towards India's increasing consumption of energy include sustained economic growth over the last few years resulting in industrialisation, urbanisation, transportation needs, infrastructure development, rising income, improved standard of living, increased access to modern energy coupled with increase in private consumption and gross fixed capital formation, etc.

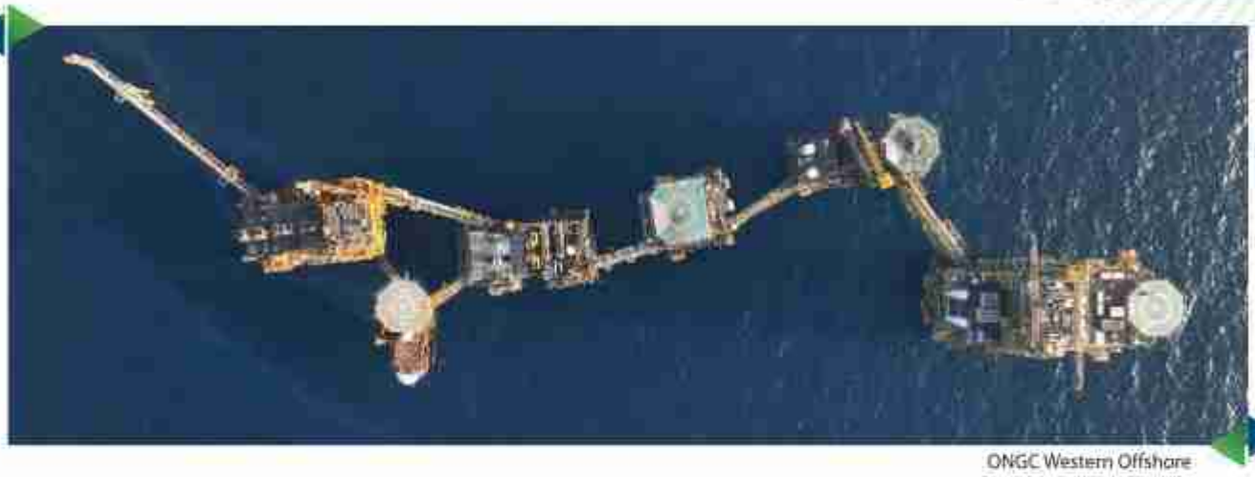
India is striving towards ensuring energy justice through accessibility and affordability which will be the key driver towards increasing per-capita energy demand in near future. The Hon'ble PM has envisaged four pillars of India's energy future-energy access, energy efficiency, energy sustainability and energy security. These four pillars are crucial for India as it marches ahead in its ambition to become an economic powerhouse in the world. The transformation of our energy system towards a more reliable, eco-friendly, and cost-effective one is a central goal of today's energy policy. The focus towards emerging fuels and alternate energy will act as key driver and lever in designing the futuristic energy systems and formulating an effective national energy policy. The issue of energy transition, diversification of energy basket, energy independence and energy security shall be affecting the energy mix of India in the years ahead.

The demand for energy is met mostly by fossil fuels as fossil fuels make up 89% of India's primary energy requirement. Coal accounts for 56% of the energy mix, oil and gas account for 27% and 6% respectively. During the financial year 2023-24, domestic crude oil production was about 29.36 Million Metric Tonne (MMT) while the production of natural gas stood at 36.44 BCM.

It is pertinent to mention that about 77% of crude oil production is by National Oil Companies (ONGC and OIL) from nomination regime and remaining 23% of crude oil production is by Private/JV companies/NOCs from Contract Regime. As far as production of



BPCL Pump at Pune



ONGC Western Offshore

natural gas is concerned, 62% of natural gas production was by National Oil Companies from nomination regime, 39% of natural gas production was by Private/JV companies/NOCs from Contract regimes (inclusive of ~2% was from Coal Bed Methane).

The current oil and gas production is not sufficient to fulfil the country's energy demand and leads to import of crude oil and natural gas. The import dependency on crude oil and natural gas based on consumption of petroleum products in 2023-24 was about 87.7% and 47.1% respectively.

Government has adopted a multi-pronged strategy to improve energy security and fulfil the increasing demand of oil and gas which comprises increasing domestic production of oil and gas, promoting energy efficiency and conservation measures, giving thrust on demand substitution, promoting biofuels and other alternate fuels/renewables, EV charging facilities and refinery process improvements. In addition, Government has launched National Biofuel Policy, 2018, to boost availability of biofuels in country and use of alternative clean fuels like ethanol, bio-diesel and bio-CNG through schemes for Ethanol Blending, Bio-diesel blending and Sustainable Alternative Towards Affordable Transportation. Government has also taken various initiatives towards economic stability through growth-promoting policies which inter-alia includes Capex-led growth strategy, comprehensive reforms in foreign direct investment, controlling inflation, Good and Services Tax Reforms, cut in the Corporate tax rate, the Make in India and Start-up India strategies and Production linked incentive Schemes, etc.

1.2. Production of Oil, Gas and Petroleum Products

The crude oil production during the year 2023-24 was 29.36 (MMT) against production of 29.18 MMT in 2022-23, showing an increase of 0.62%. In indigenous maximum production of crude oil from the western offshore of ONGC around 13.196 MMT, 44.95% of total crude oil production during 2023-24. Out of total crude oil & condensate production of 29.36 MMT in 2023-24, 65.43% (19.21 MMT) was from ONGC (nomination fields), 11.39% (3.344 MMT) from OIL (nomination fields) and 23.18% (6.8 MMT) from PSC/RSC regime.

Natural Gas production during FY 2023-24 was 36.44 Billion Cubic Meters (BCM), which was 5.8% higher than the production of 34.45 BCM in 2022-23. Out of total natural gas production of 36.64 BCM in 2023-24, 53.02% (19.32 BCM) was from ONGC (nomination fields), 8.44% (3.091 BCM) from OIL (nomination fields) and 38.54% (14.03 BCM) from PSC/RSC/CBM regime. The maximum production of natural was from western offshore of ONGC which is around 14.761 BCM, 40.51% of the total production of natural gas during 2023-24.

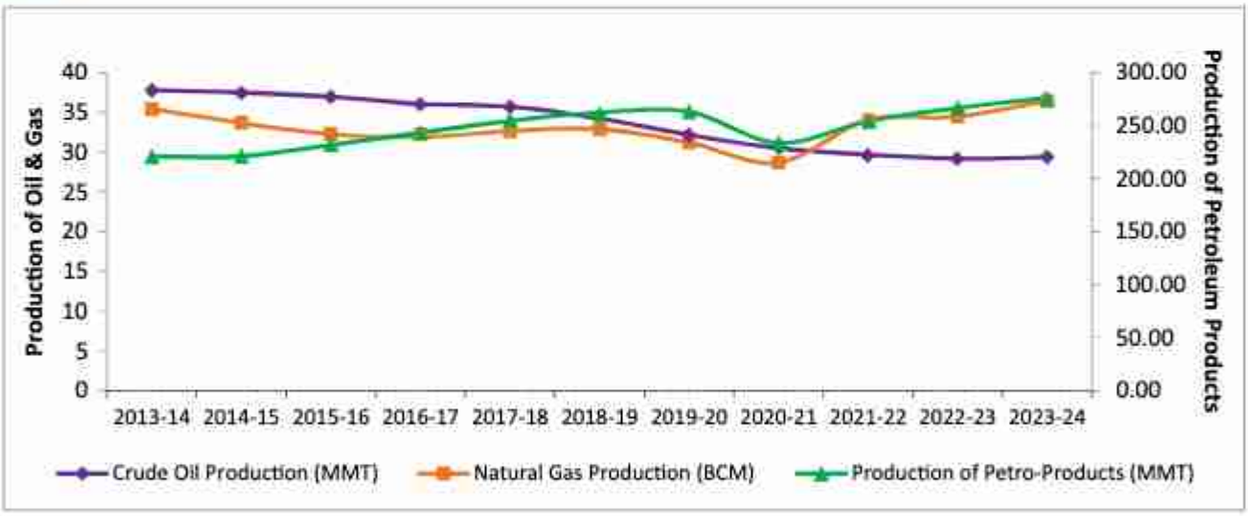
Production of Petroleum Products during the 2023-24 was 276.09 MMT, which was 3.6% higher than the production of previous year 266.54 MMT. The trends in the production of crude oil, natural gas and petroleum products are given below: -

Table 1: Trends of Production in Crude Oil, Natural Gas and Petroleum Products

Year	Crude Oil Production (MMT)	% Growth in Crude Oil Production	Natural Gas Production (BCM)	% Growth in Natural Gas Production	Import of Crude Oil (MMT)	% Growth in Imports of Crude Oil
2013-14	37.79	-0.19	35.41	-12.96	220.76	1.39
2014-15	37.46	-0.87	33.66	-4.94	221.14	0.17
2015-16	36.94	-1.39	32.25	-4.18	231.92	4.88
2016-17	36.01	-2.53	31.90	-1.09	243.55	5.01
2017-18	35.68	-0.90	32.65	2.36	254.40	4.46
2018-19	34.20	-4.15	32.87	0.69	262.36	3.13
2019-20	32.17	-5.95	31.18	-5.14	262.94	0.22
2020-21	30.49	-5.21	28.67	-8.05	233.51	-11.19
2021-22	29.69	-2.63	34.02	18.66	254.31	8.90
2022-23	29.18	-1.72	34.45	1.25	266.54	4.81
2023-24 (P)	**29.36**	**0.61**	**36.44**	**5.77**	**276.09**	**3.58**

P: Provisional

Graph 1: Trends of Production in Crude Oil, Natural Gas and Petroleum Products



1.3. Refining Capacity & Refinery Crude Throughput

Indian refining industry has done well in establishing itself as a major player globally. India, which is the fourth largest refiner in the world and second largest refiner in Asia after China, has emerged as a refining hub with refining capacity exceeding demand. As of 31st March 2024, India's oil refining capacity stood at 256.82 million metric tonnes per annum (MMTPA) increasing from 253.92 MMTPA as on 31st March 2023.

Crude oil processed during FY 2023-24 was 261.5 MMT against 255.2 MMT in FY 2022-23 marking an increase of 2.47%. The refinery Capacity utilization during the year 2023-24 was 102.99% (provisional). The trend in Refining Capacity & Crude throughput is depicted below:

Table 2: Trends of Refinery Capacity & Refinery Crude Oil processed

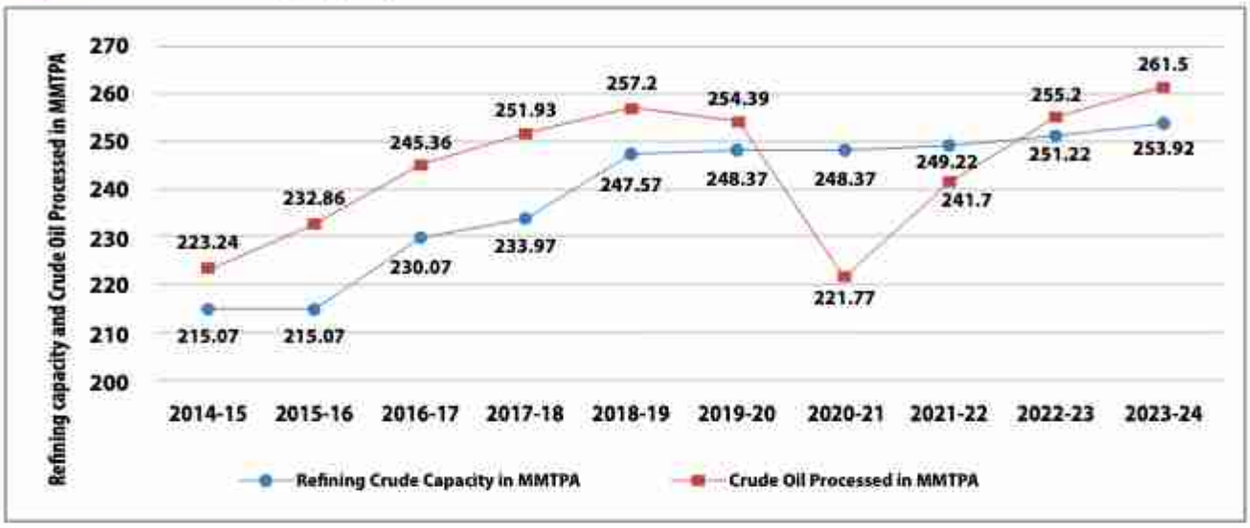
Year	Refining Capacity (MMTPA)	% Growth in Refinery Capacity	Crude Oil Processed	% Growth in Crude Oil Processed	Refining Capacity Utilization
2014-15	215.07	0.00	223.24	0	103.80
2015-16	215.07	0.00	232.86	4.31	108.27
2016-17	230.07	6.97	245.36	5.37	106.65
2017-18	233.97	1.70	251.93	2.68	107.68
2018-19	247.57	5.81	257.2	2.09	103.89
2019-20	248.37	0.32	254.39	-1.09	102.42
2020-21	248.37	0.00	221.77	-12.82	89.29
2021-22	249.22	0.34	241.70	8.99	96.98
2022-23	251.22	0.80	255.20	5.59	101.58
2023-24 (P)	**253.92**	**1.07**	**261.50**	**2.47**	**102.99**
As on 01.04.2024	256.82	1.14			

P: Provisional @: As on 1st April of initial year



BPCL Kochi Refinery

Graph 2: Trend in Refining Capacity & Crude Oil Processed



1.4. Consumption of Petroleum Products & Natural Gas

The country has experienced sustained economic growth over the past few years resulting in increased industrialization, urbanization and infrastructure development along with the rise in total sales of vehicles. These are the major factors which have contributed to overall higher demand for transportation, energy, and fuel, consequently driving up fuel consumption. Oil consumption and imports have grown rapidly on account of rising vehicle ownership and road transport use. The Pradhan Mantri Ujjawala Yojna (PMUY) scheme provides LPG connections to households living below the poverty line. Alongside the increasing use of LPG in rural areas, there has also been growth in the use of pipeline natural gas (PNG) in urban areas. The transportation sector has experienced remarkable growth in recent years, emerging as the fastest-growing end-use segment. India is led for a significant expansion of its transportation infrastructure-from highways, railways and metro lines to airports and ports.



View of BCPL Petrochemical Complex, Lepetkata

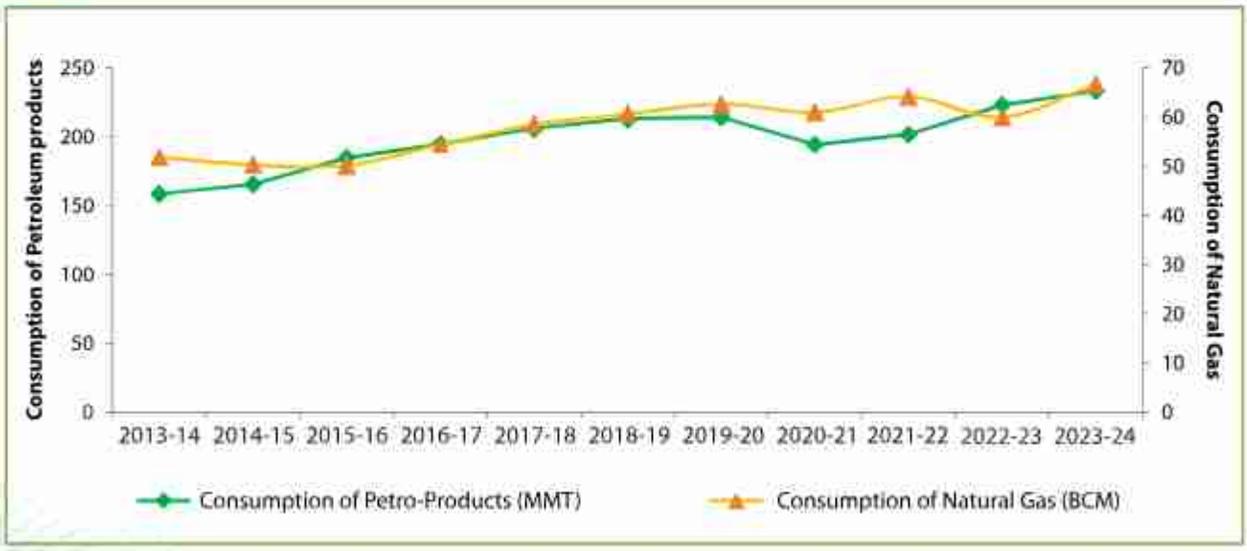
The consumption of petroleum products during FY 2023-24 with a volume of about 234.3 MMT reported a growth of 5% compared to the volume of about 223.0 MMT during FY 2022-23. Around 52.9% of our natural gas demand fulfilled through the indigenous source and 47.1% depend on the import. Total consumption of natural gas in 2023-24 stands at 67.51 BCM which is 12.58% higher than the consumption during the 2022-23 (59.97 BCM). Consumption of natural gas for energy purposes as fuel stands at 62.3% against 37.7% for non-energy purpose as feedstock. During 2023-24, highest consumption of natural gas was in fertilizer industry at 31% followed by City & Local Natural Gas Distribution Network (including Road Transport) at 20%, power sector 13% and refinery 8%.

Table 3: Consumption of Petroleum Products and Natural Gas

Year	Consumption of Petro-Products (MMT)	% Growth in Consumption of Petro-Products	Consumption of Natural Gas (BCM)	% Growth in Consumption of Petro-Products
2013-14	158.41	0.86	51.83	-9.33
2014-15	165.52	4.49	50.30	-2.94
2015-16	184.67	11.57	50.18	-0.24
2016-17	194.60	5.37	54.41	8.43
2017-18	206.17	5.95	58.47	7.45
2018-19	213.22	3.42	60.60	3.66
2019-20	214.13	0.43	62.61	3.31
2020-21	194.30	-9.26	60.98	-2.60
2021-22	201.70	3.81	64.16	5.21
2022-23	223.02	10.57	59.97	-6.53
2023-24 (P)	**234.30**	**5.00**	**67.51**	**12.58**

P: Provisional

Graph 3: Consumption of Petroleum Products and Natural Gas



1.5. Pricing Policy on Sensitive Petroleum Products & Crude Oil

Due to India's reliance on imports to meet the domestic demand, the prices of crude oil and petroleum products in the international markets have a decisive influence on the domestic prices of petroleum products. The prices of Indian basket crude oil, after continuously being at the level of more than $100/bbl for over three years, started falling sharply during the second half of 2014. As a result, the average price of Indian basket crude oil basket during 2015-16, 2016-17 and 2017-18 was recorded at $46.17/bbl, $47.56/bbl and $56.43/bbl respectively. The price increased to $ 69.88/ bbl during 2018-19 and fell to $60.47/bbl in 2019-20. The prices increased from a low of $19.90 /bbl during April 2020 to a high of $64.73/bbl during March 2021 and averaged at $44.82/bbl for 2020-21 and further increased to $79.18/bbl during 2021-22. The Indian Basket of crude oil has averaged $93.15/bbl and $82.58/bbl during 2022-23 & 2023-24 respectively.

1.6. Import of Crude Oil and Natural Gas (LNG):

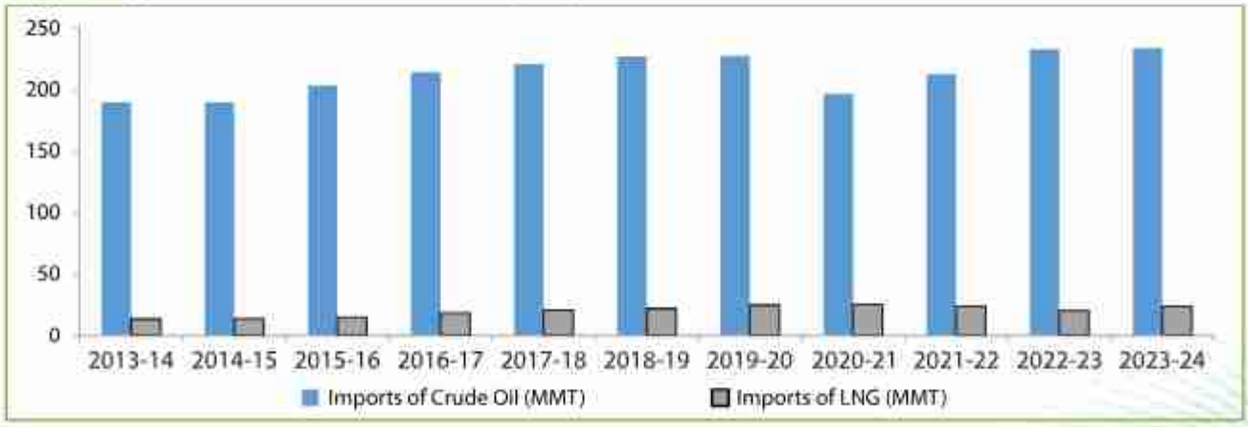
Import of crude oil during 2023-24 was 233.1 MMT valued at ₹ 11,00,589 crore as against import of 232.7 MMT valued at ₹ 12,60,372 crore in 2022-23 which is higher by 0.2% in quantity terms and lower by 12.7% in value terms vis-a-vis 2022-23. Import of natural gas (LNG) 2023-24 was 24.00 MMT (P) valued at ₹ 1,10,994 crore (P) as against import of 19.85 MMT valued at ₹ 1,37,210 crore in 2022-23 which is higher by 17.5% (P) in quantity terms and lower by 20.0% (P) in value terms vis-a-vis 2022-23. The trend in growth of crude oil & natural gas (LNG) shown in Table-4 & Graph- 4.

Table 4: Trends of Imports of Crude Oil and LNG

Year	Import of Crude Oil (MMT)	% Growth in Import of Crude Oil	Imports of LNG (MMT)	% Growth in Imports of LNG
2013-14	189.24	2.40	13.02	-0.88
2014-15	189.43	0.10	13.29	2.06
2015-16	202.85	7.08	14.38	8.19
2016-17	213.93	5.46	17.78	23.69
2017-18	220.43	3.04	20.18	13.46
2018-19	226.50	2.75	21.54	6.78
2019-20	226.95	0.20	24.42	13.33
2020-21	196.46	-13.44	25.05	2.61
2021-22	212.38	8.10	23.42	-6.54
2022-23	232.70	9.57	19.85	-15.22
2023-24 (P)	**233.12**	**0.18**	**24.00**	**20.9**

P: Provisional

Graph 4: Import of Crude Oil and Natural Gas (LNG)



1.7. Import & Export of Petroleum Products

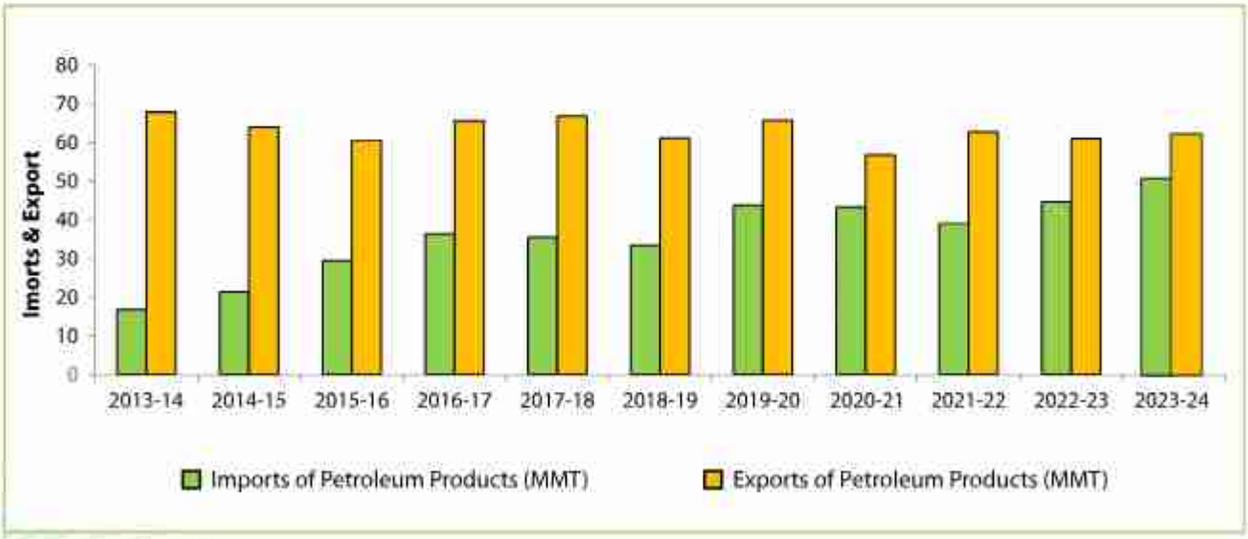
The import of petroleum products during 2023-24 was 48.67 MMT (Provisional) valued at ₹ 1,90,914 crore (Provisional) against the import of 44.6 MMT valued at ₹ 2,15,854 crore in 2022-23 which is higher by 9.1% in quantity terms and lower by 11.6% in value terms vis-a-vis 2022-23. Further, while the exports of petroleum products during 2023-24 was 62.4 MMT (Provisional) valued at ₹ 3,94,153 crore (Provisional) showing an increase of 2.3% in quantity terms and decrease of 14.1% in value terms against the export of 61.0 MMT valued at ₹ 4,58,729 crore during 2022-23. The trend of import and export of petroleum products in quantity-term is depicted below:

Table 5: Import & Export of Petroleum Products:

Year	Import of Petroleum Products (MMT)	% Growth in Imports of Petroleum Products	Exports of Petroleum Products (MMT)	% Growth in Export of Petroleum Products
2013-14	16.70	2.10	67.86	7.03
2014-15	21.30	27.57	63.93	-5.79
2015-16	29.46	38.28	60.54	-5.31
2016-17	36.29	23.19	65.51	8.22
2017-18	35.46	-2.28	66.83	2.01
2018-19	33.35	-5.96	61.10	-8.58
2019-20	43.79	31.30	65.69	7.51
2020-21	43.25	-1.23	56.77	-13.57
2021-22	39.02	-9.78	62.75	10.54
2022-23	44.60	14.30	61.01	-2.77
2023-24 (P)	**48.67**	**9.13**	**62.44**	**2.33**

P: Provisional

Graph 5: Trends of Import and export of petroleum products



1.8. Equity Oil and Gas from Abroad

During FY 2023-24, India imported ~87.7% of its crude oil and ~47.1% of natural gas to meet the demand. The over-reliance on a single geographical region has the potential to adversely impact our energy security. To insulate ourselves from vulnerabilities in supply of crude oil and natural gas, and to reduce dependency on OPEC, the Government emphasizes diversification of supply sources of oil & gas. Over the last few years, new suppliers of crude oil such as USA, Canada, Angola and Guyana have been added. Similarly, LNG imports have also diversified from Qatar to new sources namely Australia, USA, Russia among others.

In a major shift in its stance on acquisition of foreign assets, India is gradually moving from pure dividend-based investment model to entitlement on equity oil model. This will help us secure crucial oil for its growing energy needs. During FY 2023-24, the overseas production of oil and gas was approx. 19.9 MMTOE, which represents a substantial amount of the India's domestic production.



1.9. Reforms in Exploration and Licensing Policy

Government has taken various Policy initiatives with the objective to intensify exploration activities, attract foreign and domestic investment and enhance domestic production. The major policy initiatives taken by the Government to enhance domestic production of oil and gas and to reduce import dependency are as under:

Long Term Initiatives:

i. Policy for Relaxations, Extensions, and Clarifications under Production Sharing Contract (PSC) regime for early monetization of hydrocarbon discoveries, 2014.

ii. Discovered Small Field Policy, 2015.

iii. Hydrocarbon Exploration and Licensing Policy, 2016.

iv. Open Acreage Licensing Policy (OALP): Modalities for operationalization of Hydrocarbon Exploration & Licensing Policy (HELP), 2017.

v. Policy for Extension of Production Sharing Contracts, 2016 and 2017.

vi. Policy for early monetization of Coal Bed Methane, 2017.

vii. Setting up of National Data Repository, 2017.

viii. Appraisal of Unappraised areas in Sedimentary Basins, 2017.

ix. Re-assessment of Hydrocarbon Resources, 2017.

x. Site Restoration and abandonment guidelines for Petroleum Operations, 2017.

xi. Policy Framework to streamline the working of Production Sharing Contracts in Pre-NELP and NELP Blocks, 2018.

xii. Amendment in the Definition of 'Petroleum' under clause (k) of Rule-3 of the Petroleum & Natural Gas Rules 2018.

xiii. Policy to Promote and Incentivize Enhanced Recovery Methods for Oil and Gas, 2018.

xiv. Policy framework for exploration and exploitation of Unconventional Hydrocarbons under existing Production Sharing Contracts, Coal Bed Methane contracts, and Nomination fields, 2018.

xv. Policy framework for Exploration and exploitation of Coal Bed Methane (CBM) from areas under Coal Mining Lease allotted to Coal India Limited (CIL) and its subsidiaries, 2018.

xvi. Policy Framework for Streamlining working of Production Sharing Contracts in respect of Pre-NELP and NELP Blocks, 2018.

xvii. Reforms in Hydrocarbon Exploration and Licensing Policy for enhancing domestic exploration and production of Oil and Gas, 2019.

xviii. Dispute Resolution Committee, 2019.

xix. Natural Gas Marketing Reforms, 2020.

xx. Discovery of Market Price for Domestically Produced Natural Gas through e-bidding, 2020.

xxi. Deregulation of sale of domestically produced crude oil, 2022.

xxii. Discovery of Market Price and Sale and Resale of Gas produced from Discoveries in Deepwater, Ultra Deepwater and High Pressure-High Temperature areas with marketing and pricing freedom, 13th January, 2023.

xxiii. Under Special Arrangements with Indian Navy, around 99% of No Go Area has been opened up for Exploration and Production activities.

Short-Term Initiatives:

i. Early Monetization of Existing Discoveries

ii. Enhancement of Recovery Factor through the implementation of IOR/EOR techniques and redevelopment of existing mature fields.

iii. Drilling of infill oil/ gas wells

iv. Monetization of small and marginal discoveries onshore through service contracts and outsourcing

v. Redevelopment of existing matured fields and development of newfields/marginal fields

vi. Induction of suitable technologies in selective fields

vii. Implementation of Production Enhancement Contracts.

viii. Implementation of IOR/ EOR techniques.

Promoting Ease of Doing Business:

i. Redefined Role of DGH: Delegation of additional powers and functions to strengthen DGH role for compliance/ regulatory, developmental and coordination role done on October 2019.

ii. Simplified contractual terms with emphasis on cutting down approvals of Government/DGH /Management Committee and expeditious grant of approvals.

iii. Electronic Single Window Clearance System created at DGH for and processing of grant of approvals based on IT workflow for the following:

   a. PEL / PML Application System
   b. PDMS System
   c. PSC Management System
   d. ECMS Application
   e. Vessel Clearance Management System (VCMS)
   f. Expat Clearance System
   g. Environmental Clearance

iv. Simplification of Processes and Procedures including Standard Operating Procedures (SoP) for submission of documents on Self-Certification basis for 37 PSC processes.

1.10. Hydrocarbon Exploration Licensing Policy (HELP)

Government notified Hydrocarbon Exploration and Licensing Policy (HELP) on 30th March, 2016 and formally put in operation w.e.f. 1st July, 2017 with notification of Open Acreage Licensing Policy (OALP). HELP is a paradigm shift from Production Sharing Contract (PSC) regime to Revenue Sharing Contract (RSC) regime which completely overhauls the regulatory regime for the future Exploration and Production (E&P) activities by reducing the regulatory burden based on the principle of 'Ease of doing business'. The Policy inter-alia enables E&P operators to explore and extract all hydrocarbon resources (conventional and unconventional) covered under the Oilfields Regulation and Development (ORD) Act, 1948 and Petroleum and Natural Gas (PNG) Rules, 1959 through a uniform license. The salient features of the HELP Policy are as follows:

- Single license for all types of hydrocarbon
- Revenue Sharing Model
- Freedom to carve out blocks
- Submission of Expression of Interests throughout the year
- Pricing and Marketing freedom
- Low Royalty rates

To make policy more attractive, Government further notified the policy reforms on 28th February 2019, where many of the processes and approvals were relaxed to promote "Ease of Doing Business". These reforms provide many other benefits in addition to mentioned above, some of the features are as follows:

- More weightage to Work Programme than the Revenue Share.
- Revenue Share from Category II & III type of basins were removed except in case of windfall gain of USD 2.5 billion in a financial year only.
- Concession in Royalty rates for early production from the OALP blocks.
- Flexibility to revise FDP
- Liberal freedom to Transfer/Exit the blocks
- No obligation to run Drill Stem Test

Further, recognizing the need for further incentives in the under-explored Category-II & III basins, several additional incentives are introduced through 2023 changes in OALP Bid Documents.

Moreover, recognizing the need for further incentives in the under-explored Category-II & III basins, several additional incentives are introduced for OALP-VIII and upcoming rounds: -

- Commitment for seismic work programme only and no wells to be committed at the time of bid.
- Increase in Stabilization Period, Early Monetization Schemes.
- Provision of Excusable delays.
- Rationalize bidding and EoI submission process.

The following steps have been taken under HELP/Open Acreage Licensing Policy (OALP) to award acreage area for exploration and development:

i. A total of 144 exploration blocks spread over 2,42,056 sq. km. area in all Basin categories have been awarded to successful bidders under eight concluded OALP Bid Rounds.

ii. To further enhance acreage under exploration and development, the Government has launched the OALP Bid Round-IX, offering 28 blocks for International Competitive Bidding on 03rd January, 2024. Bidders can study the data available in National Data Repository (NDR) and select blocks for the bidding. Bids can be submitted through a dedicated online e-bidding portal till 29th February, 2024. A total of 9 (nine) Onland Blocks, 8 (eight) Shallow-Water Blocks and 11 (eleven) Ultra Deep-Water Blocks are on offer.

iii. Special CBM Bid Round 2021 under OALP (SCBM-2021): The Government of India on 22nd September 2021 launched the Special CBM Bid Round-2021 under the Open Acreage Licensing Policy (OALP) offering 15 CBM Blocks covering 8,458 sq. km. with ~700 BCM prognosticated CBM resource. Based on International Competitive Bidding (ICB) and subsequent evaluation of bids received, 4 Blocks covering 3,862 sq.

km area and having around 120 BCM CBM Resources were awarded to three companies, including one NOC (ONGC) and 2 private companies (Vedanta and Invenire Petrodyne Energy) and Revenue Sharing Contract (RSC) signed with Government of India on 9th September 2022.

iv. Special CBM Bid Round 2022 under OALP (SCBM-2022): Government of India announced offering 16 CBM Blocks under Open Acreage Licensing Policy ("OALP") through International Competitive Bidding ("ICB") covering an area of 5,817 sq. km under SCBM-2022. The bidding timeline for SCBM-2022 was from 01st May, 2023 to 30th June 2023. The bids were received for 3 CBM Blocks (717 Sq. Km) and the blocks were awarded to successful bidders in the month of December, 2023 and contract was signed on 03rd January 2024.



1.11. Discovered Small Field Policy (DSF)

The Marginal Field Policy (MFP) notified vide Gazette Resolution dated 14.10.2015 and later renamed as the Discovered Small Field (DSF) Policy vide notification dated 05.04.2018 is aimed at monetizing hydrocarbon resources locked-in for years in a time bound manner to boost domestic production of Oil and Gas. Under the three concluded DSF bid rounds, DSF Bid Round-I (2016) and DSF Bid Round-II (2018) and DSF Bid Round-III (2022), a total of 85 Revenue Sharing Contracts (RSC) comprising 175 discoveries were awarded to successful bidders.

1.12. Natural Gas Marketing Reforms

i. Taking another significant step to move towards gas-based economy, Government approved 'New Domestic Natural Gas Pricing Guidelines' in October 2014, based on the prices prevailing in major international hubs like Henry Hub (USA), Alberta (Canada), NBP (UK), Russia etc. to strike a balance between the requirements of both producing and consuming sectors. The prices of natural gas were revised after every six months and notified by Petroleum Planning and Analysis Cell (PPAC) under MoP&NG. These Guidelines were applicable to natural gas produced from Nomination Fields and NELP, Pre-NELP Blocks/Fields, where pricing is to be approved by Government under per Production Sharing Contract (PSC).

ii. Subsequently, from 2015 onwards, Government provided marketing and

pricing freedom for gas under DSF, OALP, CBM regimes and for gas produced from North-Eastern Region (NER) and new gas discoveries after 28.02.2019 under all regimes.

iii. To incentivize gas production from difficult areas such as High Pressure- High Temperature (HP-HT) reservoirs and Deepwater and ultra-deepwater areas, Government, on 23rd March, 2016, granted marketing including pricing freedom on natural gas production with a price ceiling announced on half yearly basis by Petroleum Planning and Analysis Cell (PPAC).

iv. Further, vide Notification dated 15.10.2020, a standard procedure was formulated to discover market price of gas through a transparent and competitive process and allowing affiliates to participate in bidding. Taking another significant step to move towards gas based economy, 'Natural Gas Marketing Reforms' were announced vide Notification dated 15.10.2020, to prescribe standard procedure to discover market price of gas to be sold in the market by gas producers, through a transparent and competitive process; permit Affiliates to participate in bidding process for sale of gas and allow marketing freedom to certain Field Development Plans (FDPs) where Production Sharing Contracts already provide pricing freedom. Subsequently, detailed guidelines for Discovery of Market Price for Domestically Produced Natural Gas through e-bidding were issued vide Notification dated 03.12.2020. Agencies, empaneled by DGH for carrying out e-bidding also been notified.

v. Furthermore, gas producers having pricing and marketing freedom have been permitted for selling small quantity of gas through gas exchanges authorized by PNGRB vide OM dated 19.08.2021.

vi. As a further momentum to gas reforms and saving the environment, Government issued detailed guidelines for monetization of Ad-hoc/Test Gas produced during the Testing of oil and gas wells vide OM dated 22.11.2021.

vii. Vide Notification dated 13th January, 2023, Government provided clarifications on discovery of market price and sale and resale of gas produced from discoveries in Deepwater, Ultra Deepwater and High Pressure/ High Temperature areas with marketing and pricing freedom.

viii. Revised guidelines regarding pricing of gas produced from nomination fields of ONGC/OIL, New Exploration Licensing Policy (NELP) blocks and pre-NELP blocks, where Production Sharing Contract (PSC) provides for Government's approval of prices were issued in April, 2023. As per the guidelines, the price of such natural gas shall be 10% of the monthly average of Indian Crude Basket and shall be notified on a monthly basis and shall have a floor and a ceiling. This has resulted in reduction of APM /NAPM gas prices from the nominated fields from USD 8.57 per MMBTU to USD 6.5 per MMBTU.

1.13. Reduced No-Go Areas

The Government has been successful in reducing 'No-Go' areas by almost 99% in April 2022, hitherto not available for E&P activities. This made around 1 million sq. km. area of India's EEZ available for exploration.

1.14. Enhanced Prospectivity Perception through Data Generation:

i. **National Data Repository (NDR):** NDR was launched on 28th June, 2017 and set up at DGH to make the entire Exploration and Production (E&P) data available for commercial exploration, research and development and academic purposes. It acts as a repository of geo-scientific database of the country and plays a key role in facilitating prospective bidders to carve out their choice of blocks for bidding under OALP. In order to cope with the ever-increasing demands of E&P data, NDR is being upgraded to cloud-enabled hyper-converged infrastructure to facilitate easy access of data to the industry for meaningful usage. Total data uploaded in NDR till 31st March 2024 is 3.667 million line kilometers (LKM) of 2D Seismic Data, 1.139 million square kilometers (SKM) of 3D

Seismic data and 23,436 number of well and log data and 49,603 number of Well Reports.

ii. **Re-assessment of Hydrocarbon Resources:** For updated estimation of hydrocarbon resource potential in the country, re-assessment of hydrocarbon resources for all 26 sedimentary basins in the country was completed in 2017 almost after two decades of earlier estimation. This resulted in prognosticated conventional hydrocarbon resources of the order of 41.87 billion tonnes (oil and oil equivalent of gas), which is about 49% increase as compared to earlier estimate of 28.08 billion tonnes (oil and oil equivalent of gas).

iii. **National Seismic Programme (NSP):** The National Seismic Programme (NSP) was launched in 2016 for conducting 2D seismic surveys in un-appraised sedimentary basins. It envisaged 48,243 Line Kilometers (LKM) 2D seismic data for appraisal of onland areas with a sanction cost of ₹ 2,932.99 crores and was executed by ONGC and OIL. 97% (~46,960 LKM) of Seismic Data Acquisition, Processing and Interpretation was completed. Remaining geographical inaccessible area, where data could not be acquired due to inaccessible terrain and hostile environment, was proposed to be taken up through Airborne Geophysical Survey.

The data generated under NSP using long spreads (12 to 18 km) and modern technology has provided vital sub-surface geological information in many unappraised areas which will facilitate understanding of the geological set-up of these basins. The presence of sub-trappean Mesozoic sediments has also been indicated in some of the areas. The data has provided significant leads towards the extension of existing producing basins as the information about the tectonics framework has improved. Features of geological interest are seen in 2D lines of many such basins viz. Mahanadi, Kutch-Saurashtra, Vindhyan, Ganga, Bengal, Himalayan Foreland, KG, Rajasthan, Ganga, Chhattisgarh, Cuddapah, Deccan Synclise etc.

iv. **Airborne Gravity and Gradiometry (AGG) Survey:** To cover the inaccessible and hostile geographical areas under NSP project, a volume of 49,000 flight LKM Airborne Geophysical Survey has also been planned with approximate cost of ₹ 80 crores. On behalf of Ministry, Oil India Ltd. has been selected as Nodal agency for carrying out Airborne Gravity and Gradiometry (AGG) survey. AGG Survey was started on 27.05.2023 and got completed on 15th March, 2024 with total data acquisition of 42,943 LKM. The processing and interpretation of data is under progress

v. **Complete Appraisal of Andaman Basin:** For comprehensive appraisal of Andaman offshore, a plan was formulated to acquire 22,500 LKM 2D Broadband seismic data acquisition, processing, and interpretation thereof covering basinal area of approx. 2,81,613 sq. km. The project has been implemented through M/s Oil India Limited. A total of 22,500 LKM seismic data was acquired in deep Andaman offshore. The acquisition and processing was completed in October 2022 and interpretation of the entire dataset has been completed in month of March 2023. Complete data is submitted to NDR.

vi. **Appraisal of Offshore basin area upto Exclusive Economic Zone (EEZ):** In order to assess the entirety of the offshore basin area extending up to the Exclusive Economic Zone (EEZ) of the nation, efforts were undertaken to conduct a 2D broadband seismic survey covering an area of approximately 80,000 LKM. ONGC was entrusted as nodal agency for EEZ survey. As a result, a total of approximately 79,540 LKM of 2D seismic data acquisition was successfully accomplished during the month of June 2023 (against the contracted target of 70,000 LKM with a provision of additional 20%) encompassing all three sectors: East Coast, West Coast, and the Andaman Sector. Processing of Interpretation of acquired 2D seismic data have been completed and the processed output been received at DGH.

vii. **Mission Anveshan:** In order to further explore the Indian sedimentary basins and

plug the gap areas in seismic coverage, Ministry of Petroleum & Natural Gas has approved "Mission Anveshan" for conducting 2D Seismic Acquisition, Processing & Interpretation of 20,275 Line Kilometers with a budgetary outlay of ₹792 crore.

viii. **Appraisal of areas in India's Extended Continental Shelf (ECS):** To ascertain the hydrocarbons potential of the Continental Shelf area beyond the current EEZ boundary of 200 Nautical Miles, Ministry of Petroleum and Natural Gas has approved the proposal "Appraisal of areas in India's Extended Continental Shelf (ECS)" for conducting 2D broadband Seismic Data Acquisition, Processing and Interpretation (API) of ~30,000 Line Kilometers with a budgetary outlay of ₹410 crore.

ix. Ministry of Petroleum & Natural Gas has for the first time, approved the proposal of drilling of four stratigraphic wells in Category-II and Category-III basins at the estimated cost of ₹ 3,200 crore. This demonstrates the Ministry's commitment to aggressively commence exploration in unexplored areas.

1.15. Initiatives for facilitating clearances/ approvals and enhanced coordination:

- **Empowered Coordination Committee (ECC):** This committee has been constituted under the chairmanship of Cabinet Secretary to discuss the defense, environment, license etc. related issues pertaining to the Hydrocarbon sector
- **Creation of 'Hydrocarbon Clearance Cell' (HCC):** A dedicated 'Hydrocarbon Clearance Cell' has been institutionalized within DGH. The cell liaises with Central/State Government authorities for expeditious grant of clearances/approvals.
- **Creation of North-East Coordination Committee (NECC):** ECC under HCC of DGH created in September 2021 and 18 Coordinators are placed with various Departments of State Govts of Assam, Arunachal Pradesh and Tripura for ease of processing Clearance and Approval proposals under various environmental regulations as well as expediting the other issues related to Oil & Gas E&P activities requires administrative/regulatory supports from the State Govt.
- **UrjaPragati Portal (Upstream Response by Joint Action for proactive Governance and Timely Implementation):** To facilitate E&P operators and monitor the approvals/ clearances, URJA PRAGATI web-based interactive portal has been launched recently by DGH to prioritize and flag the long pending issues concerning the upstream hydrocarbon sector involving various stakeholders such as Operators, Central Ministries and State Governments. The issues to be dealt through this portal covers clearances related to PEL (Petroleum Exploration License), PML (Petroleum Mining Lease), FC (Forest Clearance), WLC (Wildlife Clearance), CTE (Consent To Establish)/CTO (Consent To Operate), ESZ (Eco Sensitive Zone) and CRZ (Coastal Regulation Zone).
- **Upstream India Portal:** The 'Upstream India' portal was launched to provide support to E&P operators. It offers services such as sharing of facilities and infrastructure available at DGH, creation of a Knowledge Sharing Platform, and organization of regular workshops, seminars, conferences, training sessions, and discussions on the latest government policies, technologies, and usage of inventories.
- **Urja Suraksha Samanvay:** GIS based monitoring and decision support system for swift information exchange.

1.16. Natural Gas Grid and City Gas Distribution (CGD)

A City Gas Distribution (CGD) network is the interconnected network of pipelines to make supply of natural gas to domestic, industrial or commercial premises and CNG stations situated in a specified Geographical Area (GA). CGD networks are being developed based on the availability of trunk gas pipeline connectivity or gas sources and techno-commercial feasibility in a GA.

CGD network ensures the supply of environment friendly cooking fuel at the door

step of domestic households in the form of Piped Natural Gas (PNG) as well as clean fuel to transport sector in the form of Compressed Natural Gas (CNG). The usage of CNG in transport sector helps in curbing the vehicle emissions in urban area and it improves the air quality.

- Till May 2014, CGD networks was available in about 33 Geographical Areas (GAs) spread over 53 districts (part/full) in different part of the country.
- During the years 2014-18 (upto May 2018), 92 GAs spread over 113 districts (part/full) were covered for development of CGD network.
- With the successful conclusion of 9th & 10th CGD bidding rounds in 2019, the coverage of CGD network was extended to additional 136 GAs covering 298 districts (part/full).
- In 2022, PNGRB concluded 11th and 11A CGD bidding round and authorized 67 more GAs. With the completion of this round, the potential coverage of CGD network has expanded to about 98% of country's population spreading over 88% of India's area.
- The Petroleum and Natural Gas Regulatory Board (PNGRB) under 12th and 12A CGD Bidding Round has finalized successful bidders covering 103 Districts, encompassing 6 North East States viz. Arunachal Pradesh, Meghalaya, Manipur, Nagaland, Sikkim & Mizoram and 2 Union Territories of Jammu & Kashmir and Ladakh. Accordingly, Letters of Intent has been issued to the successful bidders for 7 GAs on 04.03.2024. Further, authorization shall be granted to the successful bidders after receipt of the requisite Performance Bank Guarantee from the concerned entities by PNGRB as per CGD Authorisation Regulations.
- PNG supplies to domestic households has increased from a level of 25.4 lakh (May 2014) to 123.66 lakh (as on January 2024). In total, 6,348 CNG stations (as on 31.01.2024) are making clean and economical transportation fuel available to about 55 lakh CNG vehicles across the country.

In order to promote the expansion of City gas networks and enhance the usage of natural gas in cities, the Government has taken following steps-

i. Domestic gas, which is cheaper than imported gas, has been allocated to meet the entire requirement of PNG (D) and CNG (T) segments of CGD sector and it has been kept under no cut category.

ii. Public Utility Status granted to CGD Projects by Ministry of Labour and Employment (MoLE).

iii. Ministry of Defence (MoD) has issued guidelines for use of PNG in its residential areas/unit lines

iv. Dept. of Public Enterprises (DPE) has issued guidelines to Public Sector Enterprises (PSEs) to have the provisions of PNG in their respective Residential complexes.

v. Ministry of Housing & Urban Affairs (MOHUA) has issued advisory to State Governments on following aspects-

a. To standardize the Road Restoration/ permission charges along with time bound permission in accordance with the local conditions.

b. Earmarking of land plot for development of CNG Stations at the planning stage of town/city and same should be specified in the revised Master Plan.

c. Relevant modification in building by-laws for providing gas pipeline infrastructure in residential & commercial buildings at architectural design stage.

vi. Further, MOHUA has directed to CPWD & NBCC to have the provisions of PNG in all Government Residential complexes.

vii. DIPP notified amended Rule 2018 to ease out process to set up CNG dispensing facilities at existing OMC ROs.



1.17. Regasification infrastructure in the country

Country commenced the first import of Liquefied Natural Gas (LNG) in year 2004 with the establishment of its first regasification LNG (RLNG) terminal located at Dahej (Gujarat). The import of LNG is being carried out as Open General License (OGL) item. The imported RLNG is being supplied at market determined prices as per contractual agreement between suppliers and buyers across the country. Establishment of LNG terminals is also permitted as an infrastructure project and eligible for 100% Foreign Direct Investment (FDI).

At present, the Country is having seven (7) operational LNG re-gasification terminals operational with capacity of about 47.7 MMTPA (~172 MMSCMD). The terminal-wise details are as under:

Location	Owner & Operator	Capacity (MMTPA)
Dahej (Gujarat)	PLL	17.5
Hazira (Gujarat)	SHELL	5.2
Kochi (Kerala)	PLL	5
Dhabol (Maharashtra)	GAIL (KLPL)	5.0
Mundra (Gujarat)	GSPC LNG Ltd	5
Dhamra (Odisha)	Adani LNG Pvt Ltd	5
Ennore (Tamilnadu)	IOCL	5
	Total Capacity (MMTPA)	**47.7**

In addition to above, following LNG terminals are under construction:

Location	Owner & Operator	Capacity (MMTPA)
Dahej Expansion (Gujarat)	PLL	5
Gopalpur (Odisha)	PLL	4
Jafrabad (Gujarat)	Swan Energy	5
Chara(Guajrat)	HPLNG	5
	Total Capacity (MMTPA)	**19**

1.18. Energy Diplomacy:

The Government of India has been actively engaged in shaping its global engagement and securing its energy needs in an increasingly interconnected world. India's energy diplomacy is not only limited to cultivating, sustaining and enhancing energy partnerships with hydrocarbon-rich countries and prominent international organizations dealing with energy matters but also fostering collaboration on hydrocarbons and clean technologies with countries of global south and neighborhood.

India has been raising voices for all oil-consuming countries of the global south for responsible pricing and stabilizing the global oil market. This makes India a sui generis case and has driven our energy strategy, now acknowledged the world over as being pragmatic and balanced. India has raised the issues faced by consuming countries such as high prices, high volatility, Asian Premium, etc. from time to time with major producers bilaterally and at various international forums including Abu Dhabi International Petroleum Exhibition and Conference-2023 (ADIPEC-2023)

held in Abu Dhabi, United Arab Emirates; India Energy Week-2023 held in Bengaluru, India.

India has also been engaging with major International Organizations working in the domain of Oil & Gas such as Organization of the Petroleum Exporting Countries (OPEC), International Energy Forum (IEF), International Energy Agency (IEA) etc. for advocating responsible pricing of Oil and Gas resources.

India's quest for energy security works under the framework of four 'A's: availability, accessibility, affordability and acceptability, which is to make energy accessible to all the sections and sectors at an affordable price. Although Oil and Gas will continue to play a role in India's primary energy mix in the coming future, India is also fostering all forms of energy including Solar, Wind, Biofuel and Hydrogen to ensure energy availability to its citizens at an affordable price and in a sustainable manner. Notably, India has spearheaded the launch of the Global Biofuels Alliance at G20 summit, underscoring India's commitment to steering the energy transition towards a sustainable future.

Ministry of Petroleum and Natural Gas has been working very closely with Ministry of External Affairs and our Embassies abroad, to not only ensure energy security for the country, but to safeguard and promote the interests of our oil and gas PSUs abroad. The integration of energy diplomacy as part of India's foreign policy is giving dividends to the country by ensuring energy security and by highlighting the importance of India as a destination for Oil & Gas investments in the entire value chain.

The following salient features of Energy Diplomacy merit mentioning:

- Supporting Indian refiners for securing uninterrupted and timely supply of crude oil.
- Geographical diversification and widening of oil & gas sourcing including the acquisition of E&P assets by Indian PSUs.
- Launching initiatives to promote 'Neighborhood first policy' in the oil and gas sector by building energy corridors and energy bridges.
- Negotiating long-term Oil and LNG deals.
- Developing India as a prominent venue for global energy events-the inauguration of the first India Energy Week, holding the ninth meeting of the Asian Ministerial Energy Roundtable and the Third Energy Ministers Meeting of the Shanghai Cooperation Organization.
- Developing close linkages with International organizations and institutionalizing dialogues.
- Leveraging India's relationship and huge hydrocarbon needs with multilateral energy organizations such as OPEC, IEF & IEA, where India's voice can make a difference towards balancing the needs of producer and consumer nations.
- Launched Global Biofuel Alliance to promote global collaboration for decarbonization and circularity of energy sources.

1.19. Sustainable Alternative Towards Affordable Transportation (SATAT):

Government has launched "Sustainable Alternative Towards Affordable Transportation (SATAT)" initiative on 1st October 2018, with the aim of establishing an ecosystem for production of Compressed Bio Gas (CBG) from various waste/biomass sources and for promoting its use along with Natural Gas. Under this initiative, Oil and Gas Marketing Companies (OGMCs) invites Expression of Interest (EOI) to procure CBG from potential entrepreneurs.

This initiative synergises with GOBARdhan Scheme, Swachh Bharat Mission/AtmaNirbhar Bharat/target of Net Zero emission. For development of biogas/CBG sector 'Whole of Government' approach is being adopted. Some of the enablers provided by different Ministries and Departments are: Central Financial Assistance to all kind of CBG/biogas plants under Umbrella Scheme of National Bio Energy Programme of Ministry of New and Renewable Energy (MNRE); additional Central Assistance on MSW based CBG plants to States and Union Territories for solid waste management by Ministry of Housing and Urban Affairs under the Scheme of Swachh Bharat Mission Urban 2.0; Market Development Assistance @ ₹ 1,500/MT on Fermented Organic Manure produced from

CBG projects under Policy on Promotion of Organic Fertilizer by Department of Fertilizers; incentive on biomass aggregation machinery by Department of Agriculture and Farmers Welfare under Sub Mission on Agricultural Mechanization and Crop Residue Management scheme; categorization of CBG projects under priority sector lending by RBI ; categorization of CBG projects under 'White category' by CPCB on case-to-case basis; excise duty exemption on amount of GST-paid on compressed bio gas contained in the blended CNG.

Ministry of Petroleum and Natural Gas has issued guidelines for co-mingling of domestic gas for supply for Compressed Natural Gas (Transport) & Piped Natural Gas (Domestic) segments of City Gas Distribution (CGD) Networks for synchronization of CBG with CNG in CGD Network.

Further, Government has approved Scheme for providing financial assistance to CBG producers for procurement of biomass aggregation machinery to support collection of biomass for a period of 04 years from FY 2023-24 to FY 2026-27. Scheme guidelines has been issued on 02.02.2024.

In order to promote the production and consumption of CBG in the country, National Biofuels Coordination Committee (NBCC) on 24.11.2023 approved, the introduction of phase wise mandatory blending of CBG in CNG (Transport) & PNG (Domestic) segments of CGD sector. CBG Blending Obligation (CBO) will be voluntary till FY 2024-2025 and mandatory blending obligation would start from FY 2025-26. CBO shall be kept as 1%, 3% and 4% of total CNG/PNG consumption for FY 2025-26, 2026-27 and 2027-28 respectively. From 2028-29 onwards, CBO will be 5%.

Government has approved a scheme for Development of Pipeline Infrastructure (DPI) for injection of CBG in City Gas Distribution (CGD) network on 15.03.2024. As on 1st March 2024, 58 CBG/biogas plants with a total production capacity of around 360 MT per day have been commissioned. Sale of CBG has been initiated from more than 160 Retail Outlets. CBG is also being supplied to industrial customers. Under CBG-CGD synchronization scheme, GAIL has signed 77 Tripartite Agreements and CBG sale has been started in 25 Geographical Areas of CGD Network.

1.20. National Policy on Biofuels- 2018

The National Policy on Biofuels 2018 envisages an indicative target of 20% blending of ethanol in petrol by Ethanol Supply Year (ESY) 2025-26 and 5% biodiesel in diesel by 2030. This goal is to be achieved by:

a. Reinforcing ongoing ethanol/biodiesel supplies through increasing domestic production

b. Setting up Second Generation (2G) bio refineries

c. Development of new feedstock for biofuels

d. Development of new technologies for conversion to biofuels.

e. Creating suitable environment for biofuels and its integration with the main fuels.

1.21. Non Conventional Energy

1.21.1. EBP Programme: Government has been implementing Ethanol Blended Petrol (EBP) Programme wherein Oil Marketing Companies (OMCs) sell petrol blended with ethanol at varying percentages as per availability of ethanol. This Programme has been extended to whole of India to promote the use of alternative and environment friendly fuels. This intervention also seeks to reduce import dependence for energy requirements and give boost to agriculture sector.

To increase indigenous production of ethanol the Government has taken multiple interventions including, re-introduction of administered price mechanism, opening of alternate route for ethanol production, amendment to Industries (Development & Regulation) Act, 1951 which legislates exclusive control of denatured ethanol by the Central Government, reduction in Goods & Service Tax (GST) on ethanol meant for EBP Programme from 18% to 5%, notification of National Policy on Biofuels-2018, scheme for financial assistance to sugar mills for enhancement and augmentation of the ethanol production capacity, allowed multiple feed-stocks viz. B heavy molasses, sugarcane juice, sugar, sugar syrup, damaged food grains,

maize and surplus rice available with Food Corporation of India (FCI) to be used for ethanol production, differential ethanol price based on feed stock utilized for ethanol production, enhanced and remunerative ethanol pricing, long term ethanol procurement policy, framework for setting up ethanol distillation capacities in ethanol deficit states to name the few.

The aforesaid actions helped in increasing ethanol procurement by Public Sector OMCs from 38 crore litres during Ethanol Supply Year (ESY) 2013-14 (December 2013 to November, 2014) to 508.48 crore litres during ESY 2022-23 (December, 2022 to October, 2023). In line with the 'Roadmap for ethanol blending in India 2020-25', OMCs have achieved the target of average 10% and 12% ethanol blending in petrol during Ethanol Supply Year (ESY) 2021-22 and 2022-23 respectively. ESY wise procurement/blending performance are tabulated below:

ESY	Ethanol procurement/blending quantity in crore litres	Blending Percentage (%)
2013-14	38.0	1.53
2014-15	67.4	2.33
2015-16	111.4	3.51
2016-17	66.5	2.07
2017-18	150.5	4.22
2018-19	188.6	5.00
2019-20	173.0	5.00
2020-21	302.3	8.10
2021-22	433.6	10.02
2022-23	508.48	12.06

As per the 'Roadmap for ethanol blending in India 2020-25', the estimated requirement of ethanol to achieve 20% blending in petrol is around 1,016 crore litres during ESY 2025-26. Department of Food and Public Distribution (DFPD), the nodal agency for setting up ethanol distillation capacities in the country, has estimated a requirement of 1,700 crore litres per annum of capacity to meet the EBP requirement and other uses. Interest subvention scheme for augmentation and enhancement of ethanol production capacities has been notified and the process for grant of Environmental Clearance (EC) has also been smoothened. The distillation capacity has increased from 685 crore litres per annum in 2018-19 to over 1,444 crore litres per annum as on 15.03.2024. The ex-mill prices of ethanol produced to be paid to the suppliers from different feedstock for ESY 2022-23 are as under:

Feed Stock	Ethanol Rates (ESY23-24)
Sugar Cane Juice^	65.61[$]
B Heavy Molasses^	60.63[$]
C Heavy Molasses^	56.28*
Damaged Food Grain %	64.00
Surplus Food Grain %	58.50
Maize %	71.86[#]

$ Previous ESY Basic Rates

Incentive 5.79 Rs/Ltr

* Incentive 6.87 Rs/Ltr

^ Price approved by Government

% Price fixed by OMCs

GST and transportation being paid to ethanol suppliers

1.21.2. 2G Ethanol Programme: To augment ethanol supplies, in December, 2014, the Government allowed ethanol procurement from cellulosic and lignocellulosic materials such as rice/ wheat straw, corn cobs, cotton stalk, etc. and petrochemical route. To encourage setting up of 2G Bio-refineries, Government launched a scheme "Pradhan Mantri JI-VAN (Jaiv Indhan-Vatavaran Anukool fasalawashesh Nivaran) Yojana" for providing financial assistance to integrated bio-ethanol projects. Under this scheme, financial assistance of more than ₹ 1,200 crore has been approved to Public and Private Sector Companies for eight commercial Second Generation (2G) bio-ethanol projects and four demonstration 2G ethanol projects. 2G Ethanol plant of IOCL at Panipat has been dedicated to the Nation on 10.08.2022 (World Biofuel Day).



1.21.3. Biodiesel Programme: During the Financial Year 2023-24, OMCs have procured 43.99 crore litres of Biodiesel for blending with Diesel.

1.21.4. Bio-Jet (ATF): The Government has set an indicative target of 1%, 2% and 5% blending of SAF in Aviation Turbine Fuel (ATF) initially for international flights with effect from 2027, 2028 and 2030, respectively. The first commercial flight of India between Pune to Delhi using indigenously produced SAF blend aviation turbine fuel was successfully flown on 19th May 2023. Bio ATF plants are being set up by IOCL, at Panipat (337.2 KLPD) and Mangalore Refinery Petrochemical Limited (MRPL) at Mangalore, (20.2 KLPD).

1.21.5. World Biofuel Day: World Biofuel Day is observed every year on 10th August to create awareness about the importance of non-fossil fuels as an alternative to conventional fossil fuels and to highlight the various efforts made by the Government in the Biofuel sector. The theme for this year was "Biofuels-Fuels for a sustainable future". On the occasion of World Biofuel Day, IndianOil, on the behalf of Oil & Gas Industry, organised a webinar on Biofuels to mark the occasion of World Biofuel day. The commencement of the webinar was marked by the inauguration from Shri Pankaj Jain, the Secretary of MoPNG. During his speech, Secretary, PNG underlined the industry's unwavering commitment to sustainability and responsible environmental practices.

1.21.6. National Biofuel Coordination Committee (NBCC): The 5th meeting of NBCC was held on 24.11.2023 under the chairmanship of Minister, P&NG and following decisions were taken:

a. The indicative blending targets of 1%, 2% and 5% for blending of SAF in ATF by 2027, 2028 and 2030 respectively initially for international flights.

b. Compressed biogas Blending Obligation (CBO) will be voluntary till FY 2024-25 and mandatory blending obligation would start from FY 2025-26. CBO shall be kept as 1%, 3% and 4% of total CNG/PNG consumption for FY 2025-26, 2026-27, and 2027-28 respectively. From FY 2028-29 onwards, CBO will be 5%. A Central Repository Body (CRB) shall monitor and implement the blending mandate based on the operational guidelines;

c. Export of 2G ethanol will be allowed as per Clause 6.3(ii) of the National Policy on Biofuels; and

d. Residual sugar/sugar syrup/sweeteners (beverages, juices etc.) post Best Before Date (BBD) products will be allowed as a feedstock for ethanol production and the pricing of ethanol from these feedstocks may be decided by OMCs.

1.22. Outlay for Ministry of Petroleum & Natural Gas:

The Government is committed to promote petroleum and gas sector throughout the country. Capital expenditure creates employment opportunities through the construction of infrastructure projects and

supporting economic growth and promoting investment. Total budgeted Internal and Extra Budgetary Resources (IEBR) for CPSEs' under the Ministry of Petroleum and Natural Gas in FY 2023-24 was ₹ 1,06,401 crore against which ₹ 1,36,821 crore is the actual expenditure during the April-March, 2023-24 i.e. 128.6% of the budgeted IEBR. The targeted budgeted IEBR for the FY 2024-25 is ₹ 1,18,499 crore.



1.23. Clean fuel access (LPG + PNG)

LPG and PNG put together provide clean fuel for domestic household needs. As part of the initiative to cut India's carbon footprint, government is envisaging a gas-based economy by increasing the share of natural gas in India's primary energy mix from 6.3% to 15% by the year 2030. The push for natural gas has seen the number of households with PNG connections reached to 1.29 crore as on 31st March 2024. Total PNG connections are expected to rise as more cities get city gas service. Piped Natural Gas is safer, cheaper, and more convenient than comparable fossil fuels such as LPG. Uninterrupted availability round the clock and inability to get pilfered are the added advantages that have attracted customers to switch to PNG. Households in India primarily use Natural Gas for cooking.

LPG is a globally recognised clean fuel for cooking and will play a vital role in achieving SDG-7 targets. LPG directly contributes to SDG 3,5,8,9,11,13 and indirectly contributes to remaining 10 SDGs. Since 2014, Government of India is in a mission mode to promote the use of LPG as a clean cooking fuel so as to replace/reduce the usage of traditional fuels such as biomass, wood and kerosene etc. LPG consumption is consequently increasing both in urban and rural areas due to its inherent benefits over traditional cooking fuels. There were 14.51 crore active domestic LPG consumers as on 01.04.2014, which have increased to 32.42 crore as on 31st March 2024.



1.24. Promotion of Digital Payments

There has been a significant expansion of digital payment infrastructure at retail outlets. As on 31.03.2024 there are 81,338 (IOCL-37,473, BPCL-21,841, HPCL-22,024) Retail outlets across the country and all these ROs have been covered with digital infrastructure having 4,91,379 POS terminals and 1,03,224 e-wallet facility. Further, all 81,338 retail outlets are enabled with BHIM UPI. All the LPG Distributors are enabled with BHIM UPI.

1.25. Electric Vehicle Charging Station

In order to increase the electric vehicle charging infrastructure in the country, Oil Marketing companies are putting up Electric Vehicle Charging Stations (EVCS) at their Retail outlets (ROs) in different parts of the country in phased manner based on techno commercial feasibility and compliance of PESO norms. As on 31.03.2024, OMCs have set up 15,800 EV charging stations and 162 Battery Swapping stations at their ROs.

1.26. Market Authorization

Ministry of Petroleum and Natural Gas vide Resolution dated 8.11.2019 revised the guideline for authorization to market transportation fuels i.e. MS & HSD. As on 31.03.2024, there are 8 entities which are authorized to market transportation fuels under the said Resolution.

1.27. Startup India

Under the Startup India initiative of Oil and Gas Sector, proposals/applications are invited

through open advertisements by the individual PSUs for funding and mentoring. The themes for the proposals include leveraging Internet of Things (IoT) in Upstream/ Midstream/ Downstream operations of Oil PSUs, Digitization of business processes, Green Fuels, Alternative Energy, Improved technologies for Hydrocarbon industry besides topics of societal relevance. Before the round of receiving Start-up applications, Oil PSUs also organize Hackathon/ iDEATION challenges periodically for the Start-ups to showcase their talents and provide innovative ideas.

The PSUs under the Ministry of Petroleum and Natural Gas have created startup funds aggregating to ₹ 495 crore. At present, a total no. of 270 Startups are being funded by oil and gas PSUs with disbursed fund value of approximately ₹ 262 crores. Some startups supported by Oil and Gas PSUs have already matured.

1.28. Skill Development

Under Skill India initiative, Hydrocarbon Sector Skill Council (HSSC) was set up under Societies Registration Act, 1860 on 26-04-2016. An MoU for collaboration in the area of skill development was signed between Ministry of Petroleum & Natural Gas and Ministry of Skill Development & Entrepreneurship on 28th November, 2016.

Several high priority trades were identified in consultation with the Industry members for National Occupational Standard (NOS)/ Qualification Pack (QP) development. Till date, 44 QPs have been approved by National Skill Qualification Committee (NSQC).

Skill Development Institutes (SDIs) for hydrocarbon sector have been setup at six cities viz Bhubaneswar, Vizag, Kochi, Ahmedabad, Guwahati and Raebareli. Till March, 2024, more than 34,773 trainees have been trained in these SDIs.

The permanent campus of Skill Development Institute (SDI), Bhubaneswar, which envisages providing world class industry based skill training using state of the art infrastructure and technology to create an industry ready talent pool was dedicated to the Nation on 20th August, 2021.

1.29. PM Gati Shakti in MoP&NG

PM GatiShakti National Master Plan (NMP) launched by the Hon'ble PM on 13th October 2021 is a transformative approach for integrated planning of multimodal connectivity to various economic zones, using technology and innovation. PM GatiShakti is facilitating the development of Next Generation Infrastructure, Ease of Doing Business and Ease of Living. Two key elements of this programme include: (i) a GIS platform that brings together a National Master Plan (NMP) and (ii) an Institutional framework to drive implementation of planning of multimodal infrastructure connectivity on the NMP.

PMGS unlocks seamless transportation and connectivity through diverse modes, including pipelines, addressing last-mile connectivity challenges for petroleum products and natural gas. Leveraging the NMP's information, the Ministry of Petroleum and Natural Gas (MoP&NG) strategically prioritizes infrastructure augmentation and new developments, ensuring last-mile connectivity within defined timeframes.

Vision of PM Gati Shakti

PM Gati Shakti will incorporate the infrastructure schemes of various Ministries and State Governments like Bharatmala, Sagarmala, inland waterways, dry/land ports, UDAN etc. Economic Zones like textile clusters, pharmaceuticals clusters, defence corridors, electronic parks, industrial corridors, fishing clusters, agri zones will be covered to improve connectivity & make Indian businesses more competitive. It will also leverage technology extensively including spatial planning tools with ISRO (Indian Space Research Organisation) imagery developed by BISAG-N

(Bhaskaracharya National Institute for Space Applications and Geoinformatics)



In Similar lines of PMGS institutional mechanism, working framework has been constituted in MoP&NG for ensuring effective implementation of PMGS within the ministry and attached PSUs:-

a. **GatiShakti Cell:** Under the chairpersonship of DDG (E&S) constituted to oversee the implementation of GatiShakti in MoP&NG.

b. **GatiShakti Core Team:** GM &above level officers from each CPSE nominated to monitor and implementation of GatiShakti in respective Entity.

c. **Technical Support Team:** Consists of Technical Experts. Framed To assist GatiShakti Cell & Nodal Officers in development and implementation of GatiShakti initiative in MoP&NG.

After creating initial framework, to harness full potential of this platform MoP&NG has developed various tools and also used it for planning of projects, some of which are:

- **Development of URJA SURAKSHA SAMANVAY Portal**

  In pursuit of optimizing Exclusive Economic Zone (EEZ) usage and ensuring the safety of Exploration and Production (E&P) operators, MoPNG developed the GIS-based URJA SURAKSHA SAMANVAY Portal. By leveraging mapped data on the PMGS-NMP portal, the USS portal reduces No-Go areas, opening 99% of the EEZ for concurrent usage by all agencies adhering to protocols. The USS portal enables co-existence in EEZ through seamless inter-ministerial coordination & provides boost to our blue economy and energy security. With the help of the portal, restriction has been eased for E&P Operations from about 10 lakh sq. km. of offshore areas in EEZ.

- **Electronic-Detailed Route Survey (e-DRS) Tool**

  A detailed route survey is a prerequisite for the planning and execution of any pipeline project. However, this is a time-consuming and complex process with tasks requiring identifying the terrain, soil composition coordination with multiple agencies etc.

  To streamline the traditionally time-consuming pipeline route survey process, MoP&NG developed the e-DRS tool. Leveraging existing updated data from the PM GatiShakti NMP Portal, this tool significantly reduces the time required for detailed route survey reports, offering real-time data on surface features, cadastral maps, crossing details, RoU acquisition and revenue details, crop and soil types, and population density along the route. The tool's efficiency translates to substantial financial savings in pipeline construction.

  This real-time data availability and efficiency in generating approx. 50 reports can lead to significant financial savings up to ₹ 25,000 per kilometre in pipeline construction.

  e-DRS tool was used for verification of survey reports of New Mundra-Panipat pipeline of IOCL, Gurdaspur-Jammu Pipeline and newly announced Siliguri-Jhapa product pipeline (SJPL). During planning of SJPL, substantial forest stretch was avoided using NMP.-DRS tool was used for verification of survey reports of New Mundra-Panipat pipeline of IOCL, Gurdaspur-Jammu Pipeline and newly announced Siliguri-Jhapa product pipeline (SJPL). During planning of SJPL, substantial forest stretch was avoided using NMP.

  - Comprehensive Desktop Analysis of 16 Coal Bed Methane (CBM) blocks offered under Special CBM Bid Round-2022
  - Route Optimisation of the Indian section of Indo-Nepal Pipeline namely Siliguri Jhapa Product Pipeline

MoP&NG has achieved significant progress in adopting PM GatiShakti initiative. MoP&NG Portal of PM GatiShakti has been developed as a first instance which has integration with the Main NMP Platform. In MoP&NG PM GatiShakti Portal, total 9 layers and 23 sublayers are finalised in consultation with MoP&NG GatiShakti Cell and Core Team. Standard Data Base Structure i.e. Definition of layers, sub-layers, attributes and Metadata has been created. For maintaining data quality on NMP, a three-tier validation mechanism (Maker, Checker and Approver) is in place. Standard Operating Procedure (SOP) for Quality Improvement Programme (QIP) has been finalized shared with stakeholders. PMGS NMP Portal User Manual has been prepared and uploaded on NMP dashboard. More than 1 lakh assets and 1 lakh km of pipelines pertaining to PNG sector have been meticulously mapped on the NMP which corresponds to nine layers and 23 sub-layers.

MoP&NG has taken proactive steps in onboarding stakeholders for PM GatiShakti, with cell members attending regional workshops conducted by DPIIT. Frequent brainstorming sessions are being conducted. Multiple Sensitization workshops for Nodal Officers and the Technical Support Team at BISAG-N have been organized, supplemented by in-house training sessions. The cumulative efforts have resulted in the training of more than 300 officers, to date, which is continuously increasing. All the CPSEs have been advised to include PMGS in their annual training calendar for executive cadre.

In line with the Area Development approach under PM GatiShakti, MoPNG identified Nagapattinam-a coastal district of Tamil Nadu where Cauvery Basin Refinery and Petrochemical Limited (CBRPL) Refinery of 9 MMTPA and associated pipelines project with CAPEX of approx. ₹ 40,000 crores is under progress. Nagapattinam possess high potential for industrialization with opportunity to develop the district as Petroleum, Chemicals and Petrochemicals Investment Region (PCPIR). Various infrastructure projects such as Port development, Railways siding, widening of existing national and State Highways for transportation of heavy equipment, Schools, Aanganwadi Centres-PHC, CHC, MSME centres, skill development centres, ITIs, Hospitals, Tourism & hospitality etc. has been identified.

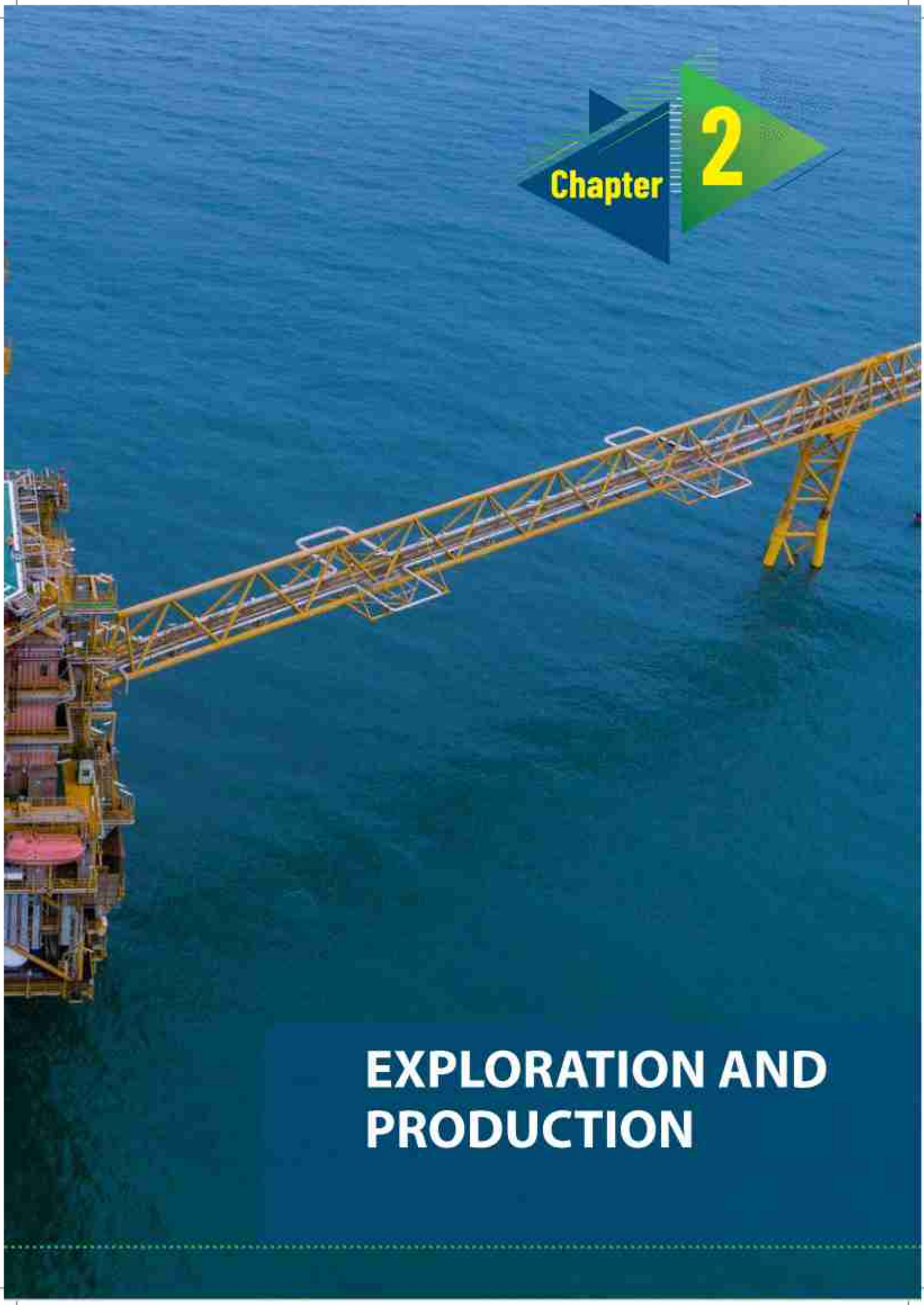
1.30. MoP&NG Monitoring Dashboard, 2019

The Monitoring dashboard of MoP&NG known as MoP&NG Pariyojana portal was launched in 2019 for online monitoring and analysis of various KPIs pertaining to exploration and production performance of Nomination and PSC/RSC/CBM regime. Furthermore, the MoP&NG Pariyojana portal was integrated via API with the monitoring systems of all the oil and gas CPSEs/Organizations of MoP&NG in first quarter of 2023 for automatically generating Production Performance in Oil and Gas Sector report pertaining to Oil and Gas Production, CAPEX report, Swachhata Action report etc. The MoP&NG Monitoring Dashboard i.e. MoP&NG Pariyojana portal was also integrated via API with the NIP portal in last quarter of 2023 to facilitate automatic data transfer from the MoP&NG Pariyojana portal to the NIP portal.






PLOP



EXPLORATION AND PRODUCTION

2 Exploration and Production

2.1. Context/Background

2.1.1. The Directorate General of Hydrocarbons (DGH) was established under the administrative control of Ministry of Petroleum and Natural Gas (MoP&NG) by Government of India Resolution in 1993. The objective of setting up of DGH was to promote sound management of the Indian oil and natural gas resources having a balanced regard for environment, safety, technological and economic aspects of petroleum activity. In addition, DGH has been strengthened with certain responsibilities concerning the Production Sharing Contracts (PSCs) for Discovered fields/Exploration blocks, promotion of investment through implementation of policies including Discovered Small Field Policy, Hydrocarbon Exploration & Production Policy (HELP) and monitoring of E&P activities.

2.2. Sedimentary Basins in India

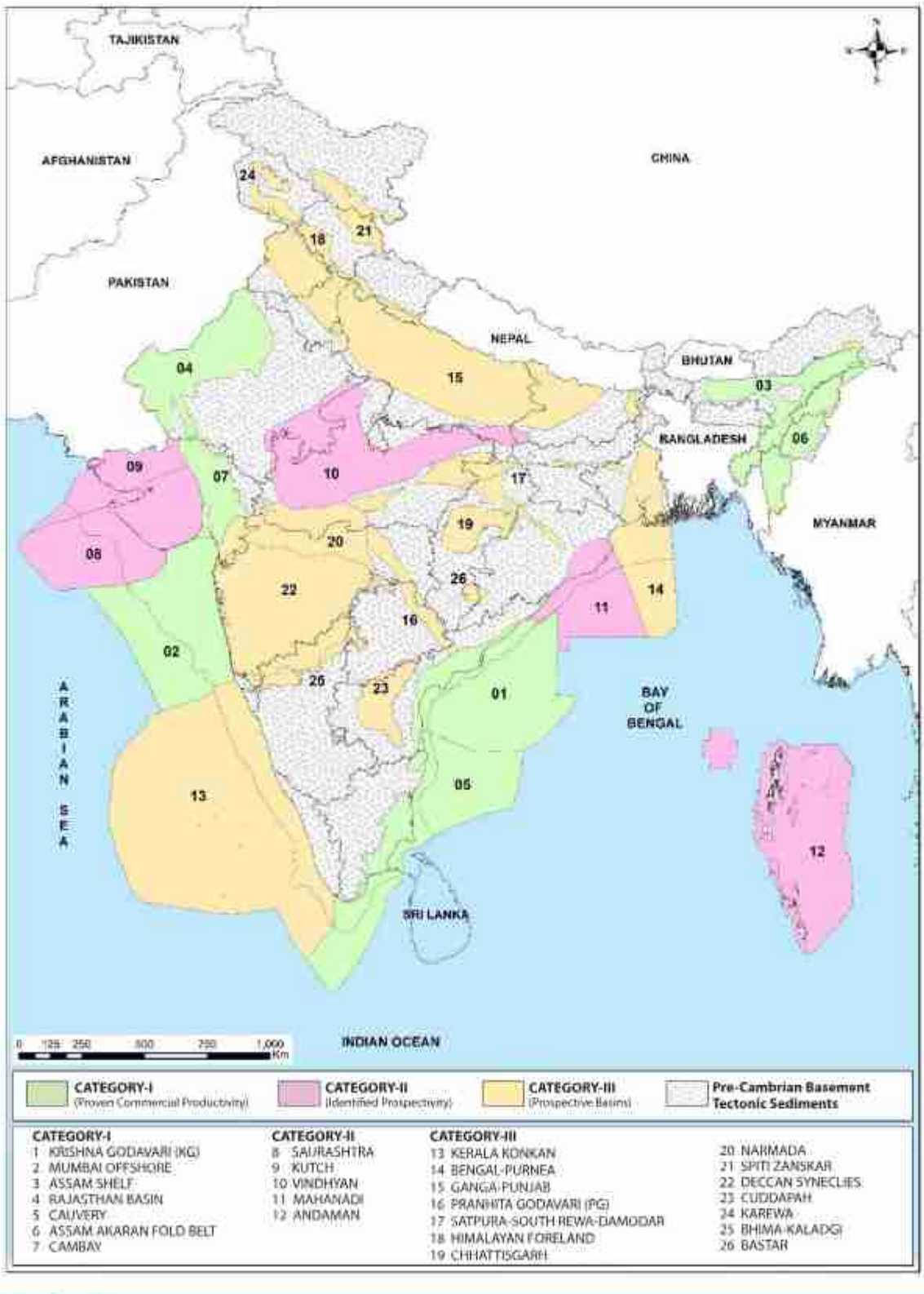
2.2.1. India has 26 sedimentary basins covering an area of 3.36 million square kilometres. The onland sedimentary basins of India have an acreage of about 1.63 million square kilometres; offshore sedimentary basins, upto the 400 meters isobath have an aerial extent of about 0.41 million square kilometres and in the deepwater beyond 400 meters isobath, the sedimentary area has been estimated to be about 1.32 million square kilometres.

2.2.2. The Indian sedimentary basins have been broadly divided into three categories based on their degree of prospectivity as presently known which is as under:

TABLE 2.1: CATEGORIES OF INDIAN SEDIMENTARY BASINS

Type of Basins	Area (Sq. Km.)	Hydrocarbons Prospectivity	Basins/ Region
Category-I (7 Basins)	9,98,325	Established commercial production	Cambay, Assam Shelf, Mumbai Offshore, Krishna Godavari, Cauvery, Assam Arakan Fold Belt and Rajasthan
Category-II (5 Basins)	7,80,974	Discovered accumulation of hydrocarbons but no commercial production as yet	Kutch, Mahanadi-NEC & Andaman-Nicobar, Vindhyan, Saurashtra
Category-III (14 Basins)	15,86,150	No known accumulation of hydrocarbon yet. Prospective by analogy	Himalayan Foreland, Ganga, Kerala-Konkan-Lakshadweep, Bengal, Karewa, Spiti-Zanskar, Satpura-South Rewa Damodar, Narmada, Deccan Syneclise, Bhima-Kaladgi, Cuddapah, Pranhita-Godavari, Bastar, Chhattisgarh
Total	**33,65,449**		

INDIAN SEDIMENTARY BASIN



2.2.3. Crude oil and Natural Gas production in the country is mainly confined to Category-I sedimentary basins. In addition, significant quantity of petroleum resources has been established in five category-II basins, however production is yet to commence from these basins. The distribution of total Indian sedimentary area of 3.36 million square kilometre under different categories is presented as under:



2.3. Estimated Resources of Crude Oil and Natural Gas Conventional Hydrocarbon Resources

2.3.1. The prognosticated conventional hydrocarbon resources in 26 sedimentary basins of the country are of the order of 41.87 billion tonnes (oil and oil equivalent of gas), which is about 49% increase as compared to earlier estimates of 28.08 billion tonnes. The basin-wise details are as under:

TABLE 2.2: ESTIMATED HYDROCARBON RESOURCES IN INDIA

Basin Category	No.	Basin Name	Prognosticated Resource (MMTOE) Estimate (2017)	Total Area, Sq. km.	Active Area (PEL/PML), Sq. Km.
Category I (Basins with reserves being produced and Exploited)	1	Assam Arakan Fold Belt	1,632.80	80,825	16160.5
	2	Assam Shelf	6,001.20	56,000	30057.67
	3	Cambay	2,585.60	53,500	0340.592
	4	Cauvery	1,964.40	2,40,000	20904.42
	5	Krishna Godavari	9,554.50	2,30,000	19354.813
	6	Mumbai Offshore	9,646.00	2,12,000	57542.66
	7	Rajasthan	4,126.00	1,26,000	24221.2
Category I Total			**35,510.50**	**9,98,325**	**1,88,582**
Category II (Basins with contingent resources to be developed and monetized)	8	Andaman	371.4	2,25,918	23262
	9	Kutch	898.4	58,554	13779
	10	Mahanadi	650.6	99,500	28609.73
	11	Saurashtra	1,325.20	1,94,114	10882.6
	12	Vindhyan	632.5	2,02,888	13722
Category II Total			**3,878.10**	**7,80,974**	**90,255**
Category III (Basins with only prospective resources to be explored and discovered)	13	Bastar	1.3	5,360	
	14	Bengal	828.3	1,21,914	17428
	15	Bhima-Kaladgi	3.2	14,100	
	16	Chhattisgarh	25	32,000	
	17	Cuddapah	5.1	40,100	3306
	18	Deccan	11	2,37,500	
	19	Ganga	128.4	3,04,000	2428
	20	Himalayan Foreland	44.4	30,110	666
	21	Karewa	4	6,671	
	22	Kerala Konakan	1,244.60	5,80,000	11350
	23	Narmada	18	95,215	2999
	24	Pranhita Godavari	95.4	30,000	
	25	Satpura-S.Rewa-Damodar	63	57,180	906
	26	Spiti-Zanskar	11.1	32,000	
Category III Total			**2,482.80**	**15,86,150**	**39,083**
Total (MMTOE)			**41,871.40**	**33,65,449**	**3,17,920**

2.3.2. Country's Reserves (2P) and Resources (2C) as on 01.04.2024: E&P operating regimes in the country, namely Nomination, Production Sharing Contract (PSC), Open Acreage Licensing Policy (OALP), Discovered Small Fields (DSF), and Coal Bed Methane (CBM) for conventional and unconventional hydrocarbon reserves. As on 01.04.2024, the Operators have reported recoverable (2P+2C) reserves and resources of about 671 MMT of crude oil and 1,130 BCM of natural gas at the country level. The reserves and contingent resources status of the country across regimes is provided at Table 2.3.

The reported contingent resources (2C) at the country level are significantly high and need to be prioritized by new or re-development projects within a defined timeframe.

TABLE 2.3: HYDROCARBON RESERVES STATUS, AS OF 01.04.2024

Regime	2P In -Place		2P EUR		Accretion during 2023-2024		Reserves (2P)		Contingent Resources(2C)	
	Oil + Cond. (MMT)	Gas (BCM)	Oil + Cond. (MMT)	Gas (BCM)	Oil+ Cond. (MMT)	Gas (BCM)	Oil+ Cond. (MMT)	Gas (BCM)	Oil+ Cond. (MMT)	Gas (BCM)
Nomination (ONGC & OIL)	6209.4	2761.8	1697.6	1421.0	9.3	10.7	361.9	374.8	110.2	289.4
PSC	956.1	770.8	229.9	346.9	3.8	19.7	67.1	187.3	121.1	106.7
DSF	63.8	91.6	5.4	24.5	1.2	6.3	5.3	24.1	5.0	19.1
OALP	6.2	34.1	0.00	0.00	0.0	0.0	0.00	0.00	0.9	20.1
CBM*	0.00	342.7	0.00	63.7	0.00	-1.2	0.00	57.2	0.00	15.4
Grand Total	**7,235.4**	**4,001.1**	**1,933.0**	**1,856.1**	**14.2**	**35.6**	**434.3**	**643.4**	**237.1**	**450.8**

2.3.3. Unconventional Hydrocarbon Resources (CBM): The estimated CBM resources are of the order of 2,600 Billion Cubic Metres (BCM) or 91.8 Trillion Cubic Feet (TCF) spread over in 11 States in the country. The State-wise details of CBM resources are as under:



ONGC OEC Shed

TABLE 2.4: STATE WISE DISTRIBUTION OF COAL BED METHANE RESOURCES IN INDIA

No.	State	Estimated CBM resources (in BCM)	Estimated CBM resources (in TCF)	GIIP (in TCF)
1	Jharkhand	722.08	25.5	1.92
2	Rajasthan	359.62	12.7	0
3	Gujarat	351.13	12.4	0
4	Odisha	243.52	8.6	0
5	Chhattisgarh	240.69	8.5	0
6	Madhya Pradesh	218.04	7.7	3.65
7	West Bengal	218.04	7.7	4.85
8	Tamil Nadu	104.77	3.7	0
9	Telangana & Andhra Pradesh	99.11	3.5	0
10	Maharashtra	33.98	1.2	0
11	North east	8.50	0.3	0
	Total CBM Resource	**2,599.48**	**91.8**	**10.42**

* Conversion factor: 1 cubic metre = 35.3147 cubic feet

2.3.4. Shale Gas/Oil Resource

1. Shale gas/oil is a form of natural gas/oil that remain unexpelled, unmigrated, and entrapped within the pore space and fractures of a source rock (commonly, shale). They are categorized as an unconventional resource due to their nature of occurrence and method of extraction.

2. It is estimated that a number of sedimentary basins (Gangetic plain, Gujarat, Rajasthan, Andhra Pradesh and other coastal areas) in India, including the hydrocarbon bearing ones-Cambay, Assam-Arakan and Damodar estimates of shale gas and oil are prospective from shale oil and gas point of view. Since 2011, various agencies such as United States Geological Survey (USGS), Central Mine Planning and Design (CMPDI) and ONGC have carried out studies for shale gas reserve estimation in the country.In order to understand the prospectivity and untap the Shale Gas and Oil resource potential in India, GoI announced a Shale gas and Oil exploration policy on 14th October 2013 for the National Oil Companies (NOCs), ONGC, and OIL. Under the Shale Gas Policy-2013, ONGC identified 50 blocks in 4 basins while OIL identified 6 blocks in 2 basins A total of 34 Shale wells were drilled (30 by ONGC & 4 by OIL) in their nomination areas, however, the prospectivity of Shale Gas/oil couldn't be established.

2.3.5. Re-assessment of Hydrocarbon Resources

For updated estimation of hydrocarbon resource potential in the country, re-assessment of hydrocarbon resources for all 26 sedimentary basins in the country was completed in 2017 almost after two decades of earlier estimation. This resulted in prognosticated conventional hydrocarbon resources of the order of 41.87 billion tonnes (oil and oil equivalent of gas), which is about 49% increase as compared to earlier estimate of 28.08 billion tonnes.

2.4. Crude oil and Natural Gas Production

2.4.1. Crude oil production in FY 2023-24 is about 29.34 MMT. About 77% of crude oil is by ONGC and OIL from nomination regime (excluding JV share) and remaining 23% of crude oil production is by Private/JV companies from PSC regime.

2.4.2. In FY 2023-24, the share of offshore crude oil production is about 51%. The remaining onland crude oil production was from mainly Andhra Pradesh, Arunachal Pradesh, Assam, Gujarat, Rajasthan, Tamil Nadu, West Bengal etc. The details of crude oil production in FY 2023-24 and last 6 years are as under:

TABLE 2.5: STATE-WISE CRUDE OIL PRODUCTION TRENDS (MMT)

Location Type	State/ Location	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Offshore	Eastern Offshore	0.83	0.65	0.56	0.74	0.63	0.55	1.46
	Gujarat Offshore	0.40	0.74	0.59	0.41	0.34	0.38	0.33
	Western Offshore	16.92	15.48	14.85	14.24	13.60	13.55	13.24
Offshore Total		**18.14**	**16.87**	**16.00**	**15.39**	**14.57**	**14.48**	**15.03**
Share of PSUs		**16.24**	**14.97**	**14.54**	**14.24**	**13.62**	**13.54**	**13.21**
Share of Private/JVs		**1.91**	**1.90**	**1.47**	**1.15**	**0.95**	**0.94**	**1.82**
Onland	Andhra Pradesh	0.30	0.30	0.24	0.19	0.20	0.24	0.25
	Arunachal Pradesh	0.05	0.04	0.06	0.05	0.05	0.05	0.05
	Assam	4.34	4.31	4.09	3.90	3.99	4.16	4.36
	Gujarat	4.59	4.63	4.71	4.65	4.63	4.85	4.95
	Rajasthan	7.89	7.67	6.65	5.89	5.89	5.07	4.42
	Tamil Nadu	0.35	0.40	0.42	0.41	0.37	0.32	0.29
	Tripura	0.003	0.003	0.003	0.003	0.003	0.003	0.002
	West Bengal	0.000	0.000	0.000	0.00010	0.00010	0.000008	0
Onland Total		**17.520**	**17.340**	**16.170**	**15.100**	**15.133**	**14.699**	**14.329**
Share of PSUs		**9.36**	**9.37**	**9.20**	**8.87**	**8.82**	**9.11**	**9.35**
Share of Private/JVs		**8.15**	**7.97**	**6.97**	**6.23**	**6.30**	**5.59**	**4.98**
Grand Total		**35.66**	**34.20**	**32.17**	**30.49**	**29.69**	**29.18**	**29.36**
Share of PSUs		**25.60**	**24.34**	**23.73**	**23.11**	**22.44**	**22.65**	**22.56**
Share of Private/JVs		**10.06**	**9.87**	**8.44**	**7.39**	**7.25**	**6.53**	**6.80**

2.4.3. **Natural Gas production** in 2023-24 is about 36.438 BCM. About 61.5% of natural gas production is by ONGC and OIL from nomination regime (excluding JV share) and remaining 38.5% of natural gas production was by Private/JV companies from PSC regime.

2.4.4. The share of offshore natural gas production in FY 2023-24 is about 63%. The remaining natural gas production including CBM was from 10 States viz., Andhra Pradesh, Arunachal Pradesh, Assam, Gujarat, Rajasthan, Tamil Nadu, Tripura, Jharkhand, Madhya Pradesh and West Bengal. The details ofNatural gas production in 2023-24 and last 6 years are as under:

TABLE 2.6. STATE-WISE NATURAL GAS PRODUCTION TRENDS (MMSCM)

Location Type	State/ Location	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Offshore	Eastern Offshore	2816.7	2458.9	1823.1	1621.5	7024.8	7999.99	10823.6
	Gujarat Offshore	97.7	122.2	128.7	147.6	163	231.93	214.375
	Western Offshore	19096.2	19535.9	18683.6	16659.9	15681.1	15176.6	14833.12
Offshore Total		**22,010.6**	**22,117.1**	**20,635.4**	**18,429.1**	**22,868.9**	**23,408.6**	**25,871.09**
Share of PSUs		**17,791.2**	**19,041.8**	**18,576**	**17,086.4**	**15,942.9**	**15,325.02**	**14,978.61**
Share of Private/JVs		**4,219.5**	**3,075.3**	**2,059.4**	**1,342.6**	**6,926**	**8,083.60**	**10,892.48**
Onland	Andhra Pradesh	955.9	1076.5	906.1	827.5	808.6	709.694	721.9115
	Arunachal Pradesh	29.5	27.8	45.6	55.4	57.7	53.314	39.634
	Assam	3219	3289.1	3141.2	2995.4	3371.5	3557.47	3489.19
	Gujarat	1606.7	1402.2	1347.7	1138.4	1017.3	923.242	926.01
	Rajasthan	1436.4	1483.2	1882.5	2039.7	2618.8	2340.15	2198.923
	Tamil Nadu	1207.2	1207.9	1096.7	910.9	1066.5	1109.45	1015.771
	Tripura	1440.4	1554.3	1472.8	1633.8	1530.8	1674.94	1524.863
Onland-CBM	Jharkhand	4	3.6	4.6	1.7	4	10.095	5.371
	Madhya Pradesh	199.8	356.7	344.9	333.7	290.1	263.93	234.16
	West Bengal	531.1	350.2	305.9	307	389.2	399.421	410.947
Onland Total		**10,629.9**	**10,751.5**	**10,547.9**	**10,243.4**	**11,154.6**	**11,041.7**	**10,566.78**
Share of PSUs		**8,511**	**8,350**	**7,837.5**	**7,265.3**	**7,578.3**	**7,685.2**	**7,427.5**
Share of Private/JVs		**2,118.9**	**2,401.5**	**2,710.4**	**2,978.1**	**3,576.3**	**3,356.5**	**3,139.28**
Grand Total		**32,640.5**	**32,868.6**	**31,183.3**	**28,672.4**	**34,023.5**	**34,450.3**	**36,437.87**
Share of PSUs		**26,302.2**	**27,391.8**	**26,413.6**	**24,351.7**	**23,521.2**	**23,010.2**	**22,406.12**
Share of Private/JVs		**6,338.3**	**5,476.8**	**4,769.8**	**4,320.7**	**10,502.3**	**11,440.1**	**14,031.75**

2.4.5. The CBM production of the country is 650 MMSCM in FY 2023-24. Commercial production of CBM in India has commenced w.e.f July, 2007 in Raniganj (South) block in West Bengal. CBM production in the Raniganj (South) block is about 0.25 MMSCMD in March, 2024. Another three blocks, Raniganj (East) block operated by ESSAR is producing at the rate of 0.91 MMSCMD and Jharia and Bokaro operated by ONGC is producing at the rate of 0.008 MMSCMD. CBM production of Sohagpur (West) operated by RIL is about 0.66 MMSCMD and that of Sohagpur (East) is about 0.003 MMSCMD. Thus, CBM production from 6 blocks in the country is about 1.83 MMSCMD in March, 2024 which includes test gas from 1 block and commercial production from 5 blocks.

2.5. Indian Sedimentary Area

Onland area covers 1.63 Million sq. km. (48.5%) and Offshore area covers 1.73 Million sq. km. As of now, 72.8% of the basinal areas have been appraised. About 1.6% sedimentary basinal area

has been declared as "NO GO area" by Ministry of Defence/Ministry of Environment & Forest which remains unapprised. This means, about half of the Indian sedimentary basins have the undiscovered potential of hydrocarbons.

2.6. Blocks Awarded for Exploration and Production

2.6.1. Government of India signed 310 Production Sharing Contracts (PSC) including 29 discovered fields, 28 exploration blocks under pre-NELP Exploration Blocks and 254 blocks under NELP regime. Also 85 RSCs have been signed under three DSF Bidding Rounds (Discovered Small Field) involving 85 Contract Areas. Under HELP, in OALP, Bid Round I to VIII 144 RSCs have been signed. At present, out of 310 PSCs & 229 RSCs signed so far under various bidding rounds (Discovered Field, Pre-NELP, NELP, HELP and DSF), 62 PSCs and 188 RSCs are currently operational.

2.6.2. There have been different regimes according to which blocks/acreages have been awarded/ granted to companies (PSUs and Private). A brief overview of different E&P regimes are given below:

a). **Nomination Basis:** Acreages for exploration and production were granted to National Oil Companies viz. Oil and Natural Gas Corporation Ltd (ONGC) and Oil India Ltd. (OIL) on nomination basis prior to implementation of NELP.

b). **Pre-NELP Discovered Field:** Government offered Contract Areas of small/medium sized discovered fields (proven reserves were discovered by ONGC and OIL) to the private sector in August 1992. Government of India has signed 28 contracts for 29 discovered fields under Pre-NELP Discovered (Small and Medium size fields) regime.

c). **Pre-NELP Exploration Blocks:** 28 Exploration Blocks were awarded to private companies between 1990 and prior to implementation of NELP where ONGC and OIL had the rights for participation in the block after hydrocarbon discoveries.

d). **New Exploration Licensing Policy (NELP)-1999 onwards:** Under NELP, exploration blocks were awarded to Indian Private and foreign companies through international competitive bidding process where National Oil Companies viz, ONGC and OIL also competed on equal footing.

e). **Discovered Small Field (DSF) Policy:** Under Discovered Small Field Policy, Government has awarded 85 Contract areas, DSF-I, DSF-II & DSF-III Bid Rounds, based on Revenue Sharing Model.

f). **Hydrocarbon Exploration & Licensing Policy:** Under Hydrocarbon Exploration & Licencing Policy (HELP), Government has awarded 144 Exploratory Blocks on Revenue Sharing basis, in Eight bidding rounds, till March 2024.

2.7. Petroleum Exploration Licence (PEL) and Petroleum Mining Lease (PML)

2.7.1. Under Nomination regime, ONGC is operating in 5 PEL and in 329 PML blocks covering an area of about 49,084.8 sq. km. In addition, OIL is operating 1 PEL and 25 PML fields under nomination regime covering an area of 4,852.14 sq.km. The basin-wise details of PEL/PML operated by ONGC and OIL are as under:

TABLE 2.7. BASIN-WISE PEL & PML UNDER NOMINATION REGIME (ONGC) AS ON 31.03.2024

Basin	Nomination			
	PEL		PML	
	Acreages	Area (sq.km.)	Acreages	Area (sq.km.)
Assam-Arakan (Cachar+Mizoram)	0	0	8	818
Assam-Arakan (Tripura)	0	0	18	3045
Assam Shelf +Nagaland	3	1583	39	1477
Bengal	0	0	0	0
Cambay	0	0	160	5677
Kutch Onland	0	0	0	0
Saurashtra			0	0
Cauvery (On)	0	0	26	3956
Ganga Valley	0	0	0	0
Purnea	0	0	0	0
Himalayan Foreland	0		0	0
Krishna-Godavari (On)	0	0	37	4289
Palar	0	0	0	0
Jharkhand			0	0
Jaisalmer	0	0	4	838
Bikaner-Nagaur			0	0
Vindhyan	0	0	0	0
Satpura-South Reva-Damodar			0	0
Narmada			0	0
Total Onland	**3**	**1,583**	**292**	**20,099**
Mumbai Offshore (SW)	0	0	27	25794
Mumbai Offshore (DW)	1	985	0	0
Mumbai Offshore (SW+DW)	1	985	27	25794
Kerala-Konkan (SW)	0	0	0	0
Kerala-Konkan (DW)	0	0	0	0
Kerala-Konkan (SW+DW)	**0**	**0**	**0**	**0**
Kutch (SW)	0	0	0	0
Kutch (DW)	1	420	0	0
Kutch (SW+DW)	**1**	**420**	**0**	**0**
Saurashtra (SW)	0	0	2	422
Saurashtra (DW)	0	0	0	0
Saurashtra (SW+DW)	**0**	**0**	**2**	**422**

Gulf of Cambay (SW)	0	0	0	0
Gulf of Cambay (DW)	0	0	0	0
Gulf of Cambay (SW+DW)	**0**	**0**	**0**	**0**
Total W. Offshore (SW)	**0**	**0**	**29**	**26,216**
Total W. Offshore (DW)	**2**	**1,405**	**0**	**0**
Total W. Offshore (SW+DW)	**2**	**1,405**	**29**	**26,216**
Krishna-Godavari (SW)	0	0	5	357
Krishna-Godavari (DW)	0	0	2	224
Krishna-Godavari (SW+DW)	**0**	**0**	**7**	**581**
Cauvery (SW)	0	0	1	11
Cauvery (DW)	0	0	0	0
Cauvery (SW+DW)	**0**	**0**	**1**	**11**
Bengal Offshore (SW)			0	0
Bengal Offshore (DW)			0	0
Bengal Offshore (SW+DW)	**0**	**0**	**0**	**0**
Mahanadi (SW)	0	0	0	0
Mahanadi (DW)	0	0	0	0
Mahanadi (SW+DW)	**0**	**0**	**0**	**0**
Andaman (SW)	0	0	0	0
Andaman (DW)	0	0	0	0
Andaman (SW+DW)	**0**	**0**	**0**	**0**
Total E. Offshore (SW)	**0**	**0**	**6**	**368**
Total E. Offshore (DW)	**0**	**0**	**2**	**224**
Total E. Offshore (SW+DW)	**0**	**0**	**8**	**592**
Total Offshore (SW)	**0**	**0**	**35**	**26,583**
Total Offshore (DW)	**2**	**1,405**	**2**	**224**
Total Offshore	**2**	**1,405**	**37**	**26,807**
Total ONGC	**5**	**2,988**	**329**	**46,907**

TABLE 2.8: BASIN-WISE PEL & PML UNDER NOMINATION REGIME (OIL) AS ON 31.03.2024

Company/ Operator	Basin		PEL		PML		Total	
			No.	Area (Km^2)	No.	Area (Km^2)	No.	Area (Km^2)
OIL - Nomination	Rajasthan	onland	-	-	2	446.71	2	446.71
	Assam-Arakan	onland	1	23.3	23	4382.13	24	4405.43
Total-OIL			**1**	**23.3**	**25**	**4,828.84**	**26**	**4,852.14**

2.7.2. Private/JV companies under PSC regime are operating 24 PEL and 65 PML blocks covering an area of 29,664 sq.km. The basin-wise details of PEL/PML operated by private/JV companies are as under:

TABLE 2.9: BASIN-WISE PEL & PML WITH PRIVATE /JOINT VENTURE COMPANIES UNDER PSC REGIME AS ON 31.03.2024

Basin	Sum of Nos of PEL	Sum of No of PML	Sum of Present PEL Area	Sum of Present PML Area
Assam-Arakan Fold Belt	1	0	3213	0
Assam-Arakan Shelf	6	4	5713.55	263.43
Bengal-Purnea	1	0	2364	0
Cambay	4	47	258.19	1287.766
Cauvery	0	2	266.8	156
Krishna Godavari	2	12	2075.87	2388.03
Mahanadi	1	0	831.73	0
Mumbai	2	0	1215.66	0
Rajasthan	0	4	0	3287.17
Saurashtra	1	0	552	0
Vindhyan	1	0	462	0
Grand Total	**19**	**69**	**16,952.8**	**7,382.396**

TABLE 2.10: BASIN-WISE PML WITH PRIVATE /JOINT VENTURE COMPANIES UNDER DSF AS ON 31.03.2024

Basin	No. of PMLs	PML Area, sq.km.
Assam- Arakan fold belt	3*	638
Assam Shelf	9**	189
Bengal-Purnea	1	541
Cambay	10	1193
Krishna Godavari	11	1703
Kutch	2	2092
Mumbai	16	6285
Rajasthan	3	167
Total	**55**	**12,808**

* 2 PMLs for DSF-III Contract Area AA/ONDSF/PATHARIA/2021 & AA/ONDSF/TUKBAI/2021 is granted but it will be effective once PML deed is signed.

** 1 PML for DSF-III Contract Area AA/ONDSF/TIPHUK/2021 is granted but it will be effective once PML deed is signed.

2.7.3. Status of grant of Petroleum Exploration Licence (PELs) as on 31.03.2024

A total of 177 PEL were to be granted in 144 blocks awarded in Eight OALP bid rounds. A total of 156 PELs for an area of 2,25,978 sq.km have been granted till 31.03.2024. Summary of status of PELs is as under:

TABLE 2.11: BID ROUND WISE STATUS OF PEL UNDER OALP AS ON 31.03.2024

OALP Bid Round	Total No. of PELs	PEL Granted	PEL Pending	PEL Denied	PEL not applied	PEL Granted Area, Sq.Km
OALP I	76	66	2	8**		55518
OALP II	18	17	1	0		28,394
OALP III	21	15	2	4**		22,731
OALP IV	7	7	0	0		18,510
OALP V	13	13	0	0		19,789
OALP VI	24	22	2	0		32,347
OALP VII	8	8	0	0		15,766
OALP VIII	10	8	1	0	1***	32,976
Total	**177**	**156**	**8**	**12**	**1**	**2,26,031**

*Some of the awarded blocks falls under the jurisdiction of multiple states hence the number of PELs are more than the number of awarded blocks.
** Due to Non-grant of PEL in the State of Tamil Nadu, Puducherry & Andhra Pradesh, the Block/Part Area is surrendered by the Contractor.

TABLE 2.12: BASIN WISE STATUS OF PEL UNDER OALP AS ON 31.03.2024

OALP Bid Round	Total No. of PELs	PEL Granted	PEL Pending	PEL Denied	PEL not applied	PEL Granted Area, Sq.Km
Andaman-Nicobar	6	6	0	0		23,262
Assam Arakan Fold Belt	17	16	1	0		4,041
Assam Shelf	31	29	2	0		20,832
Bengal-Purnea	6	5	1	0		14,523
Cambay	26	24	2	0		11,925
Cauvery	15	6	2	7**		16,515
Cuddapah	1	1	0	0		3,306
Ganga-Punjab	4	4	0	0		2,428
Himalayan Foreland	1	1	0	0		666
Kerala Konkan	3	3	0	0		11,350
Krishna Godavari	10	4	0	5*	1***	8,318
Kutch	9	9	0	0		11,267
Mahanadi	10	10	0	0		27,778
Mumbai Offshore	9	9	0	0		23,263
Narmada	2	2	0	0		2,999
Rajasthan	16	16	0	0		19,482
Satpura-South Rewa-Damodar	1	1	0	0		906
Saurashtra	5	5	0	0		9,909
Vindhyan	5	5	0	0		13,260
Total	**177**	**156**	**8**	**12**	**1**	**2,26,031**

Some of the Basins cover multiple jurisdiction such as Onshore/Offshore or multiple states
*5 PEL denied by Tamil Nadu/Puducherry, Operator Surrendered the area/Block.
** Due to Non grant of 7 PELs comprising the States Tamil Nadu, Andhra Pradesh and Puducherry, Operator Surrendered the Block.
*** Operator has not applied PEL as per RSC till date.

2.8. Exploratory Efforts by ONGC and OIL under Nomination Regime

ONGC and OIL have carried out 9,17,494 line kilometre (LKM) of 2D seismic survey 1,48,242 sq. km. of 3D seismic survey and drilled 6871 exploratory wells since inception as on 31.03.2024. The details of exploratory efforts in terms of 2D, 3D seismic and exploratory wells made by ONGC and OIL in the Nomination regime are as under:

TABLE 2.13: EXPLORATORY INPUTS BY ONGC AND OIL UNDER NOMINATION REGIME

Sr. No.	Company	Cumulative exploration as on 31.03.2024			2023-24		
		2D seismic (LKM)	3D seismic (sq.km.)	Exploratory Well (No)	2D seismic (LKM)	3D seismic (sq.km.)	Exploratory Well (No)
1	**ONGC**	8,83,141	1,36,009	6,437	274	2392	80
2	**Oil India Ltd.**	34,353	12,233	434	378.72	240.57	17
	Total	**9,17,494**	**1,48,242**	**6,871**	**652.72**	**2,632.57**	**97**

2.9. Exploratory Efforts by Private/JV companies under PSC

2.9.1. The basin-wise exploratory efforts made by Private/Joint venture companies in terms of 2D seismic, 3D seismic and exploratory wells under PSC and RSC Regimes as on 31.03.2024 are as under:

TABLE 2.14: EXPLORATORY INPUTS IN PSC REGIME AS ON 31.03.2024

Basin Name	2D Seismic LKM	3D Seismic SKM	Exploratory Wells (No.)
Andaman-Nicobar	27070	16562	6
Assam-Arakan Fold Belt	1352	613	4
Assam-Arakan Shelf	5468	2203	43
Bengal-Purnea	5247	4909	16
Cambay	29994	9167	321
Cauvery	64727	44561	51
Deccan Syneclise	476	0	0
Ganga	3876	263	4
Ganga-Punjab	2542	1420	4
Himalayan-Foreland	810	0	1
Kerela Konkan	52290	14035	7
Krishna Godavari	76106	70711	210
Kutch	2985	8345	21
Mahanadi	59542	64659	53
Mumbai	21349	27285	51
Pranhita Godavari	195	0	1
Rajasthan	14157	16396	312
Satpura-South Rewa-Damodar	2050	304	2
Saurashtra	16037	15428	16
Vindhyan	3918	858	10
Grand Total	**3,90,191**	**2,97,718**	**1,133**

TABLE 2.15: EXPLORATORY INPUTS IN RSC REGIME (OALP) AS ON 31.03.2024

As on 31st March 2024, contractors of the blocks have acquired 31,467 LKM of 2D Seismic data and 33,705 sq. km. of 3D Seismic data.

Basin	2D Seismic (LKM)	3D Seismic (Sq.km)	Exploratory Wells
Andaman-Nicobar	8501	2131	0
Assam Arakan Fold Belt	1051	150	3
Assam Shelf	3001	496	2
Bengal-Purnea	904	1728	0
Cambay	1519	1760	15
Cauvery	0	5709	0
Cuddapah	0	221	0
Ganga-Punjab	0	597	0
Himalayan Foreland	0	0	0
Kerala Konkan	0	1028	0
Krishna Godavari	431	1514	1
Kutch	398	1358	0
Mahanadi	2305	3586	5
Mumbai Offshore	940	9248	10
Narmada	0	0	0
Rajasthan	10701	870	11
Satpura-South Rewa-Damodar	0	0	0
Saurashtra	476	1856	1
Vindhyan	1241	1453	4
Total	**31,467**	**33,705**	**52**

2.10. Hydrocarbon Discoveries in 2023-24

During FY 2023-24, ONGC has made 11 hydrocarbon discoveries in its operated acreages including 5 discoveries in OALP Blocks. Out of these, 6 are in onshore, 3 in shallow offshore and 2 in Deep water offshore acreages. Out of these, three on-land discoveries viz. Gopavaram-21, South Mahadevapatnam-2 and East Lakhibari-6 have been monetized by ONGC. The details of hydrocarbon discoveries made in 2023-24 are as under:

TABLE 2.16: HYDROCARBON DISCOVERIES BY ONGC

Sl. No.	Discovery Name	Well Name	BASIN	Type of Discovery	Date Discovery	Type of Discovery
Onland						
1	Gopavaram-21	GMDL	KG Onland	Pool	14/06/2023	Oil
2	South Mahadevapatnam-2	SMA-AD	KG Onland	Pool	03/10/2023	Gas & Condensate
3	Chitabari	Chitabari-1 (GO-20A (GOAI_Sub)	Assam Fold Belt	Pool	02/01/2024	Gas
4	Tulamura-3	Tulamura-3 (TMAB)	Assam Fold Belt	Pool	23/01/2024	Gas
5	West Amod-1	West Amod-1 (CBONH212A-A)	Cambay	Prospect	16/03/2024	Oil & Gas
6	East Lakhibari-6	East Lakhibari-6	Assam	Pool	21/03/2024	Oil
Shallow Water						
1	Moonga	MBS182HDA-1 (MBS182HDA-A)	Mumbai Offshore	Prospect	09/05/2023	Oil & Gas
2	Moti	MBS181HCA-1 (MBS181HCA-A)	Mumbai Offshore	Prospect	16/05/2023	Oil & Gas
3	Pukhraj	ST-6 (ST-A)	Mumbai Offshore	Prospect	17/06/2023	Gas
Deep Water						
1	Utkal	MDW-27 (MNDW181H-A-1)	Mahanadi Offshore	Prospect	03/01/2024	Gas
2	Konark	MDW-26 (MNDW181H-B-1)	Mahanadi Offshore	Prospect	15/01/2024	Gas

During FY 2023-24, OIL has made one discovery (oil) in well South Baghjan-10, Tinsukia Extension PML, Assam in June 2023. The commerciality of the well has been established through detail well testing and is presently on production

Five hydrocarbon discoveries, have been notified under Contract Regime. The details of hydrocarbon discoveries made in 2023-24 upto 31st March, 2024 are as under:

TABLE 2.17: HYDROCARBON DISCOVERIES IN 2023-24

Sl. No.	Company	Oil Discovery	Gas Discovery	Total
1	ONGC (Nomination)	3	3	6
2	OIL (Nomination)	1	0	1
3	PSC/RSC	3	2	5
Total		**7**	**5**	**12**

Discovery Name	Type of Discovery	Block	Basin
West Amod#1	Oil	CB-ONHP-2021/2	Cambay
Konark	Gas	MN-DWHP-2018/1	Mahanadi-NEC
Utkal	Gas	MN-DWHP-2018/1	Mahanadi-NEC
MBS181HCA-1 (Moti)	Oil	MB-OSHP-2018/1	Mumbai Offshore
MBS182HDA-1	Oil	MB-OSHP-2018/2	Mumbai Offshore

2.11. National Data Repository (NDR)

2.11.1. The Government of India notified the OALP as a part of the HELP on 30th June, 2017. National Data Repository (NDR) is a pre-requisite and key component for making OALP operational to view the surface and sub-surface geological, geophysical and other technical data by the investors. NDR was launched on 28th June, 2017.

2.11.2. National Data Repository (NDR) set up at DGH and launched on 28th June, 2017 to make the entire Exploration and Production (E&P) data available for commercial exploration, research and development and academic purposes.

The Cumulative data loaded in NDR as on 31st March 2024:

a) 2D Seismic Data : 3.6944 Million LKM

b) 3D Seismic Data : 1.1482 Million SKM

c) Well and Log Data : 23,616 No. of Wells

d) Well Reports : 49,704 Nos. of reports

2.11.3. Future ready National Data Repository 2.0 [NDR 2.0]

Since its operationalisation in June 2017, NDR has been successfully meeting the demands of all its stakeholders such as investors, operators, service-providers, R&D institutes, academia, and government bodies. In view of its ageing hardware and software and the increasing volumes of both raw and field data acquired and assimilated in the intervening years has necessitated its upgradation to next generation IT platform which is scalable to grow with time and equipped with enhanced storage, compute and network resources. Further, in order to bring efficiency in data management and better serve its global users with enhanced functionalities of anytime, anywhere access, DGH has to upgrade the present client-server platform to Next Generation cloud based National data repository. Next generation National Data Repository 2.0 (NDR 2.0) aims to substantially improve the data accessibility (downloading), data reporting, submission (uploading) and enhance storage (for all E&P data types including seismic field data) and create a cloud-enabled database platform. For expert advice and design a cloud solution for NDR 2.0, DGH has engaged project management consultant, namely, Digital India Corporation (DIC), under ministry of Electronics and Information Technology. With assistance from DIC, DGH prepared and submitted a detailed project proposal to MoPNG seeking administrative approval and expenditure Sanction of an estimated 127.38 Cr plus taxes. The Ministry of Petroleum and Natural Gas (MoP&NG) granted this approval on 20th October 2023. Further to this, tenders for NDR 2.0 were floated on the Government E-Marketplace (GeM) on 23rd February 2024, achieving a significant milestone in the journey to this ambitious upgrade. The project envisages award of tender by end of 2nd quarter of 2024.

2.12. Policy Initiatives taken by the Government for Enhancing Crude Oil and Gas Production

In a major drive to give a boost to upstream hydrocarbon sector, the Government has unveiled a series of policy initiatives. The reforms in hydrocarbon sector are based on the guiding principles of enhancing domestic oil and gas production, increasing investment, generating sizable employment, enhancing transparency, and reducing regulatory burden. Some of the notable policy reforms are listed as under:

2.12.1. Hydrocarbon Exploration and Licencing Policy/Open Acreage Licensing Programme (March 2016)

In March 2016, Government launched Hydrocarbon Exploration Licensing Policy (HELP). HELP is a paradigm shift from Cost Recovery to Revenue Sharing Mechanism wherein contractor shares revenue with the Government from the start of the production. The Government introduced the Open Acreage Licensing Program (OALP) as a part of the HELP on 30th March 2016 and formally it was put in operation w.e.f. 1st July 2017 which gives exploration companies the option to

select the exploration blocks on their own, without having to wait for the formal bid round from the Government.

HELP comes with attractive and liberal terms like reduced royalty rates, no oil cess, marketing and pricing freedom, round the year bidding, freedom to investors for carving out blocks of their interest, a single license to cover both conventional and unconventional hydrocarbon resources, exploration permission during the entire contract period, and an easy, transparent and swift bidding and awarding process. HELP also encourages Round the year submission of Expression of Interest (EOI) in 3 windows (1st April to 31st July, 1st August to 30th November and 1st December to 31st March) by the interested bidders.

Salient features of HELP

- Opportunity to carve out blocks using National Data Repository (NDR)
- Unified Licence for both conventional and unconventional Hydrocarbons
- Simple and easy to administer Revenue Sharing model
- Low regulatory burden
- Easy entry and exit barriers
- Complete transparency and time bound process
- Level playing field for global private companies as well as National Oil Companies
- Market pricing and free market access
- Concessional royalty regime for Ultra-Deep water and Shallow Water areas
- Exploration rights for full contract life

Government further notified policy reforms in upstream sector on 28th February 2019 under HELP to increase exploration activities, attract domestic and foreign investment in unexplored/ unallocated areas of sedimentary basins and promote ease of doing business by streamlining and expediting the approval processes. These reforms were made applicable from OALP Round IV onwards. Category specific Bid Evaluation Criteria with more weightage to exploratory work programme in Category-I basins (70% vis-à-vis 50% earlier), Category-II and III type blocks bided based on exploratory work programme only, shorter exploration period, concessional royalty rates to expedite oil and gas production, introduction of alternate dispute resolution mechanism and Empowered Coordination Committee (ECC) for expediting statutory clearances/approvals.

a. Summary of Participation

In Eight rounds of bid under OALP, 149 blocks were on offer and 144 exploration blocks covering an area of 2,42,057 sq. km. were awarded to successful bidders. Five (5) un-awarded blocks were offered under OALP-Round-III for CBM, however no bids were received for these CBM blocks. 252 bids were received for remaining 144 blocks that are spread over 19 Sedimentary Basins.

Summary of participation in OALP rounds is as under:

OALP Bid Round	Blocks on offer	Number of participants	No. of bids	Area on offer (sq.km.)	Area awarded (sq.km.)
OALP-I	55	9	110	59,282	59,282
OALP-II	14	8	33	29,233	29,233
OALP-III	18+5*	5	42	31,722	29,765
OALP-IV	7	2	8	18,510	18,510
OALP-V	11	3	12	19,789	19,789
OALP-VI	21	3	24	35,346	35,346
OALP-VII	8	4	10	15,766	15,766
OALP-VIII	10	6	13	34,365	34,365
Total	**149**	**40**	**252**	**2,44,014**	**2,42,057**

* No bid received for five CBM Blocks.

The committed investment till Round VIII is around 3.37 Billion USD. Out of the total committed Work Programme of 51,725 LKM 2D Seismic, 66,843 SKM 3D seismic and 499 Exploratory Wells; ~31,467 LKM of 2D Seismic data, 33,705 sq. km. of 3D Seismic data and drilling of 52 wells have completed till FY 2023-24. 10 discoveries (6 oil+4 gas) have been made so far.

The Government has launched the OALP Bid Round-IX, offering 28 blocks covering an area of 136,596 sq. km for International Competitive Bidding on 3rd January-2024. A total of 9 (nine) Onland Blocks, 8 (eight) Shallow-Water Blocks and 11 (eleven) Ultra Deep-Water Blocks are on offer.

2.12.2. Discovered Small Field Policy (DSF)

DSF Policy: Background

- The Marginal Field Policy was approved by the Cabinet Committee on Economic Affairs (CCEA) on 2nd September, 2015 and notified vide Notification No. O-19018/22-95-ONG-III dated 14.10.2015 to bring un-monetized discoveries of National Oil Companies (NOCs) on production. This Policy was later renamed as Discovered Small Field (DSF) Policy.

Salient Fiscal and Policy Features of DSF Rounds:

- Single license for conventional and non-conventional hydrocarbons
- No restriction on exploration activity during Contract Period
- No upfront Signature Bonus
- Bids invited under International Competitive Bidding.
- Pricing and Sale-marketing Freedom
- Royalty, No Cess, Exemption from custom duty
- Eligibility: No Technical Experience Required, up to 100% participation by Foreign companies

Three DSF rounds have been conducted so far. Salient details are as under:

DSF round	DSF-I	DSF-II	DSF-III	Grand Total
Launched on	25.05.2016	09.08.2018	10.06.2021	
Total Offered Blocks	46	25	32	103
Total Offered Discoveries	67	59	75	201
Total O+OEG (MMt)	86	190	232	508
Total Offered Area (Sq km)	1551	3042	13000	17593
Date of Signing of RSC	27.03.2017	07.03.2019	09.09.2022	
Total awarded Blocks	30	24	31	85
Total awarded Discoveries	43	58	74	175
Total awarded O+OEG (MMt)	45	189	230	464
Total awarded Area (Sq km)	777	3004	12727	16508
E-bids received	134 bids for 34 contract areas	145 bids for 24 Contract areas	107 bids for 32 contract areas	

Status of DSF I, II & III Contract is as under:

S.No.	Status	DSF-I	DSF-II	DSF-III	Total
1	Awarded Contract Area (CA)	30	24	31	85
2	CAs where PML pending	4	3	6	13
3	Contract Area under relinquishment	6	-	-	6
4	Cases under termination/terminated	5	5	0	10
5	RSC to be signed			1	1
5	**Operational**	**15**	**16**	**24**	**55**

2.12.3. Bidding for CBM Blocks

- The Government of India formulated Coal Bed Methane (CBM) policy in 1997. About 26,000 sq. km. was identified for CBM exploration in the country. India's CBM resources are estimated at around 2,600 billion cubic meters (BCM).
- Four CBM bidding rounds (2001, 2003, 2005 & 2008) were implemented by MoP&NG, resulting in the award of 33 CBM blocks [including 2 blocks on Nomination and 1 block through the Foreign Investment Promotion Board (FIPB) route] covering 16,598 sq.km.
- GoI launched two Special CBM Bid Rounds (2021 & 2022), under the HELP through International Competitive Bidding. 7 Blocks (4 in SCBM-21 & 3 in SCBM-22) of area 4,579 sq. km were awarded in these Special CBM Rounds.
- At present in total, 15 CBM Blocks (7,009 Sq.km) are active. Out of which, 04 blocks are in exploration phase, 03 are in the development phase and 05 blocks are in production phase. The cumulative production of CBM up to March 2024 is around 6.4 BCM.

2.12.4. GoI's efforts to acquire geoscientific data in India's sedimentary basins

i. National Seismic Programme (NSP) project, (completed):

National Seismic programme (NSP) was launched on 12th October 2016 with an objective to appraise the unappraised onland basinal areas of the country. Under the programme, Government has approved the proposal for conducting 2D seismic survey for data Acquisition, Processing, and Interpretation (API) of 48,243 Line Kilo Metres (LKM).

Acquisition, Processing and Interpretation of 46,960 LKM (~97%) 2D seismic data could be acquired out of the total target of 48,243 LKM. Gujarat Energy Research and Management Institute (GERMI), Gandhinagar carried out a Third-Party evaluation study of NSP data and submitted a report to NDR.

To cover the inaccessible and hostile geographical areas (where seismic data could not be acquired due to inaccessible terrain and hostile environment) under NSP project, a volume of 40,000 flight LKM Airborne Geophysical Survey had also been planned with approximate cost of INR 80 crores. On behalf of Ministry, Oil India Ltd (OIL) carried out Airborne Gravity Gradiometry and Gravity Magnetic (AGG & GM) data survey and completed the API(Acquisition, Processing and Interpretation) of 42,944 Flight LKM of AGG & GM Survey.

The sector wise/state-wise break-up of AGG & GM targets and achievements are tabulated below.

Area	Target	Achievement (in Flight LKM)
AS-AP	2064	2064.46
AS-AP-NL	8131	8131.15
AS-ML-MN-NL	11240	11227.83
MZ-TR	5606	5573.59
North-East India Total	27,041	26,997.03
Cauvery	11888	12295.14
Bastar	1764	1833.99
Karewa	1710	1816.93
Spiti*	7392	-
Rest of India Total	**22,754**	**15,946.06**
Project Total	**49,795**	**42,943.09**

*Test flight was conducted to analyses the risk involved over high altitudes in Spiti valley, however, due to the HSE concerns, data in Spiti valley was not acquired.

ii. Deep Andaman offshore Project

Andaman Basin is a potential petroleum proliferous basin located in the south-eastern part of the Bay of Bengal in the proximity of the most prolific petroleum provinces of Southeast Asia. Andaman Basin measures 2,25,918 sq. km. and comprises a major chunk of the unappraised area of the offshore sedimentary basins of India. The basin had been appraised to the extent of 36% with 71,290 LKM of 2D seismic and 13,710 sq. km. of 3D seismic data and 22 exploratory wells, in the eastern part of the basin.

The 2D/3D seismic or well data acquired in the basin was scanty and the data coverage was moderate to sparse. The area surrounding the Andaman & Nicobar (A&N) islands has significant potential for oil and gas, but the exploratory activities could not be taken up there because most of the area was designated as a "No-Go" Zone (0.37 million sq. km. of the "No-Go" zone area falls in the Andaman Basin)

For comprehensive appraisal of Andaman offshore, DGH formulated a plan to acquire 22,500 LKM 2D Broadband seismic data acquisition, processing, and interpretation thereof covering basinal area of approx. 2,81,613 sq. km. and Accordingly, Deep Andaman offshore survey was launched by GoI.

The project has been implemented through M/s Oil India Limited. A total of 22,500 LKM seismic data was acquired in deep Andaman offshore. The acquisition and processing was completed in October 2022 and interpretation of the entire dataset has been completed in month of March 2023 data is uploaded on NDR portal.

iii. Reduced No-Go Areas:

The Government has been successful in reducing 'No-Go' areas by almost 99% in April 2022, hitherto not available for E&P activities. This made around 1 million sq. km. area of India's EEZ available for exploration.

iv. Exclusive Economic Zones (EEZ) survey (Ongoing):

Approximately 1.13 Million sq. km. area of offshore Basinal Areas of Indian sedimentary basins up to EEZ was lying

unappraised. In order to assess the entirety of the offshore basin area extending up to the Exclusive Economic Zone (EEZ) of the nation, efforts were undertaken to conduct a 2D broadband seismic survey covering an area of approximately 80,000 LKM (implementing agengy: ONGC). As a result, a total of approximately 79,540 LKM of 2D seismic data acquisition was successfully accomplished during the month of June 2023 2D seismic data processing and interpretation was started from 22.07.2023 and completed in June, 2024.

v. Mission Anveshan (Upcoming):

To comprehensive appraisal of the Indian sedimentary basins, closed 2D seismic profiles have been planned in 07 onland sedimentary basins under proposed Mission Anveshan. The objective of this project is to infer comprehensive appraisal of the basins and bring out the hydrocarbon prospectivity. The proposal for closed grid 2D seismic API (Acquisition, Processing & Interpretation) 20,275 LKM in 07 on-land sedimentary basins has been formulated.

vi. Appraisal of India's Extended Continental Shelf (Upcoming):

A good quality high resolution seismic data with close spacing in Continental shelf in Western and Eastern offshore beyond EEZ boundary will provide valuable inputs regarding the presence of sediments and help to ascertain hydrocarbons potential in the Continental Shelf area. All these inputs will be useful for formulating the long-term energy policy in offshore areas in the context of the blue economy. This work will help in supporting the claim of extended continental shelf boundary in East and West coast by MoES beyond the EEZ boundary. The proposed seismic reflection profiles with extended streamers and high-power seismic sources are expected to provide details of sub-basement reflections for determining the nature of the crust within the Laxmi Ridge.

2D seismic API is proposed to be carried out for 30,000 LKM in Eastern & western Offshore (Quantum: 15,500 LKM in Western Sector by ONGC & 14,500 LKM In Eastern Sector by OIL).

2.12.5. Natural Gas Marketing Reforms

- Government approved 'New Domestic Natural Gas Pricing Guidelines' in October, 2014, based on the prices prevailing in major international hubs like Henry Hub (USA), Alberta (Canada), NBP (UK), Russia etc. to strike a balance between the requirements of both producing and consuming sectors. The prices of natural gas are revised after every six months and notified by Petroleum Planning and Analysis Cell (PPAC) under MoP&NG. These Guidelines are applicable to natural gas produced from Nomination Fields and NELP, Pre-NELP Blocks/Fields, where pricing is to be approved by Government under per Production Sharing Contract (PSC).
- Subsequently, from 2015 onwards, Government provided marketing and pricing freedom for gas under DSF, OALP, CBM regimes and for gas produced from North-Eastern Region (NER) and new gas discoveries after 28.02.2019 under all regimes.
- To incentivize gas production from difficult areas such as High Pressure-High Temperature (HP-HT) reservoirs and deepwater and ultra-deepwater areas, Government, on 23rd March 2016, granted marketing including pricing freedom on natural gas production with a price ceiling announced on half yearly basis by Petroleum Planning and Analysis Cell (PPAC).

- Further, 'Natural Gas Marketing Reforms' were announced vide Notification dated 15.10.2020, to prescribe standard procedure to discover market price of gas to be sold in the market by gas producers, through a transparent and competitive process through electronic bidding; permit Affiliates to participate in bidding process for sale of gas and allow marketing freedom to certain Field Development Plans (FDPs) where Production Sharing Contracts already provide pricing freedom. Subsequently, detailed guidelines for Discovery of Market Price for Domestically Produced Natural Gas through e-bidding were issued vide Notification dated 03.12.2020. Agencies empanelled by DGH for carrying out e-bidding also been notified.
- Furthermore, gas producers having pricing and marketing freedom have been permitted additional option for selling small quantity of gas (i.e. upto 500 MMSCM per annum) through gas exchanges authorized by PNGRB vide OM dated 19.08.2021.
- As a further momentum to gas reforms and saving the environment, Government issued detailed guidelines for monetization of Ad-hoc/Test Gas produced during the Testing of oil and gas Well vide OM dated 22.11.2021.
- Vide Notification dated 13th January, 2023, Government provided clarifications on discovery of market price and sale and resale of gas produced from discoveries in Deepwater, Ultra Deepwater and High Pressure/High Temperature areas with marketing and pricing freedom.

2.12.6. Policy Framework to Promote and Incentivize Enhanced Recovery Methods for Oil and Gas (October 2018)

- The Government approved the Policy framework to promote and incentivize Enhanced Recovery (ER)/Improved Recovery (IR)/Unconventional Hydrocarbon (UHC) production methods/ techniques through fiscal incentives in the form of partial waiver of royalty and cess and an enabling ecosystem to improve productivity of existing fields and enhance overall production of domestic hydrocarbons. Pursuant to the Policy, an Enhanced Recovery (ER) Committee has been constituted to oversee the implementation of the policy.
- Under the present policy, Preliminary assessment of ER potential of more than 200 oil and gas fields had been carried out. ER Screening Reports of 19 projects (field-wise; ER method-wise) were approved for commencement of ER Pilot Phase. Out of which five pilot projects had been approved and operators were required to formulate/submit commercial implementation plan for the field(s) under the ER policy. Out of which, two fields were granted in-principal approval for the incentivization of commercial projects.

2.12.7. Policy on Crude Oil Deregulations (June, 2022)

- The Cabinet Committee on Economic Affairs approved the 'Deregulating Sale of Domestically Produced Crude Oil'. Through this policy decision, Government shall cease to allocate crude oil and condensate with effect from 01.10.2022, granting marketing freedom across all policy regimes. The condition in the Production Sharing Contracts (PSCs) to sell crude oil to the government, or its nominee, or government companies shall be waived off and all exploration and production operators will be free to sell crude oil from their fields in domestic market. However, as earlier, export of crude oil will not be permissible. The government revenues like Royalty, Cess, and Contractual Payments, etc. shall be calculated based on the sales price or the price of Indian Basket of Crude Oil, as calculated by Government nominated Agency, **whichever is higher.**

2.12.8. Policy Framework for Exploration & Exploitation of Unconventional Hydrocarbons (August 2018)

The policy has been introduced to encourage the existing Contractors to unlock the potential of unconventional hydrocarbons including shale oil and gas and CBM in the existing acreages under PSCs and CBM contracts subject to conditions stipulated in policy document. This was not permitted earlier. Due to this policy, an area of 72,027 sq. km. held under PSCs and 5,269 sq. km. area under CBM contracts has been opened for simultaneous exploration and exploitation of conventional or unconventional hydrocarbons.

2.12.9. Enhanced Prospectivity Perception through Data Generation

- **Upgradation of National Data Repository (NDR):** NDR acts as a repository of geo-scientific database of the country and plays a key role in facilitating prospective bidders to carve out their choice of blocks for bidding under OALP. In order to cope with the ever-increasing demands of E&P data, NDR is being upgraded to cloud-enabled hyper-converged infrastructure to facilitate easy access of data to the industry for meaningful usage.
- **Re-assessment of Hydrocarbon Resources:** For updated estimation of hydrocarbon resource potential in the country, re-assessment of hydrocarbon resources for all 26 sedimentary basins in the country was completed in 2017 almost after two decades of earlier estimation. This resulted in prognosticated conventional hydrocarbon resources of the order of 41.87 billion tonnes (oil and oil equivalent of gas), which is about 49% increase as compared to earlier estimate of 28.08 billion tonnes.
- **Policy Reforms in Exploration and Licensing Policy for enhancing domestic exploration and production of oil and gas (28th February, 2019):** Government notified 'Reforms in Exploration and Licensing Policy for enhancing domestic exploration and production of oil and gas' on 28th February 2019 with the objective to intensify exploration activities, attract foreign and domestic investment and enhance domestic production.

2.12.10. Guidelines for Early Monetization of Hydrocarbon Discoveries, June 2020

As a step towards energy security of the country, the guidelines was issued on 23.06.2020 for monetization of discovery under Production Sharing Contract/Revenue Sharing Contract at an early stage within prescribed contractual timeline i.e. before completion of other activities such as Appraisal, Declaration of Commerciality (DoC) and submission of Field Development Plan (FDP).

2.13. Major Reforms taken for enhancing Ease of Doing Business (EODB) in E&P

- **Reducing Compliance Burden-Simplification of Procedures and Processes for submission of Documents on Self Certification basis:** With a view to make the system transparent and faster, under Ease of doing business, guidelines for simplification of procedures and processes for submission of documents on self-certification were issued on 28.02.2020 wherein government rationalized 37 processes in 3 categories under PSC contract.
- **Notification regarding Dispute Resolution Committee (2019):** External Committee of eminent persons/experts has been set up vide Notification dated 16.12.2019 and modalities and structure of Dispute Resolution Mechanism has been finalized.
- **Delegation of powers to DGH (2018-2020):** To streamline the operations under PSC and removing the extra layers of

approvals, all powers except for few, have been delegated to DGH for Contract Management.

- A variety of applications and systems such as Production Sharing Contract Management System, Petroleum Exploration Lease/ Petroleum Mining Lease Data Management System, Production Database Management System, E-bidding portal etc. have also been launched.
- **Digitalization E&P Roadmap document:** With the intent to identify and facilitate opportunities for digitalization across the entire upstream value chain through collaboration with the entire India E&P ecosystem, the 'Digitization Roadmap for E&P Industry' was released by Secretary, PNG on 10th June, 2021.
- **Performance Monitoring Dashboard:** A comprehensive Digital Monitoring Dashboard was created in 2019 for monitoring various key E&P performance indicators. It has been integrated with the MoP&NG portal in 2021.



CPCL, Chennai




Chapter 3
PIPELINE AND NATURAL GAS

3 Pipeline and Natural Gas

India is not only 3rd largest energy consumer in the world after China and USA, but also one of the fastest growing energy consumers. In year 2021, the primary energy consumption in the country was about 870 Million Tonnes of Oil equivalent (Mtoe) which has increased to 932 Mtoe during FY 2023-24 and Natural Gas has a share of about 6% of the country's primary energy mix. It has been envisaged to increase the share of natural gas in primary energy mix of the country from current level to 15% in coming years. In order to move forward, thrust has been put to enhance domestic gas production, encourage the import of Liquefied Natural Gas (LNG) and augment LNG import capacity, completion of national gas grid and speedier roll out of City Gas Distribution (CGD) network across the country.

Sectoral consumption of Natural Gas is given below:

	FY 2023-24		
Sector	**Domestic**	**RLNG**	**Total**
Energy Sector			
Power	6504	2578	9082
CGD	10041	3451	13491
Refinery	2147	3689	5837
IC for P/L System	1871	52	1924
Agriculture (Tea Plantation)	142	0	142
Industrial	530	516	1046
Manufacturing	79	332	412
Other/Misc	8885	2053	10938
Non Energy Sectors			
Fertilizer	3029	18017	21046
Petrochemical	1115	1552	2667
LPG Shrinkage	977	24	1001
Sponge Iron/Steel	684	493	1177
Total	36004	32757	68761
Grand Total	**68,761**		

3.1. Gas Grid

Gas Pipeline infrastructure is the most economically feasible and safe mode of transporting the natural gas by connecting gas sources to gas consuming markets. Gas pipeline practically determines the structure of the gas market and its development. Therefore, an inter connected National Gas Grid is envisaged to ensure the adequate availability and equitable distribution of natural gas in all parts of the country. As on March 2024, about 24,881 km long gas pipeline network is under operation in the country and around 10,404 km pipeline is under various stages of construction. Efforts are being made to complete the Gas Grid in a time bound manner.

In order to develop gas pipeline network in the Eastern part of the country, the Cabinet Committee on Economic Affairs (CCEA) has approved partial capital grant at 40 percent (₹ 5,176 crore) of the estimated capital cost of ₹ 12,940 crore to GAIL for the development of Jagdishpur-Haldia and Bokaro-Dhamra Pipeline project. This project has connected Eastern part of the country with National Gas Grid and will ensures the availability of clean and eco-friendly fuel i.e. Natural Gas to the industrial, commercial, domestic and transport sectors in the States of Uttar Pradesh, Bihar, Jharkhand, Odisha and West Bengal. These pipeline Projects has supported the revival of 3 Fertilizer Plants namely Gorakhpur, Barauni and Sindri along the route of these pipeline projects. Connecting North east part with NGG has become more viable after the advent of JHBDPL (Pradhan Mantri Urja Ganga project). The pipeline has also been extended from Barauni to Guwahati (via Siliguri & Bongaigaon), as an integral part of Jagdishpur Haldia & Bokaro Dhamra Pipeline (JHBDPL) to connect North East Region (NER) with the National Gas Grid.

729 km Barauni-Guwahati pipeline is passing through three states namely Bihar, West Bengal

and Assam. Total 3,384 km pipeline i.e. Jagdishpur-Haldia & Bokaro-Dhamra and Barauni-Guwahati has been executed with the total estimated investment of ₹ 15,520 crore. Further, 253 km of Dhamra-Haldia Pipeline section has also been authorised to GAIL as an expansion of JHBDPL Project. Pipeline has been connected and gas supply commenced to 4 Fertilizer Plants namely HURL Gorakhpur, Barauni, Sindri and Matix Fertilizer. Connectivity has also been provided to Varanasi, Patna, Ranchi, Jamshedpur City Gas distribution and other CGDs en-route the pipelines in the states of Uttar Pradesh, Bihar, Jharkhand and West Bengal. In addition, 326 km has been mechanically completed and under commissioning. As on December 2023, about 2,952 km of pipeline has been commissioned for Integrated JHBDPL.

A MoU was signed on 03.02.2018 among oil and gas CPSEs i.e. GAIL, IOCL, OIL, ONGC and NRL to form a joint venture company which will lay the pipeline connecting all north eastern State capital including Sikkim. Accordingly, "Indradhanush Gas Grid Ltd" (IGGL) a JVC has been incorporated on 10.08.2018. This JVC is developing trunk pipeline connectivity in all North Eastern States i.e. Assam, Sikkim, Mizoram, Manipur, Arunachal Pradesh, Tripura, Nagaland and Meghalaya in a phased manner. PNGRB issued Final authorization to IGGL on 17.11.2020 for the development of North-East gas pipeline grid (NEGG). This project will also facilitate developing City Gas projects which will ensure the availability of clean cooking fuel to the households and environment friendly fuel to the industrial, commercial and transport sectors in major cities of North Eastern States. CCEA has approved Capital Grant (60% of project cost) of ₹ 5,559 Crore to improve viability of project. Further, out of 1,656 km of NEGG, about 847 km of lowering has been completed as on March 2024.

In the Southern region, as on December 2023, work is under progress for construction of remaining ~462 km long Kochi-Kootanad-Bangalore-Mangalore (KKBMPL) Natural Gas pipeline in the state of Tamil Nadu.

IOCL is laying of 1,440 km (R-LNG) Pipeline of capacity 35 MMSCMD for supply of Natural Gas to anchor customers and city gas distribution in states of Tamil Nadu, Andhra Pradesh, Karnataka and UT of Puducherry. This project aims at establishing National Gas Grid in parts of Southern India, in line with the GoI vision of creating a gas based economy. As on December 2023, about 1,080 km of pipeline has been commissioned.

Further, the spurlines of the subject pipeline are under construction and will help in catalyzing the industrial growth in the Region The pipeline is presently supplying gas to the GAs of Chennai & Thiruvallur Districts and Kanchipuram District GA. Further, IOCL is to supply gas to 9 more GAs along the route of this pipelines based on agreements with respective authorised CGD entities. Supply of cleaner and greener fuel to domestic, commercial and transport segment customers will improve the quality of life and ease of living apart from ensuring environmental well being.

PNGRB has authorised GAIL India Limited for laying of Natural Gas pipeline from Gurdaspur to Jammu on 12.07.2023. To cater the demand of Srinagar region, PNGRB has invited bids for laying of 325 km long Natural Gas Pipeline from Jammu to Srinagar, emanating from GAIL's Gurdaspur Jammu Natural Gas Pipeline. Additionally, PNGRB has also invited bids for laying of 875 km long Natural Gas Pipeline from Ennore, Tamil Nadu to Barshi, Maharashtra. This pipeline shall emanate from Ennore LNG Terminal and connect to East-West pipeline at Barshi which shall also enable onward transportation of natural gas to major interconnecting pipelines in the country.

3.2. Regasification infrastructure in the country

Country commenced the first import of Liquefied Natural Gas (LNG) in year 2004 with the establishment of its first regasification LNG (RLNG) terminal located at Dahej (Gujarat). The import of LNG is being carried out as Open General License (OGL) item. The imported RLNG is being supplied at market determined prices as per contractual agreement between suppliers

and buyers across the country. Establishment of LNG terminals is also permitted as an infrastructure project and eligible for 100% Foreign Direct Investment (FDI).

At present, the Country is having seven (7) operational LNG re-gasification terminals operational with capacity of about 47.7 MMTPA (~172 MMSCMD). The terminal-wise details are as under:

Location	Owner & Operator	Capacity (MMTPA)
Dahej (Gujarat)	PLL	17.5
Hazira (Gujarat)	SHELL	5.2
Kochi (Kerala)	PLL	5
Dhabol (Maharashtra)	GAIL (KLPL)	5.0
Mundra (Gujarat)	GSPC LNG Ltd	5
Dhamra (Odisha)	Adani LNG Pvt Ltd	5
Ennore (Tamilnadu)	IOCL	5
Total Capacity (MMTPA)		**47.7**

In addition to above, following LNG terminals are under construction:

Location	Owner & Operator	Capacity (MMTPA)
Dahej Expansion (Gujarat)	PLL	5
Gopalpur (Odisha)	PLL	4
Jafrabad (Gujarat)	Swan Energy	5
Chara(Guajrat)	HPLNG	5
Total Capacity (MMTPA)		**19**

3.3. City Gas Distribution (CGD)

CGD networks are being developed based on the availability of trunk gas pipeline connectivity or gas sources and techno-commercial feasibility in a GA.

CGD network ensures the supply of environment friendly cooking fuel at the door step of domestic households in the form of Piped Natural Gas (PNG) as well as clean fuel to transport sector in the form of Compressed Natural Gas (CNG). The usage of CNG in transport sector helps in curbing the vehicle emissions in urban area and it improves the air quality.

- Till May 2014, CGD networks was available in about 33 Geographical Areas (GAs) spread over 53 districts (part/full) in different part of the country.
- During the years 2014-18 (upto May 2018), 92 GAs spread over 113 districts (part/full) were covered for development of CGD network.
- With the successful conclusion of 9th & 10th CGD bidding rounds in 2019, the coverage of CGD network was extended to additional 136 GAs covering 298 districts (part/full).
- In 2022, PNGRB concluded 11th and 11A CGD bidding round and authorized 67 more GAs. With the completion of this round, the potential coverage of CGD network has expanded to about 98% of country's population spreading over 88% of India's area.
- The Petroleum and Natural Gas Regulatory Board (PNGRB) under 12th and 12A CGD Bidding Round has finalized successful bidders covering 103 Districts, encompassing 6 North East States viz. Arunachal Pradesh, Meghalaya, Manipur, Nagaland, Sikkim & Mizoram and 2 Union Territories of Jammu & Kashmir and Ladakh. Accordingly, Letters of Intent has been issued to the successful bidders for 7 GAs on 04.03.2024. Further, authorization shall be granted to the successful bidders after receipt of the requisite Performance Bank Guarantee from the concerned entities by PNGRB as per CGD Authorisation Regulations.
- After completion of 12/12A CGD bidding round, PNGRB has authorized 307 Geographical Areas (GAs) covering almost 100% of the mainland area and almost 100% of total geographical area of the country spread over around 733 districts in 34 states/UTs for the development of CGD network with MWP target of establishing 18,336 CNG stations and approx. 12.63 crore PNG connections across the country by 2032.

- PNG supplies to domestic households has increased from a level of 25.4 lakh (May 2014) to 129.22 lakh (as on March 2024). In total, 6,861 CNG stations (as on 31.03.2024) are making clean and economical transportation fuel available to about 55 lakh CNG vehicles across the country.

In order to promote the expansion of City gas networks and enhance the usage of natural gas in cities, the Government has taken following steps:

i. Domestic gas, which is cheaper than imported gas, has been allocated to meet the requirement of PNG (D) and CNG (T) segments of CGD sector and it has been kept under no cut category.

ii. Public Utility Status granted to CGD Projects by Ministry of Labour and Employment (MoLE).

iii. Ministry of Defence (MoD) has issued guidelines for use of PNG in its residential areas/unit lines

iv. Dept. of Public Enterprises (DPE) has issued guidelines to Public Sector Enterprises (PSEs) to have the provisions of PNG in their respective Residential complexes.

v. Ministry of Housing & Urban Affairs (MOHUA) has issued advisory to State Governments on following aspects:

a. To standardize the Road Restoration/ permission charges along with time bound permission in accordance with the local conditions.

b. Earmarking of land plot for development of CNG Stations at the planning stage of town/ city and same should be specified in the revised Master Plan.

c. Relevant modification in building by-laws for providing gas pipeline infrastructure in residential & commercial buildings at architectural design stage.

vi. Further, MOHUA has directed to CPWD & NBCC to have the provisions of PNG in all Government Residential complexes.

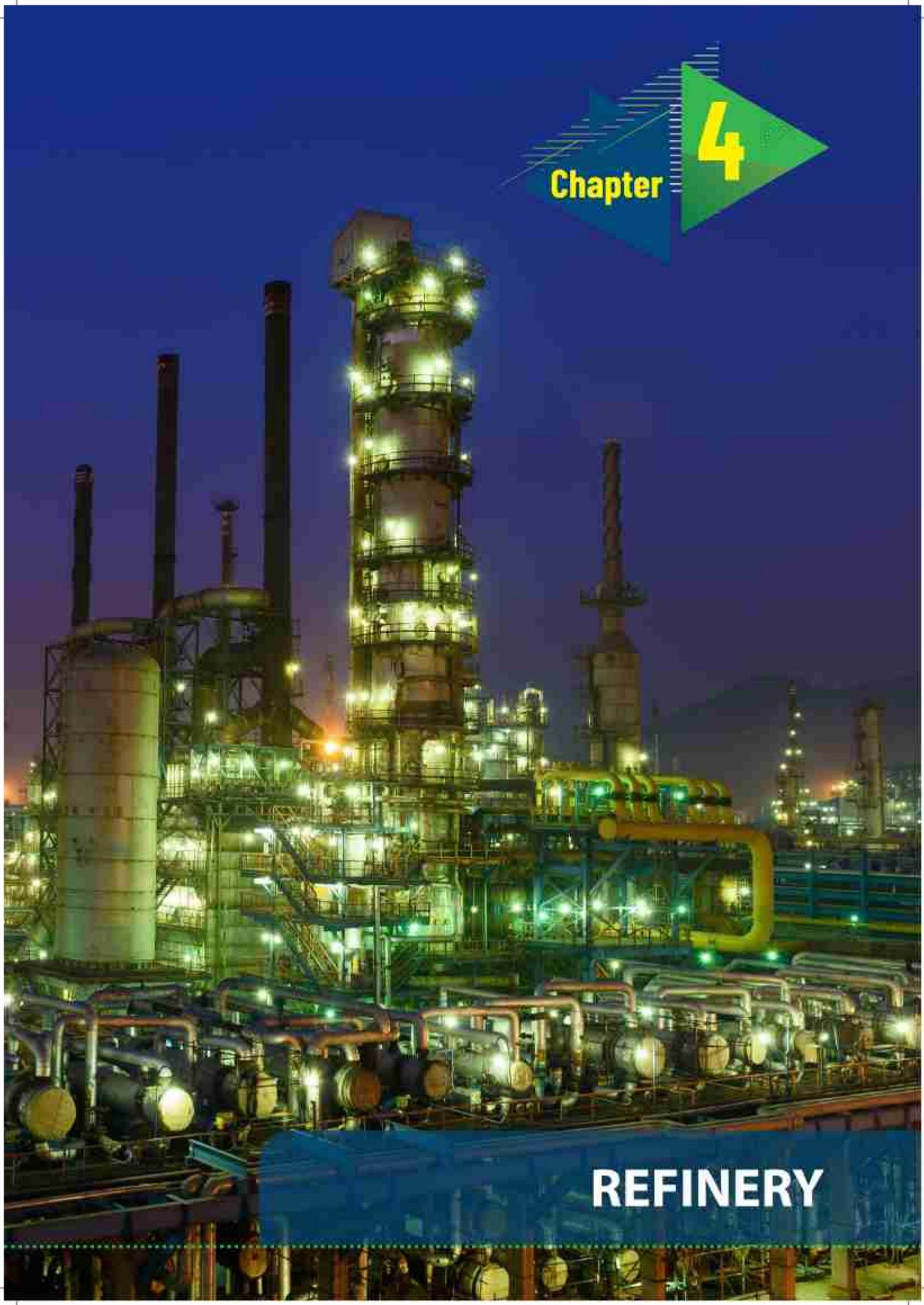
vii. DIPP notified amended Rule 2018 to ease out process to set up CNG dispensing facilities at existing OMC Ros.

viii. The government has approved the revised domestic natural gas pricing guidelines vide gazette notification dated 07.04.2023 for gas produced from nomination fields of ONGC/OIL, New Exploration Licensing Policy (NELP) blocks and pre-NELP blocks, where production Sharing Contract (PSC) provides for Government's approval of prices.





BPCL's Mumbai Refinery


Chapter
4
REFINERY

4 Refinery

4.1. The Indian refining industry has established itself as a major player globally. India is emerging as a refinery hub and refining capacity exceeds the demand. The country's refining name plate capacity has increased from a modest 62.0 Million Metric Tonnes Per Annum (MMTPA) in 1998 to 256.82 MMTPA as on 01.04.2024, comprising of 23 refineries – 19 under Public Sector, 3 under Private Sector and 1 in Joint Venture (JV).

The capacity wise details of the refineries are given below:

S. No.	Refinery Location/ Year of commissioning	Name of the Company	Name Plate Capacity (MMTPA)
1	Digboi – 1901 #	Indian Oil Corporation Ltd.	0.650
2	Guwahati - 1962		1.200
3	Barauni - 1964		6.000
4	Koyali - 1965		13.700
5	Bongaigaon - 1974		2.700
6	Haldia - 1975		8.000
7	Mathura - 1982		8.000
8	Panipat - 1998		15.000
9	Paradip - 2016		15.000
10	Manali - 1965	Chennai Petroleum Corporation Ltd.	10.500
11	Nagapattinam - 1993 @		0
	Total IOCL Group		**80.750**
12	Mumbai - 1954	Hindustan Petroleum Corporation Ltd.	9.500
13	Visakhapatnam - 1957		13.700
	Total HPCL		**23.200**
14	Mumbai - 1955	Bharat Petroleum Corporation Ltd.	12.000
15	Kochi - 1963		15.500
16	Bina, 2011		7.800
	Total BPCL		**35.300**
17	Numaligarh - 2000	Numaligarh Refinery Ltd.	3.000
18	Mangalore - 1996	Mangalore Refinery & Petrochemicals Ltd.	15.000
19	Tatipaka - 2001	Oil & Natural Gas Corporation Ltd.	0.066
	Sub-total PSU		**157.300**
20	Jamnagar, RIL DTA, 1999	Reliance Industries Ltd	33.000
21	Jamnagar, RIL SEZ, 2008	Reliance Industries Ltd	35.200
22	Vadinar, 2006	Nayara Energy	20.000
	Sub-total Private sector		**88.200**
23	Bhatinda, HMEL, 2012	HPCL Mittal Energy Ltd	11.300
	Sub-total Joint venture		**11.300**
	Total		**256.816**

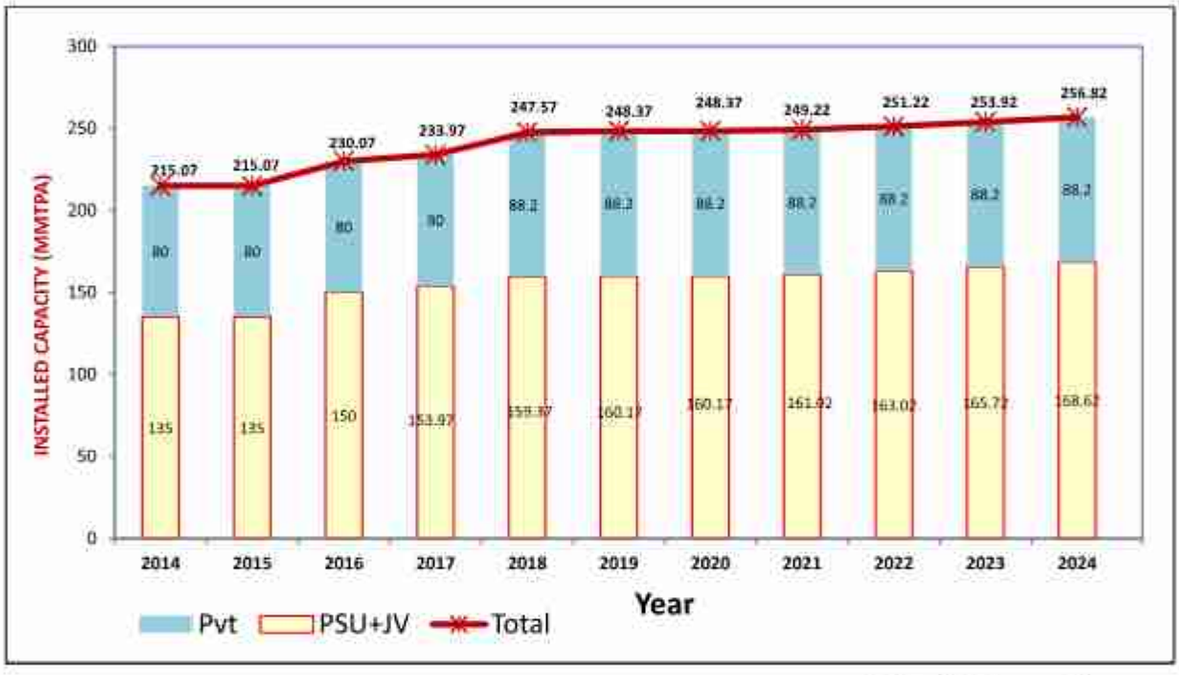
#Refinery was set up at Digboi in 1901 by Assam Oil Company Ltd and later on IOCL took over the refinery on 14.10.1981.

@Operation of Cauvery Basin Refinery (CBR) at Nagapattinam of 1.0 MMTPA has been stopped since 01.4.2019 to carryout project activities for a proposed 9 MMTPA capacity refinery.

4.1.1 The refining capacity is not only sufficient for domestic consumption but leaving a substantial surplus also for export of petroleum products. Since 2001-02, India is a net exporter of petroleum products. During FY 2023-2024, the country has exported 62.4 Million Metric Tonnes (MMT) (provisional) of Petroleum products worth US D 47.7 Billion (provisional).

4.2. Refining Capacity Addition over the years

4.2.1. The graphical representation of the refining capacity addition over the years shown in Graph.



as on 1st April of respective years

4.3. Green Field Refinery and Expansion of Existing Refineries

Green Field Refinery

S.No.	Name of the Company	Location of the Refinery	Target year	Capacity, MMTPA
1	HPCL Rajasthan Refinery Limited (HRRL)	Barmer, Rajasthan	2025-26	9.0

Expansion of existing Refineries

The Capacity expansion plan of existing refineries till 2027-28 is as under:

S. No.	Name of the Company	Location of the Refinery	Target year	Increase in Capacity, MMTPA
1	Bharat Petroleum Corporation Limited	Bina, Madhya Pradesh	2027-28	3.2
2	Bharat Petroleum Corporation Limited	Mumbai, Maharashtra	2025-26	4.0
3	Bharat Petroleum Corporation Limited	Kochi, Kerala	2026-27	2.5
4	Indian Oil Corporation Limited	Digboi, Assam	2025-26	0.35
5	Indian Oil Corporation Limited	Koyali, Gujarat	2025-26	4.3
6	Indian Oil Corporation Limited	Barauni, Bihar	2024-25	3.0
7	Indian Oil Corporation Limited	Panipat, Haryana	2025-26	10.0
8	Hindustan Petroleum Corporation Limited (HPCL)	Visakhapatnam, Andhra Pradesh	2024-25	1.3
9	Numaligarh Refineries Limited (NRL)	Numaligarh, Assam	2025-26	6.0

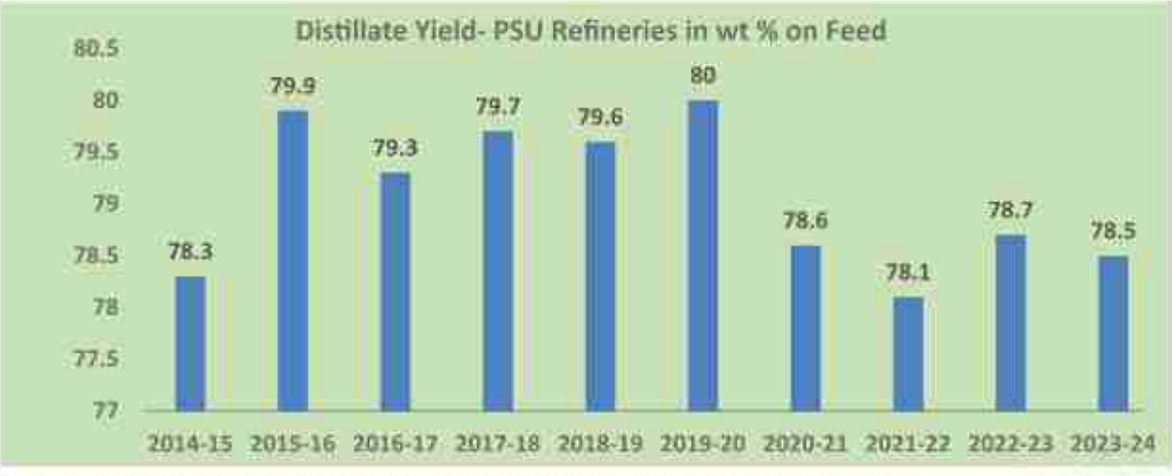
4.4. Refinery Performance Improvement

4.4.1. Indian public sector refineries are equipped with modern technologies and have continuously upgraded the technologies in line with the international trend and as per the requirement. Indian refineries have accorded top priority to reduce the energy consumption through various energy conservation measures.

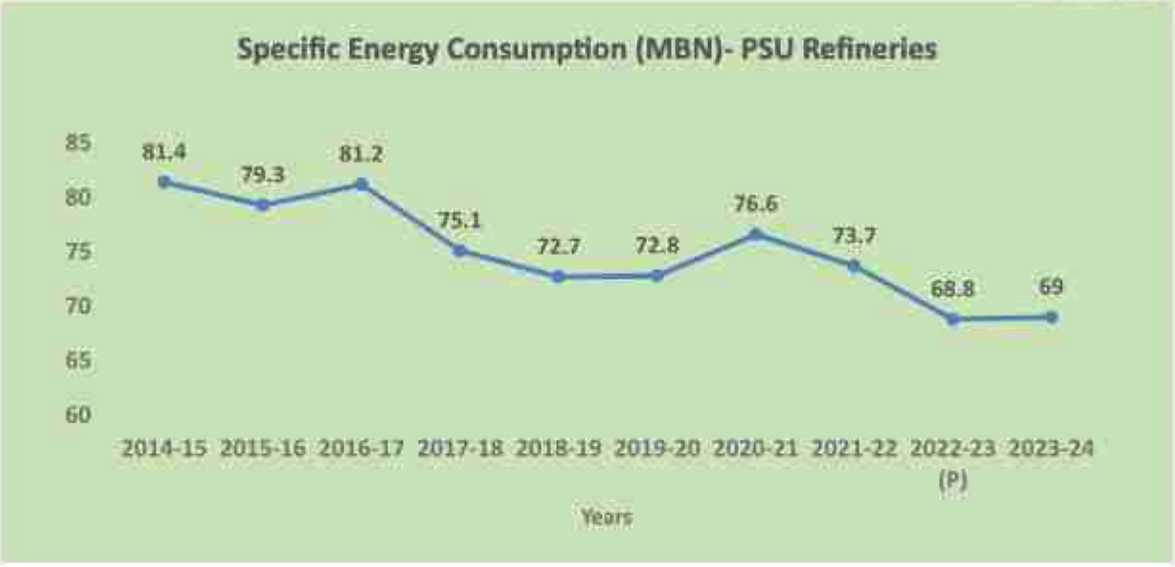
The Centre for High Technology (CHT) carried out a Performance Benchmarking Study of public sector Refineries through M/s Solomon Associates for consecutive cycles 2010, 2012, 2014, 2016, 2018, 2020 and 2022.

The distillate yield and quality of petrol/diesel has been improved progressively by PSU refineries through adoption of modern technologies. For standardization of distillate yield, all Indian refineries has adopted a standard distillate yield methodology developed by CHT from 2020-21 onwards.

The PSU refineries' average distillate yield (wt% on crude) has improved from 73.3% in 2005-06 to 78.5% in FY2023-24. Similarly, energy conservation measures have helped the industry in reducing the Specific Energy Consumption (MBN), measured in terms of MBTU/bbl/NRGF by about 30% during the period 2005-06 to 2023-24. As Fuel & Loss varies with the complexity of the refinery, the MBN methodology was developed by CHT to capture Fuel & Loss along with complexity. The MBN methodology was revamped to reflect technological trends based on input from consultants and reporting has been changed to New MBN from 2015-16.



From 2020-21 onwards, distillate methodology of CHT was adopted for standardization



* 2022-23 MBN figures under validation by BEE

Specific Energy Consumption written as SEC or MBN;mbn=MBTU/Bbl/NRGF;MBTU: Net energy & loss in Refinery (Thousand British Thermal Unit);

From 2015-16 onwards, new MBN Methodology was adopted for standardization

4.5. Auto Fuel Quality Up-gradation

The supply of BS-IV quality fuel across the entire country was completed in phases by 01.04.2017. Govt. decided to leap frog directly from BS-IV to BS-VI emission norms in the country w.e.f. 01.04.2020. Ministry of Road transport & Highways, vide Notification No. GSR 889(E) dated 16.09.2016, notified emission standards for BS VI fuels. Considering rise in pollution level in Delhi, Government implemented BS-VI in NCT Delhi w.e.f. 01.04.2018, followed by major parts of NCR from 01.04.2019. The nationwide supply of BS-VI quality fuels commenced from 01.04.2020.



4.6. BRIEF DESCRIPTION OF THE REFINERIES

Public Sector Refineries

IOCL Refineries

4.6.1. Digboi Refinery (Assam)-Indian Oil Corporation Limited (IOCL)

Digboi Refinery was commissioned in 1901 by Burmah Oil Company Ltd. (later Assam Oil Company Ltd.). Indian Oil Corporation Ltd. took over the Refinery and marketing management of Assam Oil Company Ltd. with effect from 14.10.1981 and created a separate division. This division had both Refinery and Marketing operations. Digboi refinery is the oldest operating refinery in the world and produces premium grade Paraffin wax and micro-crystalline wax. The present capacity of the Refinery is 0.65 MMTPA.The crude refining capacity utilisation of the refinery was 109.23% in 2023-24.

4.6.2. Guwahati Refinery (Assam)-Indian Oil Corporation Limited (IOCL)

Guwahati Refinery was commissioned in January, 1962 with design capacity of 0.75 MMTPA. The refinery was set up in collaboration with Romania. Guwahati refinery was first refinery in the Public Sector. It was the first refinery to install "Indmax Unit", a novel technology developed by IOCL R&D Centre for upgrading heavy ends to LPG, motor spirit and diesel oil in 2003. The present capacity of the Refinery is 1.2 MMTPA. The crude refining capacity utilisation of the refinery was 83.33% in 2023-24.

4.6.3. Barauni Refinery (Bihar)-Indian Oil Corporation Limited (IOCL)

Barauni Refinery was commissioned in July, 1964. The refinery was set up in collaboration with the then Soviet Union. The refinery, which was originally designed for processing indigenous Assam crudes, was subsequently revamped and expanded and is now capable of processing imported crudes.The present capacity of the Refinery is 6.00 MMTPA. The crude refining capacity utilisation of the refinery was 110.33 % in 2023-24.

4.6.4. Koyali Refinery (Gujarat)-Indian Oil Corporation Limited (IOCL)

Koyali Refinery was commissioned in October, 1965. The refinery was set up in collaboration with former Soviet Union. Koyali refinery commissioned the country's first Hydrocracker Unit for conversion of heavier ends of crude oil to high value superior quality kerosene/ATF and Diesel. It also has the world's largest single train Linear Alkyl Benzene (LAB) plant which marked Indian Oil's entry into Petrochemicals. The present capacity of the Refinery is 13.70 MMTPA. The crude refining capacity utilisation of the refinery was 110.94 % in 2023-24.

4.6.5. Bongaigaon Refinery (Assam)-Indian Oil Corporation Limited (IOCL)

Bongaigaon Refinery & Petrochemicals Ltd. (BRPL) was incorporated on 20.02.1974, as a fully owned Central Government company. BRPL became a subsidiary of Indian Oil Corporation Ltd. in March, 2001. BRPL was amalgamated with the holding company, Indian Oil Corporation Limited effective from 25.03.2009. BRPL which was originally processing Assam crudes is now capable of processing imported crudes. The present capacity of the Refinery is augmented from 2.35 to 2.7 MMTPA in 2020-21. The crude refining capacity utilisation of the refinery was 111.48% in 2023-24.

4.6.6 Haldia Refinery (West Bengal)- Indian Oil Corporation Limited (IOCL)

Haldia Refinery is the 4th Refinery of Indian Oil and was commissioned in January, 1975. It a coastal Refinery and is situated 136 km down-stream of Kolkata in the district of Purba Medinipur, West Bengal, near the confluence of river Hoogly and Haldia.

It is also one of the two refineries of Indian Oil Group Companies producing Lube Oil Base Stocks (LOBS) apart from being the sole producer of Jute Batching Oil (JBO).

Initially installed with a crude processing capacity of 2.5 MMTPA, capacity of the Refinery was increased to 2.75 MMTPA through de-bottlenecking in 1989-90, and to 3.75 MMTPA in 1997 with the installation/ commissioning of the 2nd CDU of 1.0 MMTPA capacity. The Refinery has subsequently been augmented to capacity of 7.5 MMTPA. The present capacity is 8.0 MMTPA after revamp of CDU-1 in 2020 (Revamp CDU-1 to

3.9 MMTPA from 3.4 MMTPA). The crude refining capacity utilisation of the refinery was 100.75% in 2023-24.

4.6.7. Mathura Refinery (Uttar Pradesh)-Indian Oil Corporation Limited (IOCL)

Mathura Refinery was commissioned in January, 1982. The primary units of the refinery were designed by USSR. It is first Green Refinery of India equipped with elaborate environment monitoring system and ecological park. It also uses natural gas to control SO2 emissions from the refinery. The present capacity of the Refinery is 8.00 MMTPA. The crude refining capacity utilisation of the refinery was 114.87% in 2023-24.

4.6.8. Panipat Refinery (Haryana)-Indian Oil Corporation Limited (IOCL)

Panipat Refinery was commissioned in 1998. Panipat refinery is the first modern integrated refinery cum Petrochemical complex in public sector. The Purified Terephthalic Acid (PTA) plant is the largest in the country. The commissioning of Panipat Naphtha Cracker Unit, Mono ethyleneGlycol (MEG) unit, Poly propylene (PP) unit, LinearLow-density Poly Ethylene (LLDPE) and High-density Poly ethylene (HDPE) units etc. heralded Indian Oil's entry into Plastics Industry.

The present capacity of the Refinery is 15.00 MMTPA. The crude refining capacity utilisation of the refinery was 95.33 % in 2023-24.

4.6.9. Paradip Refinery (Odisha)-Indian Oil CorporationLimited (IOCL)

Paradip Refinery was dedicated to the nation by the Hon'ble Prime Minister 07.02.2016. Paradip Refinery is Indian Oil's most prestigious and capital-intensive project till date and this is the 11th refinery of IOCL group, located at Paradip, Odisha. This refinery serves as an economic stimulus for industrial development in the region by way of immediate potential growth of ancillary industries.

This refinery is the most modern refinery with state-of-the-art technologies from various technology licensors across the world. The refinery was designed to process 15.0 MMTPA crude with an overall Nelson complexity factor of 10.8, which makes it capable of processing 100% High Sulfur and Heavy Crude oil to produce various petroleum products like LPG, Motor Spirit (Petrol) & Diesel of BS-VI quality, Kerosene, Aviation Turbine fuel, Propylene, Sulfur and Petroleum Coke. The refinery is also producing premium quality Motor Spirit and other green auto fuel variants for export to various countries.

The products from the Refinery meets the energy demands of the domestic market and partly the South-East Asian export market. The present capacity of the Refinery is 15.00 MMTPA. The crude refining capacity utilisation of the refinery was 101.4% in 2023-24.

HPCL Refineries

4.6.10. Mumbai Refinery (Maharashtra)-Hindustan Petroleum Corporation Limited (HPCL)

Mumbai Refinery was first incorporated in 1952as Standard Vacuum Refining Company of India(StanVac) which was commissioned in 1954. In1962 StanVac was named ESSO India Limited.In 1969, Lube India Ltd came into existence formanufacturing Lube Oil Base Stock (LOBS). On 15th July, 1974 the undertakings of ESSO andLube India Ltd were nationalized and merged to form Hindustan Petroleum Corporation Limited (HPCL). HPCL-Mumbai refinery is the only refinery of HPCL to produce Lube Oil Base Stocks. The refinery also produces special products like Food Grade Hexane, Rubber Processing (RPO), Diana Processing oil (Clear and transparent paraffin type of process oil, with excellent heat resistant and weather resistant properties.) etc. The capacity of the Refinery has been augmented from 7.5 to 9.5 MMTPA w.e.f 01.04.2022. The crude refining capacity utilisation of the refinery was 101.47% in 2023-24

4.6.11. Visakh Refinery (Andhra Pradesh)-Hindustan Petroleum Corporation Limited (HPCL)

HPCL's Visakh Refinery was commissioned in 1957 by Caltex Oil Refining (India) Ltd. The Refinery was taken over by the Government of India in 1976 and was consequently amalgamated with HPCL in 1978. HPCL-Visakh

refinery was first oil Refinery on the East Coast and was one of the first major industries of Visakhapatnam. With the commissioning of the Single Point Mooring (SPM) facility at Visakh in the year 2010, Very Large Crude Carriers (VLCC), which carry up to 2 million barrels of oil, can now be received at VisakhRefinery. The Indian Strategic Petroleum Reserves Ltd. (ISPRL) exists nearby the refinery. The capacity of the Refinery has been augmented from 11.0 to 13.7 MMTPA in 2023-24. The crude refining capacity utilisation of the refinery was 92.62 % in 2023-24.

BPCL Refineries

4.6.12. Mumbai Refinery (Maharashtra)–Bharat Petroleum Corporation Limited (BPCL)

The refinery in Mumbai was commissioned in January 1955 under the ownership of Burmah Shell refineries Ltd. Following the Government acquisition of the Burmah Shell, Bharat Petroleum Corporation Ltd came into existence on 24th January 1976. BPCL-Mumbai refinery has pioneered the processing of indigenous crude oil and currently can handle processing of 72 types of crude oil. The refinery has also Lube Base Oil Unit for production of environment friendly Group II/III base oil. The present capacity of the Refinery is 12.00 MMTPA. The crude refining capacity utilisation of the refinery was 125.83% in 2023-24.

4.6.13. Kochi Refinery (Kerala)-Bharat Petroleum Corporation Limited (BPCL)

The Kochi Refinery Ltd (KRL) was set up in pursuance of formation agreement dated 27th April, 1963 between Govt. of India, Philips Petroleum Co. of USA and Duncan Brothers of Calcutta. The refinery has been amalgamated with Bharat Petroleum Corporation Ltd in 2006. The refinery is equipped to receive crude oil in Very Large Crude Carriers (VLCC). The product portfolio of the Kochi Refinery today includes petrochemical feedstocks and specialty products in addition to its range of quality fuels. Kochi refinery has undertaken an ambitious plan to diversify into petrochemical manufacturing for value addition. The present capacity of the Refinery is 15.5 MMTPA. The crude refining capacity utilisation of the refinery was 111.61 % in 2023-24.

4.6.14. Bina Refinery-Bharat Oman Refineries Limited (BORL) (Madhya Pradesh)

Bina refinery was set up by Bharat Oman Refineries Limited (BORL), a joint venture of Bharat Petroleum Corporation Limited (BPCL) and Oman Oil Corporation Limited (OOCL) was commissioned in May 2011. Since March 2020, the Company has become subsidiary of Bharat Petroleum Corporation Limited and in July 2021, OQ SAOC (formerly known as Oman Oil Company SAOC) entire shareholding was purchased by Bharat Petroleum Corporation Limited.

Bina refinery is the first refinery in central part of India and augments the availability of petroleum products in central and northern India. Other facilities include Single Point Mooring facility (SPM), Crude Oil storage Terminal (COT) at Vadinar in Gujarat and 935 km long cross-country crude pipeline from Vadinar to Bina (VBPL). The present capacity of the Refinery is 7.80 MMTPA. The crude refining capacity utilisation of the refinery was 91.02% in 2023-24.

CPCL Refineries

4.6.15. Manali Refinery (Tamil Nadu)-Chennai Petroleum Corporation Ltd. (CPCL)

Chennai Petroleum Corporation Limited (CPCL), formerly known as Madras Refineries Limited (MRL) was formed as a joint venture in 1965 between the Government of India (GOI), AMOCO and National Iranian Oil Company (NIOC). CPCL became a subsidiary of IOCL in 2001. CPCL-Manali refinery is one of the most complex refineries in India with Fuel, Lube, Wax and Petrochemical feedstocks production facilities. The 5.8 MGD Sea Water Desalination Project to augment the water requirements of its refinery was first of its kind in the industry. The present capacity of the Refinery is 10.50 MMTPA. The crude refining capacity utilisation of the refinery was 110.85% in 2023-24.

4.6.16. Cauvery Basin Refinery (Nagapattinam-Tamil Nadu)-Chennai Petroleum Corporation Limited (CPCL)

Operation of Cauvery Basin Refinery (CBR) of CPCL of 1.0 MMTPA Capacity has been stopped since 01.04.2019 and a new refinery of 9.0 MMTPA has been planned.

NRL Refinery

4.6.17. Numaligarh Refinery (ASSAM)- Numaligarh Refinery Limited (NRL)

Numaligarh Refinery, popularly known as "Assam Accord Refinery" was commissioned in October, 2000. Current shareholding pattern of NRL is: Oil India Limited (72.15%), Government of Assam (23.48%) and Engineers India Limited (4.37%). NRL is the largest refinery in the North- East equipped with modern units Hydrocraker and Delayed Coker for maximising distillate yield. The present capacity of the Refinery is 3.00 MMTPA. The crude refining capacity utilisation of the refinery was 83.66 % in 2023-24.

MRPL Refinery

4.6.18. Mangalore Refinery (KARNATAKA)-Mangalore Refinery and Petrochemicals Ltd. (MRPL)

Mangalore Refinery and Petrochemicals Limited (MRPL) was commissioned in March, 1996. MRPL was originally set up as a Joint Venture refinery, promoted by Hindustan Petroleum Corporation Ltd. (HPCL) and the Aditya Birla Group of Companies. In March, 2003 MRPL became a subsidiary of ONGC. The Refinery has got a versatile design with high flexibility to process Crudes with 24 to 46 API gravity and has high degree of Automation. MRPL is the only Refinery in India to have 2 Hydrocrackers producing Premium Diesel (High Cetane). It is also the only Refinery in India to have 2 CCRs producing Unleaded Petrol of High Octane. The present capacity of the Refinery is 15.00 MMTPA. The crude refining capacity utilisation of the refinery was 110.20 % in 2023-24.

ONGC Refinery

4.6.19. Tatipaka Refinery (Andhra Pradesh)-Oil & Natural Gas Corporation Limited (ONGC)

The refinery, set up as mini refinery (Phase-I) of ONGC, was commissioned in September, 2001 at Tatipaka in East Godavari District of Andhra Pradesh. The present capacity of the Refinery is 0.066MMTPA. The crude refining capacity utilisation of the refinery was 98.5% in 2023-24.

Joint Venture Refinery

4.6.20. Guru Gobind Singh Refinery-HPCL-Mittal Energy Limited (HMEL), Bathinda (Punjab)

Guru Gobind Singh Refinery (GGSR), owned by HPCL-Mittal Energy Limited (HMEL), a joint venture between HPCL and Mittal Energy Limited, was commissioned in April, 2012. The refinery is a testimony to a successful Public Private Partnership in the oil and gas sector given the strategic location of Bathinda, the refinery serving the fuel requirements of the northern States of India. HMEL has also incorporated a wholly owned subsidiary HPCL-Mittal Pipelines Limited (HMPL) to set up and operate an SPM for crude oil receipt, storage and cross-country transportation of crude oil. The present capacity of the Refinery is 11.30 MMTPA. The crude refining capacity utilisation of the refinery was 111.5% in 2023-24.

Private Sector Refineries

4.6.21. Reliance Industries Limited (Domestic Tariff Area) (RIL-DTA), Jamnagar (Gujarat)

The refinery was commissioned in July 1999. RIL-DTA was the first private sector refinery in the country. RIL-DTA is the World's biggest grassroots Refinery having a petrochemical plant for the production of paraxylene, a polymer plant for the production of Polypropylene. The present capacity of the Refinery is 33.00 MMTPA. The crude refining capacity utilisation of the refinery was 104.24% in 2023-24.

4.6.22. Reliance Industries Limited- SEZ (RIL-SEZ), Jamnagar (Gujarat)

The refinery was commissioned in December, 2008. An export based SEZ refinery has a unique design and path breaking configuration with 'Clean Fuels' process plant. It is designed with high level of flexibility to change grades based on economy and to capture margins based on market dynamics. The new SEZ refinery was the first refinery in India to produce Euro-IV grades of gasoline and diesel. The present capacity of the Refinery is 35.20 MMTPA. The crude refining capacity utilisation of the refinery was 80.39 % (Provisional) in 2023-24.

4.6.23. Nayara Energy Limited, Vadinar Refinery, Vadinar (Gujarat)

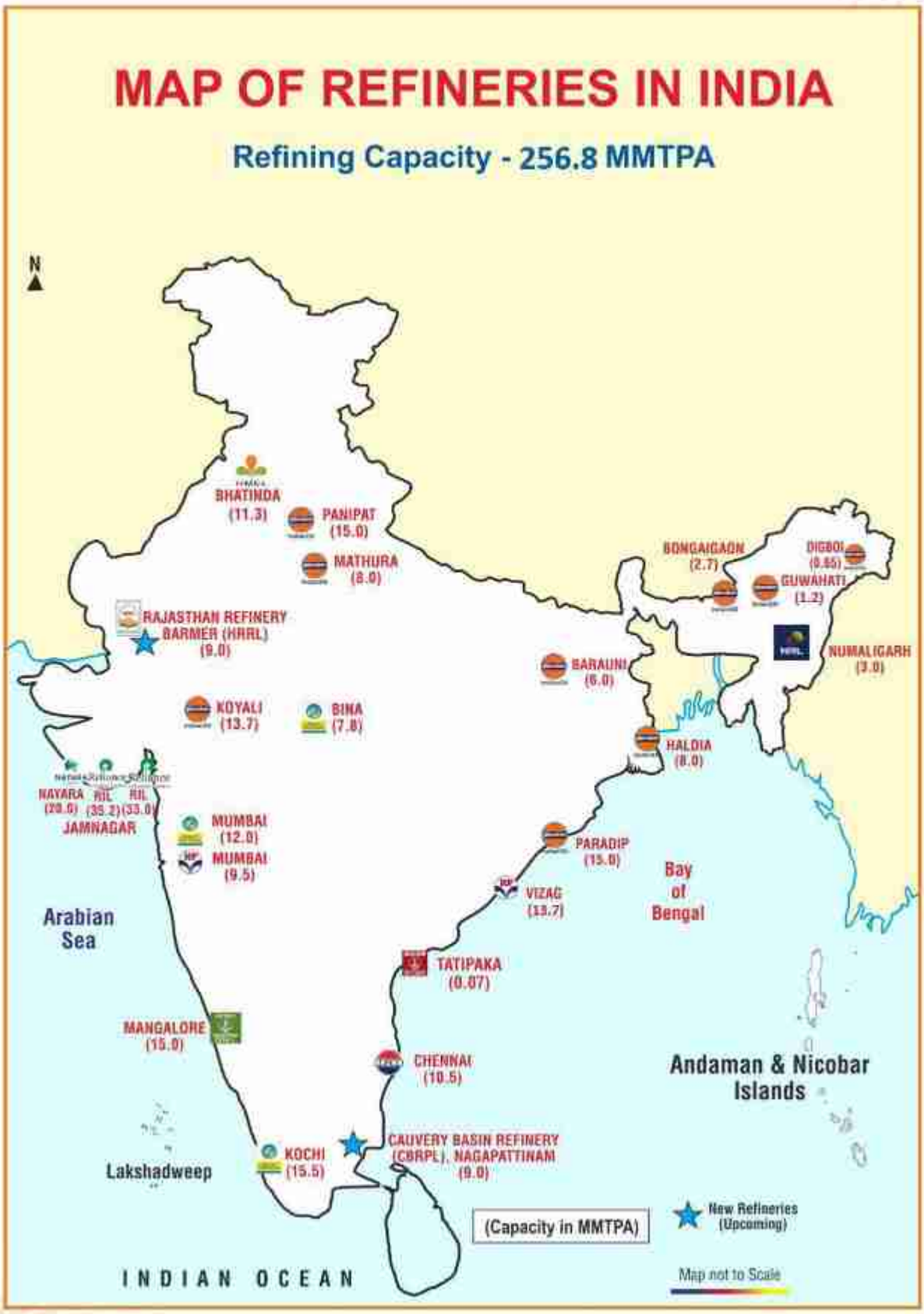
The refinery was commissioned in November, 2006. Vadinar refinery is the single-location second largest refinery in the country. The present capacity of the Refinery is 20.00 MMTPA. The crude refining capacity utilisation of the refinery was 101.50 % in 2023-24.

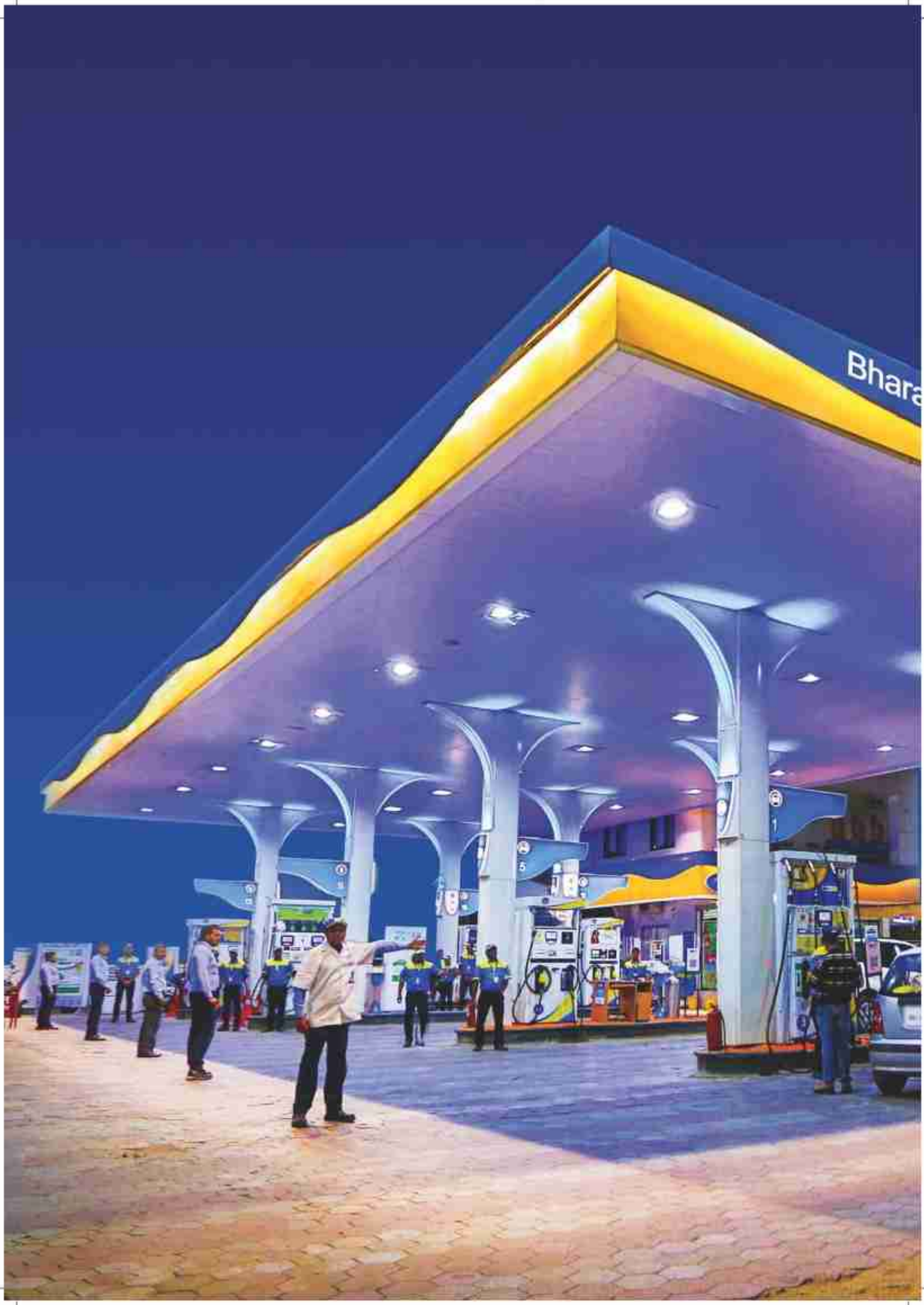


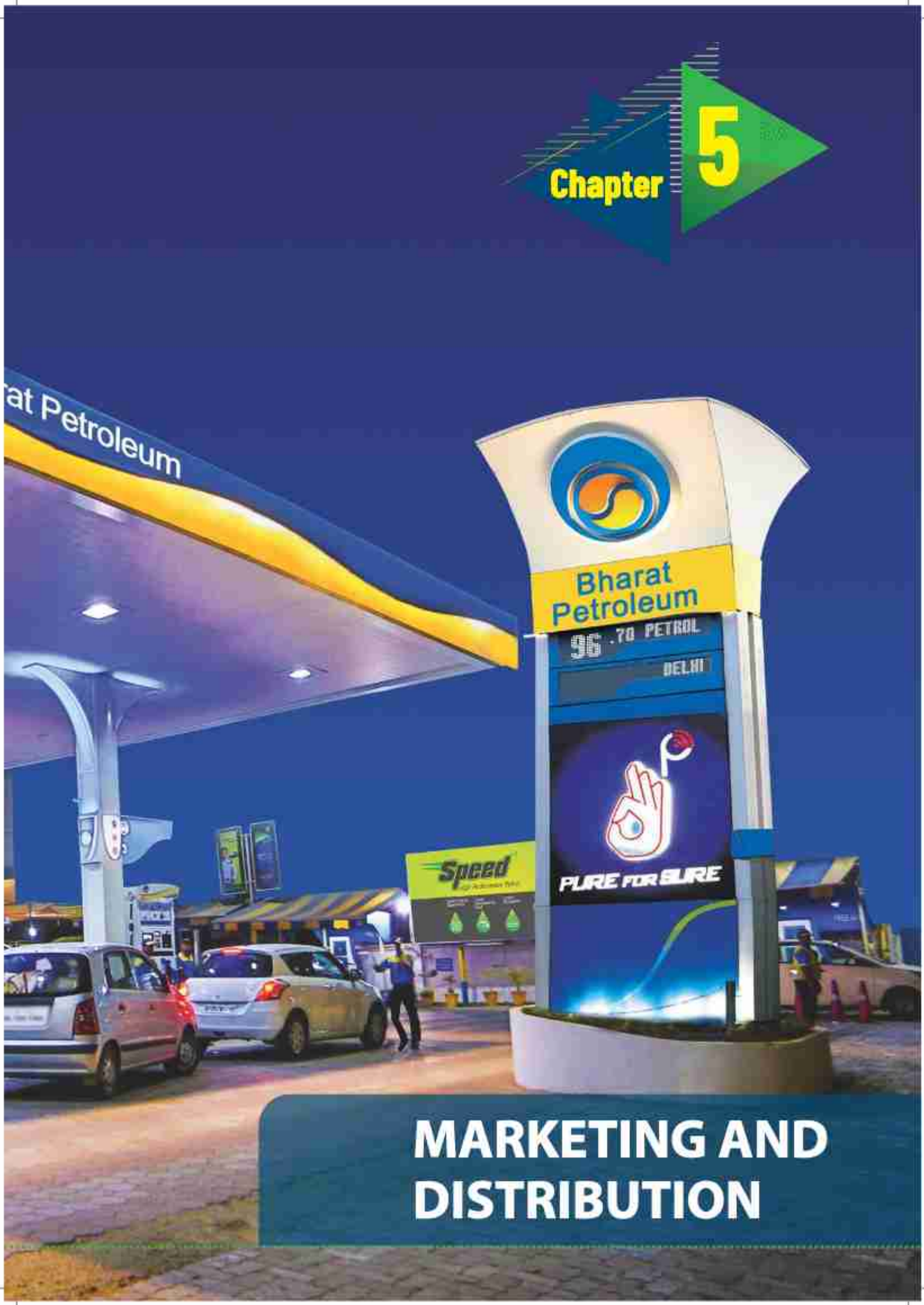
View of IOCL's Panipat Refinery

MAP OF REFINERIES IN INDIA

Refining Capacity - 256.8 MMTPA




Bhara



MARKETING AND DISTRIBUTION

5 Marketing and Distribution

5.1. Retail Marketing Infrastructure of LPG

The retail marketing of LPG in India is done by the Public Sector Oil Marketing Companies (OMCs) i.e. Indian Oil Corporation Ltd (IOCL), Hindustan Petroleum Corporation Ltd (HPCL), Bharat Petroleum Corporation Ltd. (BPCL) and Private Companies such as Reliance Industries, Essar, Shell, etc. There were 210 LPG Bottling Plants having rated bottling capacity of 22,843 TMTPA, operated by Public Sector Oil Marketing Companies and 25,481 LPG Distributorships in the country as on 31.03.2024. Total active LPG consumers as on 31.03.2024 in the Country were 32.42 crore. During FY2023-24, a total of 96 new LPG distributorships and 5 new bottling plants have been commissioned by public sector OMCs. Also, a total of 112.7 lakh new LPG connections have been issued by OMCs during FY2023-24 including 74.18 lakh connections under PM Ujjwala Yojana.

5.2. Major Initiatives

5.2.1. PAHAL (DBTL Scheme)



Government of India launched Direct Benefit Transfer for LPG consumer (DBTL) scheme namely, 'PAHAL' (Pratyaksh Hanstantrit Labh), in 54 districts of the country on 15.11.2014. Later the scheme was extended to all over the country and as on 31.03.2024, a total of 30.04 crore LPG consumers have joined the scheme.

The scheme aims to rationalise subsidies and cut subsidy leakages. LPG consumers who join the PAHAL scheme, get their LPG refills at non-subsidised price and receive LPG subsidy (as per their entitlement) directly into their bank accounts. With the implementation of PAHAL, new regime of transparency in subsidy management has been put in place empowering the LPG consumers in the country. PAHAL has further helped in identifying 'ghost' accounts, multiple accounts and inactive accounts. This resulted in curbing diversion of subsidised LPG to commercial purposes.

Give it up: As a part of subsidy management, the Hon'ble Prime Minister of India appealed to all well-off LPG consumers to voluntarily surrender their LPG subsidy by launching 'Give it up' campaign. Give it up campaign evoked huge response from socially committed individuals and has resulted in more than 1.15 crore consumers giving up their LPG subsidy voluntarily as on 31.03.2024. Give it up campaign of the government has received widespread acclaim from all over the world and is a leading and one of the earliest example of Nudge tool used in Public Policy inspired from the domain of Psychology and behavioral Economics.

5.2.2. Pradhan Mantri Ujjwala Yojana (PMUY)

In May 2016, Ministry of Petroleum and Natural Gas (MoP&NG), introduced the 'Pradhan Mantri Ujjwala Yojana' (PMUY) as a flagship scheme with an objective to make clean cooking fuel such as LPG available to the rural and deprived households which were otherwise using traditional cooking fuels such as firewood, coal, cow-dung cakes etc. Usage of traditional cooking fuels had detrimental impacts on the health of rural women as well as on the environment.

Hon'ble Prime Minister of India formally launched the scheme on 01.05.2016.

Initially, PMUY envisaged a target of 5 crore connections over a period of 3 years starting from FY 2016-17. Later, the target of Pradhan Mantri Ujjwala Yojana (PMUY) was increased from five crore to eight crore by Government. Along with the increase in target Government also extended the benefit of PMUY to such poor families who had been left out on account of their names not appearing in either the SECC list or 7 identified categories to cover all poor families of the country. This extended list of beneficiaries included categories i.e SC, ST, Pradhan Mantri Awas Yojana, Most Backward Classes, Antyodaya Anna Yojana, tea & ex-tea garden tribes, forest dwellers, island & river island people and poor household as per 14-point self-declaration by applicant.

Under this scheme, the Government provides deposit free LPG connection to the adult woman member of a BPL family. Government bears the cost of security deposit towards cylinder and Pressure Regulator, DGCC Card, Suraksha Hose and administrative/installation charges amounting ₹ 1,600/- for each new connection.

The target of releasing 8 crore LPG connections under PMUY scheme was achieved on 7th September, 2019, 7 months ahead of the target date of 31st March 2020.

UJJWALA 2.0



Hon'ble Finance Minister during her Budget Speech on 01.02.2021 announced that Ujjwala Scheme which has benefited 8 crores households would be extended to cover 1 crores more beneficiaries.

Accordingly, the Ujjwala 2.0 was launched in the esteemed presence of the Hon'ble Prime Minister in the Mahoba District of Uttar Pradesh on 10th August, 2021 on pan India basis to provide additional one crore LPG connections under PMUY.

Along with a deposit free LPG connection, Ujjwala 2.0 provides first refill and hotplate free of cost to all beneficiaries. Special provision has been made for migrant families to avail new connection. A self-declaration for both 'family declaration' and as a 'proof of address' will suffice for migrant applicant.

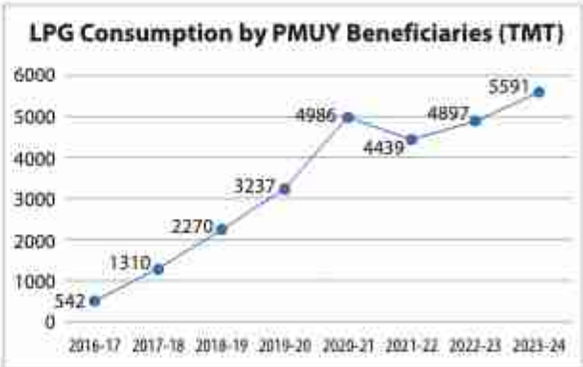
Online application option has been provided for the first time for applicants along with existing options like CSC centres, Helpdesk and OMC distributors etc. Applicants can apply online for an Ujjwala connection using scheme website www.pmuy.gov.in.

The target of 1.0 crore under Ujjwala 2.0 was achieved by Jan'22. Further, to cover the left-out households, the target under the scheme was enhanced by additional 60 lakh connections to 1.6 crore and same was achieved during December 22. As on 01.01.2023, a total of 1.6 crore LPG connections have been released under Ujjwala 2.0.

Government approved expansion of Ujjwala Yojana in September 2023 for 75 lakh additional LPG connections to be released in 3 financial years (2023-24 to 2025-26) out of which more than 74 lakhs have been released. As on 31.03.2024, there are total 10.33 crore PMUY connections in the country.

Improving LPG consumption of PMUY beneficiaries

The LPG Consumption of PMUY beneficiaries has improved from 542 TMT in FY 2016-17 to 5,591 TMT in FY 2023-24.



The per capita consumption for PMUY Beneficiaries in FY 2023-24 was 3.95 as against 3.0 in FY 2019-20.

Targeted subsidy to PMUY Households

To make LPG more affordable to PMUY consumers and ensure sustained usage of LPG by them, Government started a targeted subsidy of ₹ 200/- per 14.2 kg cylinder for up to 12 refills per year (and proportionately pro-rated for 5 Kg connections) to the PMUY consumers in May 2022. This subsidy was increased by ₹ 100 in October 2023 taking the total subsidy to ₹ 300. The subsidy is credited directly to the registered bank accounts of the eligible beneficiaries.

5.2.3. New LPG Connections

LPG domestic connections are easily available on demand and are released to prospective customers once they approach the concerned distributorship and fulfil the KYC formalities. LPG distributors of the OMCs immediately register and act on a request for a new LPG connection. There is no waiting list for an ordinary LPG connections in the country.

FY	New LPG connections issued (No. in Crore)
2021-22	1.58
2022-23	1.01
2023-24	1.12

Portability for Domestic LPG customers

a. **Refill Portability**: Consumers are given an option to select a distributor other than their parent distributor while booking refills through the portal and mobile app. The list of all distributors serving in the pin code/market is displayed to the customer along with their star rating. A total of 15.8 lakh refill portability requests were processed in 2023-24.

b. **LPG connection Portability for consumers**: The facility of Online Transfer of LPG connection to another distributor serving in the same area has been provided for the first time to LPG customers through respective OMCs' web portals and Mobile Apps. In 2023-24, Public Sector OMCs processed 6.4 lakh connection portability requests from LPG consumers.

5.2.4. Commissioning of New Distributorships

Currently, the selection process for all types of distributorships is undertaken under Unified Guidelines for Selection of LPG distributorships. In FY 2021-22, 214 new LPG distributorships were commissioned. In FY 2022-23, a total of 116 new LPG distributorships were commissioned and in FY 2023-24, a total of 96 new LPG distributorships were commissioned across the country. As on 31.03.2024 there are total 25481 distributorships.

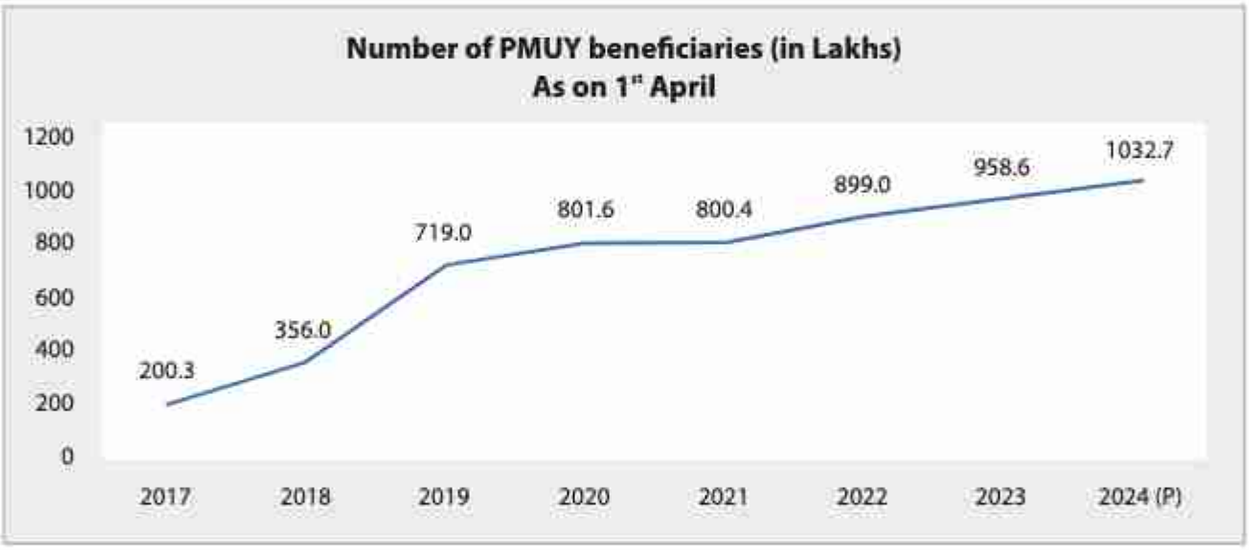
State wise details of distributorships as on 31.03.2024 are as follows:

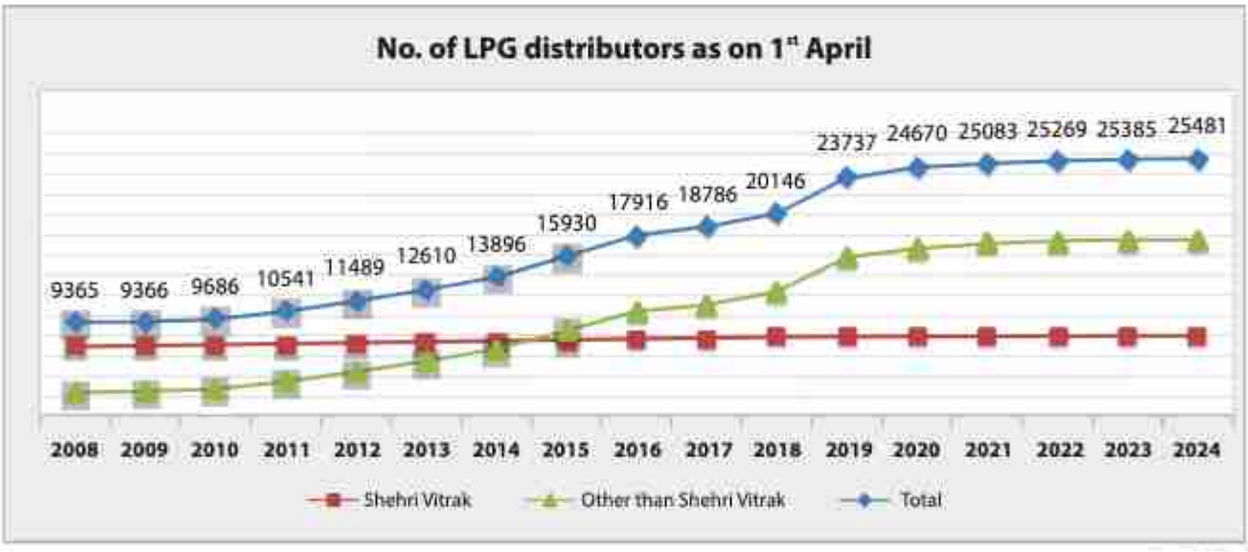
STATE/UT	Sheheri Vitrak	Rurban Vitrak	Gramin Vitrak	Durgam Kshetriya Vitrak	TOTAL
CHANDIGARH	26	0	0	0	26
DELHI	317	0	0	0	317
HARYANA	282	103	232	9	626
HIMACHAL PRADESH	69	13	91	36	209
JAMMU & KASHMIR	125	47	76	49	297
PUNJAB	334	256	249	21	860
RAJASTHAN	434	163	654	133	1384
UTTAR PRADESH	1008	706	2306	122	4142
UTTRANCHAL	114	105	59	40	318
SUB TOTAL NORTH	**2,709**	**1,393**	**3,667**	**410**	**8,179**

STATE/UT	Sheheri Vitrak	Rurban Vitrak	Gramin Vitrak	Durgam Kshetriya Vitrak	TOTAL
ANDAMAN & NICOBAR	0	4	5	1	10
ARUNACHAL PRADESH	6	6	33	40	85
ASSAM	128	101	307	61	597
BIHAR	240	252	1502	39	2033
JHARKHAND	163	51	353	20	587
MANIPUR	15	13	36	38	102
MEGHALAYA	21	9	19	16	65
MIZORAM	11	6	26	16	59
NAGALAND	15	11	17	40	83
ORISSA	173	100	579	113	965
SIKKIM	9	1	9	10	29
TRIPURA	18	8	46	11	83
WEST BENGAL	405	164	948	74	1591
SUB TOTAL EAST	**1,204**	**726**	**3,880**	**479**	**6,289**
CHATTISGARH	105	75	172	182	534
DADRA & NAGAR HAVELI	3	1	1	0	5
DAMAN & DIU	2	0	0	0	2
GOA	44	4	5	2	55
GUJARAT	422	120	486	13	1041
MADHYA PRADESH	472	210	484	385	1551
MAHARASHTRA	1008	192	846	191	2237
SUB TOTAL WEST	**2,056**	**602**	**1,994**	**773**	**5,425**
ANDHRA PRADESH	323	286	427	108	1144
KARNATAKA	534	139	547	51	1271
KERALA	225	132	319	22	698
LAKSHADWEEP	1	0	0	0	1
PONDICHERRY	15	11	3	0	29
TAMILNADU	566	362	609	106	1643
TELANGANA	288	103	332	79	802
SUB TOTAL SOUTH	**1,952**	**1,033**	**2,237**	**366**	**5,588**
ALL INDIA	**7,921**	**3,754**	**11,778**	**2,028**	**25,481**

Source: IOCL on behalf of Public sector OMCs







Source: Petroleum Planning and Analysis Cell

1.28: **Promotion of Digital Payments:** There has been a significant expansion of digital payment infrastructure at Retail Outlets. As on **31.03.2024,** out of a total of **81338 (IOCL-37473, BPCL-21841, HPCL-22024)** Retail Outlets across the country, **81,338 ROs** have been covered with digital infrastructure having **4,91,379** POS terminals and **1,03,224** e-wallet facility and **81,338** retail outlets are enabled with BHIM UPI. All the LPG Distributors are enabled with BHIM UPI.

1.29: **Electric Vehicle Charging Station:** In order to increase the electric vehicle charging infrastructure in the country, Oil Marketing Companies are putting up Electric Vehicle Charging Stations (EVCS) at their Retail outlets (ROs) in different parts of the country in phased manner based on techno commercial feasibility and compliance of PESO norms. As on **31.03.2024,** OMCs have put up **15,800** EV charging stations and 162 Battery Swapping stations at their ROs.

1.30: **Market Authorization:** Ministry of Petroleum and Natural Gas vide Resolution dated 08.11.2019 revised the guidelines for authorization to market transportation fuels i.e. MS & HSD. As on **31.03.2024,** there are **8** entities which are authorized to market transportation fuels under the said Resolution.

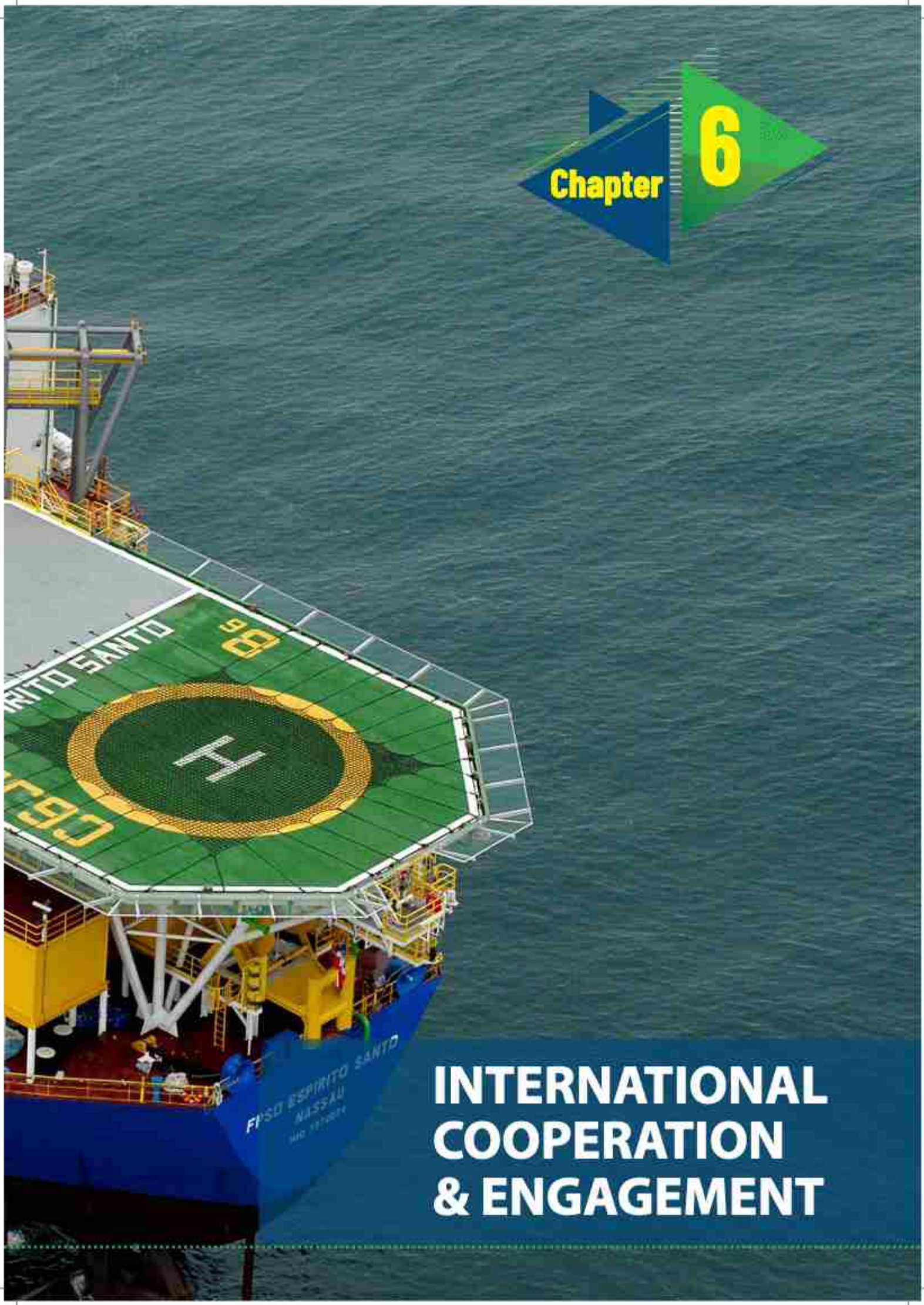









SO ESPIRITO SANTO


Chapter 6
INTERNATIONAL COOPERATION & ENGAGEMENT

6 International Cooperation & Engagement

India is amongst the world's leading energy consumer and is widely considered as the emerging energy superpower as a demand driver of both conventional and clean energy resources. As per the latest world energy statistics, India is currently 3rd largest energy consumer, 3rd largest consumer of Oil, 3rd Largest LPG Consumer, 4th largest LNG importer and 4th largest refiner of the world.

In this context, it is pertinent to note that India's per capita energy consumption is only approximately 1/3rd of the World average. As India continues on a high trajectory of economic recovery and rapid urbanization and industrialisation on account of "Atmanirbhar Bharat", India's demand for energy is bound to grow exponentially. This view on India's growth is unequivocally shared by Top economic institutions and agencies.

According to the International Energy Agency's (IEA) World Energy Outlook 2022, India's energy consumption will double by 2040. India's energy demand is expected to grow at about 3% per annum till 2040, compared to the global growth rate of 1%.The outlook also forecasts that India's share in global energy demand will double to 11% - the largest growth in that period of any country from the current 6% and India will overtake the European Union in terms of total energy consumption in 2030. OPEC also resonates with this view in its World Oil Outlook (WOO) 2023 and forecasts that India will have the highest energy demand growth in the outlook, where oil demand is projected to increase from 5.1 mb/d in 2021 to 11.6 mb/d in 2045, driven by transportation, petrochemicals and residential sectors. India's energy demand is projected to double in the outer period, reaching 38.5 million barrels of oil equivalent per day in 2045, driven by economic growth, increasing population and expanding middle class. WOO 2023 also stated that renewable energy in India will have an average growth rate of 11.5% per year, which will be the fastest growth globally.

This potential comes against the backdrop of notable dependency on imports. Our dependency on imported crude oil and natural gas is nearly 87% and 44% respectively for FY2022-23. With a view to safeguarding this rising demand and over-reliance on imports, the Government of India is working towards long-term solutions for mitigation of geo-political risks arising out of concentrated sourcing of crude oil. This strategy can be summarised in India's four-plank strategy for energy security namely diversification of energy supplies, increasing exploration and production footprint, using alternate energy sources, and meeting energy transition through the gas-based economy, green hydrogen and EVs.

6.1. Diversification of Crude Oil & LNG imports

Energy Security of India has been prone to geopolitical risks. As a safeguarding measure against this situation Indian government has prioritised the diversification of its crude oil and LNG import portfolio along with enhancing domestic production.

Over the last five years, new suppliers of crude oil have been added to India's Crude basket i.e. USA, Russia, Canada, Angola, Guyana and Mexico. Similarly, LNG imports have also been diversified from Qatar to Australia, USA and Russia. Accordingly, India has diversified crude oil sources from 27 countries in 2006-2007 to 39 countries in 2022-23.

To reduce the spot purchases and secure the supplies, OMCs made term crude oil arrangements with Petrobras (Brazil) & Ecopetrol (Colombia). This was the first time that Indian companies had signed a term arrangement with a Brazilian company (Petrobras). Further, the term arrangement with Eco petrol (Colombia) has re-established the old arrangements, which was not renewed after FY 2015-16.

Other notable efforts in this direction include the emergence of the United States as an important energy partner. Between 2017-18 and 2022-23, in a short span of 5 years, the USA has become the 5th largest crude oil and 2nd largest LNG supplier to India accounting for

more than 1,570% & 1,050% increase in the import of crude and LNG respectively from 2017-18 values.

6.2. Global Biofuel Alliance

Global Biofuels Alliance (GBA) is a multi-stakeholder alliance of Governments, International Organizations and Industries, an initiative by India as the G20 Chair, bringing together the biggest consumers and producers of biofuels to drive the development and deployment of biofuels. GBA Members-USA, Brazil and India, contribute about 85% share in production and about 81% in consumption of ethanol.

The initiative aims to position biofuels as a key to energy transition and contribute to jobs and economic growth. The Alliance intends to expedite the global uptake of biofuels through facilitating capacity-building exercises across the value chain, technical support for national programs and promoting policy lessons-sharing, technology advancements, and intensifying utilization of sustainable biofuels through the participation of a wide spectrum of stakeholders.

GBA will facilitate the development, adoption and implementation of internationally recognized standards, codes, sustainability principles and regulations to incentivize biofuels adoption and trade. The initiative will be beneficial for India on multiple fronts and will help strengthen India's position globally. It will accelerate India's existing biofuels programs such as PM-JIVAN Yojna, SATAT, and GOBARdhan scheme, thereby contributing to increased farmers' income, creating jobs and overall development of the Indian ecosystem. Further, the alliance will provide additional opportunities to Indian industries in the form of exporting technology and equipment.

Hon'ble Minister of Petroleum and Natural Gas & Housing and Urban Affairs participated in the Special Ministerial Consultations & Recommendations on the Global Biofuels Alliance in Goa organized on 22nd July 2023. Hon'ble Minister emphasized, "True success of Global Biofuels Alliance will depend on moving this project from a project of the government to the project of the people." Several countries including Brazil, Italy, Kenya, & UAE highlighted the importance of sharing best practices across policy, technology, & implementation. The forum recognized that overcoming challenges such as feedstock management, standards development, & technological innovations requires a collaborative approach & welcomed the initiative by the Indian Presidency to move towards the creation of the global alliance.



Subsequently, Global Biofuels Alliance (GBA) was launched by Hon'ble Prime Minister Shri Narendra Modi along with the leaders of the USA, Brazil, Italy, Argentina, Singapore, Bangladesh, Mauritius and UAE on 9th September 2023, on the sidelines of the G20 Summit in New Delhi. Till 31st March 2024, 24 countries and 12 international organisations have agreed to join the alliance.



On the sidelines of the World Economic Forum, 2024, Hon'ble Minister hosted a global Roundtable on Global Biofuels Alliance on 18th January 2024 along with Brazilian Minister of Mines & Energy, H.E. Alexandre Silveira,

Minister of Energy Brazil, Executive Director of IEA Mr. Fatih Birol, & Mr. Roberto Bocca of WEF. The Roundtable brought stakeholders & captains of the industry together to chart the way towards the adoption of SAF, clean cooking fuel options and alternative sources of biofuel.



The First Temporary Executive Committee (TEC) meeting was conveyed virtually on 26th October 2023 and the second TEC meeting was held on 16th January 2024. Interim Director General of the GBA, Shri Pankaj Jain, Secretary MoP&NG chaired the meetings. He highlighted that GBA received enthusiastic support from global energy industry leaders and extensive media coverage, underscoring the importance of biofuels in the global energy landscape. The TEC deliberated on the GBA Charter, GBA logo entries, the headquarters agreement and the action plan for the GBA. TEC also engaged in the GBA participation at international forums & discussed other important issues of mutual cooperation.

Further, the first sub-committee meeting was hosted virtually on 10th January 2024 with delegates from Brazil, Italy, Kenya, and the USA. Currently, the Global Biofuel Alliance is deliberating on the GBA charter and constructive path forward.



6.3. Enhanced Bilateral Energy Engagements with Key Partner Countries

6.3.1. Engagement with the United States of America (USA)

- India and the USA have engagements in the entire spectrum of the Oil and Gas sector. India imports crude oil, LNG and LPG from the USA. Indian PSUs have long-term contracts for the import of LNG. Further, Indian PSU companies have invested in the Oil and Gas sector in the USA. The bilateral hydrocarbon trade between India and USA has touched USD 19.4 billion in 2022-23 marking a 306% increase compared to 2017-18. During the period, the value of crude oil & LNG imports has also increased substantially, by 1,570% & 1,050% respectively.
- In September 2021, both sides announced the India-US revamped Strategic Clean Energy Partnership (SCEP) with the addition of a fifth Pillar on Emerging Fuels and Technologies, which signals a joint resolve to promote cleaner energy fuels.
- Hon'ble Minister co-chaired the Ministerial meeting of the India - U.S.A Strategic Clean Energy Partnership (SCEP) with U.S. Energy Secretary H.E. Jennifer Granholm on 18th July 2023 in New Delhi. Agencies from across the U.S. and Indian governments demonstrated several accomplishments

across the five technical pillars of cooperation on: 1) Power & Energy Efficiency, 2) Renewable Energy, 3) Responsible Oil & Gas, 4) Sustainable Growth, and 5) Emerging Fuels and Technologies. During the meeting, both sides reviewed the ambitious clean energy cooperation in biofuels, Green Hydrogen, renewable energy, energy storage & smart grids.



- Hon'ble Minister also met H.E. Mr. Greg Abbott, Governor of Texas, USA on 24th January 2024 in New Delhi wherein both sides discussed ways to strengthen the "Hydrocarbon Bridge" between USA and India.
- Further, the Hon'ble Minister held one-on-one discussions with Mr. Geoffrey Pyatt, Assistant Secretary of State for Energy Resources, U.S. Department of State, on 29th January 2024. Both sides discussed the global developments in the energy sector, reviewed the existing energy cooperation and discussed ways to further strengthen cooperation across the energy value chain.

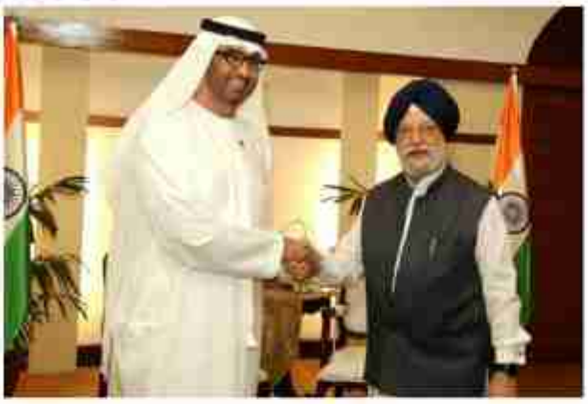


6.3.2. Engagement with Saudi Arabia

- India upholds long-standing collaboration under the hydrocarbon sector with Saudi Arabia. Saudi Arabia is among the largest trade partners and a major source of energy for India. Saudi Arabia was the 3rd largest source of our crude oil and 3rd largest source of our LPG imports in FY 2022-23.
- India and Saudi Arabia are also exploring the participation of Saudi Aramco in phase-II of India's Strategic Petroleum Reserve Program and other investment opportunities in the hydrocarbon sector.

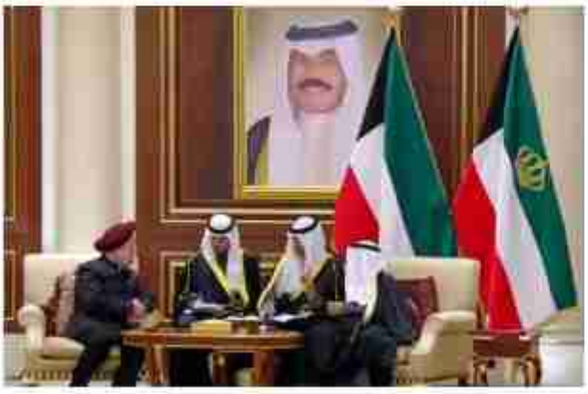
6.3.3. Engagement with UAE

- India and UAE are close trading and investment partners. Together both countries are involved in the trade of crude oil, LNG, LPG and Petroleum products as well as in exploration and production activities. India's relationship with the UAE has been elevated to Strategic Partnership with a focus on hydrocarbon sector.
- In the FY 2022-23, UAE was the 4th largest source of Crude Oil, 2nd largest source of LPG, 2nd largest source of LNG and the 2nd largest export destination for finished petroleum products.
- Hon'ble Minister met H.E. Dr. Sultan Al Jaber, COP28 President, UAE Special Envoy for Climate Change and Minister of Industry and Advanced Technology in Goa on 22nd July 2023. Both sides discussed ways to further deepen & expand the cooperation between India and UAE across the entire energy value chain. The two leaders also met during ADIPEC-2023 underscoring the importance of India's relationship with UAE.
- On the sidelines of ADIPEC 2023 and IEW 2024, Hon'ble Minister also held a bilateral meeting with H.E. Suhail Mohammed Al Mazrouei, Minister of Energy and Infrastructure, UAE. Both sides discussed ways to further strengthen India - UAE robust association.



6.3.4. Engagement with Kuwait

- Kuwait was the 6th largest supplier of crude oil and the 4th largest supplier of LPG to India in FY 2022-23.
- The 6th India-Kuwait Joint Working Group for hydrocarbon was held in July 2023, wherein both sides reviewed the existing bilateral cooperation in the hydrocarbon sector and further areas of collaboration.
- On the sad demise of the visionary leader His Highness Sheikh Nawaf Al-Ahmad Al-Jaber Al-Sabah, Hon'ble Minister visited Kuwait as Special Envoy to pay condolences on behalf of the Government & people of India & deliver personal letters of condolences from the President & Prime Minister of India to His Highness Sheikh Meshal Al-Ahmad Al-Jaber Al-Sabah, the new Amir.



6.3.5. Engagement with Oman

- Oman is a strategic partner of India in the Gulf region and both nations are among the top trading partners.
- India has been importing crude oil, petroleum products and LNG from Oman while exporting substantial quantities of petroleum products to Oman. During FY 2022-23, Oman was the 4th largest source of LNG, 8th largest source of LPG and 10th largest source of crude for India, while India is the 2nd largest market for Oman's crude oil exports.
- In a bid to diversify India's energy basket, both sides are exploring the opportunities to enter into long-term crude oil sourcing contracts, and other opportunities across the entire hydrocarbon value chain.



- Further, Indian strategic storage arm, ISPRL and Oman Tanking Terminal Company LLC (OTTCO) executed an MoU in June 2023, exploring the participation of ISPRL in a crude storage facility being developed by OTTCO in Oman.

6.3.6. Engagement with Iraq

- Iraq has been among the top suppliers of crude oil to India for the last several years. In FY 2022-23, Iraq supplied around 51 MMT of crude oil to India which accounts for nearly 21.5% of India's total oil imports.
- Hon'ble Minister hosted H.E. Hayan Abdul Ghani Abdul Zahra Al Sawad, Deputy Prime Minister for Energy Affairs, and Minister of Oil of the Republic of Iraq, at the 18th India-Iraq Joint Commission Meeting (JCM), held in New Delhi on 20th June 2023. During the meeting, both sides highlighted the natural and traditional synergies which exist between the two countries and agreed to move from a buyer-seller relationship to an energy partnership.





6.3.7. Engagement with Russia

- Russia has been a long standing and time-tested partner for India. In the face of extreme volatility in international crude oil prices, Indian PSUs have increased imports from Russia. As a result, our cumulative import from Russia increased from near nil levels to USD 34 Billion in FY 2022-23.
- With an investment of more than USD 16 billion, Russia is the largest destination of investment for Indian Oil & Gas companies. Indian PSUs have a participating interest in 5 blocks in Russia.

6.3.8. Engagement with Brazil

- Brazil was the 12th largest supplier of crude oil to India in FY 2022-23 and was the 7th largest market for the export of petroleum products from India.
- India and Brazil are also collaborating to scale up international production and use of sustainable bioenergy and biofuels, as an important vertical of the global transition to a low-carbon future.In this context, a Brazilian Parliamentary delegation along with members of UNICA visited New Delhi in July 2023. Both sides discussed the ongoing trade & bilateral relations, mainly in Oil & Gas between the two countries. Both sides acknowledged the immense potential for collaboration between the two countries to scale up international production and use of sustainable bioenergy and biofuels.



- On a special invite from H.E. Alexandre Silveira de Oliveira, Minister of State of Mines and Energy, Brazil; Secretary of Petroleum & Natural Gas, participated in Sustainable Mobility: Ethanol Talks, Special Edition Energy Week, India on 20th July 2023. The Seminar was organized by UNICA, APLA from Brazil, and ISMA & SIAM from the Indian side.

6.3.9. Endeavours to 'Neighbourhood'

- 'Neighbourhood First' is one of the key elements of India's foreign policy. India shares the conviction that better connectivity, including energy links/corridors with its neighbours will bring greater prosperity to all in an equitable and balanced manner.

6.3.9.1. Engagement with Bangladesh

- Bangladesh is an important energy partner in the immediate neighbourhood. For FY2022-23, the bilateral hydrocarbon trade between the two sides amounted to USD 830 million. Indian PSUs have also made investments in the upstream sector of Bangladesh.
- The India-Bangladesh Friendship Pipeline (IBFP) was jointly commissioned by Hon'ble Prime Minister Shri Narendra Modi and Hon'ble Prime Minister of Bangladesh Ms. Sheikh Hasina on 18th March 2023. This is the second cross-country Pipeline in South Asia after the India-Nepal pipeline.

6.3.9.2. Engagement with Nepal

- India has been supplying 100% petroleum product requirements to Nepal since 1974.
- India and Nepal concluded the 4th meeting of the India - Nepal Joint Working Group (JWG) on Petroleum & Gas in April 2023. As an outcome of the JWG, a G2G MOU was signed on 31st May 2023 for the development of petroleum infrastructure in Nepal, which includes the Extension of Motihari-Amlekhgunj Pipeline (MAPL) from Amlekhgunj to Chitwan, construction of a Greenfield Terminal at Chitwan, construction of Siliguri - Jhapa Pipeline and construction of Greenfield Terminal at Jhapa. The MoU will strengthen Petroleum infrastructure, reduce costs and support supply security to the citizens & economy of Nepal.



6.3.9.3. Engagement with Sri Lanka

- India and Sri Lanka have a vibrant energy partnership. India has traditionally been among Sri Lanka's largest trade partners and Sri Lanka remains among the largest trade partners of India in the SAARC.
- During the time of the energy crunch in Sri Lanka, India extended support by supplying petroleum products against the line of credits of a total USD 4 billion extended to Sri Lanka.
- Indian companies are exploring the development of the Trincomalee region as an energy hub which is in line with the Sri Lankan Government's plan for the region.
- India and Sri Lanka are also exploring the supply of LNG to Sri Lanka for RLNG based Power Plant at Kerawalapitiya in Colombo, a multi-product pipeline from CBR, Nagapattinam in India to Colombo & Trincomalee and opportunities in the E&P sector of Sri Lanka.



6.3.10. Germany

- Hon'ble Minister led an Industry Delegation to Germany and Vienna from 7th-9th November 2023 to promote bilateral collaboration in Alternate and Sustainable Fuels. During the visit, the Hon'ble Minister had a bilateral meeting with Robert Habeck, the Vice Chancellor and Federal Minister for Economic Affairs and Climate Action wherein both sides discussed collaborating in the field of alternative fuels.

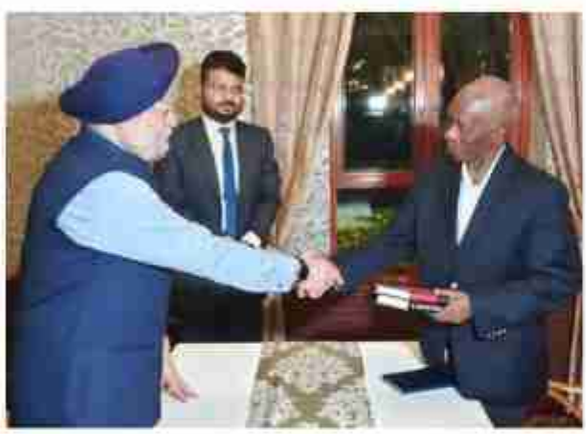


- Hon'ble Minister participated in a roundtable discussion with Dr. Claudius da Costa Gomez, CEO of the German Biogas Association and other industry leaders in biogas and biofuels. Both sides discussed India's quest for cleaner sources of energy & avenues to create an additional source of income for the farmers.



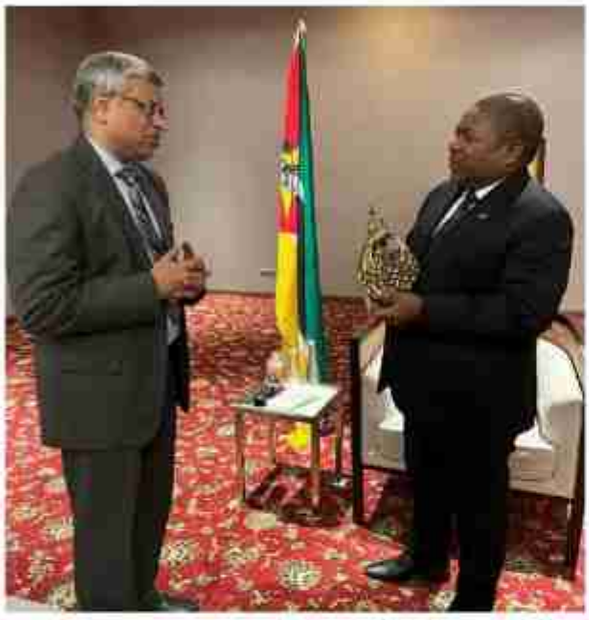
6.3.11. Mozambique

- With an investment of USD 8.5 billion, Mozambique is the second-largest upstream investment destination for India and the largest in Africa. It is also the largest investment in a single asset among all the investments by the Indian PSUs globally. The growing importance of natural gas in India's primary energy basket provides it a strategic edge over other sources & Mozambique LNG could be a preferred source for LNG supply at competitive rates.
- Hon'ble Minister led a high-level ministerial and industrial delegation to Mozambique in October 2023. Hon'ble Minister called on the President of the Republic of Mozambique, H.E. Filipe Jacinto Nyusi, and requested for the support towards early revival of the project as a win-win situation for both Mozambique and India.
- During his visit, Hon'ble Minister also had a bilateral meeting with H.E. Carlos Zacarias, Minister of Mineral Resources & Energy of Mozambique, H.E. Ernesto Max Elias Tonela, Minister of Economy & Finance of Mozambique. Both sides discussed the early resumption of the project and thereby underscored the strategic importance of the project for both countries.
- Furthermore, giving prime importance to asset in Mozambique, the Hon'ble Minister also visited the Area-1 project site in Cabo Delagado, situated 2,500 km from the capital, Maputo, to review the security situation. Hon'ble Minister also had a review meeting with the CEO of Total Energies. Total Energies briefed about the situation and the efforts being made to have "Resumption Ready" of the project as the local situation improves.





- In an overall engagement with Mozambique, on the sidelines of the 10th Vibrant Gujarat Global Summit 2024, Secretary Petroleum and Natural Gas called on the President of the Republic of Mozambique, H.E. Filipe Jacinto Nyusi, on 9th January 2024 wherein both the sides discussed plans to revive the Area-1 LNG project.



6.4. Engagements with International Organizations

6.4.1. Engagement with the Organization of the Petroleum Exporting Countries (OPEC)

- Regular Engagement with OPEC is a crucial element of India's Energy diplomacy for advocating responsible pricing of Oil and Gas resources as OPEC has a major role in shaping oil prices.



- India has imported approx. 60% crude oil, 63% LPG, 19% LNG, and 40% Petroleum products from OPEC countries, amounting to imports valued at approximately USD 120 billion. Accordingly, India is constantly emphasising upon OPEC's leadership role in nudging the large producers of oil to move towards a more responsible pricing system in the overall interest of buyers and sellers.
- OPEC, in its latest released World Oil Outlook 2023, stated that with average long-term growth of 6.1% p.a. India is expected to remain the fastest-growing major developing country and the largest contributor to the non-OECD incremental oil demand. The report also highlighted that India would add another 6.5 mb/d to the existing oil demand of 5.1 mb/d by 2045. At the same time, in India, renewables will have the fastest growth, with an average growth rate of 11.5% per year.
- The 6th High-Level Meeting of the India-OPEC Energy Dialogue took place on 9th November 2023 at the OPEC Secretariat in Vienna, Austria. Hon'ble Minister co-chaired the meeting with H.E. Haitham al Ghais, Secretary General of OPEC. India-OPEC Energy Dialogue was incepted in June 2015. Over the years, the India-OPEC Energy Dialogue has provided a unique forum for discussing a broad range of topics and challenges within the Oil and Gas industry, with a focus on enhancing market stability, particularly on the technical level. The meeting focused on key issues related to oil & energy markets with a specific emphasis on ensuring availability, affordability & sustainability which are necessary for ensuring the stability of energy markets & India's role as a driver of both economic growth & energy demand.



6.4.2. Engagement with the International Energy Agency (IEA)

- India-IEA collaboration gained momentum from March 2017 onwards when India became an Associate country of IEA. Since then, India and IEA have been collaborating on various topics including sharing of data analysis and international best practices on expansion of renewable, energy efficiency, gas security, oil stocks and emergency preparedness, investment, innovation, digitization etc.
- India is now exploring full membership of the IEA. In this regard, the Hon'ble Minister had regular meetings with the Executive Director of IEA, Dr. Fatih Birol.

6.4.3. Engagement with the International Energy Forum (IEF)

- India and IEF have a long-standing collaboration. India has been a Permanent Member of the Executive Board since its set-up in 2002. Joint Secretary (IC), MoP&NG is the executive board member of the IEF.
- IEF has been playing a leading role in strengthening international cooperation through dialogue between consumers and producers of energy.
- On 7th February 2023, India in association with IEF hosted the 9th Asian Ministerial Energy Roundtable (AMER9) on the sidelines of India Energy Week 2023.

6.5. International Events Organized/ Participated by Ministry of Petroleum & Natural Gas

6.5.1. India Energy Week 2023

The first edition of the India Energy Week (IEW), 2023 was held in Bengaluru from 6th to 8th February, 2023. The Hon'ble Prime Minister, Shri Narendra Modi inaugurated the inaugural edition of IEW 2023. The event attracted the participation of more than 35 Foreign ministers, including Heads of international organisations, 500 international speakers, over 30,000 energy professionals, over 8,000 delegates and 700 exhibitors from more than 100 countries.

IEW 2023 brought together all the stakeholders, domestic as well as international, on a common platform to facilitate growth, collaboration and transition.

IEW has also emerged as a marquee event at par with most anticipated annual events in the energy sector such as CERA Week, Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC), World Petroleum Congress & Gastech.



IEW has further created a separate space as an energy event that highlights energy security, customer centricity, just energy transition, energy affordability, India as a demand hub and fosters innovation and collaboration. The energy narrative at India Energy Week is being recognized as more inclusive, pragmatic and just, thereby attracting global attention and participation from CEOs and industry leaders.

The strategic conference was successful in sharing insights on strategies and trends impacting global energy markets, while Executive sessions call together leaders at the forefront of business operations to share best practices in pursuing the net zero agenda and the technical conference offered engineers and project managers access to the latest industry expertise. During IEW 2023, India's journey across the energy spectrum was showcased through immersive digital exhibitions and Ministerial dialogues.

IEW 2023 led to several reinforcements and revelations, including

- Driven by global decoupling-the global energy equation is fundamentally different for emerging markets and advanced economies. The energy equation for emerging markets with import dependency is a quadrilemma, wherein the 'security' becomes a pivotal and precursor element to the other variables- 'access,' affordability', and 'sustainability'.
- Spiralling market volatility and an abrupt reorganization of energy relations have brought back producer-consumer dialogue on energy security market stability, orderly and just transitions to the top of the international agenda.
- The energy transition will be more of a wave of managed change in the global energy portfolio. Achieving the transition requires global coordination and access to skills, technology, and global financing.
- Energy security and low carbon & high energy density trade-offs rely on open, transparent, and undistorted markets. Greater connectivity and level playing competition will bring more cost-efficient transitions and inclusive growth.

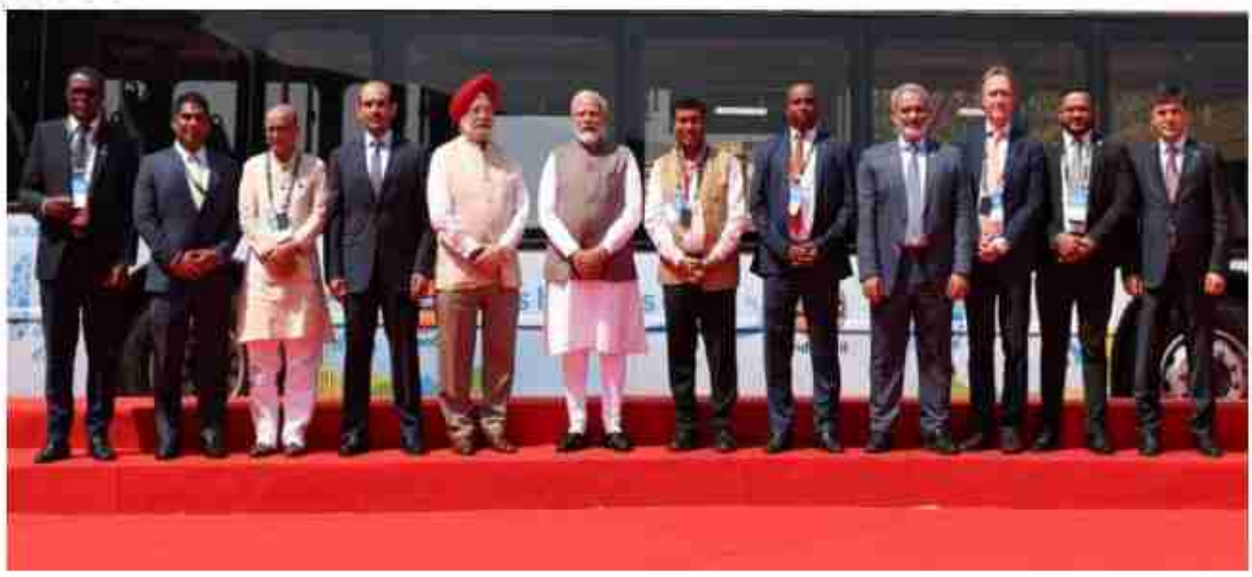
Some of the major MoUs/agreements signed during the IEW are:

- MoU between Directorate General of Hydrocarbon, Ministry of Petroleum & Natural Gas (MoP&NG) and University of Houston, Texas, USA signed as a step forward in strengthening a strategic partnership between India and the United States for establishing a data centre with the University of Houston.
- Statement of Intent (SoI) between the Petroleum Planning and Analysis Cell (PPAC) and the International Energy Agency (IEA) to strengthen cooperation in the field of data and research in the energy sector to enhance global energy security.

6.5.2. India Energy Week 2024

The second edition of the India Energy Week (IEW) was held from 6th-9th February 2024 at the ONGC's Institute of Petroleum Safety, Health and Environment Management (IPSHEM). Hon'ble Prime Minister Shri Narendra Modi inaugurated the second edition of IEW 2024, emphasising on India's commitment to unprecedented levels of investment in the energy sector while addressing the gathering of global energy leaders. Hon'ble Prime Minister underlined that the massive government spending in the sector will create new avenues for investment in India.

The event showcased an impressive gathering, with the active participation of more than 13 foreign Ministerial and Deputy Ministerial delegates, along with a diverse panel of 360+ speakers. The event drew an extensive audience of over 40,000+ visitors who explored the offerings of 900+ exhibitors representing 25+ countries. The global appeal of IEW 2024 was evident in its reception, as the event attracted significant interest, resulting in the submission of approximately 2,000 technical abstracts from 193 presenters across 18 technical categories.



The strides made by the second edition of IEW are evident in its substantial growth when compared to the inaugural edition. Notably, there has been a remarkable 25% increase in the exhibition area, with IEW 2024 covering 18.5 thousand square meters, a significant expansion from iEW 2023's 15 thousand square meters.

IEW 2024 gave an impetus to India as an energy innovator by providing a platform for over 300 startups and MSMEs via the Make in India and the Startup Pavilions. IEW witnessed many indigenous solutions taking the global stage and solving the problems of the world, highlighting the Make in India spirit. The Startup event challenge - Avinya organized during the IEW 2024 received an overwhelming response with 116 innovative applications covering a spectrum of sectors. During the event, 5 startups were selected as winners of the challenge. The event brought together luminaries from various sectors including VCs, incubators, accelerators, industry leaders and startups to propel innovation prowess.

Supporting the progressive vision of inviting the world to invest in the energy sector in India, IEW 2024 served as a platform for highlighting the potential opportunities for collaboration, of which many were achieved:

- India secured a historic USD 78 billion LNG deal with QatarEnergy, extending its import agreement until 2048, which is expected to save the nation USD 6 billion.
- ONGC signed a cooperation agreement with Total Energies to carry out methane emissions detection and measurement campaigns using Total Energies' pioneer AUSEA (Airborne Ultralight Spectrometer for Environmental Applications) technology.
- ONGC signed an agreement with Ossus Biorenewables to produce green hydrogen using a bioelectrical process that treats effluent water generated during oil production.

IEW 2024 also facilitated the launch of pivotal reports, including the "LNG as a Transportation Fuel in Medium and Heavy Commercial Vehicles" by NITI Aayog and the Kingdom of the Netherlands, the PPAC journal, and the "India Oil Market Outlook" by the International Energy Agency (IEA) offering essential insights for reshaping the energy landscape. The IEA has forecasted that India will emerge as the largest source of global oil demand growth from now until 2030.

Innovative solutions were showcased during IEW 2024, including (i) IOCL's and India's first

buses powered by green hydrogen fuel cells, (ii) BPCL-BARC's and India's first domestically developed electrolyzers, HPCL's fuel flex engine, (iii) a biodiesel plant utilizing Used Cooking Oil (UCO), (iv) GAIL's ship-to-ship LNG transfer, floating CNG station and long-haul LNG buses, (v) clean cooking fuel ethanol stove.

The overwhelming response, the growth recorded by IEW and the strategic direction and pragmatism on energy transition, IEW is showcasing to the global energy landscape are testimony to the recognition that India commands in the global energy transition landscape and the niche IEW is carving in the global energy events.

6.5.3. Interaction of Hon'ble Prime Minister of India with Global Oil & Gas CEOs and Experts

The Hon'ble Prime Minister of India Shri Narendra Modi, chaired the 8th annual Roundtable with Global Oil & Gas CEOs and Experts during the India Energy Week 2024. The interaction drew participation from 26 leaders prominent in the energy sector.

The discussion spanned a wide array of topics including the importance of enhancing domestic oil and gas production, the importance of investments and collaborations, boosting energy efficiency, incorporating sustainable fuels, digitization, and AI India's position as a global energy demand centre, initiatives like 'Make in India' and 'Skilling in India'.

Oil and gas experts lauded the government for its recent accomplishments in enhancing energy accessibility, affordability and security. They appreciated the Prime Minister's leadership in spearheading India's transition to cleaner energy, citing visionary goals backed by five elements of nectar-"Panchamrit" and supporting policies. Additionally, they highlighted India's rapid adoption of clean energy technologies and its potential to influence global energy supply chains.

In the introductory remarks, Hon'ble Minister PNG emphasized the significance of continued dialogue in harmonizing strategies, comprehending diverse perspectives and aligning with India's vision and plans.



Secretary, MoP&NG made a presentation on "An Overview of Oil and Gas sector". The presentation highlighted that India will drive global energy demand and focused on initiatives, achievements and investment opportunities.

Hon'ble Prime Minister highlighted the reforms undertaken in the oil and gas sector, including enhancing domestic Oil & Gas production, moving towards a gas-based economy & transitioning towards clean energy and invited the global Oil and Gas majors to be part of India's growth story.

6.5.4. World Petroleum Congress

Shri Pankaj Jain, MoP&NG, lead a high-level Industry delegation, to Calgary, Canada from 17th - 21st September 2023, to participate in the 24th World Petroleum Congress (WPC). The Secretary, MoP&NG inaugurated the Indian Pavilion at WPC highlighting India's Journey of energy growth story.

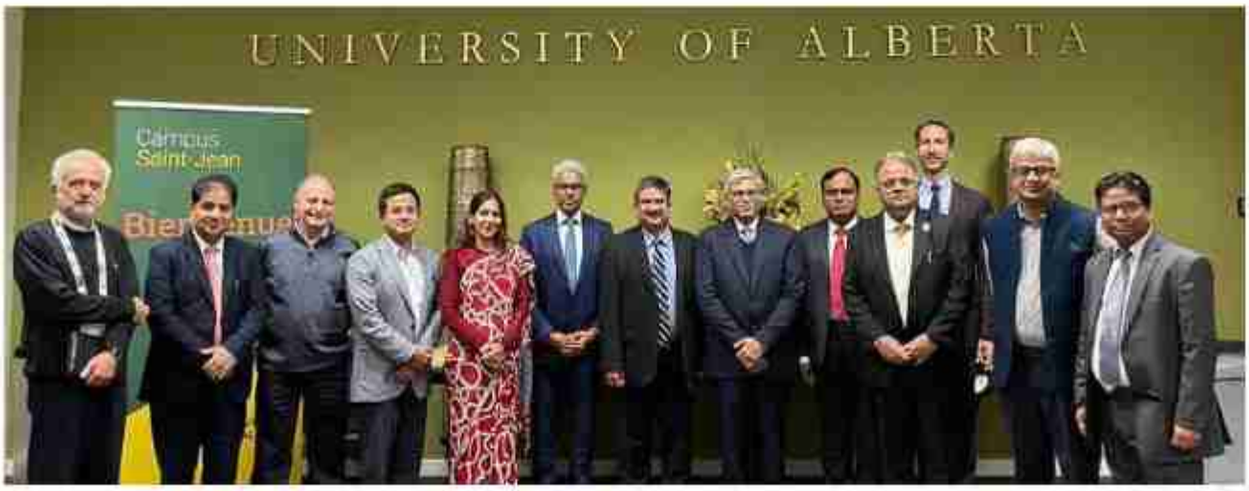
During the visit, Secretary, MoP&NG participated as a speaker in Ministerial Round Table: What does the energy transition mean for your country? with Mr. Pavel-Casian Nițulescu, State Secretary-Ministry of Energy, Romania and Mr. Heineken Lokpubiri, Minister-Ministry of Petroleum Resources, Nigeria as his co-panellist. The need for energy security, affordability & reliability was emphasised. Further, Secretary MoP&NG stressed the crucial need for sufficient energy supplies to sustain economic prosperity & growth for India in the session.



During the visit, Secretary, MoP&NG had one-on-one meetings with various officials & experts of upstream & and downstream International oil and gas service providers such as Katch Kan, Computer Modelling Group (CMG) Ltd, Pharos Energy Plc., PTRC, Semi Geo, Blackfish Industries, University of Calgary. Secretary, MoP&NG also held a round table discussion with SamiGeo, a Seismic Reservoir Characterisation Company, focusing on technology for Seismic Processing and Interpretation.

Secretary, MoP&NG also visited IOCL's PNW assets in Canada on 20th September, 2023. The field visit included a visit to a drill-site (Gundy Creek West pad d-D82-J/94-B-9) in the Kobes area followed by a visit to the biggest gas plant (B-89-J) of the project with a total processing capacity of 400 mmscfd consisting of two trains.

Secretary MoP&NG also led an Indian delegation at the University of Alberta. The delegation participated in Round-table discussions at the University of Alberta.



6.5.5. ADIPEC-Abu Dhabi 2023

Hon'ble Minister visited UAE from 2nd-4th October 2023, to attend the Abu Dhabi International Petroleum Exhibition & Conference (ADIPEC 2023) - the world's most influential gathering for the energy industry. At ADIPEC 2023, the Hon'ble Minister also inaugurated the India Pavilion.



During the visit, Hon'ble Minister delivered his remarks in the spotlight session on 'Energy Talks: India's energy industry: from diversification to economic growth'. He discussed how the growth-energy correlation is evident in India as it is now the world's 3rd largest energy consumer. India's energy demand will continue to provide fuel for future economic growth, as it is bound to grow exponentially: India is the world's 3rd largest consumer of oil, 3rd largest LPG consumer, 4th largest LNG importer, 4th largest refiner and the 4th largest automobile market.

During the visit, the Hon'ble Minister took part in a bilateral discussion with his counterparts from UAE, H.E. Suhail Mohammed Al Mazrouei, Minister of Energy and Infrastructure, UAE; and H.E. Dr. Sultan Ahmed Al Jaber, COP28 President-Designate, UAE Special Envoy, Minister of Industry & Advanced Technology; MD & Group CEO, ADNOC. Both sides discussed the ways to deepen the India - UAE relationship and thereby strengthen energy cooperation within the overall framework of India-UAE Strategic Partnership. Hon'ble Minister also met the team of Indian People's Forum, UAE.

Hon'ble Minister had a bilateral meeting with Rt Hon. Obongemem Ekperikpe Ekpo & Senator Heineken Lokpobiri, Hon'ble Ministers of State Petroleum Resources (Oil), Federal Republic of Nigeria. Hon'ble Minister also hosted H.E. Tarek El Molla, Minister of Petroleum & Mineral Resources of Egypt.





Hon'ble Minister had a meeting with the Chairman & CEO of Total Energies, Mr. Patrick Pouyanné wherein both sides discussed ways to expedite the Mozambique project. Further, during the visit, the Hon'ble Minister had meetings with CEOs of global oil & gas companies. Hon'ble Minister had meetings with the Interim CEO of BP, Mr. Murray Auchincloss; CEO of Schlumberger, Mr. Olivier Le Peuch; Chairman & CEO of Baker Hughes, Mr. Lorenzo Simonelli and President & CEO of Occidental

Petroleum, Ms. Vicki Hollub. Hon'ble Minister emphasised the immense opportunities in India's E&P sector wherein India has opened one million sq. km 'No Go' areas for exploration and has created National Data Repository which can be shared for the benefit of companies interested in E&P in India.



Secretary, MoP&NG, participated in the Ministerial session 'Navigating Energy and Geopolitics in the New World Order', where he emphasized the need for energy security, affordability, and reliability. He stressed crucial need for sufficient energy supplies to sustain economic prosperity & growth for India.



6.5.6. 2nd Voice of Global South Summit

Hon'ble Minister chaired the Energy Ministers' session under the 2nd Voice of Global South Summit, focusing on 'Affordable and Inclusive Energy Transition for Sustainable Development held on 17th November 2023. The 2nd Voice of Global South Summit, under the theme 'Global South: Together for Everyone's Growth, Everyone's Trust,' is committed to tackling the unique challenges faced by nations in the Global South. A united effort towards inclusivity, development and trust.

India's broad diversification of its energy policy underscores its commitment to mitigate climate change while supporting national interests and meeting India's energy demand. Ministers & Deputy Ministers from 15 nations convened to pave the way towards a cleaner, greener and sustainable future, laying a strong emphasis on collaboration.





6.5.7. World Economic Forum

Hon'ble Minister led an Industry Delegation to participate in the World Economic Forum (WEF) 2024 at Davos from 15th-19th January 2024. WEF engages the foremost political,

business, cultural and other leaders of society to shape global, regional and industry agendas.

At WEF 2024 Hon'ble Minister participated in around 7 sessions:

a. CII-EY Breakfast session on Accelerating India's Energy Transition Towards Sustainable Economic Growth

b. WEF session on Energy amid Rivalry

c. CII Session: Green Hydrogen Opportunities in India

d. WEF Session-Roundtable: Energy Transition Leaders

e. WEF Session: Can India Seize its Moment?

f. WEF Session: Country Strategy Dialogue on India

g. WEF Session-Roundtable IGWEL (Informal Gathering of World Economic Leaders): Energy Session

Hon'ble Minister had an engaging conversation with leaders of the global energy industry. Hon'ble Minister highlighted that the world now reckons the emergence & tremendous potential of India's energy sector on the global stage; its process of Green Energy Transition, Net Zero targets & journey towards energy sufficiency. India is now the growth engine of the world and innovation in India is providing solutions to the challenges of nations of the Global South.

Hon'ble Minister had a bilateral meeting with Mr. Iain Lindsay, Senior Adviser to the Managing Board, Bahrain Economic Development Board; Mr. Mark Thomas, CEO of BAPCO Energies wherein both sides discussed the emerging situation in the Middle East. Both sides discussed how India, ranking as the 4th largest refiner globally with a current capacity of 254 MMTPA and Bahrain which is set to upgrade & expand the Sitra refinery, present significant opportunities to enhance mutual bilateral hydrocarbon trade & investment in the refinery cum petrochemical sector as well as 2G/3G biofuels refineries.

Hon'ble Minister also held several bilateral meetings with key participating Ministers and CEOs of Major Oil & and Gas companies as well as prominent Biofuel companies.



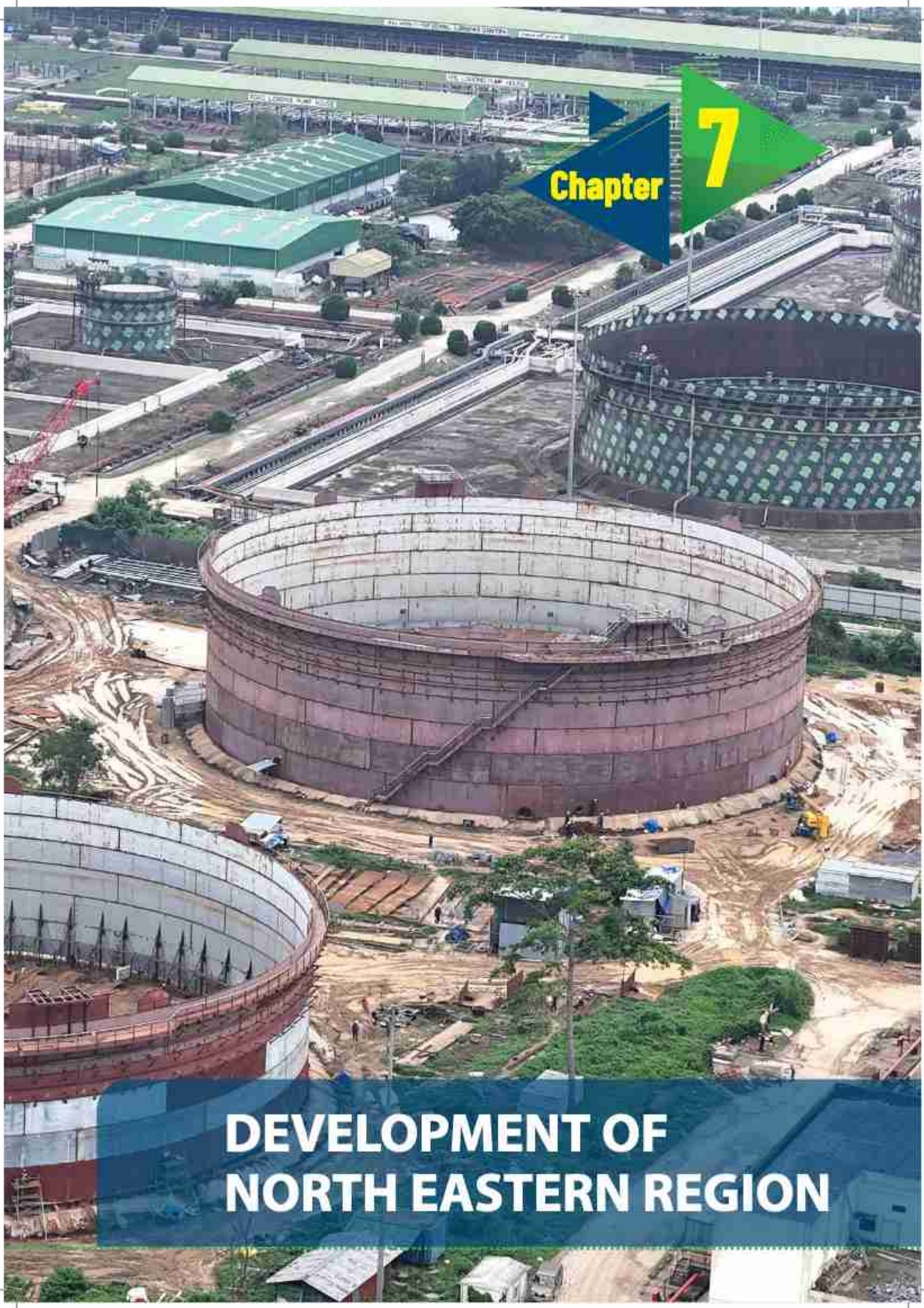


6.6. Acquisition of Overseas Asset

- The Ministry of Petroleum and Natural Gas is facilitating Indian Oil & Gas PSUs to aggressively pursue opportunities for acquiring quality Oil and Gas assets overseas to strengthen the country's energy security.
- During the last 6 years, Indian companies have acquired assets in UAE (Lower Zakum and Onshore Block-1), Oman (Mukhaizna) and Russia (Vankorneft & TassYuryakh).
- Till 1st April 2024, Indian PSUs have invested approx. USD ~38 billion in various E&P overseas assets. During FY 2023-24, the share of equity Oil and Gas for Indian PSUs from these assets was approx. 19.9 MMTOE, which works out to 30.24% of the India's domestic production. List of asset is at Appendix-XI.







Chapter 7

DEVELOPMENT OF NORTH EASTERN REGION

7 Development of North-Eastern Region

7.1. Background

7.1.1. Oil and gas exploration in North-East took place mainly during post-independence. These include the discoveries of the Nahorkatiya and Moran fields by Assam Oil Company (AOC) and Rudrasagar oil fields by ONGC in 1953, 1956 and 1960 respectively. Subsequently, more than 100 Oil and Gas fields, that include fields such as Jorajan, Kumchai, Hapajan, Shalmari, Dikom, Kathaloni, Tengakhat, Bhogpara, Chabua, Baghjan, Barekuri, Tichna, Gojalia, Rokhia, Khobal, Hortoki have been discovered by OIL and ONGC in the North-Eastern states of Assam, Arunachal Pradesh, Nagaland, Tripura and Mizoram.

7.1.2. The area was opened for exploration to private/JV and foreign companies through pre-NELP, NELP, DSF and OALP rounds of biddings. OIL & ONGC have proven substantial amounts of producible hydrocarbons and have technical know-how of producing and managing complex reservoirs and contributing to (about 8.99 MMToE in 2021-22) per annum of oil plus oil equivalent of gas (O+OEG) from their producing assets in North-East.

7.1.3. The North-East region is having around 18% (7634 MMT) of country's total prognosticated hydrocarbon resources. About 2246.6 MMT of inplace hydrocarbon reserves have been established so far by E&P companies, which means about 73% of hydrocarbon resources are under "yet to discover' category.

7.1.4. The two national oil companies, namely, ONGC and OIL have been engaged in the North-East Region for exploration and exploitation of oil and gas for more than 60 years and generated a vast geo-scientific database and geological understanding of the basin.

7.2. Exploration Activities in North-East under the Nomination Regime

7.2.1. OIL since its inception in February, 1959 has been actively pursuing exploration & development activities in the state of Assam.

7.2.2. During 1969-79, extensive geophysical survey and development effort in Assam and Arunachal Pradesh was carried out which led to the discovery of the Jorajan field in 1972 and establishment of gas resources in Eocene of Tengakhat (west of Naharkatiya) in 1973. As on 31.12.2022, OIL has acquired more than 16,280.59 GLKM of 2D seismic data and nearly 10,846.15 Sq. Kms of 3D seismic data in North-East and drilled 71 nos. of exploratory and 1424 nos. of development wells. As on 31st March 2024, OIL holds 1 exploration block in Northeast under nomination regime. OIL also holds 2 NELP



BCPL Duliajan Plant

exploration blocks in the Northeastern region. Moreover, under Open Acreage License Policy (OALP), OIL was awarded 17 blocks (7 Blocks in OALP Round I, 3 Blocks in OALP Round III and 2 Blocks each in OALP Rounds V, VI & VI and 1 Block in VIII) as an operator in Northeast across Assam, Arunachal Pradesh, Nagaland & Tripura. OIL has been awarded 1 Block in South Tripura under DSF Round II.

7.2.3. ONGC started its exploration work in Assam in 1956.The first wild cat well of ONGC was drilled on Disangmukh structure in 1960, however, the first commercial oil discovery was on Rudrasagar structure in the same year. In the North-eastern Region, as on 31.03.2024, ONGC has drilled 826 exploratory wells in the state of Assam, 235 wells in Tripura, 3 in Meghalaya, 4 in Mizoram and 26 in the State of Nagaland.

7.2.4. A significant number of oil and gas fields, including Panidihing, Disangmukh, Lakwa, Lakhmani, Sonari, Geleki, Demulgaon, Amguri and Charali, were discovered with this exploration philosophy.

7.2.5. Currently, ONGC holds 3 PEL blocks in the State of Nagaland under nomination regime. It also holds 65 PML blocks (46 in Assam, 18 in Tripura,1 in Nagaland) in North East comprising both long term and short term PMLs. During FY:2023-24, ONGC acquired 299.99 LKM of 2D seismic data (65.2 LKM in Assam Shelf and 234.79 LKM in Assam Arakan Fold Belt), 216.93 SKM of 3D seismic data (59.22 in Assam Shelf and 157.71 in Assam Arakan Fold Belt) and drilled 22 exploratory wells (9 in Assam Shelf and 13 in Assam Arakan Fold Belt). Further, exploratory G&G efforts are in progress to acquire more acreage in North Eastern region.

7.3. Exploration Activities in North-East under the PSC Regime

Under the PSC regime, exploration blocks were first awarded in the State of Assam in the year 1998 under Pre-NELP rounds of bidding. Subsequently, blocks were awarded under various rounds of NELP. A total of 33 blocks have been awarded (02 Blocks under Discovered field rounds, 5 Exploration Blocks and 26 NELP Blocks). These awarded blocks (Assam-21, Manipur- 2, Mizoram- 3, Nagaland-3 and Tripura-3 & Arunachal Pradesh - 1) covering an area of 43,439 sq. km. Out of these, 11 blocks are operational, 1 block had been proposed for relinquishment by operators and 21 blocks have been relinquished.

7.4. Crude Oil and Natural Gas Production in North-East

7.4.1. The contribution in crude oil production by North Eastern States is about 15% of the total production. In FY 2023-24, crude oil production in North-East is about 4.43 Million Metric Tonnes (MMT). The state wise and company-wise trend of crude oil production in last 5 years is given below:

Company	Asset	2019-20	2020-21	2021-22	2022-23	2023-24
OIL Nomination	Arunachal Pradesh	0.02	0.02	0.02	0.02	0.03
	Assam	3.08	2.90	2.96	3.11	3.29
OIL Total		**3.10**	**2.92**	**2.98**	**3.13**	**3.32**
ONGC Nomination	Assam	0.99	0.96	0.99	1.007	1.044
	Tripura	0.002	0.003	0.003	0.003	0.002
ONGC Total		**0.99**	**0.96**	**0.99**	**1.01**	**1.05**
Contractual Regime	Arunachal Pradesh	0.03	0.03	0.03	0.02	0.03
	Assam	0.03	0.03	0.04	0.04	0.03
PSC Total		**0.06**	**0.06**	**0.07**	**0.06**	**0.06**
Grand Total		**4.15**	**3.94**	**4.04**	**4.20**	**4.43**

7.4.2. From the above table, it may be observed that in FY 2023-24 OIL has the share of ~75 % in crude oil production in North-East, followed by ONGC with a share of ~24 %. The share of Private/Joint Venture companies in crude oil production is about ~1 %.

7.4.3. The contribution in natural gas production by North-Eastern States in FY 2023-24 is about 14% of the total production. In 2023-24 natural gas production natural gas in North-East is about 5.06 Billion Metric Standard Cubic Metre (BCM). The state-wise and company wise trend of natural gas production in last 5 years is given below:

Company	Asset	2019-20	2020-21	2021-22	2022-23	2023-24
OIL Nomination	Arunachal Pradesh	0.04	0.05	0.05	0.04	0.04
	Assam	2.38	2.24	2.62	2.81	2.89
OIL Total		**2.42**	**2.29**	**2.67**	**2.85**	**2.93**
ONGC Nomination	Assam	0.46	0.39	0.37	0.36	0.33
	Tripura	1.47	1.63	1.53	1.67	1.52
ONGC Total		**1.93**	**2.02**	**1.90**	**2.03**	**1.86**
PSC	Arunachal Pradesh	0.01	0.00	0.00	0.01	0.00
	Assam	0.30	0.37	0.38	0.39	0.27
PSC Total		**0.31**	**0.37**	**0.38**	**0.40**	**0.27**
Grand Total		**4.66**	**4.68**	**4.95**	**5.28**	**5.06**

7.4.4. From the above table, it may be observed that in FY 2023-24 OIL has the share of ~58% in natural gas production in North-East, followed by ONGC with a share of ~37%. The share of Pvt/JV companies in natural gas production is about ~5%.

7.4.5. Assam contributed ~99% of total oil production out of north-eastern states in the country and 15% of country's Total Oil production during the last FY. Arunachal Pradesh contributed ~1.4% of total oil production out of north-eastern states in the country while Tripura contributed ~0.05% of total oil production out of north-eastern states in the country.

Table 7.1 : Crude OIL Production in Last Five Years in North-East (in MMT)

State/Region	Source	2019-20	2020-21	2021-22	2022-23	2023-24
Assam	OIL	3.075	2.905	2.957	3.114	3.286
	ONGC	0.985	0.961	0.991	1.007	1.044
	Pvt/JV	0.030	0.033	0.040	0.042	0.028
	Total	**4.090**	**3.899**	**3.988**	**4.164**	**4.359**
Arunachal Pradesh	OIL	0.023	0.024	0.021	0.024	0.032
	Pvt/JV	0.032	0.030	0.027	0.023	0.027
	Total	**0.055**	**0.054**	**0.048**	**0.047**	**0.059**
Tripura	ONGC	0.002	0.003	0.003	0.003	0.002
North-East	**Grand Total**	**4.147**	**3.956**	**4.039**	**4.214**	**4.420**

7.4.6. Assam contributed ~69% of total gas production from north-eastern states in the country and 9.6% of country's Total gas production during the last FY. Arunachal Pradesh contributed ~0.8% of total Gas production from north-eastern states while Tripura contributed ~30% of total gas production from north-eastern states.

Table 7.2 : Natural Gas Production in Last Five Years in North East (MMSCM)

State/Region	Source	2019-20	2020-21	2021-22	2022-23	2023-24
Assam	OIL	2379	2241	2620	2812	2885
	ONGC	460	387	373	355	335
	Pvt/JV	302	367	378	390	270
	Total	**3,141**	**2,995**	**3,371**	**3,557**	**34,89**
Arunachal Pradesh	OIL	38.22	50.41	52.79	48.30	34.69
	Pvt/JV	7.37	4.95	4.92	5.02	4.94
	Total	**45.59**	**55.36**	**57.71**	**53.31**	**39.63**
Tripura	ONGC	1473	1634	1531	1675	1525
North-East	**Grand Total**	**4,660**	**4,684**	**4,960**	**5,286**	**5,054**

7.5. Discovered Small Field Policy:

The details blocks under DSF in the North Eastern Region are as under:

Status	Basin	DSF Bid Round	State / Location	Contract Area	Operator
PML Granted	**Assam-Arakan fold belt**	DSF-II	**Tripura**	AA/ONDSF/ Tulamara/2018	Oil India Limited
	Asam Shelf	DSF-I	**Assam**	AA/ONDSF/ BARSILLA/2016	Ramyana Ispat Pvt. Ltd. & Mahendra Infratech Pvt. Ltd.
				AA/ONDSF/CHARAIDEO/2016	Oilmax Energy Private Limited
				AA/ONDSF/ DIPLING/2016	Ramyana Ispat Pvt. Ltd. & Mahendra Infratech Pvt. Ltd.
				AA/ONDSF/DUARMARA/2016	Antelopus Energy Private Limited
				AA/ONDSF/ LAXMIJAN/2016	Megha Engineering and Infrastructures Ltd.
		DSF-II	**Assam**	AA/ONDSF/Disaijan/2018	Invenire Energy Private Limited
				AA/ONDSF/Hazarigaon/2018	Vedanta Limited
				AA/ONDSF/Umatara/2018	Indian Oil Corporation Ltd.
		DSF-III	**Assam**	AA/ONDSF/TIPHUK//2021	Oilmax Energy Private Limited
	Assam-Arakan fold belt	DSF-III	**Assam**	AA/ONDSF/PATHARIA/2021	Vedanta Limited
				AA/ONDSF/TUKBAI/2021	Vedanta Limited
PML not granted	**Assam Shelf**	DSF-I	**Arunanchal Pradesh**	AA/ONDSF/KHEREM/2016	HOEC Ltd., Prize Petroleum

Relinquished	**Assam Shelf**	DSF-I	**Assam**	AA/ONDSF/JERAIPATHAR/2016	Indian Oil Corporation Limited
Terminated	**Assam-Arakan fold belt**	DSF-I	**Assam**	AA/ONDSF/HILARA/2016	Prize Petroleum Company Limited
				AA/ONDSF/PATHARIA/2016	Vijayasri Bhaskar Industries Pvt. Ltd.
	Assam Shelf	DSF-II	**Assam**	AA/ONDSF/Madhakali/2018	Arsh Corporate Services Pvt. Ltd (Duganta)
				AA/ONDSF/Tiphuk/2018	Shanti G.D. Ispat and Power Pvt. Ltd.

7.6. Alternate Hydrocarbon sources in North-East:

7.6.1. Shale Gas: 3 shale gas blocks operated by ONGC and 4 blocks operated by OIL are in the state of Assam. So far ONGC has drilled 2 wells (GKBO in Namti ML Block and LDG in Lakwa). OIL has acquired conventional four cores from Jaisalmer PML in Rajasthan, Dibrugarh, Dumduma and Chabua PML of Assam. The evaluation results show poor prospectivity at these locations as the shales are entered into early oil generation window. In Arunachal Pradesh, OIL has identified two locations for acquiring the conventional cores viz., Jairampur Extn. PEL and Deomali PEL for acquiring extensive amount of conventional cores against the target shale of Upper Tikak Partbat and Disang shales respectively for establishment of Shale Gas/Oil potential.

In Arunachal Pradesh, OIL has identified two locations viz., Jairampur Extn. PEL and Deomali PEL for acquiring extensive amount of conventional cores against the target shale of Upper Tikak Partbat and Disang shales respectively for establishment of Shale Gas/Oil potential.

7.7. North-East Vision 2030

7.7.1. The North-East Vision Document has been a focused and consultative exercise to develop a common and shared aspiration for benefiting people of the North-Eastern region.

7.7.2. The objectives of the plan are to leverage the region's hydrocarbon potential, enhance access to clean fuels, improve availability of petroleum products, facilitate economic development and to link common people to the economic activities in this sector. The states covered include Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. The Ministry also undertook series of consultations with the state Governments while drafting the vision document.

7.7.3. The Vision aims at doubling Oil & Gas production by 2030, making clean fuels accessible, fast tracking projects, generating employment opportunities and promoting cooperation with neighbouring countries.

To fulfill one of the major goal envisaged under Vision 2030, Government has allowed special dispensation of 2 year extension in exploration period and 1 year in Appraisal period for operational blocks in North–Eastern region. Government has also provided marketing and pricing freedom for natural gas produced in future in North-Eastern region.



7.7.4. Under the North East Vision 2030, ONGC has envisioned an exploration plan for seismic data acquisition and drilling of exploratory wells in Assam Shelf and Fold belt areas in the north east region. Recently, considering the exploratory priorities of different basins, a three year Action plan for the period from 2022-23 to 2024-25 has been prepared. Under this plan, the exploratory inputs proposed to be expended in the north East sector during the commensurate period are tabulated below:

Particulars		2022-23	2023-24	2024-25	Total
Assam & Assam Arakan	2D (LKM)	254	377	200	831
	3D (SKM)	320	455	470	1245
	Exploratory wells	21	23	24	68

7.7.5. Under the North East Vision 2030, OIL exploration plan for seismic data acquisition and drilling of exploratory wells in Assam Self and Assam Arakan Fold basin areas in NE region from 2024-25 to 2026-27 are tabulated below.

OILs planned seismic survey and exploratory drilling activities in NER is tabulated below:

North-East Region	Activity	2024-25	2025-26	2026-27
Assam & Assam Arakan	2D Survey (LKM)	269	150	100
	3D Survey (sq.km.)	234	250	300
	Exploratory Drilling (No.)	25	29	30

7.7.6. In 2023-24, ONGC has completed the acquisition of 299.99 LKM of 2D seismic data, 216.93 SKM of 3D seismic data and drilled 9 wells in Assam Shelf and 13 wells in Assam Arakan Fold Belt region.

7.8. New Exploration blocks in North-Eastern Region under Hydrocarbon Exploration & Licencing Policy (HELP)

Oil E&P Companies are showing keen interest in the North-Eastern region. Details of exploration blocks awarded in the North-eastern region till 31st March 2024 and the status is as under:

S. No.	OALP Round	Block Name	Contractor/ Operator	Basin Name	Original Contract Area (sq. km)	Remark
1	OALP-I	AA-ONHP-2017/1	Vedanta Limited	Assam Shelf	714.71	PEL of Nagaland Area is pending
2	OALP-I	AA-ONHP-2017/10	Oil India Limited	Assam Shelf	543.28	
3	OALP-I	AA-ONHP-2017/11	Vedanta Limited	Assam Shelf	784.55	
4	OALP-I	AA-ONHP-2017/12	Oil India Limited	Assam Shelf	489.06	
5	OALP-I	AA-ONHP-2017/13	Oil India Limited	Assam Shelf	840.69	
6	OALP-I	AA-ONHP-2017/14	Vedanta Limited	Assam Arakan Fold Belt	1719.17	
7	OALP-I	AA-ONHP-2017/15	Vedanta Limited	Assam Shelf	1367.38	
8	OALP-I	AA-ONHP-2017/16	Oil India Limited	Assam Shelf	361.49	
9	OALP-I	AA-ONHP-2017/17	Oil India Limited	Assam Shelf	309.07	
10	OALP-I	AA-ONHP-2017/18	Oil India Limited	Assam Shelf	1711.1	
11	OALP-I	AA-ONHP-2017/19	HOEC	Assam Arakan Fold Belt	79.21	
12	OALP-I	AA-ONHP-2017/2	Vedanta Limited	Assam Arakan Fold Belt	73.19	

S. No.	OALP Round	Block Name	Contractor/ Operator (Operator)	Basin Name	Original Contract Area (sq. km)	Remark
13	OALP-I	AA-ONHP-2017/20	Oil India Limited	Assam Arakan Fold Belt	125.08	
14	OALP-I	AA-ONHP-2017/3	Vedanta Limited	Assam Arakan Fold Belt	267.94	
15	OALP-I	AA-ONHP-2017/4	Vedanta Limited	Assam Shelf	839.33	PEL of Nagaland Area is pending
16	OALP-I	AA-ONHP-2017/5	Vedanta Limited	Assam Shelf	758.23	
17	OALP-I	AA-ONHP-2017/6	Vedanta Limited	Assam Arakan Fold Belt	278.79	
18	OALP-I	AA-ONHP-2017/8	Vedanta Limited	Assam Shelf	610.54	
19	OALP-I	AA-ONHP-2017/9	Vedanta Limited	Assam Shelf	18.32	
20	OALP-III	AA-ONHP-2018/1	Vedanta Limited	Assam Shelf	248.87	
21	OALP-III	AA-ONHP-2018/2	Oil India Limited	Assam Arakan Fold Belt	2526.74	
22	OALP-III	AA-ONHP-2018/3	Oil India Limited	Assam Shelf	1234.42	
23	OALP-III	AA-ONHP-2018/4	ONGC Limited	Assam Arakan Fold Belt	44.01	
24	OALP-III	AA-ONHP-2018/5	Oil India Limited	Assam Arakan Fold Belt	207.74	
25	OALP-V	AA-ONHP-2019/1	Oil India Limited	Assam Shelf	1278.27	
26	OALP-V	AA-ONHP-2019/2	Oil India Limited	Assam Shelf	2405.12	Relinquished
27	OALP-VI	AA-ONHP-2020/1	Oil India Limited	Assam Arakan Fold Belt	557.33	
28	OALP-VI	AA-ONHP-2020/2	ONGC Limited	Assam Arakan Fold Belt	50.41	
29	OALP-VI	AA-ONHP-2020/3	Oil India Limited	Assam Arakan Fold Belt	219.37	
30	OALP-VI	AA-ONHP-2021/1	ONGC Limited	Assam Arakan Fold Belt	37.68	
31	OALP-VI	AS-ONHP-2021/1	ONGC Limited	Assam Shelf	24.64	
32	OALP-VII	AA-ONHP-2021/2	ONGC Limited	Assam Arakan Fold Belt	382.05	
33	OALP-VII	AS-ONHP-2021/2	Oil India Limited	Assam Shelf	2445.3	
34	OALP-VII	AS-ONHP-2021/3	Oil India Limited	Assam Shelf	1840.87	
35	OALP-VIII	AS-ONHP-2022/1	Oil India Limited	Assam Shelf	2057.63	PEL Deed not executed

7.9. National Seismic Programme

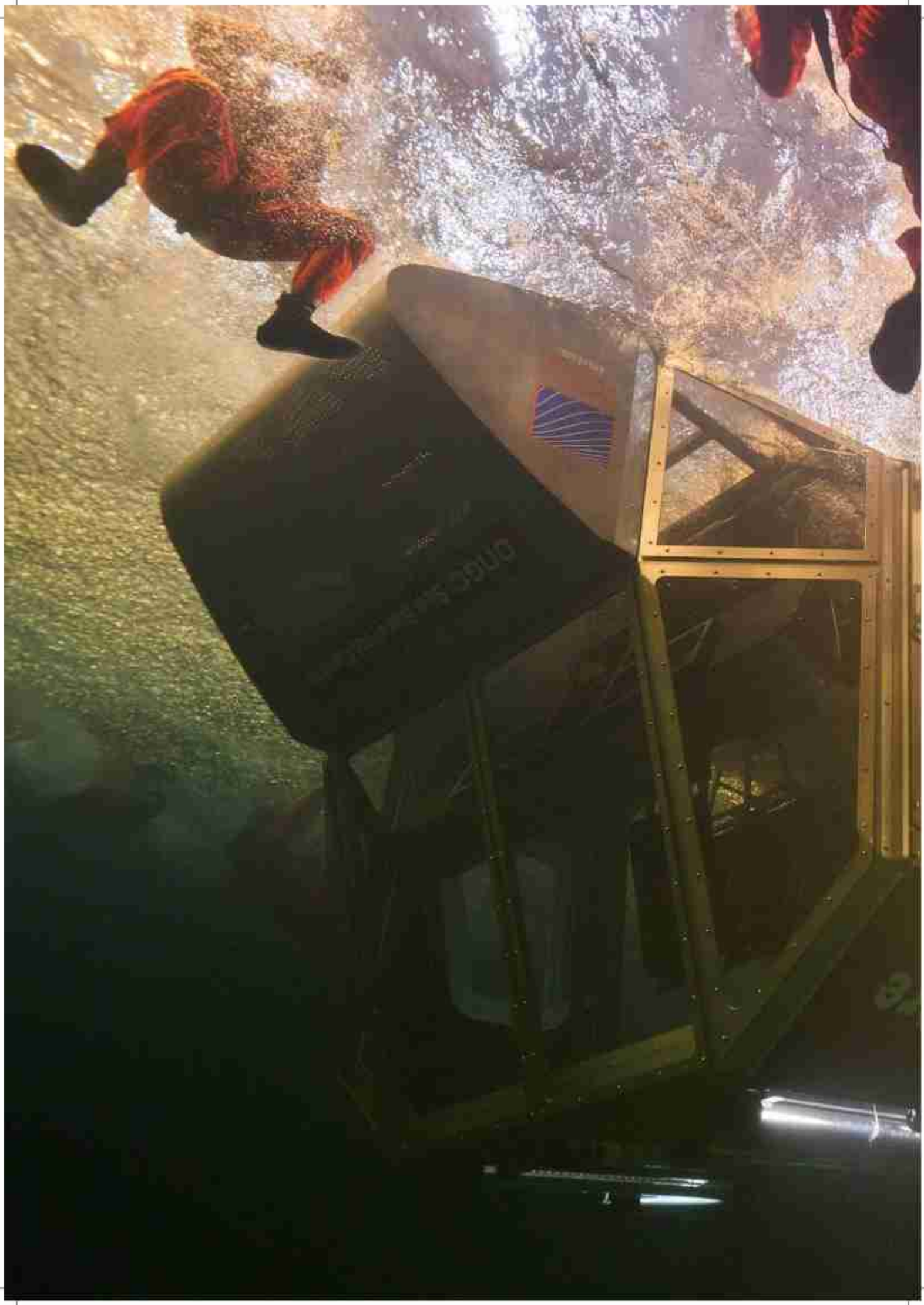
National Seismic Programme (NSP) was launched on 12th October 2016 as part of the Government initiative for conducting 2D seismic survey of entire unappraised areas of onland sedimentary basins. The objective was appraisal of un-appraised sedimentary basins in India and it envisaged 48,243 Line Kilometers (LKM) 2D seismic data for appraisal of onland areas. NSP got completed in Year, 2022. The areas where seismic survey couldn't be carried out due to inaccessible terrain and hostile environment, are currently being taken up for appraisal by undertaking Airborne Geophysical Survey. The Sector wise acquired data is under NSP is as below:

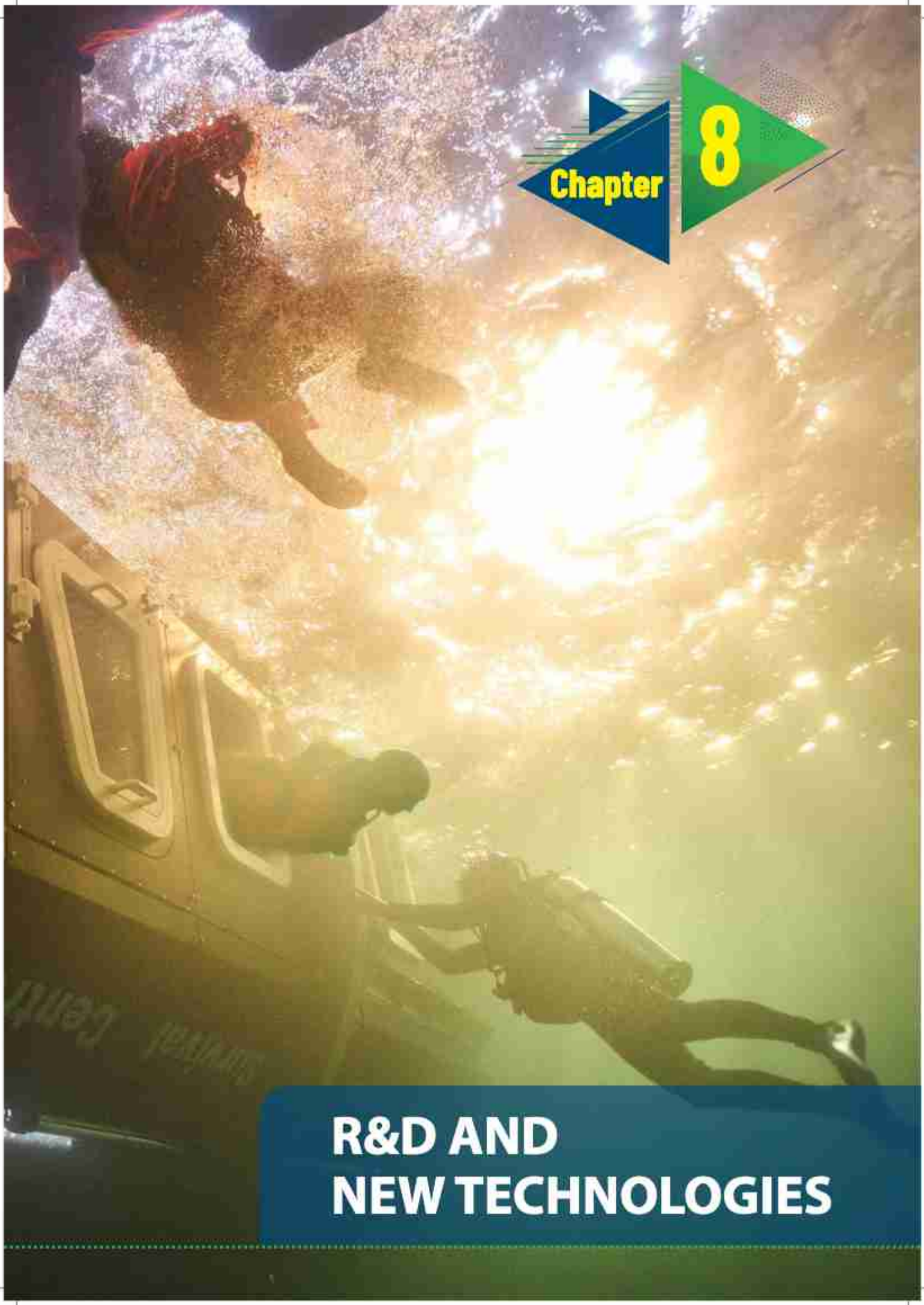
NSP Details State/Location wise in North East	
State/Location	**2D Seismic (LKM)**
Arunachal Pradesh	185.58
Assam	3899.34
Manipur	4.74
Meghalaya	12.66
Mizoram	980
Nagaland	0
Total	**5,082.32**

7.10. Airborne Gravity Gradiometry & Gravity Magnetic survey (AGG & GM)

Contract for AGG & GM survey was awarded by OIL for API of 40,000 LKM in North East India, Cauvery, Baster & Spiti and Karewa areas. The survey was started on 27.05.2023 and sector wise data acquisition, Processing and Interpretation in North-East India as on 31.03.2024 are given below:

NORTH EAST			
State	**Block Name**	**Approx. Area (sq.km)**	**Line Spacing: 2x2 km-LKM**
Arunachal Pradesh	AS_AP & As_Man_Naga	4,000	2,112
Assam	AS_AP & AS_Man_Naga	10,100	5,489
Nagaland	AS_Man_Naga	13,500	7,336
Manipur	AS_Man_Naga	10,030	5,451
Meghalaya	AS_Man_Naga	1,700	924
Mizoram	AS Miz_Tri	8,478	4,726
Tripura	AS Miz_Tri	1,722	960
		Total	**26,997**





Chapter 8

R&D AND NEW TECHNOLOGIES

8 R&D and New Technologies

8.1 Oil and Natural Gas Corporation (ONGC)

At ONGC, research and development (R&D) and innovation serve as pivotal catalysts for its sustained growth over the long term. The organization places considerable emphasis on investing in research and development (R&D) endeavors to nurture innovation. ONGC through its R&D Institutes is pursuing applied research across energy value chain.

ONGC has established separate R&D institutions to undertake specific activities in key areas of Exploration, Drilling, Reservoir Management Production Technology, Ocean Engineering and Health, Safety and Environment (HSE) Management. In the year 2023-24,ONGC carried out several R&D studies for conventional and Non-conventional Hydrocarbons at its different Institutes.

8.1.1. Industry-Academia Participation

ONGC has entered into a Memorandum of Collaboration (MoC) with Pan IIT in January 19 2015 at New Delhi to work towards a collective R&D Programme for developing indigenous technologies to enhance exploration and exploitation of hydrocarbons and alternate sources of energy. Pan IIT is a consortium of seven premier Indian Institutes of Technology namely, IIT-Kharagpur, IIT-Kanpur, IIT-Madras, IIT-Mumbai, IIT-Delhi, IIT-Guwahati and IIT-Roorkee. This is a long-term initiative for sustained research, development and capacity building. Under this program, ONGC Institutes/ R&D centres have taken up 40 R&D Projects in 4 phases under memorandum of collaboration signed between ONGC and IIT Kharagpur (On behalf of seven IITs). The R&D Programme has a definite objective for developing indigenous technologies to enhance exploration & exploitation of hydrocarbons. As on 31.03.2024, 39 projects have been completed and 01 project is in progress.

- Collaborative Project with IIT, Kharagpur for research in areas of drilling of wells, particularly on frontier areas with a futuristic vision with a view to synergise the capabilities of IDT and IIT Kharagpur to accelerate the developmental efforts towards meeting the emerging requirements of the petroleum industry. One Collaborative R&D project titled "Development of Thermally-Stable Additives and High-Performance Water-Based Drilling Fluids up to 230°C" has been entered under which Sodium Formate based DF formulations using a Fluid loss Control Additive with 13 ppg MW and stable up to 350°F has been successfully.
- **ONGC collaborates with IIT Bombay for gas sweetening process:** Uran Plant on 26th April 2023 signed an agreement with the Indian Institute of Technology, Bombay (IITB), for initiating an R&D project for sweetening of natural gas through an intensification strategy involving interphase mass transfer processes.
- **ONGC Inked contract with IIT-B, Mumbai to boost carbon capture, utilization, and storage (CCUS)** research and development in ONGC: The Institute of Reservoir Studies (IRS) ONGC signed a comprehensive three-year contract with the National Centre of Excellence in Carbon Capture & Utilization (NCOE CCU) at IIT-B. Mumbai recently. This collaboration marks a significant step in furthering the cause of CCUS, in line with the Net-Zero ONGC-2038 vision.



IRS,ONGC,Ahmedabad signed three year contract with IIT-B,Mumbai to boost carbon capture, utilization, and storage (CCUS) research and development in ONGC

- **Institute of Production, Engineering and Ocean Technology (IPEOT) signs a commercial consultancy project with M/s Mansarovar Energy Colombia Limited (MECL)** for providing technical consultancy services in the area of corrosion 'Failure Causes and Corrosion Prevention in Hydrocarbon Production Wells' in Velasquez field in Colombia, South America.





IPEOT,ONGC signed commercial consultancy project with M/s Mansarovar Energy Colombia Limited

- **Collaborative Project with Rajiv Gandhi Institute of Petroleum Technology (RGIPT)** to identify & pursue research projects of direct interest & relevance to petroleum industry and to develop solutions to drilling, drilling fluid, cementing, completion fluid challenges in oil & gas wells and other mutually agreeable research areas. Under this agreement, One Collaborative R&D project titled "Single-Step Silica Nanofluids to Enhance Mechanical Properties, Microstructure Refinement and as a Shale Stabilizer for Cement Slurries" is under progress.

- **MoU between Keshava Deva Malaviya Institute of Petroleum Exploration (KDMIPE), ONGC and CSIR National Institute of Oceanography (NIO), Dona Paula, Goa** for Collaborative working relationship in the **areas of Geoscience for a period of five (05) years** was signed with NIO on 05.01.2022. A collaborative project entitled "Plate tectonic evolution of the Indian Plate with emphasis on the north-western continental margin encompassing onland and offshore basins and its implication on hydrocarbon proclivity" has been envisaged by both KDMIPE and CSIR-NIO. Project agreement between KDMIPE and CSIR-NIO has been signed on 23.02.2024. Collaborative project initiation is under progress.

- A collaborative project among **ONGC, IIT Bombay, BPRL and OIL** for **"High-resolution sequence stratigraphic interpretations of Cretaceous succession of Jaisalmer Basin and its implication for reservoir characterization"** was planned to execute at CoE-OGE, IIT Bombay. Kick off meeting of this project was held on 17.11.2023.

- **A collaborative project "Study of Gas Hydrates formation** and dissociation & understanding the role of functionalized nanomaterials as kinetic inhibitor" has been taken up with IOCL R&D centre at Faridabad.

- **R&D Collaboration with CSIR: NEIST:** Taking its research initiatives one step further and to explore a strategic alliance on a broad range of Industry academia collaboration ONGC, over the years, has been collaborating with academia/industry for pursuing high quality basic and applied research in the fields of interest to ONGC. Institute of Biotechnology and Geotectonic Studies (INBIGS), Assam & Assam Arakan Basin, Jorhat has also inked a Project Agreement with CSIR-NEIST to address the waste water treatment issues related to ONGC operations using electrospun nanofiber membranes with an aim for sustainable environment.

- **R&D Collaboration with North Eastern Hill University (NEHU), Shillong:** Over the past few decades, the magnetotelluric (MT) technique has emerged as an effective geophysical exploration tool for probing and mapping the deep electrical resistivity of the earth's interior in various geological settings such as the sedimentary basins, Precambrian shields, orogenic belts, etc. Such studies have proved useful in understanding the crustal evolutionary processes. An agreement was inked between Institute of Biotechnology and Geotectonic Studies (INBIGS), Assam & Assam Arakan Basin, Jorhat and NEHU, Shillong to configure the deep geoelectric structure of Banaskandi area and also to ascertain the basin configuration and the sediment thickness. In this regard, 157 LKM of MT data was collected which is helping in further exploration activities.

ONGC Energy Centre (OEC):

OEC is working over 15 collaborative R&D projects in association with leading academic R&D institutions as follows:

Technology/Programme	Institutions
Hydrogen	• Institute of Chemical Technology (ICT), Mumbai • Indian Institute of Technology (IIT), Delhi • Council of Scientific & Industrial Research (CSIR)-Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnagar • CSIR-Central Glass & Ceramic Research Institute (CGCRI), Kolkata • CSIR-National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram • Birla Institute of Technology and Science (BITS) Pilani, Goa • Indian Institute of Technology (IIT), Madras
Geothermal	• Iceland GeoSurvey (ISOR), Iceland
Biotechnology for Energy	• Agharkar Research Institute (ARI), Pune • The Energy and Resources Institute (TERI), New Delhi • PSG Institute of Advanced Studies (PSGIAS), Coimbatore • Keshava Deva Malaviya Institute of Petroleum Exploration (KDMIPE), Dehradun
CO_2 Valorisation	• Institute of Chemical Technology (ICT), Mumbai • CSIR-National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram
Uranium	• Department of Atomic Energy (DAE) • Atomic Mineral Directorate (AMD), Hyderabad • Bhabha Atomic Research Centre (BARC), Mumbai • Variable Energy Cyclotron Centre (VECC), Kolkata, West Bengal • Uranium Corporation of India Limited (UCIL), Jaduguda • CSIR - National Geophysical Research Institute (NGRI), Hyderabad • Institute of Reservoir Studies (IRS), Ahmedabad • Regional Geosciences Laboratories (RGL), Vadodara • Institute of Petroleum Safety, Health and Environment Management (IPSHEM), Goa • Keshava Deva Malaviya Institute of Petroleum Exploration (KDMIPE), Dehradun
Helium	• CSIR-Indian Institute of Petroleum (IIP), Dehradun
Solar Thermal	• Bhabha Atomic Research Centre (BARC), Mumbai • Indian Institute of Technology (IIT), Bombay
Produced Water Treatment	• CSIR-Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnagar • Bhabha Atomic Research Centre (BARC), Mumbai

8.1.2. R&D Initiatives by ONGC in the field of IOR/EOR activities

ONGC puts efforts on continuous basis for performance analysis of fields and suitable corrective measures are taken for improvement in the field performance and recovery. In fact, improving recovery factor to 40% is one of the strategic goals of ONGC. The extraction efficiency or recovery factor of fields operated by ONGC is comparable with the International standards; however, efforts are further being made for its improvement. The salient R&D measures to enhance recovery factor are as under:

- **Low Salinity Water Flood (LSWF) Pilot in Mumbai High South field:** The project has been approved by the board under MHSRD Phase-IV. Further, LSWF screening report was approved by DGH in June-2019. The pilot is under implementation. The injection started in May, 2022. It envisages to improve incremental recovery by 0.8% by 2035.
- **Commercialization of ASP project in K-IV pay of Jhalora Field:** The implementation of the ASP project is considered from March 2022. The project envisages CAPEX of ₹ 125.24 crores. Implementation of project will envisages an incremental oil of 0.774 MMt by 2036-37.
- **Gas Assisted Gravity Drainage in Kasomarigaon field:** The plan envisages incremental oil of 0.31 MMt with recovery of 33% and CAPEX of 75 crore. FR approved and project is under implementation. Likely completion by Q1 2024-25.
- **Gravity Assisted Immiscible Gas Injection (EOR) in Khoraghat Field:** The plan envisages incremental oil of 0.15 MMt with recovery of 23% and CAPEX of 157 crore. FR approved and project is under implementation. Likely completion by Q1 2024-25.
- **Down dip air injection in Santhal:** 2 patterns with 6 Air injectors and 3 new producers have been approved and under implementation. Envisaged incremental oil is 0.222 MMt.
- **Full field Polymer Flood in Bechraji field:** Full field polymer flood study carried out before pilot results to reduce field implementation time. The incremental gain is 5,057 m^3 in 13 Months against FR envisaged 4,960 m^3. The full field application of the scheme has been approved and is under implementation. The scheme envisages drilling of 63 new Development Locations (Oil Producers-35 & Polymer Injectors: 28) with an incremental oil of ~1.8 MMt by 2045-46. Polymer injection started in October 2023.
- **Santhal Field:** Simulation study carried out to optimise the existing ISC scheme and target the down dip oil below 940m MSL contour by pattern air injection. Inputs 15 Additional air injectors considered from FR (Air injection to increase from 7 to 13 LCMD). It envisages incremental oil gain of 2.6. MMt (~5% over BAU) and recovery 43% by 2035. The down dip air injection is approved and under implementation.
- **ASP Pilot in Sanand:** Envisaged incremental oil 6,450 m^3. The project started in May 2022.
- **High Pressure Air Injection Pilot in Nawagam:** First time Air injection in light oil shall be tested. Envisaged incremental oil 37,000 m^3.
- **CO_2 EOR as Carbon Capture, Utilisation and Storage (CCUS) in Gandhar Field:** This shall be first CO_2 EOR for CCUS in India. Feasibility study of CO_2-EOR as CCUS in Gandhar field was carried out. The study envisages CO_2 injection from 2025-26 and production from 2026-27. The project envisages drilling of 75 new wells and CO_2 injection @1500 tpd for 20 years. Incremental production is envisaged to be ~4.2 MMT of O+OEG by 2045-46 (Oil~3.2 MMT + Gas ~1 BCM). Around 6.5 MMt of CO_2 is expected to be sequestered during the project life.
- **Cyclic Steam Stimulation (CSS) Pilot in Lanwa Field:** The plan envisages incremental oil of 0.312 MMt over the period of 8 years. Steam injection in 1st well LNW#216 started in February 2024.

8.1.3. R&D Patents Registered by ONGC

ONGC has consistently championed creativity and innovation through its comprehensive R&D initiatives, with the goal of contributing to the overall progress of the country. The generation of intellectual property (IP) within ONGC primarily arises from R&D activities conducted across its diverse institutes and work centers, each specializing in various facets of the exploration and production value chain.During the period 1st January, 2023 to 31st March, 2024 ONGC has obtained 35 patents, filed 14 patents. Besides, it has registered 08 copyright and filed 06 copyright applications.

The details are given below.

a. Patents obtained by ONGC:

- A self-cleaning coating solution and confocal dual-spray coating process
- A system and method for quantitative estimation of thermal maturity of crude oil
- Method for reassessment of fixed offshore platform
- Method of evaluating Physio-Chemical Conditions and Events During Diagenesis of Sedimentary Rocks
- Catalyst for CO_2 Methanation Reaction having high activity and long term stability and process thereof
- Composition for Completion fluid for use in ultra high pressure and high temperature applications
- A process for preparing an Improved Oil well Cement
- Over the top assembly for gravel packing and sealing
- Process for estimating water saturation and net pay in laminated shale sand reservoirs
- Inner string casing cementation system and the cementation process for oil or gas wells
- Fiber reinforced plastic fencing system
- A system and a method for identification of petroleum provinces through microgravity
- Process for estimation of free fluid cut off value from nuclear magnetic resonance logs
- Production enhancement apparatus for a sucker rod pump
- A method for assessing shale gas potential of unconventional reservoirs
- Process for preparing non-cementitious loss control composition
- System and method for delineating reservoir layer of intermediate impedance
- A method for preparing efficient and scalable self-cleaning coating
- Apparatus and method for preventing liquid from overtopping a bund wall
- Methane production from underground coalbed methane wells
- Composition for controlling lost circulation in depleted reservoirs
- Process of estimation of realistic hydrocarbon saturation by computation cementation exponent of sub-surface formations
- Well completion fluid and process for inhibiting corrosion in oil and gas wells
- Method for characterizing fluid components of shale reservoirs using 2D NMR spectroscopy
- A system for optimized quantitative estimation of thermal maturity of crude oil
- Improved indirect bath heater for optimum heat utilization
- A debris filtration assembly
- Development of a novel anaerobic consortium for bio methane production from lignite
- Method for preparing efficient and scalable self-cleaning coating

- Design and development of universal x-over tool (service tool) for 5-½ "& 7" casing size for over the top system for gravel packing
- Lubricating formulation and application thereof
- Use of a CO_2 methanation reaction having high activity and long-term stability of the catalyst and method therefor
- Acid and oxidative resistant cation exchange membrane and its method of preparation thereof
- Design and development of alternate gravel pack/frac pack packer for high pressure/high temperature oil and gas well
- A process for the bioconversion of lignite to humic acid

b. Patents filed by ONGC:

- Fractional hydrolysis reactor system for acid hydrolysis of lignocellulosic biomass
- Novel fractional acid hydrolysis process method for the production of fermentable sugars from lignocellulosic biomass
- A method for simultaneous isolation and identification of benzocarbazoles and benzo[b]naphthothiophenes
- An Improved Gel Formation and a Process for Preparing an Improved Gel Formation
- Improved Indirect Bath Heater for Optimum Heat Utilization
- Automated Fault Detection and Picking
- Demulsifier compositions for low temperature demulsification of waxy crude oil emulsions.
- Pour point depressant composition for waxy crude oils
- A system and method for quantitative estimation of thermal maturity of crude oil
- Biocide for control of sulfate reducing bacteria
- Process for Preparing Non-Cementitious Loss Control Composition (Filed in USA)
- Process for Preparing Non-Cementitious Loss Control Composition (Filed in Malaysia)
- Process for preparing effluent water based drilling fluid
- Siloxane-based nano-hybrid pour point depressant

c. Copyright registered by ONGC:

- Oil Field Analyser (OFA) Software for Data Analysis for Oil Field-It provides a single platform to feed all well related data at single place which can be shared across the organization/Producing Asset. Ability to determine Production Variance-Maximum, minimum and percentage variation of oil, liquid and gas rate is one of the salient features of the software, which could be useful to check the performance of a particular well.
- PEBUL Software for Gas well Deliquification
- DAIL Software- Dynamic Application of Intermittent Gas Lift (DAIL)" is mechanistic software based on first principle which carries out dynamic simulation of the Intermittent Gas Lift process to predict, analyze and optimize its performance. As a Physics based model, it performs a realistic simulation of the transient physical processes in an Intermittent Gas Lift cycle.
- Hydratemind
- A-Rod (software for designing sucker rod pump(SRP) completion)
- Discontinuity Tracker (Python based Artificial Intelligence/Machine learning software)
- Well Path Optimisation Software (WPOS)
- SeisLytics (Python based Artificial Intelligence/Machine learning software)

d. Copyright filed by ONGC:

- A-Rod (software for designing sucker rod pump(SRP) completion)

- Discontinuity Tracker (Python based Artificial Intelligence/Machine learning software)
- Well Path Optimisation Software (WPOS)
- "HydrateMIND" in-house developed ML algorithm-based software that helps to identify gas hydrate zones using G&G data
- SeisLytics (Python based Artificial Intelligence/Machine learning software)
- WellLytics (Python based Artificial Intelligence/Machine learning software)

8.1.4. New Technologies inducted in ONGC

ONGC consistently endeavours to embrace and integrate state-of-the-art technologies to align with industry benchmarks. Salient features of the technologies evaluated/inducted during the period are given below.

- **State of the art Carbon Capture Utilization and Storage (CCUS) laboratory:** Keshava Deva Malaviya Institute of Petroleum Exploration (KDMIPE), Dehradun has taken astep towards achieving the aim of Net Zero target by establishing CCUS laboratory at KDMIPE. This lab aims to achieve company goals towards reduction of carbon emissions and increase the use of renewable energy.



Director (Exploration) , ONGC inaugurated State of the art Carbon Capture Utilization and Storage (CCUS) laboratory at ONGC, KDMIPE, Dehradun

- **Rheometer:** The state of art equipment new Rheometer with pressure cell (400 bar) will be used to carry out viscosity measurement of water based gel formulations and other fluid samples at temperatures up to 200°C and at particular pressure (Atmospheric to 400 bar) which was not possible in a Rheometer without pressure cell due to evaporation of water/lighter components.
- **Laser Diffraction Particle Size Analyzer:** This instrument is helpful in describing the gas hydrate-bearing sandy reservoir's depositional environment and designing optimal sand control systems in the pilot production testing that can lead to effective control of sand intrusion from the reservoir into the well bore. This equipment is also very helpful in describing the important sediment's properties like Skewness and Kurtosis, which plays a very important role while conceptualizing the reservoir's characterization of ONGC's conventional oil and gas fields. Various key sedimentological studies like Grain size (µm), Kurtosis, Skewness, StDev (µm), D10, D50 and D90 (µm) were carried out with interpretation for samples received from different Basins and Assets.
- **Chemical Free Tiny-Bubble Technology based ETP (300 KLD)-Cambay:** Next generation technology for treatment of the effluent water produced to meet the statutory norms without need of any chemical for treatment of the produced water, with a set of equipment and designed processes for this purpose. This design consists of few main components like Tilted Plate Inceptor (TPI), Tiny Bubble generator (TBG), Silica carbide Ceramic Membrane Separation System (Sic.CMS), with other components in a certain way to treat the inlet effluent water to meet the statutory guidelines of Effluent disposal.
- **ONGC developed Next-gen Acidizing Formulation 'SPRAS' for Stimulation of Western Offshore Carbonate Reservoirs:** To overcome the challenges faced by using Hydrochloric acid (HCl) in matrix stimulation in carbonate reservoirs. IPEOT has developed a novel formulation i.e. Single Phase Retarded Acid System (SPRAS) which slows down the rate of reaction by

using retarding surfactants and completely eliminates the use of diesel.

- Development of environment friendly alternate Solvent for Asphaltene removal.
- Development of suitable enzyme based breaker for frac fluid used in CBM.
- **Advanced Effluent Water Treatment Plant (AEWTP)** successfully Implemented at Mehsana Asset: ONGC in collaboration with Bhabha Atomic Research Centre/BARC in Mumbai, demonstrated conversion of Ex-ETP produced water to Potable grade on a pilot scale, achieving a remarkable recovery factor of 50-60% while keeping the cost of treatment at ₹ 40 per litre.
- **Self-Assisted Plunger Lift (SAPL):** Self-Assisted Plunger Lift is a technology for automatic de-liquefaction of wells without any need for external source of energy and other activation methods leading to sustained production. Tripura Asset successfully commissioned Plunger lift systems on pilot basis in 20 wells of Agartala Dome, Konaban & Sundalbari fields.
- State of the art equipment **"Continuous Flow Isotope Ratio Mass Spectrometer** with GC and EA Interface along with Smart EA option for Flash IRMS (CF-EA-IRMS with Smart EA option" has been procured for Stable Isotope Lab and installed. This is a unique centralized facility of ONGC, which enables studies of C, O, S, and Nitrogen Isotopes.
- **OIMS-Assam:** Onshore Innovation & Monitoring Sphere (OIMS), is set up with the physical infrastructure (Collaboration screens, servers, etc.,) at Deendayal Urja Bhavan, New Delhi, to facilitate the implementation of co-developed solutions leading to ease of decision making and reflection on pain points with the Asset team and solution prototypes specifically developed to address the same. This will facilitate quick access to Subject Matter Expert (SME), Co-location of SMEs in desirable locations, remote from the production facility and vendor SME support at a short notice. On pilot basis a prototypes was developed for Sand Influx Mitigation for 10 wells of Rudrasagar field of Assam Asset.
- **Casing while drilling (CWD):** Wells of Mumbai offshore have been facing NPT in surface sections due to short landing of conductor and surface casing. NPT is mainly on account of pile hammer failure issues/ safety, and unconsolidated formations. Proposed for 30" & 20" CWD in 6 wells on pilot basis in view of 30" conductor piling issues and further drilling for 20" casing. CWD successfully carried out at all 06 Wells. The technology has proven to be a safer and faster for vertical exploratory wells, achieved using casing as drill string for both phases. It turnout to be solution for surface seepage losses and associated complications for initial well phases.
- **Auto-Driller:** Provides Smooth and precise lowering of traveling blocks using multiple drilling parameters and feeds consistent drill line pay-out to generate a higher quality wellbore while increased ROP. Institute of Drilling Technology, ONGC inducted Auto Driller System/ e-Wildcat TM 2.0 in Type-II & above rigs as pilot project for 1 year. The same has been installed in 1 rig each of Jorhat, Ankleshwar, Rajahmundry, Sivasagar & Agartala.
- **Liner While Drilling(LWD):** Liner drilling is an integrated services solution that can shorten drilling time and costs, reduce non-productive time (NPT), lower the risk of drilling through trouble zones, and help ensure that the liner reaches total depth. LWD successfully carried out at 02 Wells.
- **Real Time Data Management and Monitoring (RTDMM)-Assam:**

  Real Time Dashboards to monitor the critical drilling parameters and Integration of Engine, Mud Pumps, Generator, Dynamic Gas Blending and other equipment parameters of entire rig fleet. It consolidate and create the high and low frequency data bank.

- **"Soft Speed-II Technology"** for Drilling Services, Assam Asset: Inducted in well GKIX (Rig EV-2000-5) and subsequently operational in GKBX (Rig EV-2000-3).
- **Axial Oscillation Tool for Drilling Services, Assam Asset:** Inducted in well NGDF (rig M-6100-1) and operational in Assam Asset.
- **Real Time Drilling Operation Centre (RTDOC):** Commissioned at Institute of Drilling Technology to monitor & supervise all drilling activities across ONGC and intervene & suggest mitigation measures to avoid complications.
- **"Thermoset resin":** Implemented new technology in well#VADA and achieved successful isolation of water bearing zone thereby adding 0.25 mmscmd of gas production.
- **12¼" x 14¾" under reamer services:** Drilled and enlarged (HEWD-Hole enlargement while drilling) the hole from 10½"x12¼"by using under reamer services with 10½" PDC bit in well NVV#AA first time in Onland ONGC and drilling of this section completed in 53 days against plan of 124 days
- **The CSS (cyclic steam stimulation) EOR technique:** To enhance oil production from heavy oil field, is being implemented in Lanwa field of Mehsana, project has made significant progress, with 12 wells planned for drilling, 8 of which have already been completed.
- **PAN India Hydro Fracturing data center:** Real time Hydro Fracturing job data transfer done on pilot scale in well Linch#219 (Mehsana Asset). Further to be extended to other work centres including offshore.
- **Stim-Gun Perforation Technology** implemented in 5 wells of Cambay and found to be moderately successful. Stim-Gun is a combination perforating gun/oxidizer sleeve that can be conveyed via slick-line, electric line, coiled tubing or tubing conveyed perforating systems and enhances well productivity in older lower pressure reservoirs and has proven beneficial when combined with under balanced TCP operation.
- **Plasma Pulse technology:** To remove near wellbore damage, Plasma pulse tool technology of BARC used in 5 nos wells in Ahmedabad-and 02 No of wells in Mehsana asset.

ONGC ENERGY CENTER:

1. **Bio-CBM process Field Applications:**

   Post job monitoring was done by OEC at Essar Oil & Gas Exploration & Production (EOGEPL), Durgapur CBM field for five (05) CBM wells where bio-stimulation microbial job was executed by OEC & TERI for enhanced CBM gas production.

2. **CO_2 Valorization in CBM field**

   Based on the encouraging lab results, field testing of OEC TERI bioprocess for in situ bio-conversion of CO_2 to methane (CH_4) has been implemented on 25.09.2023 in ONGC CBM well BK#47 with high reported CO_2 content to improve the calorific value of the produced gas by reducing CO_2 percentage.

3. **Advanced ex-Effluent Water Treatment Technology (AEWTT):**

   Mehsana Asset of ONGC, produces around 6,500 m^3/d of crude oil along with 28,000 m^3/d of produced water. A technology has been developed by OEC in collaboration with BARC Mumbai for conversion of ex-effluent treated water into potable grade (water suitable for agricultural/ industrial usage) based on advanced oxidation process for dissolved oil removal and reverse osmosis for dissolved salts removal.

   This Demo Plant can handle 10 m^3/day ex-ETP water and can produce 5 m^3/day of Potable grade water with recovery factor around 50%. The overall cost of processing is around ₹ 1.40 per litre of product water. The plant has already processed more than 6,00,000 L of ex-ETP produced water.

4. Helium exploration and pilot plant:

OEC has initiated the process for Helium exploration in Hatta area, Madhya Pradesh, Vindhyan Basin. Gas samples were collected by OEC from ONGC drilled well Hatta#06 for analysis of chemical composition for Helium and others gases. Further, drilling, coring and logging of 10000 meterage (approx. 10-15 boreholes) for Helium exploration in and around Damoh Area, Madhya Pradesh would be undertaken during 2024-25.

5. Vanadium Redox Flow Battery (VRFB)

OEC has also demonstrated 5 kW/ 10 kWh Vanadium Redox Flow Battery (VRFB) energy storage system in collaboration with IIT Madras & M/s. High Energy Batteries (HEB), Trichy at India Energy Week 2024 held at IPSHEM Goa. The said battery was installed which was capable of charging all types of EV (electric vehicles) and particularly suitable for remote areas where no grid power is available because it works on solar panel charging. The battery was demonstrated by charging of two wheeler electric vehicle near Hydrogen shed facility at IPSHEM Goa.

Vanadium redox flow battery (VRFB) is a type of rechargeable flow battery which stores energy by using a vanadium electrolyte solution. The energy storage capabilities of VRFBs are already proven in the market in view of their wider adoption of renewable power generation such as wind and solar. VRFB technology offers a long-term solution for off-grid power systems and micro-grids due to its unlimited storage capacity, long battery life, low maintenance requirements, adaptability and almost non-existent environmental footprint. It could be a good alternative for imported lithium ion batteries for stationary applications.



Demonstration of 5 k W/ 10 kWh Vanadium Redox Flow Battery (VRFB) energy storage system in collaboration with IIT Madras & High Energy Batteries (HEB), Trichy

New Projects undertaken by ONGC Energy Centre:

i. The agreement amongst OEC and CSIR-IIP was signed on 25.05.2023 for collaborative R&D Project titled 'Thermo-chemical Hydrogen Generation through Partially Open-Loop I-S Process involving H_2S Incineration: Coupling of Individual Sections for Laboratory Integrated Operation'.

ii. The agreement amongst OEC and TERI was signed on 20.06.2023 for collaborative R&D Project titled 'Demonstration for revalidation of In-situ stimulation/bio-augmentation for enhancement of Methane in three (03) marginal CBM wells of Bokaro/Jharia' with project start date as 01.07.2023.

iii. A collaborative project titled 'Electrolytic-membrane process for the production of hydrogen from sea water (Phase I: Laboratory scale optimization)' with CSIR-Institute of Minerals and Materials Technology, Bhubaneswar has been initiated on 14.11.2023.

iv. A collaborative project titled 'Scale-up Study for Electrolysis of Cuprous chloride (Phase I)' with CSIR-Institute of Minerals and Materials Technology, Bhubaneswar has been initiated on 14.11.2023.

8.1.4. Benefits achieved through R&D studies

All the R&D projects undertaken by ONGC facilitated speedier and effective E&P activities of ONGC. R&D activities carried out by the Institutes have helped in enhancing the growth of the company by ensuring high success-ratio

including enhancement of Reserves through finding new oil in existing petroleum provinces using state of the art technology available in the company. R&D activities have also facilitated in improving recovery factor, incremental oil gain, mitigating complex challenges of exploration in Frontier basins, deep-water blocks and to tap un-conventional and low carbon energy resources.

The R&D projects completed are applied in nature which provided domain specific challenges in seismic data processing, interpretation, complex reservoir characterization, reservoir modelling. Developed AI/ML based solutions are efficient leading to significant value addition and time saving.

8.1.5. R&D Expenditure in the last 3 years

FY	R&D Expenditure (₹ in crore)
2021-22	531.58
2022-23	569.84
2023-24	686.68

8.2. Oil India Limited (OIL)

Oil India Limited (OIL) has established two knowledge-based R&D Centers-Research & Development Department (R&D) at its Field Headquarters in Duliajan, Assam, India and Centre of Excellence for Energy Studies (CoEES) in Guwahati, Assam, India. These R&D Centres provide specialized & innovative research based and cost-effective solutions to the challenges encountered in the energy industry, specifically catering to the needs of OIL. Both the Centres are recognized by the Department of Scientific and Industrial Research (DSIR), Ministry of Science & Technology, Government of India. CoEES has also been recognized as a Designated Institute for conducting screening and vetting of Enhanced Recovery projects as per ER Policy, 2018 vide The Gazette of India of MoP&NG dated 24th November 2020.

Activities undertaken by OIL in FY 2023-24 are as under:

8.2.1. In-house R&D projects undertaken by OIL

Exploration and Research Projects:

i) **Surface Geochemical Prospecting:** Conducted in AS-ONHP-2021/2 and AS-ONHP-2021/3 Blocks, focusing on adsorbed gas analysis in soil samples.

ii) **Reservoir Continuity Studies:** Carried out in Baghjan Oil Field.

iii) **Geochemical Characterisation:** Analyzed gas, soil, and rock samples from Mahendraganj, Meghalaya.

iv) **Source Rock Evaluation:** Assessed well Dima Hasao-1 in ODHA location.

v) **In-House Technology Implementation:** Field implementation of Microbially Enhanced Oil Recovery (MEOR) and Microbial Geo-Prospecting for Oil and Gas (MPOG).

vi) **Bio-Stimulation Studies:** Investigated in-situ bio-stimulation of methanogens for residual oil recovery.

vii) **Enhanced Recovery Development:** Developed biosurfactants and conducted studies on well stimulation techniques.

viii) **Pilot Projects:** Conducted polymer flooding in NHK011D+018 block and CO2 EOR in NHK079D block.

ix) **Feasibility Studies:** Investigated the applicability of CWI in Dikom-Chabua Area and studied CO_2 transportation and storage feasibility in Jaisalmer Basin.

x) **Technology Deployment:** Implemented CSS in Baghewala and LSWF in various reservoirs.

xi) **Reservoir Management:** Conducted simulation studies for identifying bypassed oil and rejuvenating matured reservoirs.

xii) **Depositional Environment Analysis:** Studied Lakadong + Therria Formation in Well KLN-23.

xiii) **Resource Evaluation:** Analyzed maceral composition, vitrinite reflectance, and source rock potential in Well Puri-02.

xiv) **Petrophysical Evaluation:** Assessed reservoir characterization, including the Upper Carbonate Formation in Baghewala Field.

xv) **Reservoir Geochemistry:** Conducted continuity studies in Jorajan oil field using geochemistry techniques.

xvi) **EOR Lab Studies:** Determined the Minimum Miscibility Pressure of Kathaloni Crude with Co_2.

xvii) **Development of Low Temperature Oil Soluble Demulsifier:** OIL, in collaboration with oil field chemicals manufacturers, developed LT-OSD. Effective at 45°C compared to conventional OSD chemicals (effective at 60°C only). Improved water separation from oil emulsion, crucial for remote areas.

xviii) **Hydrogen Blending with Natural Gas at Pump Station 3 in Jorhat:** OIL established India's first Green Hydrogen pilot plant at Pump Station in Jorhat. PNGRB granted permission for hydrogen blending (up to 2% vol H_2) in MDPE network at domestic households within OIL's Base Pumping Station premise in Jorhat. Modification work underway, blending operation to commence soon.

8.2.2. Induction of New Technology

In 2023-24, OIL has intensified its efforts to modernize and incorporate cutting-edge technology to meet industry demands. Key advancements include:

i) **CMG Software Integration:** OIL has invested in advanced reservoir simulation software from Computer Modelling Group (CMG), Calgary, Canada. This software, comprising CMG IMEX for Black Oil and GEM for Compositional simulations, empowers OIL with sophisticated modeling capabilities essential for reservoir management.

ii) **ER Screening Tool Acquisition:** OIL has acquired an ER Screening software from Petroleumsoft Limited, UK, enhancing its capacity for screening and ranking various EOR methods globally. This tool facilitates comprehensive evaluation based on techno-economic parameters, enabling informed decision-making.

iii) **Core Flood System Implementation:** The introduction of a Core Flood System at CoEES enables OIL to conduct single and multiphase core flood studies under reservoir-representative conditions. This system facilitates the evaluation of diverse EOR methods, including water flooding, polymer injection, ASP injection, and gas flooding, among others. It provides critical insights into parameters such as brine sensitivity, permeability, displacement efficiency, and incremental oil recovery, vital for optimizing EOR strategies.

8.2.3. Industry-Academia Collaboration

i) Collaboration with Pan CSIR Laboratories:

- In 2023, OIL initiated a Memorandum of Understanding (MoU) with Pan CSIR laboratories in New Delhi. This collaboration focuses on research projects related to exploration, production operations, and alternate energy sources.
- Projects include the development of synthetic aviation fuel and additives for methanol diesel blending in collaboration with CSIR-IIP, Dehradun, and CSIR-NCL, Pune.

ii) Collaboration with IIT Bombay:

- OIL is engaged in projects with IIT Bombay on water management, including laboratory studies and prototype development for drilling site wastewater management and produced water treatment.

iii) Collaboration with IIT Guwahati:

- Research initiatives include the effect of hydrogen blending on natural gas and the development of nano-materials for oil and gas applications. Additionally, studies on Chemical and CO_2 EOR of depleted reservoirs are ongoing.

iv) Collaboration with RGIPT:

- Completed studies include organic petrography, biostratigraphy, and palynology study of shales in Well Sadiya-1 and 3D Geo-Mechanical model development for Balimara field.

v) Collaboration with UPES:

- OIL is conducting a collaborative study on exploring Himalayan hot-springs for microbes with biohydrogen production capabilities.

vi) Collaboration with IIPE Visakhapatnam:

- Ongoing collaborative research focuses on 2D-3D heterostructure-based green catalysts for the efficient capture and conversion of CO_2 into green fuels via artificial photosynthesis.

vii) Collaboration with Kurukshetra University

- To identify potential hydrocarbon accumulations in the subsurface, OIL has undertaken a pilot study using Low Frequency Passive Seismic method with Kurukshetra University as a part of new Technology Induction policy of OIL.
- Initial results based on Phase I and Phase II pilot study indicate that this technology could play a significant role in mitigating the exploration risk.

viii) Other Collaborative Initiatives:

- Collaborative projects with various universities and research institutes are underway, including studies on CO_2 storage potential, geological mapping, geothermal energy extraction, and EOR schemes evaluation.

8.2.4. Patents registered by OIL

Patent documents describe unique solutions to difficult or long-standing problems. In order to qualify for grant, such solutions have to be really unique and new-to-the-world in at least some aspects. Therefore, it is a matter of pride for OIL to file patent applications and OIL has so far been granted 17 patents in six (6) different countries - seven (7) in India, two (2) in Russia, three (3) in the USA, two (2) in China, two (2) in European Union and one (1) in Japan. In the medium to long run, patenting will strengthen OIL's technology capability and strengthen Government of India's initiatives such as the "Make In India" campaign.

8.2.4.1. Patent obtained by OIL in FY 2023-24

S.N.	Title	Country	Indian Patent No	Date of grant
1	Method to Determine Transformation of Kerogen to Oil/Gas at Different Maturities Using Stepwise Pyrolysis-Gas Chromatography	India	504804	30.01.2024
2	Bacteriophage mediated biocontrol in oil reservoirs	India	469611	16.11.2023

8.2.4.2. Patent obtained by OIL in FY 2023-24

S.N.	Title	Country	Application No	Date of filing
1	Polymeric Wax Deposition Inhibitor	India	202311050247	25.07.2023
2	A method for enhancing power generation of SOFC system by blending Hydrogen with Natural Gas	India	202331066053	02.10.2023
3	A process for the preparation of 2D-3D hybrid aerogels, in particular, 2D molybdenum disulphide-3D graphene aerogels	India	202341068689	12.10.2023
4	A flexible and wearable self- researched power unit and a process for the manufacture thereof	India	202341069311	14.10.2023
5	Asystem for supply of thermal energy at constant temperature using SOFCs	India	202331071621	20.10.2023

8.2.5. R&D Expenditure in the last 3 years

FY	R&D Expenditure (₹ in crore)
2021-22	100.96
2022-23	179.03
2023-24	149.22

8.3. Indian Oil Corporation Limited (IOCL)

8.3.1. Over its distinguished history since 1972, IndianOil R&D has tirelessly pursued the goal of self-reliance by addressing key industry challenges. This includes replacing imports of technologies/products to support Atmanirbhar Bharat through in-house research and development. Additionally, the focus extends to preparing for the energy transition by optimizing, localizing, and replacing carbon-based energy options with commercially and environmentally sustainable solutions. Meeting market demands is another priority, achieved by expediting developmental cycles through collaborations with reputable research and academic institutes. IndianOil R&D's commitment to protecting and commercializing knowledge is evident through aggressive patenting and licensing efforts.

Cutting-edge research is conducted across core areas of expertise, including fuels & lubricants, refining technologies & catalysts, and petrochemicals & polymers. The center's endeavors also extend to emerging fields such as Nano technology, Solar, Bio-energy, Hydrogen, Fuel Cell, and energy storage, charting the course for the future. With a substantial portfolio of 1,721 filed patents and 1,625 effective patents as of February 2024, IndianOil R&D has showcasing its dedication to innovation and progress. During the year 2023-24, major highlights of the work by IndianOil's R&D Centre are as follows:

8.3.2. IndianOil R&D Centre's contributions to **Catalyst and Process Technology** development have significantly bolstered India's self-reliance under "Atmanirbhar Bharat." In fiercely competitive sectors dominated by multinational corporations, its innovative solutions have reduced dependency on foreign licensors, empowering indigenous expertise to thrive and strengthening India's position in the global energy landscape. Major developments in 2023-24 are:

- Successful commissioning of Catalyst Manufacturing Plant (CMU) at Panipat Refinery, including ZSM-5 additive, ZSM-5 zeolite, Alumina, and DHDT/DHDS catalyst plants, marking significant progress in refining catalyst manufacturing.



- Joint R&D efforts enabled domestic production of Reference Gasoline (E0-E85), reducing import dependency.
- Installation of a 300 kTAindDSK unit at Paradip Refinery underway, licensed jointly by IOCL and EIL, to produce Pipeline Compatible Kerosene (PCK).
- IOCL R&D introduced a groundbreaking 'Mixed Metal Oxide' catalyst for Light Naphtha Isomerization, enhancing refinery capabilities and enabling licensing of ISOM technology.
- Developed DHDT Digital Twin Model integrating AI/ML techniques with R&D kinetic model (DHDT-MOD) for real-time monitoring of catalyst performance at Guwahati &Digboi Refineries, aiding in catalyst life assessment for JR and GR DHDT/NHT Units.
- BDEPs developed for Implementation of 'eBioAT' process in ETP unit at Mathura & Gujarat Refineries, upgradation projects at Mathura Refinery, including revamp of Sour Water Stripper unit, debottlenecking of **Octamax®** unit, and heat integration for energy savings and CO_2 reduction.

- Development of Crude Assay Database Management Software (CADMS) to systematize storage and retrieval of crude assay data.

8.3.3. In 2023-24, IOCL R&D's unwavering dedication not only ensured self-sufficiency in domestic requirements but also prioritized the development of long-life, energy-efficient **Lubricants & Greases.** With about 130 lubricant formulations issued and 40 OEM approvals, our focus remains on meeting customers' needs while promoting import substitution.

8.3.4. Union Minister of Petroleum & Natural Gas and Housing & Urban Affairs received India's first commercial passenger flight powered by indigenously produced **Sustainable Aviation Fuel (SAF)** The SAF blended Aviation Turbine Fuel (ATF) for the Air Asia flight was supplied by IndianOil with active support of R&D Centre and in partnership with Praj Industries Ltd.



This achievement marks a crucial step towards India's goal of achieving net-zero emissions by 2070. Other major developments in 23-24 are as follows:

- Launched premium Racing Fuel 'STORM' compliant with FIM standards, partnering with Two Wheels Motor Racing (TWMR) for Asia Road Racing Championship 2024, marking a significant leap in global racing events.



- Optimized IOC Coupler for ED5 and MD 15 diesel blends, with MD15 production scaled up at a third-party blender to supply BMTC, RDSO, NRL, and OEMs like AL and TATA. Successful trials were conducted at BMTC, RDSO, and Ashok Leyland.
- Employed cost-effective absorbent to enhance MTO quality for the paint industry, with a comprehensive report forwarded to RHQ for process implementation across refinery, terminal, and depot operations.
- Developed non-ATF based cost-effective DHPP (Z) formulation for extreme cold weather application for the Army.
- Released product formulation for corrosion inhibition (CI) in LPG pipelines.
- Developed Premium GMFA formulation for LAC dosing in gasoline at IOC refineries, certified at international labs for PFI, with production planned for trial batches.
- IOCL R&D developed the analytical method "Quantitative determination of Dimethyl ether (DME) content in DME- Blended liquefied petroleum gas (LPG) fuels by gas chromatography" which has been accepted and recommended for printing as a BIS method.
- Collaborated with M/s JCB India Limited to extend XtraGreen diesel and Green Combo concept to off-highway vehicles. NDA signed for projects including lubricants, oxygenated fuels (ED5), and H2ICE CEV evaluation.
- MoC signed with M/s Ashok Leyland for development and demonstration of ED5/MD15 fuels in Heavy Duty Commercial Vehicles. Endurance tests with ED5 fuel at IOCL R&D and field trials with MD15 fuel at KSRTC were completed successfully.

8.3.5. In 2023-24, our **Pipeline research** in R&D achieved remarkable milestones. Following the repair of the 12" Jasidih-Barauni product pipeline (132 km), R&D swiftly conducted inline inspection (ILI) within a record 10-day timeframe through collaborative efforts. Introduced 'qPCR', our in-house developed and

patented Real-Time Polymerase Chain Reaction kit, enabling precise quantification of corrosion-causing microbes and offering troubleshooting support across multiple sites. Indigenous IPIG tools facilitated a record ~2000km of pipeline inspection. We designed and successfully field-tested a new 30"IPIG tool with roller support, alongside PU cups, affirming its integrity in the Paradeep-Balasore pipelines. Repurposing existing 28" IPIG of Crude pipelines for inspecting a 30" Natural Gas Pipeline further showcased our adaptability. Additionally, we established a 5-Axis UT scanner facility for developing ultrasonic technique-based IPIGs.

8.3.6. Our **Petrochemicals & Polymer** research achieved significant milestones in 2023-24. Indigenous **XtraFlo®** DRA was successfully sold to pipeline operators such as HPCL, BPCL, and HMEL, generating a royalty earning of Rs 87 lakhs. Moreover, a successful trial of XtraFlo® DRA conducted in the Middle East showcased its potential for market expansion in that region.

8.3.7. In the realm of **Nanotechnology,** significant strides were made in 2023-24. This included the scale-up production of 5MT of an improved patented Perovskite-based nano-catalyst aimed at enhancing combustion efficiency for propane/LPG, with plans for commercial trials. Additionally, auto LPG doped with promising nano additives underwent successful testing and certification at ARAI, Pune, demonstrating notable enhancements in fuel economy, power, and acceleration. Furthermore, trials at Mathura, Paradip, and Panipat (PNC) refineries were completed with Nano-fortified coating formulation for combating Corrosion Under Insulation (CUI), showcasing promising results.

8.3.8. IndianOil R&D Centre is untiringly working in **Alternative Energyand Renewable Energy** solutions like 2G Ethanol from agri-waste, fuel cell technology for automobiles, bio-diesel production from CO_2, solar power, and energy storage devices etc. In the domain of Alternate & Renewable Energy, the following notable accomplishments were achieved in 2023-24:



- Successful demonstration of the enzyme-assisted Co_2 capture technology 'eCO_2Sorb' at the existing TFL CO_2 capture plant, resulting in a remarkable 21% improvement in energy efficiency after retrofitting.
- Construction and commissioning of a 200 TPD paddy straw-based plant at Gorakhpur, inaugurated by Union Minister of Petroleum & Natural Gas and Housing & Urban Affairs and Chief Minister, Uttar Pradesh, for producing CBG.
- Development and successful field trials of microbial blend 'StubVorous' for in-situ decomposition of crop residue, facilitating crop rotation within a short window and validated by District Agriculture Departments.
- India's first green hydrogen fuel cell buses were inaugurated at India Gate by Union Minister of Petroleum & Natural Gas and Housing & Urban Affairs. IndianOil is sourcing 15 fuel cell buses from Tata Motors Limited. The buses will be operating on specified routes in Delhi-NCR and cover about 3 lakh kms. This is the first such initiative in India where green hydrogen is being dispensed at a high pressure of 350 bar to operate fuel cell buses.



8.3.9. IndianOil's **Startup Scheme** achieved significant milestones in 2023-24. With 36 projects incubated and a committed fund value of ₹ 61.32 Cr, innovation thrived. Over 75 IPRs were generated, including patents, copyrights, trademarks, and designs. Additionally, the "Green Resolve-Amrit Kaal Adhyay" Open Innovation Challenge launched in March 2023 selected six proposals for funding and incubation, showcasing IndianOil's commitment to fostering innovative solutions in the energy sector.

8.3.10. R&D Expenditure in the last 3 years

FY	R&D Expenditure (₹ in crore)
2021-22	576.55
2022-23	698.21
2023-24	946.14

8.4. Bharat Petroleum Corporation Limited (BPCL)

8.4.1. Bharat Petroleum's Corporate Research & Development Centre (CRDC) at Greater Noida, Uttar Pradesh and Product & Application Development Centre (P&AD) at, Mumbai are the two research divisions who are proactively involved in adding value to the businesses through research activities. As a part of "Aatmanirbhar Bharat", CRDC has developed various novel and niche products/processes and is aggressively working to commercialize the same. Following activities were performed during April 2023 to March 2024:

- As part of "Aatmanirbhar Bharat" initiative of GoI, the corporate R&D team of BPCL has mastered the process chemistry of Super absorbent Polymer (SAP), using in-house acrylic acid as feedstock, which is used in various hygiene products like diapers and other incontinence products owing to its excellent ability to absorb water many times its own weight. In order to roll out the product, BPCL had earlier commissioned 200 Tons/annum pilot plant at Kochi Refinery. Based on the experience gained on the pilot plant operation, the basic engineering package for commercial scale SAP plant has been developed.
- As part of eco-system development for Green Hydrogen production, different types of electrolyser systems are being installed for performance evaluation and benchmarking of electrolyser components. For accelerated scale-up & indigenous electrolyser manufacturing, a MoA has been inked with Bhabha Atomic Research Centre. Accordingly, scale-up of BARC electrolyzer technology at 0.5 MW scale is being executed in commercial deployment. At India Energy Week, BPCL R&D demonstrated indigenous alkaline electrolyser jointly developed with BARC for Green Hydrogen production.



- In order to develop and demonstrate complete Green Hydrogen value chain, BPCL has signed a MoU with Govt of Kerala for setting up an Integrated Green Hydrogen plant and Hydrogen Re-Fueling Station near Cochin International Airport Limited (CIAL), Kochi, Kerala. The facility will have a capacity to produce and dispense 200 Nm3/h green Hydrogen produced through water electrolysis capable of fuelling the H_2 powered vehicles.
- In the mission to minimize climate change effects, hydrogen blending into natural gas pipelines is investigated as a potential solution across the globe for achieving near-term emission reductions and early market access for hydrogen technologies such as electrolysers. BPCL is working on the pilot project of Green Hydrogen blending in Natural Gas network to establish techno-commercial feasibility for large scale adoption.
- To reduce the country's dependency on imports through optimizing fuel consumption, the BPCL R&D team has developed PNG Burner with improved thermal efficiency. The new energy efficient PNG cooking stove has thermal efficiency

up to 74%, which is 10-15% more than that of stoves available in the market.

- Bharat H_2Sep Membrane Technology for H_2 Recovery: Hydrogen is one of the most expensive energy utility. In order to maximise hydrogen usage, CRDC has developed a suitable membrane-based unit for hydrogen recovery from refinery off gas. The field trials of the membrane resulted in increase of hydrogen purity from 90-92% in the feed to 99.5% in the permeate, with a recovery rate of 70-75%.
- Bharat HiGee Deaeration Technology was developed for efficient deaeration of Boiler Feed Water (BFW). After a commercial scale demo plant of 150 TPD was commissioned at CDU 4 plant of Mumbai Refinery last year, efforts are on to install a commercial scale Deaerator of 2500 TPD. This can result into a CO_2 saving of 50000 ton/annum.
- Valorisation of bio-refinery by-product stream: To valorize boiler ash that will be produced from BPCL's under-commissioning Bargarh 2G plant, an in-house process was developed for precipitated silica production from rice husk ash with an efficiency of ~70%. Commercial scale production process has been developed and trial at a tyre manufacturing site has been done.
- Clean fuel: Owing to the increasing requirement for green and clean fuels, BPCL CRDC has been working on Ethanol blended diesel using in-house developed additives. BPCL launched the products on pilot level along with collaborators-Ashok Leyland, UPSRTC and Tata MotoCorp at a BPCL Retail Outlet. Pilot trial of the fuel is being executed.
- BPCL Corporate R&D and M/s Aspen Technology signed a collaboration agreement for the integration of Aspen HYSYS and CRDC developed crude assay prediction tool - BPMARRK®. This partnership aims to offer real-time monitoring & optimization solutions to the crude oil refiners. To establish the efficacy of this integration, a case study of digital twin model using HYSYS-BPMARRK® integration is being carried out. This integrated solution will prevent product quality giveaway and maximize margins of Crude distillation units.
- CRDC developed K Model is a web-based software for quick and accurate prediction of crude compatibility and optimization of numerous crudes within minutes as compared to weeks' time required by experiments for different crudes. The software was launched as a product of BPCL and has been made available to all over the internet (https://www.bpcl. kmodel.in). K Model enables to arrive at an optimum blend based on economics, availability and processing feasibility on real time basis, thereby promoting simultaneous evaluation of multiple crude mix options in quick time and take more informed decisions. This also facilitates feeding compatible crude oil mixture to refinery to maintain equipment health, smooth operation, energy saving and reduce carbon footprint.
- Anode grade coke production: CRDC has successfully developed and demonstrated the process knowhow of Anode grade coke production from delayed coker units of refinery. 4500 MT of Anode grade coke production trial at Kochi refinery was successfully carried out.
- Corporate R&D centre of BPCL as part of "Atmanirbhar Bharat" initiative of GoI is continuously working towards the indigenisation of various process chemicals and catalysts used in refining sector. In this context, CRDC has successfully developed the process for producing Cetane Improver from existing refining product portfolio. The product was developed in laboratory scale and subsequently demonstrated at demonstration scale. In similar lines, efforts are underway to develop homogenous phase catalysts for oxo-alcohol production.

8.4.2. R&D Expenditure in the last 3 years

FY	R&D Expenditure (₹ in crore)
2021-22	77.76
2022-23	71.68
2023-24	95.87

8.5. Hindustan Petroleum Corporation Limited (HPCL)

8.5.1. HPCL has set-up its prestigious HP Green R&D Centre (HPGRDC) at Bengaluru in 2016, with a core purpose to make energy and chemicals accessible to everyone through innovation. HPGRDC is equipped with the state of art laboratories with all the advanced equipment, pilot plants and facilities to carry out cutting-edge research. The focus areas of research include developing refining technologies, products and catalysts, petrochemicals & polymers, lubricants & additives, upgradation of low value streams, novel separation technologies, process intensification, carbon capture, renewable energy and alternate energy. HPGRDC also provides advanced technical support to different refineries in India and abroad through trouble shooting services for refinery units, crude evaluation, catalyst testing and selection, Sulphur speciation, catalyst time on stream studies, etc. Additionally, HPGRDC is setting up new lab viz. Centre of Excellence (CoE) in Bitumen and Pavement Research.

The centre has filed so far, a cumulative of 547 patents in India and Abroad and has obtained grant of 210 patents. During the period January 2023- March 2024, 140 patents have been filed and 61 patents have been granted.

HPGRDC continued innovation with the objective of developing solutions for existing and new business areas, with the special thrust on commercialization of developed products, catalyst and technologies. Notably while innovation parameters got all time high, the commercialization of products also have seen all time high with 3-fold increment.

7 prestigious recognitions/rewards were received by HPGRDC including two CHT Innovation awards 2022-23 for 'Commercialization of Indigenous PSA PLC Technology' under Best Indigenous developed technology category & 'HP-HCNG Technology' under Best Innovation in R&D Institute category from MoP&NG;





FICCI award for "HP-BCA: Additive for bottoms reduction in FCC Unit", FIPI Oil & Gas Innovator of the Year Award 2022" for "HP-DWA: Dewaxing aid for Propane Dewaxing unit"; Golden Peacock Innovative Product/Service award of the year 2024 for "HP-Bioremedia: A bio-additive for enhanced bioremediation of oily sludge; "PRASHANSA PATRA" in Safety Awards-2023 from National Safety Council of India; "HP-RAMP technology" under category of "Leading RE Technology/Product Innovation" in Renewable Energy India expo, New Delhi.

During the year following technology commissioning activities were carried out:

- HP-MO2-IV (3TPD Medical Oxygen plant) at Sir Gangaram Hospital, New Delhi which is designed based on inhouse developed Pressure Swing Adsorption (PSA) process
- HiGAS Model-2 at VR which is a Rotating Packed Bed (RPB) based absorption process for H2S removal from fuel gas

HPGRDC has played lead roles as indicated below to foster innovation in oil & gas sector, biofuels technology and academic institutions:

a) Hosted 1st CHT- Activity Committee Meet (ACM) on "Role of Oil and Gas Sector R&Ds in Energy Transition" during 17th-18th October 2023





b) Hosted International Energy Agency (IEA) Task 37 Energy from biogas meeting conducted on 9th-11th May 2023 with participants from across globe

c) 5th edition New Generation Idea Contest (NGIC) was conducted in which 700 ideas from different academic institutes across India were received, screened and rewarded

During the same period, HPGRDC has commercially demonstrated 17 new products/ Technologies (taking its tally of Technologies & Products demonstration to 60), the details of which are given below:

- **HP AquaOKare:** Mineral scale deposit is very common and persisting problem faced in Industrial water systems and hampering the efficiency of the units. HPGRDC has developed comprehensive chemical

treatment package "HP AquaOkare". HP AquaOKare is a patented product; comprising of novel multi-functional polymeric additive with 3D coordinating sites, leading to more crystal growth distortion and better chelation with scale precursors. Controls hardness & Superior scale inhibition; Controls general and pitting corrosion; Very effective microbiological fouling control

- **HP-Enscour:** HPGRDC has developed a novel and cost-effective additive package HP Enscour for defouling application of tanks/units in heavy oil service. The conventional process for cleaning such tanks is time consuming, manpower intensive and requires handling & disposal of hazardous hydrocarbons. HP Enscour is a unique and advanced formulation that can dissolve heavy asphaltene sludge and converts it to processable oil. Field trial of the additive was successfully carried out at HPCL's Mumbai Refinery, where 80% of the Tank Bottom Sludge was removed from Asphalt tank as well as cleaning time was also reduced by three weeks.
- **HP Primer:** HPGRDC has developed a durable and enhanced corrosion-resistant primer for applications until 80°C. With higher tensile strength, the paint will be more durable. In addition, the additive's inherent layered structure will delay the permeation of corrosive ions to the metal surface thereby enhancing the corrosion resistance. The in-house formulation is showing three orders improvement in the impedance values than the commercially used primers. Further analysis was carried out to identify the best-suited formulations. It is surface tolerant and resistant coating over conventional Zinc silicate primer coating.
- **HP PPD-ULSD:** HP PPD ULSD is developed as a pour point depressant formulation for ultra-low sulfur diesel (ULSD). This additive prevents or delays the formation of wax crystals in cold temperatures, ensuring that diesel fuel flows freely and avoids clogging pipelines, filters, and engine nozzles. Developed PPD ULSD is cost-effective by 36% compared to commercial. So far supplied 63 MT of HP PPD ULSD to MR and a cost Benefit of ~1 Crore.
- **HP SolarOKare:** The solar panel cleaning solution exhibits superior cleaning efficiency, along with a higher level of antimicrobial effectiveness and minimal corrosion tendencies. Additionally, the thinner has undergone rigorous testing and certification by an external, NABL accredited laboratory.
- **HP NickTreat:** This is a novel additive formulation which can be used in FCC units for controlling/passivating the dehydrogenation activity of Nickel in the catalyst and thereby reducing the dry gas production in the unit. Trials at Mumbai & Visakh Refinery indicate performance at par with other commercial alternatives.
- **HP-PMA:** Propylene maximization additive is unique additive through which the propylene yield in the FCC unit can be increased c. The additive was scaled-up and toll manufactured and field trials have given delta propylene increase 0.45wt% at 5% catalyst inventory changeover.
- **HP-COP:** CO promoter additive is typically used in FCC regenerator for achieving complete conversion of carbon to CO_2. The additive is low cost solution compared to available in the market by 50%.
- **HP Frostfree:** HP Frost-free instantly melts windshield ice/frost and provides a clear viewing experience to the driver in cold-climate regions. The unique non-corrosive formulation is available in easy-to-spray packaging. The simplicity of handling and the superior effectivity makes HP Frost-free a reliable companion in your journey.
- **HP Frost Shield:** HP Frost-shield is an unique formulation which prevents overnight frost formation on vehicle windshields in cold-climate regions. The formulation provides a temporary barrier of contact for water, which helps to mitigate the issues of frost accumulation. Available in user friendly packaging, this non-corrosive formulation is a reliable partner in your journey.

- **HP Boilmax:** HP BOILMAX has been formulated to counteract the acidic compounds present in condensate water, leading to an elevation in pH levels. The product possesses the capability to neutralize amines, thereby regulating water pH effectively by virtue of its superior neutralizing capacity and enhanced distribution coefficient between steam and water phases. In field trials, the in-house developed additive HP-BOILMAX has exhibited superior performance at reduced dosages, with a decrease of around 25% in comparison to conventional commercial additives.
- **HP Power Clean:** HP Power Clean is a state of the art multifunctional gasoline additive designed to enhance SI engine performance. Leveraging superior detergency and dispersant properties, HP Power Clean delivers superior results: over 90% reduction in intake valve deposits, coupled with a 3.3% improvement in brake thermal efficiency and a 3.1% reduction in fuel consumption. Emissions are also significantly reduced in terms of NOx, HC, CO, and PM emissions.
- **HP EGIN:** HP-EGIN is a novel and cost-effective corrosion inhibitor for anhydrous ethanol and gasohol media. Its formulation allows for lower dosage levels compared to traditional commercial products, which can lead to cost savings without compromising efficacy. The successful testing of HP-EGIN across diverse temperatures and locations underscores its reliability and potential for widespread application within operational and distribution networks. The adoption of HP-EGIN could enhance the longevity and performance of infrastructure involved in the storage and transportation of ethanol blends, ultimately contributing to more sustainable industrial practices.
- **HP Shinepro:** HP shine Pro is a premium paint thinner for all purpose painting applications. HP-Shine Pro is infused with unique formulation to significantly improve the solvency of the Thinner. This in turn reduces paint agglomerates and ensures a smoother finish. Since surface asperities are reduced, surface gloss is enhanced. The improved adhesion to surface also helps keep the paint layer uniform, enhancing mechanical stability as well as improving appearance.
- **HP-BCA:** The Bottoms Cracking Additive for FCC units is proprietary catalyst designed to upgrade heavy hydrocarbons to valuable products. Field trial has completed at Mumbai & Visakh Refinery FCC unit with 0.5-0.75wt% reduction in bottoms. FICCI Award was received for the catalyst technology.
- **HP NanoLite:** Nano Additive for Light Coloured Grease for extreme pressure application. Excellent anti-wear, anti-friction, extreme pressure properties with enhanced performance. Helps in retention of color of the base grease. No need of periodic cleaning of the kettles. Compatible with all type of greases. 20% reduction in both coefficient of friction and wear scar diameter. 60% enhancement in OK and weld load.
- **HP NanOKoat:** Nano-Additized Paint for Corrosion Mitigation for saline environment. Higher impedance and bond strength compared to industry benchmark. Provides better performance even in salty environment. Three layer conventional coating system can be replaced by two-layers only. Enhanced operational life.

During the year 2023-24, 26 new lube based formulations have been launched and commercialized,

During the FY 2023-24, Global Technology Center (GTC) in R&D has monitored the performance of total 16 units of Mumbai and Visakh Refineries, which not only helped in stopping technical services agreement with licensors but also provided timely and enhanced value addition services to HPCL refineries.

For global reach of in-house developed process, Technology Partnership Agreement (TPA) was signed with M/s KBR, USA for licensing & marketing of in-house developed HiGAS technology globally for decarbonization (Carbon capture).

8.5.2. R&D Expenditure in the last 3 years

FY	R&D Expenditure (₹ in crore)
2021-22	364
2022-23	320
2023-24	352

8.6. GAIL (India) Limited

8.6.1. R&D & New Technologies

R&D and integration of new technologies in Natural Gas industry is driven by industry specific factors such as meeting increased environmental regulations, decarbonization of natural gas value chain, process and costs optimization and augmentation of new resources etc. GAIL, as one of the Natural gas pioneer in India, pursues various research projects in identified thrust areas in alignment with its corporate and business strategies to meet the present and future business interests so as to enhance our competitive advantage in the long run. In this aspect, this year GAIL has focused on the following research themes.

- **E-methane Production:**

  Strong sector coupling between energy supply and mobility is pre-requisite for India's energy transition to renewable energy. Considering the vast network of NG P/L available in India, production of e-methane (power-to-methane) or synthetic natural gas is one option for sector coupling in India. In the e-methane production scheme renewable hydrogen can be used for direct hydrogenation of CO_2 captured from Direct Air Capture (DAC) methods or CO_2 obtained from a concentrated CO_2 source. Thus, in e-methane generation it is possible to achieve additional utilization of the greenhouse gas carbon dioxide (CO_2) which contributes to the climate protection target. In the CO_2 hydrogenation reaction product selectivity is governed by the catalyst's electronic structure. By modifying the catalyst's electronic structure through doping and alloying of transition metals, different reaction pathways can be obtained. Therefore, development of highly efficient and stable catalysts is the need of hour for this process.

  Under this initiative, GAIL is developing high efficiency and robust Ni-supported catalysts using various structured supports Al_2O_3, SiO_2, $MgAl_2O_4$, ZrO_2, TiO_2, La_2O_3 and CeO_2.This project is being pursued in association with CSIR-IIP Dehradun. The success of the present research work also provides an opportunity for conversion of one of the major constituents and potent GHGs, CO_2, in Biogas into pipeline-quality biomethane (CH4, 90 vol.% min.) by these methanation process.

- **H_2-Production:**

  Clean hydrogen is expected to play a crucial role in decarbonizing the energy value chain. However, significant research challenges in electrolyzers technology is needed to be overcome to reduce the cost of the hydrogen.In this aspect, polymer-based proton exchange membrane (PEM) water electrolysis i.e. PEMWE technology is most attractive as it shows markedly enhanced performance in terms of low ohmic resistance, high current density and operating pressure, as compared to conventional alkaline water electrolysis (AWE) technology. However, the large-scale deployment of PEMWE devices is largely obstructed by the lack of active, stable and low-cost electro catalysts.

  Therefore, our research efforts in this area are focused on investigating low-cost but active earth abundant metal-based catalysts especially transition metal (TM)-based ones. Accordingly, GAIL is targeting synthesis of high efficiency non-noble metal oxide based electro catalysts using defective and metal doped oxides that work with low over potentials and under high current densities in acidic conditions. This project is being pursued in collaboration with the Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru, an autonomous research institute under the

Department of Science and Technology (DST).

- **PEM fuel cell:**

  PEM fuel cells are promising technology as the next generation of power sources for transportation, stationary, and portable applications due to their advantageous characteristics such as low operating temperature, high power density, and easy scale-up. Current, technological barriers for wider deployment of PEM fuel cell include durability and cost of Pt based catalysts.

  In this aspect GAIL is collaborating with CeNS Bengaluru for the development of indigenous scalable synthetic protocol for Pt based catalysts for PEM Fuel cell.

  In addition, GAIL also carrying out a collaborative research work through Centre for High technology (CHT) in association with IOCL and High Energy Battery Pvt Ltd , Trichy for indigenous development of 1kW PEM fuel cell. The main objective of this project is to use very low quantity of Pt loading (0.4mg/cm2)in electrocatalyst. In addition, this project also aim for development of lab scale prototype SPEEK-based membrane as an alternative to Nafion and hydrogen generation through Sodium Borohydride hydrolysis using Co based catalyst.

- **Chemical Storage of Hydrogen:**

  Safe, practical and affordable storage of hydrogen, as well as its ease of transport, remain challenges in the way of a successful hydrogen economy. Liquid Organic Hydrogen Carriers (LOHCs) represent an extremely attractive option for the chemical storage of hydrogen for bulk storage of hydrogen.

  In this direction, GAIL is pursuing a research project in collaboration with CSIR-NCL for development of cost effective transition metal catalysts for the hydrogenation/ dehydrogenation of amines and alcohols as liquid Organic hydrogen carrier leading to practical and affordable storage of hydrogen.

- **Solar cooking system:**

  With the objective of participating in GOI initiative under clean cooking mission, GAIL is targeting to develop two prototypes of 1kW solar PV cooking system using inductive heating mechanism and thermal energy storage based cooking system suitable for rural application. These initiative is being pursued in association with CSIR-Central Mechanical Engineering Research Institute (CMERI) Durgapur and CSIR-Central Electronics Engineering Research Institute (CEERI), Jaipur Centre.

- **Centre of Excellence in Oil, Gas and Energy (CoE-OGE):**

  GAIL is also pursuing various mission mode research projects at Centre of Excellence in Oil, Gas and Energy (CoE-OGE) at IIT-Bombay. The CoE-OGE was established by all central Oil & Gas PSUs to carry out Industry relevant R&D works. Currently GAIL is participating in 9 no's mission mode projects in association with other oil and Gas PSU's partners in the area of; Structural Health Monitoring of P/L System, Development of Li ion battery, Life Cycle Assessment of Petroleum Refineries/ Petrochemical units considering Decarbonization, e-fuels, methane to olefins and Tool Chain for Oil and Gas Pipeline Monitoring.

- **Patents:**

  In FY 2023-24, GAIL has been granted 12 no's of patents for our earlier work and as on today GAIL has total 32nos. of patents (29 Indian +3 foreign) portfolio for our unique innovative products, process and concepts.

8.6.2. R&D Expenditure in the last 3 years

FY	R&D Expenditure (₹ in crore)
2021-22	243.70
2022-23	180.71
2023-24	250.20

8.7. Numaligarh Refinery Limited (NRL)

8.7.1. NRL has been pursuing limited R&D activities through partnership with academia and research organizations to provide technological inputs to meet corporate objectives of technical excellence in all aspects of refinery operations, develop new value-added products and upgrade the quality of the existing petroleum products.

New product development and research Initiatives presently pursued by NRL are as follows:

a) NRL Centre of Excellence for Sustainable Material at IIT Guwahati

NRL set up 'NRL Centre of Excellence for Sustainable Material' (NRL-CoE SM) at IIT Guwahati to carry out R&D activities for development of environmentally sustainable materials from various refinery and bio refinery streams. Recently, a translational facility is set up at NRL CoE for housing a pilot plant on Bio-degradable polymer with a range of equipment related to downstream processing of bio-degradable plastics such as Blown Film Machine, Injection Moulding, Thermoforming, Cast Film Extruder etc. The pilot plant has the facility to manufacture a wide variety of items, including carry bags, toys, cutlery, decorative items etc. both from normal and biodegradable polymers.

A research project on "DEVELOPMENT OF SUSTAINABLE MATERIALS FROM OIL & BIO-REFINERY STREAMS"is being carried out under NRL-CoE. The project is successful so far in inventing a few novel methods or processes.

b) Research Collaboration with Kaziranga University and Institute of Frontier Science and Application:

NRL has signed a Memorandum of Agreement (MoA) with Kaziranga University (KU) and the Institute of Frontier Science and Application (IFSA) for collaboration to carry out a research project titled 'Assessment of Wind Energy Potential in North East India'. The collaboration is a first of its kind for systematic exploration of wind energy potential in North East India. As per the MoA, Kaziranga University, in technical collaboration with Institute of Frontier Science and Application (IFSA) and funding from NRL, will implement the project which aims to develop bankable wind energy assessment data over North East India in riverine environment using mobile Lidar observations for a period of three years.

c) R&D Collaboration with Engineers India Limited (EIL)

a. New product development: NRL and EIL entered into a Memorandum of Agreement (MoA) for joint development and commercialization of technology for production of Aqueous Ammonia from ammonia- rich sour gases of refinery. NRL will set up a plant for Aqueous Ammonia production using EIL's design know-how and NRL's expertise on operating Sulphur Recovery Unit (SRU).

b. Overground Liquid Sulphur Lock: Above Ground Sulphur Seal will be designed to handle 70 Kg per hour of liquid Sulfur flow to install at SRU of NRL using EIL's expertise on designing above Ground Sulphur Seal.

d) R&D Collaboration with CSIR: NEIST

NRL is carrying out a R&D project on "Removal of Phenol from Sour & Stripped Water, It's Reuse and Value Addition" under a framework of research collaboration with North East Institute of Science & Technology, Jorhat under Council of Scientific & Industrial Research with the objective to reduce water foot print of the refinery and to produce value added chemicals. Lab scale experiments have been conducted successfully by designing and developing hollow fiber membrane modules. A pilot demonstration facility is under development for installation at NRL site.

e) Research Project at St. Edmund's College, Shillong

NRL has engaged St. Edmund's College, Shillong for research work on utilization of cyano bacteria in the bio-remediation of

crude oil, hydrocarbon storage tank bottom sludge, and ETP hydrocarbon sludge and its environmental biotechnology implications. The objective of this project is utilization of cyano bacteria in the bio-remediation of crude oil, hydrocarbon storage tank bottom sludge, and ETP hydrocarbon sludge.

Significant developments on culture of cyano bacteria samples collected from NRL have been achieved and bio-accumulation study with the cultured bacteria on hydrocarbon sludge is being investigated.

8.7.2. Expected result of above R&D activities:

a. Production of bio-degradable plastic:

Development of indigenous technology for production of bio-degradable plastic will help in replacing non- biodegradable polyethylene-based packaging and contribute towards reduction of pollution from solid waste. Bio-degradable plastic will be a value-added stream from the Bio Refinery, being implemented by Assam Bio Refinery Pvt. Ltd. (ABRPL), a JV of NRL. The aim of the project is to convert the Furfural steam, a by-product of Bio Refinery, to biodegradable polymer, Polycaprolactone (PCL).

The following patents are applied as an outcome of research activities under this project.

a. Novel catalyst (SPEEK) for the conversion of Furfural to Hydroxymethyl Furfural

b. Novel process for the purification of HMF from a mixture of Furfural, HMF, Formalin, Levulinic Acid.

b. Exploring the potential of Wind Energy:

Assessment of Wind-Energy Potential using LIDAR technology through multi-level and multi-site high-frequency observation and Analysis in Riverine Environment at Turbine Level will provide bankable wind-energy database for Assam relevant for viable wind energy installation. The results of the project can be used to catalyze commercial wind energy generation in Assam. The project thus has huge potential for significant socio-economic benefits for Assam. With the present project as a proof-of-concept, it can also be easily scaled up to cover wider areas of the North-East.

c. Production of Aqueous Ammonia:

Production of aqueous ammonia (25%NH_3) from waste stream of NH_3 rich acid gas of sour water stripper, utilizing an indigenous technology jointly developed by NRL and EIL, will meet requirement of aqueous ammonia in Bio Refinery to maintain pH for proper performance of enzymes.

d. Technology development on Overground Sulphur Seal:

Development and commercialization of Overground Sulphur Seal technology will help refineries to improve liquid-gas phase separation of liquid Sulphur in Sulphur Recovery Units. This will also lead to a reduction in SOX emission.

e. Technology for removal of Phenol from sour water and stripped water:

Development of technology to remove phenol from sour and strip water will reduce water footprint as well as produce value added chemical, Phenol from refinery. Lab scale demonstration of technology for phenol removal has been successfully completed and design and fabrication of a pilot plant is ready for demonstration at NRL site.

f. Bio-remediation through Cyano bacterial Culture:

Utilization of cyano bacteria in the bio-remediation of hydrocarbon sludge from storage tank bottom & Effluent Treatment Plant will help in sustainable management of hazardous waste.

8.7.3. R&D Expenditure in the last 3 years

FY	R&D Expenditure (₹ in crore)
2021-22	2.73
2022-23	2.09
2023-24	3.08

8.8. Mangalore Refinery and Petrochemicals Limited (MRPL), Mangalore

8.8.1. MRPL's innovation efforts are primarily focused on technology cum catalyst development, process optimization, and the creation of niche products, Artificial Intelligence/Machine learning projects either through in-house initiatives or collaborative projects with esteemed institutions. Notably, MRPL engages in collaborative research ventures with leading institutions such as NCL-Pune, IIT-Guwahati, IICT Hyderbad, NITK-Surathkal, CIPET-Chennai, and NMAMIT, Nitte, to drive innovation and advance scientific frontiers.

Till date, MRPL has filed a total of 22 patents and has been granted 7 patents. In the fiscal year 2023-24, MRPL filed 4 new patents and was granted 2 patents during the same period

MRPL's innovation efforts are primarily in the following key areas;

8.8.2. Artificial Intelligence (AI)/Machine Learning (ML) projects

MRPL Innovation team have invented novel algorithms combining AI and ML with first principle to improve yield, energy, and throughput. MRPL is the first refinery to introduce AI based real time optimisers in its process units and has already filed 2 patents for the novel algorithms. Real time optimizers have been implemented in polypropylene, power plant and PFCC units. A roadmap for achieving full AI/ML-based prescriptive maintenance has been scheduled, alongside plans for real-time optimizers. An AI/ML based prescriptive maintenance tool for one of the critical rotary machines (Recycle Gas Compressor for hydro processing unit) has been completed in FY 2023-24. For rotary equipment reliability, vibration sensors are being installed for critical machines, with predictive models scheduled for completion by 2024-25. Similar actions are underway for electrical and instrumentation assets.

8.8.3. Process technology development for Isobutyl Benzene

MRPL has achieved a monumental milestone in the realm of pharmaceutical ingredient synthesis with the pioneering development of their in-house technology for iso-Butyl Benzene (i-BB) synthesis. This innovative process involves the conversion of the side chain alkylation of toluene, in the presence of a newly designed catalyst at MRPLs innovation Centre. Through meticulous research and innovation, MRPL has engineered a catalyst that not only maximizes the conversion of toluene but also exhibits exceptional selectivity towards the production of isobutyl benzene. Isobutyl benzene, a pivotal active pharmaceutical ingredient, serves as the crucial in the preparation of an antianalgesic drug Brufen. This remarkable innovation underscores MRPL's unwavering commitment to advancing pharmaceutical synthesis technologies, paving the way for enhanced Indigenous drug development and patient care. Currently, MRPL is in the process of setting up a IBB demo plant.

8.8.4. Deodoring refinery off gases

MRPL's patented photo-catalytic process offers a cost-effective and environmentally friendly solution to mitigate odorous emissions from refinery off-gas streams, eliminating the need for chemicals or scrubbing agents. The journey began with a proof-of-concept study in 2018, leading to the development of a demonstration-level Deodoring Photo-Catalytic Reactor (DPCR) by fiscal year 2022-23, demonstrating a Technology Readiness Level of 6 (TRL6). Leveraging insights from this, MRPL designed a commercial Deodoring Unit (DeoU) for the Effluent Treatment Plant (ETP) at WAO area, commissioned in November 2023 and the unit effectively reducing the odors emitted from the wet WAO unit, demonstrating successful performance in odor mitigation. This innovation underscores MRPL's dedication to sustainability and environmentally responsible refinery practices.

8.8.5. Superhydrophobic materials for oil spill recovery from water bodies

MRPL has achieved yet another remarkable innovation with the development of a superhydrophobic sponge tailored specifically for the recovery of oil spills. This patented method represents a significant leap forward in environmental remediation efforts. MRPL's

skills extends to the integration of this technology into an oil-absorbing skimmer, poised to revolutionize oil recovery operations from water bodies. The successful installation and demonstration of this skimmer at the treated effluent pond at ETP highlight its efficacy and versatility. With this, MRPL's initiative promises to address oil pollution on a widespread scale, showcasing the dedication to environmental stewardship and sustainable practices.

8.8.6. Plastics Circularity

A collaborative research work with CSIR-NCL commenced on 24th May 2023, focused on the depolymerization and upcycling of various plastic wastes. The proof-of-concept R&D for Polyethylene terephthalate (PET, a plastic used mainly in mineral water bottles) depolymerization, resulting in its monomer bis-2-hydroxyethyl-terephthalate, has been successfully completed. A patent for PET depolymerization was filed on 19th September 2023. This innovative approach focuses on the recovery of constituent monomers from plastics, marking a significant advancement in the field. MRPL's technique promises to overcome these limitations by efficiently isolating and extracting the monomers present in the plastic, thereby enabling the material to be recycled into high-quality products or reintroduced into the manufacturing process with minimal loss in quality. Plans are underway to establish a pilot plant for PET depolymerization in the fiscal year 2024-25.

8.8.7. High performance polypropylene

Project objective is to improve the properties of polypropylene to substitute engineering plastics such as ABS, SBS in automobile industries and is carried out in collaboration with CIPET. POC has been completed in 2022-23 and patent has been filed. Currently, second step of the project on development of recipe know-how, proto-typing to convincing the automobile customers and extending the polymer composite application to wood-plastic composite doors, sound-proof panels etc. is being taken up with CIPET.

8.8.8. R&D Expenditure in the last 3 years

FY	R&D Expenditure (₹ in crore)
2021-22	1.01
2022-23	0.57
2023-24	5.11

8.9. Engineers India Limited (EIL)

8.9.1. R&D by Engineers India Limited

The Research & Development Division of EIL has been functioning since 1970. Initially the Division was engaged in in-house capacity building for process engineering services through desktop research, process modeling and simulation. The R&D Centre at Gurgaon was set upon the recommendation of MoP&NG and the Scientific Advisory Committee and started functioning in 1988-89. The R&D center has been a national facility for equipment-oriented research and to facilitate absorption and adaptation of technologies. In addition, to carry out collaborative research, to develop scale up methodology and to provide hardware testing & diagnostic services were the key intents.

These efforts have resulted in development of more than 40 process technologies along with important hardware designs. R&D center aligns well with the Government of India initiatives such as Make In India and Aatmanirbhar Bharat with the aim of propelling the nation towards becoming a technological hub. EIL-R&D has always been in the front line when it comes to making India self-reliant in the area of Oil, Gas and Energy through the development of technologies at its Gurugram R&D Centre. In this age of energy transition, EIL R&D has taken initiatives to pursue renewable & sustainable energy areas and chart out a path for transiting the nation towards Net-Zero by 2070 while at the same time ensuring new business avenues for the Company.

8.9.2. Technology Commercialization efforts during current year up to Mar'2024

Continued efforts for Commercialization of various in-house developed technologies/ technologies developed in collaboration are carried out. Some of these include:

- Setting up of Aqueous ammonia unit at Numaligarh Refinery.
- Commissioning and PGTR activities of NRL SRU & TGTU licensed by EIL.
- Supply of Basic Engineering Design Package (BEDP) for EngHOG under CDU-2 revamp at Nayara Energy Limited.
- Refurbishment of proprietary contactor for LPG treatment technology at HPCL-VR.
- BEDP for Super Absorbent Polymer (SAP) production plant at Kochi Refinery.

8.9.3. Initiatives taken for strengthening technology tie ups

EIL has extended the synergistic potential with research organizations, educational institutes and research wings of other corporate. The collaborative efforts are pursued in diverse fields where pressing needs such as energy intensification, renewable energy, CCUS etc. are also addressed. Following fresh tie-ups were formalized:

- MoU inked with SUNRISE GROUP for Collaboration to jointly pursue marketing & securing customer orders, including basic design, detail engineering and project management and construction supervision services for providing cost competitive technical solutions in integrating renewable energy in various industrial sectors in India and Overseas
- MoU inked with HPCL to exchange scientific information, joint research, encourage demonstration in the field of hydrocarbon, petrochemicals, energy technology and commercialization of HPCL developed technologies/jointly developed technologies
- MoU inked with BPCL for Development of Joint Technology for HiGee De-aeration Technology for BFW on knowhow generated by BPCL
- MoU inked with IIT Roorkee for collaborative activities for research in areas of mutual interest like Conversion of CO_2 to valuable chemicals, Catalytic conversion of CO_2 & development of catalytic process for lingo-cellulosic biomass to chemicals
- MoU for Centre of Excellence in Oil, Gas and Energy (CoE OGE) between IIT Bombay and PSU Oil companies extended till 1st January 2029
- Renewal of membership for FY2023-24 for:
  - Process Science Technology Center (PSTC), an industry-academia collaborative research program initiated by University of Texas, USA
  - Fractionation Research Incorporated (FRI), a non-profit cooperative research organization based at Oklahoma, USA
  - Process Integration Research Consortium (PIRC), University of Manchester UK

8.9.4. Technology development projects initiated during current year up to March 2024

R&D Division constantly monitors the emerging technology contours and undertakes initiatives in the pertinent domains for technology development. Some of the new projects initiated and ongoing projects are as below:

- Development of process for prevention of SO2 slippage into TGTU Quench column.
- Design of new CDU-VDU configuration for improved operations and energy optimization.
- Development of design capabilities for multi-downcomer trays.
- Development of De-Oxo reactor technology for green hydrogen purification.
- Development of design methodology for slurry pipeline for long transportation of coal.
- Multi-functional tailored heterogenous catalyst development for green hydrogen synthesis from model biomass oil.
- Development of process for recovering rare gas from natural gas.

8.9.5. EIL has created IPR in both patents and trademarks form

As on March 2024, 46 Live Patents and 36 applications pending grant are there. The highlight of patent portfolio is that almost 65% of filed patents have been commercialized. In addition, 25 granted trademarks along with 4 pending grants add to the IPR portfolio.

The following Patents filed earlier were granted this year:

- A method and device for above ground liquid sulphur seal with degassing
- De-foaming cyclonic device in Pre-flash drum
- Flat plate type distributor for fluidised bed gasifier handling high ash coal
- A Desalter vessel
- Novel gas-liquid inlet diffuser for Cocurrent downflow trickle bed Reactor
- Apparatus for deoxygenation of water and process for the same
- A device for recovering and separating a low-pressure fluid
- Method for optimizing energy in a process carried out using a system
- An apparatus and process for neutralization of Alkaline waste water using CO_2 enriched stream
- A system and a process for high pressure, temperature and moisture content synthesis gas sampling
- A system and a process for purification of syngas from high ash Indian Coal for Methanol production along with recovery of high purity Co_2
- A self-sustaining process and system for heat recovery and improving efficiency by reducing fuel
- Maximisation of power generation from existing gas turbine using a thermodynamic cycle
- Water conditioning device and method by virtue of hydrodynamic cavitations in presence of magnetic field
- An air distribution duct system for a fired heater system
- A visibly leak-tight Explosion door arrangement for a fired heater

The following new patents have been filed during the year till March 2024:

- A method and system for treating spent caustic stream generated from H_2S rich hydrocarbon system
- A lining system for a reservoir
- Novel Tailored Distillation Tower Engineering Design for Second Generation (2G) Ethanol Bio-Refineries to counter suspended Micro-Lignin troubleshooting
- Solar energy-based process and apparatus for crude processing with reduced fuel consumption
- A method for underground storage of crude oil under ambient conditions, protected from all sides providing adequate safety levels
- Utilising Low Grade Heat in vacuum Distillation Unit
- Repurposing the delayed coker unit to process total unconverted oil from ebullated bed residue hydrocracker
- Method and system for estimating GHG emissions
- A system for mounting an industrial heater
- Distillation column with hanging downcomers
- A system for externally adjusting inaccessible wall tube hanger supports
- Novel arc-domed true counter current plate air preheater for efficient heat transfer
- A Fired Heater

8.9.6. Startup Initiatives as on March 2024

EIL R&D also remains fully committed to GOI's Flagship program for nurturing the Start-up

Eco System within India by steering EIL's startup initiative "EngSUI". Under EngSUI, EIL is providing intellectual, infrastructural and financial support to the Startups. EIL funds the Startup projects working in the field of Hydrocarbon, IT & IIOT, Renewable Energy & Storage, Nano-Materials, Waste to Energy, Health Safety and Environment. 9 IITs and 4 NITs have registered with EIL's Startup India Initiative. Totally 27 number of projects have been funded till date over 6 Rounds. Recently, the seventh-round proposals are under screening procedure.

8.9.7. R&D Expenditure in the last 3 years

FY	R&D Expenditure (₹ in crore)
2021-22	28.54
2022-23	30.09
2023-24	29.12

8.10. Chennai Petroleum Corporation Limited (CPCL)

8.10.1. In line with CPCL's corporate objective to remain in the technological forefront in all aspects of the company's operation, CPCL R&D centre was established in July 1984.

Since its inception, CPCL R&D mainly focuses in the following areas.

- New product/process development in the downstream hydrocarbon field
- Collaborative Research projects with Academia/Research Institute in key areas of research like sustainable development, renewable energy, biofuels, etc.,
- Providing solutions for refinery Process Trouble Shooting
- New Crude Assay data generation

8.10.2. R&D Highlights:

Demonstrated pilot scale production of renewable crude and liquid hydrocarbon fuels from algae.

Developed process for the commercial production of

- Missile fuel for DRDO
- Rocket propellant for ISRO
- Mineral Turpentine Oil
- Microcrystalline wax
- Pharma Grade Hexane

CPCL R&D owns 8 Patents to its credit over the diverse research areas in refining sector and the following patent has been filed during the year 2022-23:

Process for making low aromatic and ultra-low sulfur jet fuel for air breathing engine applications.

Currently CPCL R&D is actively working in the following areas:

- Production of different types of Rubber Process Oil (RPO)
- Process development for production of dearomatized fluids from refinery streams
- Alternative feedstock identification for LOBS/Wax production
- Scaling up of process for the development of Corrosion Inhibitor from Used Cooking Oil in collaborative mode with RGIPT institute.
- Scaling up of process for production of nanocellulose from biomass in collaborative mode with Rajiv Gandhi Institute of Petroleum Technology (RGIPT).

8.10.3. R&D Expenditure in the last 3 years

FY	R&D Expenditure (₹ in crore)
2021-22	7.15
2022-23	9.72
2023-24	10.72


DEMAG




Chapter
9
BIO-FUELS

9 Bio-Fuels

9.1. Non-Conventional Energy

India is one of the fastest growing economies in the world. The development objectives focus on economic growth, equity and human well being. Energy is a critical input for socio-economic development. The energy strategy of a country aims at efficiency and security and to provide access which is environment friendly and of an optimum mix of primary resources for energy generation. Fossil fuels will continue to play a dominant role in the energy scenario in our country in the next few decades. However, conventional or fossil fuel resources are limited, non-renewable, polluting and, therefore, need to be used prudently. On the other hand, renewable energy resources are indigenous, non-polluting and virtually inexhaustible. India is endowed with abundant renewable energy resources. Therefore, their use should be encouraged in every possible way. Biofuels are derived from renewable biomass resources and, therefore, provide a strategic advantage to promote sustainable development and to supplement conventional energy sources in meeting the rapidly increasing requirements for transportation fuels associated with high economic growth, as well as in meeting the energy needs of India's vast rural population.

9.2. Ethanol Blended Petrol (EBP) Programme

The Government through Oil Marketing Companies (OMCs), is implementing Ethanol Blended Petrol (EBP) Programme under which, OMCs sell ethanol blended petrol with percentage of ethanol up to 20%. In 2001, Government of India launched three pilot projects, two in Maharashtra and one in Uttar Pradesh for supplying ethanol blended petrol only to the retail outlets under their respective supply areas. Apart from the above field trials through pilot projects, R&D studies also were undertaken simultaneously. Both pilot projects and R&D studies were successful and established blending of ethanol up to 5% with petrol and usage of ethanol blended petrol in vehicles. Accordingly, Government of India, with effect from 01.01.2003 resolved to supply ethanol blended petrol in nine States and four Union Territories for sale of 5% ethanol blended Petrol.

This Programme is aimed at achieving multiple outcomes such as:

- addressing environmental concerns,
- reducing import dependency, and
- providing boost to agriculture sector,

In order to augment the supply of ethanol, the Government on 10th December, 2014, decided to procure ethanol produced from other non-food feedstocks besides molasses, like cellulosic and ligno-cellulosic materials including petrochemical route. It was also decided to administer the price of ethanol under EBP Programme.

In ESY 2018-19 sugar and sugar syrup were allowed for the first time for ethanol production to support the industry in liquidating their excess stocks. Further, in ESY 2020-21, surplus rice available with the Food Corporation of India (FCI) and maize were also allowed for the production of ethanol With these decisions, the availability of ethanol for the EBP Programme increased significantly.

During Ethanol Supply Year (ESY) 2021-22, (01.12.2021-30.11-2022) 433.6 crore litres of ethanol was blended in petrol resulting in a blending percentage of 10.02% by PSU OMCs. The Public Sector OMCs achieved the target of 10% blending of ethanol in petrol in June, 2022 much ahead of the target date of November

2022. Further, during ESY 2022-23, the PSU OMCs blended more than 500 crore litres of ethanol in petrol thereby blending percentage of 12.06%. OMCs have also started selling E20 (20% ethanol blended) petrol since 6th February, 2023 and this fuel is sold at more than 13,500 retail outlets across the country. E-100 fuels are also being sold at more than 180 retail outlets across the country.

9.2.1. For increasing the use of biofuels, a roadmap for Ethanol Blending in India 2020-25 was prepared by an inter-Ministerial Committee and placed in public domain on World Environment Day i.e. on 5th June, 2021. This roadmap provides guidance to achieve the target of 20% ethanol blending in petrol by bringing all stakeholders together. Further, the National Policy on Biofuels-2018 was amended in June, 2022 which inter-alia includes:

i) allowing more feedstocks for production of biofuels,

ii) advancing the ethanol blending target of 20% blending of ethanol in petrol to ESY 2025-26 from 2030,

iii) promotion of the production of biofuels in the country, under the Make in India program, by units located in Special Economic Zones (SEZ)/Export Oriented Units (EoUs), and

iv) grant of permission for export of biofuels in specific cases.

9.3. Sustainable Aviation Fuel (SAF)/ Bio-Aviation Turbine fuel (Bio-ATF)

The Government has set an indicative target of 1%, 2% and 5% blending of SAF in Aviation Turbine Fuel (ATF) initially for international flights with effect from 2027, 2028 and 2030, respectively. The first commercial flight of India between Pune to Delhi using indigenously produced SAF blend aviation turbine fuel was successfully flown on 19th May, 2023.

9.4. Second Generation (2G) Ethanol

The National Policy on Biofuels announced in 2018 is aimed at accelerated promotion of Biofuels with indicative targets of achieving 20% blending of ethanol in Petrol by ESY 2025-26. Therefore, to maximize the production of ethanol in the country for the purpose of blending with petrol, other options/routes for enhancing ethanol production need to be explored. Government has already allowed procurement of ethanol produced from other non-food feedstock besides molasses, like cellulosic and lingo-celluloses materials including petrochemical route.

Ligno-cellulosic biomass is being considered as a prospective source of Second Generation (2G) ethanol for supplementing the rising demand of ethanol for EBP Programme. As per the report of Technology Information, Forecasting & Assessment Council (TIFAC), an autonomous organization under Department of Science & Technology, there is an availability of surplus bio-mass across the country which is generally being burnt by the farmers as a waste disposal activity which is also contributing towards the environment pollution.

In order to encourage setting up of 2G bio-refineries, Government has launched a scheme namely "Pradhan Mantri JI-VAN (Jaiv Indhan-Vatavaran Anukool fasal awashesh Nivaran) Yojana" for providing financial support to integrated bio-ethanol projects, using lingo-cellulosic bio-mass and other renewable feedstock. Under this scheme, twelve commercial scale 2G ethanol projects and 10 demonstration scale projects will be set up with a financial contribution of Rs. 1969.50 crore from Government.

Under this scheme, financial assistance has been approved to Public and Private Sector Companies for six commercial Second Generation (2G) bio-ethanol projects and four demonstration 2G ethanol projects. 2G Ethanol plant of IOCL at Panipat has already been dedicated to the Nation.

9.5. World Biofuel Day

World Biofuel Day is observed every year on 10th August to create awareness about the importance of non-fossil fuels as an alternative to conventional fossil fuels and to highlight the various efforts made by the Government in the Biofuel sector. The theme for this year was "Biofuels - Fuels for a sustainable future". On the occasion of World Biofuel Day, IndianOil, on the behalf of Oil & Gas Industry, organised a webinar on Biofuels to mark the occasion of World Biofuel Day.

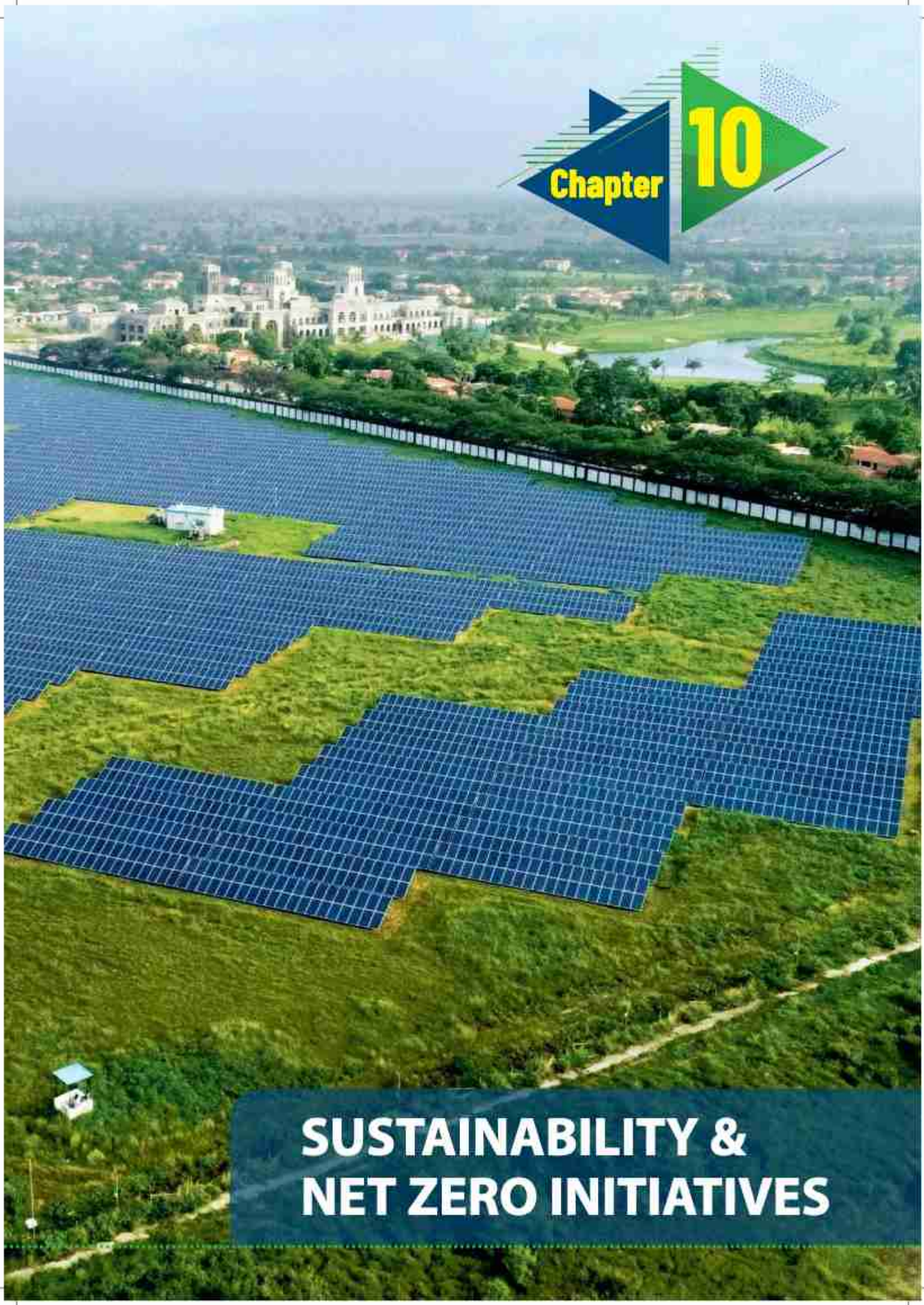




BPCL Bio-Refinery at
Bargarh, Odisha



IOCL's Solar Power Plant at
Sanand LPG Bottling Plant


Chapter
10
SUSTAINABILITY &
NET ZERO INITIATIVES

10 Sustainability & Net Zero Initiatives

10.1. India has announced ambitious target to reduce the emission intensity of its GDP by 45% by 2030 over the base year 2005 and reach net zero emission by 2070. India has also announced that it will meet fifty percent of its electricity requirements from renewable energy sources by 2030, including installing 500 gigawatts of renewable energy capacity.

Govt. has taken several initiatives such as increasing share of renewable energy (solar/wind), bio fuels (blending of ethanol, Compressed biogas) and National Hydrogen Mission. The Government is promoting blending of ethanol in Petrol under the Ethanol Blended Petrol (EBP) programme and CBG under SATAT scheme. PM JI-VAN Yojana has been launched for production of 2G ethanol in the country. Govt. has announced National Green Hydrogen Mission, which is aimed at promoting green hydrogen and demonstration/ development of associated infrastructure including its export with target to produce 5 MMTPA of green Hydrogen by 2030. In addition, for improvement of energy efficiency in energy-intensive sectors of the economy, PAT (Perform, Achieve and Trade) scheme has been operating in the country successfully. PAT is a market-based regulatory instrument to reduce specific energy consumption in the energy-intensive sectors of the economy through tradable energy saving certificates. Refinery sector was included in PAT in 2015 starting cycle-2 (2016-17 to 2018-19).

Oil and Gas is one of the hard-to-abate sectors of the economy, where decarbonization options are limited and difficult to achieve. However, various state-run oil companies have prepared plans to achieve goal of becoming net zero operational emission encompassing scope-1 and 2 emissions.

10.2. SATAT

i. Government has launched "Sustainable Alternative Towards Affordable Transportation (SATAT)" initiative on 1st October 2018, with the aim of establishing an ecosystem for production of Compressed Biogas (CBG) from various waste/ biomass sources and for promoting its use along with Natural Gas. Under this initiative, Oil and Gas Marketing Companies (OGMCs) invites Expression of Interest (EOI) to procure CBG from potential entrepreneurs.

ii. This initiative synergises with GOBARdhan Scheme, Swachh Bharat Mission/ AtmaNirbhar Bharat/target of Net Zero emission. For development of biogas/CBG sector 'Whole of Government' approach is being adopted. Some of the enablers provided by different Ministries and Departments are: Central Financial Assistance to all kind of CBG/biogas plants under Umbrella Scheme of National Bio Energy Programme of Ministry of New and Renewable Energy (MNRE); additional Central Assistance on MSW based CBG plants to States and Union Territories for solid waste management by Ministry of Housing and Urban Affairs under the Scheme of Swachh Bharat Mission Urban 2.0; Market Development Assistance @₹1,500/MT on Fermented Organic Manure produced from CBG projects under Policy on Promotion of Organic Fertilizer by Department of Fertilizers; incentive on biomass aggregation machinery by Department of Agriculture and Farmers Welfare under Sub Mission on Agricultural Mechanization and Crop Residue Management scheme; categorization of CBG projects under priority sector lending by RBI; categorization of CBG projects under 'White category' by CPCB on case-to-case basis; excise duty exemption on amount of GST-paid on compressed bio gas contained in the blended CNG.

iii. Ministry of Petroleum and Natural Gas has issued guidelines for co-mingling of

domestic gas for supply for Compressed Natural Gas (Transport) & Piped Natural Gas (Domestic) segments of City Gas Distribution (CGD) Networks for synchronization of CBG with CNG in CGD Network.

iv. Further, Government has approved Scheme for providing financial assistance to CBG producers for procurement of biomass aggregation machinery to support collection of biomass for a period of 04 years from FY 2023-24 to FY 2026-27. Scheme guidelines has been issued on 02.02.2024. As on date 5 CBG projects have received the Sanction Letter.

v. In order to promote the production and consumption of CBG in the country, National Biofuels Coordination Committee (NBCC) on 24.11.2023 approved, the introduction of phase wise mandatory blending of CBG in CNG (Transport) & PNG (Domestic) segments of CGD sector. CBG Blending Obligation (CBO) will be voluntary till FY 2024-2025 and mandatory blending obligation would start from FY 2025-26. CBO shall be kept as 1%, 3% and 4% of total CNG/PNG consumption for FY 2025-26, 2026-27 and 2027-28 respectively. From 2028-29 onwards, CBO will be 5%.

i. Scheme Guideline for Development of Pipeline Infrastructure (DPI) for injection of CBG in City Gas Distribution (CGD) network were issued on 26th June 2024.

ii. As on 1st July 2024, 71 CBG/biogas plants with a total production capacity of around 450 MT per day have been commissioned. Sale of CBG has been initiated from more than 200 Retail Outlets. CBG is also being supplied to industrial customers. Under CBG-CGD synchronization scheme, GAIL has signed 77 Tripartite Agreements and CBG sale has been started in 33 Geographical Areas of CGD Network.

10.3. Carbon Capture, Utilization, and Storage (CCUS)

The role of Carbon Capture, Utilisation, and Storage (CCUS) in climate change mitigation has been a topic of discussion for over two decades. The Intergovernmental Panel on Climate Change's (IPCC) Special Report on Global Warming of 1.5°C and the recent series of announcements made by nations on net-zero have enthused the proponents of this technology, given the potential the technology can play in reducing emissions. India too has made a commitment to become net zero by 2070. Addressing the 26th COP at Glasgow, the Hon'ble PM announced the Panchamrit to mitigate climate change including achieving net zero by 2070. Consequently, various steps including promoting renewable and alternate energy sources such as solar, wind, hydrogen, reducing emission from vehicles through adoption of B-VI norms, increasing green cover, promoting R&D, adoption of carbon neutral technologies like CCS/ CCUS have started gaining prominence. CCUS/ CCS has emerged as one of the technologies to mitigate climate change. There have been a few limited efforts made historically to understand the potential of the CCUS technology and associated geological assessment. However, the high cost of capital has been a significant barrier to adopting CCUS technology despite the technology enjoying nearly five decades of global development, since USA's Carbon dioxide Enhanced Oil Recovery (CO_2-EOR) project. Apart from the technical aspects, politico-economic aspects also play a crucial role in carving the path for CCUS adoption in low carbon transition. India being a price sensitive market, the additional cost to be borne due to CCUS could be detrimental in a more extensive policy context. In view of future net zero objective and strong commitment towards environment, there is an essential requirement for India to examine options to reduce its carbon intensity further, for which CCS/CCUS could be a key option.

CPSEs under MoP&NG such as OIL, IOCL, BPCL, HPCL, GAIL, ONGC, EIL signed an MoU on January 2, 2019, with IIT Bombay to set up a Centre of Excellence in oil Gas and Energy (CoE-OGE) at IIT Bombay. Under this MoU, a mission mode project is being undertaken that aims to estimate the CO_2 storage potential and develop a risk-assessment-and-management framework for CO_2 storage. Numerical and laboratory studies will be conducted on the selected field data to accurately simulate the

reservoir response to CO_2 injection. The project is presently under progress since May 2023 with estimated duration of 24 months.

The initiatives undertaken by Oil & Gas PSUs are as under:

ONGC: ONGC is prioritizing CCUS as a major lever for decarbonization. By exploring partnerships and initiatives related to CO_2 storage and enhanced oil production from mature fields, ONGC aligns its operations with sustainable practices and strengthens its competitive edge. The proposed CCUS project at Gandhar has the potential of 10% oil gain and cumulative sequestration capacity of 5 to 6 million ton of CO_2 by the year 2040. Also, a Lab has been set-up in KDMIPE to undertake R&D work of CCUS. The Lab is also working on gas adsorption studies in coal, which can also act as an excellent trap for CO_2 as it permits higher storage than its pore volume capacity.

Oil India Ltd.: OIL intends to carry out a feasibility study for identification of suitable reservoirs/aquifers for permanent storage of CO_2 in the Tanot Field of Rajasthan. It has signed a MoU with M/s Indian Oil Corporation Limited (IOCL) to develop CCUS in Northeast India as an emission mitigation tool for combating climate change. In this regard a feasibility study of implementing CO_2 EOR in Makum-North Hapjanfield which is close to the Digboi refinery of IOCL is being initiated. Project on Carbon Capture and Utilization (CCU) has been initiated as part of new technology development jointly with IIPE, Visakhapatnam for effective carbon capture from industrial sources/atmosphere. On successful development of the laboratory demonstration, a pilot plant will be set up to study the feasibility of CO_2 capture and utilization at large scale. OIL has executed two MOUs; one with NTPC on potential of CO_2 sequestration in neighboring areas of NTPC power plants and another with M/s LINDE GmbH, Germany to develop bilateral co-operation in exploring the possibility of CCS/CCUS.

IOCL: Indian Oil has developed an advanced enzyme assisted solvent-based CO_2 capture technology (e CO_2Sorb) which is based on proprietary enzymes and solvents that synergistically enhance the efficiency of CO_2 capture while reducing the energy required for regeneration. It has also developed a low-energy bio catalyzed CO_2 mineralization method to enhance mineralization efficiency while reducing the Hydraulic Retention Time (HRT) of the process of CCU based on CO_2 mineralization.

BPCL: BPCL is exploring novel energy-efficient processes like simulated moving bed and Hi-Gee Rotating Packed concept using novel solvents for capturing CO_2 from refinery flue gases and other point sources of CO_2, having CO_2 composition in the range of 3 - 20 wt%. BPCL along with CHT has given support to M/s Caliche for "Carbon capture & utilization using photosynthetic bacteria" that is a bio-catalytic route wherein CO_2 capture and conversion into value-added products is being targeted. This methodology can be extended for CBG plants to convert CO_2 into biomass for establishing a CO_2 circular economy. BPCL is also exploring advanced Carbon Capture and Utilization (CCU) technology developed by IIT, Bombay to capture CO_2 in an aqueous medium at near ambient pressure, offering a cost-effective platform for CO_2 capture and in-situ conversion to CaCO3.

HPCL: HPCL has drawn a roadmap for de-carbonization of its operations in line with its Net-Zero target of 2040 for Scope-1 & Scope-2 emissions. This roadmap has a strong focus on transitioning towards a multi-energy green and low carbon Corporation.

The following key levers for achieving net zero by 2040 under Scope 1 and 2:

- Use of renewable power in refineries and other operating locations
- Replacing hydrogen requirements with green hydrogen at refineries
- Enhancing energy efficiencies in its own operations at refineries and other operating locations
- Reducing flare gas emissions
- Replacing use of Natural Gas at refineries with CBG
- Carbon Capture, Utilisation and Storage (CCUS)

CPCL: A feasibility study to capture CO_2 (approx. 400 TPD) from existing Grey Hydrogen Generation Units has been initiated. The project is estimated to reduce CO_2 emissions to the tune of 1,20,000 tCO_2e.

NRL: The CO_2 captured from the SMR gas of existing grey hydrogen unit which is approximately 180 TPD (60000 TPA) CO_2, as part of a new CO production unit will be utilized by Oil India Limited for EOR activity in their crude oil exploration.

GAIL: GAIL has set-up a Pilot Plant at Pata in association with M/s CIMFR, Dhanbad to capture 1 TPD of CO_2 through micro-algae. Various species of micro-algae are being analysed for their effectiveness in CO_2 capture and conversion for value-added products. GAIL has signed an MoU with M/s LanzaTech Inc., USA on 18.07.2023 to jointly explore, identify, evaluate, and implement the Projects for operational decarbonization at GAIL. Discussions are ongoing with M/s LanzaTech for setting up a Pilot / Commercial Plant to produce bio-ethanol.

10.4. Green Hydrogen

Green Hydrogen can enable utilization of domestically abundant renewable energy resources across regions, seasons, and sectors, feeding multiple usage streams, either as a fuel or as an industrial feedstock. It can directly replace fossil fuel derived feedstocks in petroleum refining, fertilizer production, steel manufacturing etc. Hydrogen fuelled long-haul automobiles and marine vessels can enable decarbonisation of the mobility sector.

The initiatives undertaken by Oil & Gas PSUs are as under:

IOCL: IndianOil is setting up its first green hydrogen plant at Panipat (10KTPA) on Build Own Operate (BOO) basis. Given the significant momentum hydrogen as a clean energy source has gained, IOCL's future plans involve extensive trials on 15 fuel cell buses (FCB) developed by Tata Motors Limited, running for 3 Lakh kilometers involving various stakeholders. This involves fuel cell bus operations for passenger transit including defence and Tourism public transit. Further, 4 fuel cell buses will be deployed in Vadodara, Gujarat, for trials and will be refuelled at the IndianOil Hydrogen Refuelling Station (HRS) in Vadodara.

IndianOil has established Hydrogen Infrastructure for vehicle refuelling stations as a strategic initiative to boost the hydrogen market and encourage stakeholders by providing state-of-the-art refuelling facilities for fuel cell vehicles. The infrastructure configuration includes hydrogen derived from electrolysis, natural gas reforming, and purification units, alongside compression, storage and dispensing facilities.

HPCL: Hindustan Petroleum Corporation Limited (HPCL) has initiated its foray into Green Hydrogen (GH2) ecosystem way back in the year 2019-20. This was the time when its pioneering HP Green R&D Centre (HPGRDC) installed a Proton Exchange Membrane (PEM) electrolyser. This was to meet the entire captive requirement of hydrogen for hydro processing for R&D, powered by its captive solar energy plant.

HPCL has set up an eletrolyser plant at its Visakh Refinery which has been commisision on 24th July, 2024. HPCL is in the process of floating a tender of 5 KTPA capacity under SIGHT 2B program of MNRE.

MRPL: MRPL is setting up a Green Hydrogen plant with a capacity of 500 TPA which is likely to be commissioned by 2026-27. Under Sight 2B scheme, MRPL has floated a tender of 10 KTPA capacity in June 2024.

CPCL: CPCL is setting up a 2 KTPA Green Hydrogen Unit on BOO basis which is likely to be commissioned by 2026-27. The Green Hydrogen generation capacity will be subsequently ramped-up to 10 KTPA progressively by 2030 in line with the National Green Hydrogen mandate.

NRL: NRL is setting up a 2.4 KTPA green hydrogen plant on EPC basis, which is targeted to be commissioned by June 2025. NRL is floating a tender to set up a 5 KTPA Green hydrogen on BOO basis and supply Green Hydrogen for use in refinery, under SIGHT 2B scheme of MNRE.

BPCL: BPCL is setting up approx. 5 MW of Electrolyser plant for Green Hydrogen production at Bina Refinery. BPCL R&D has signed an MoA with BARC for scale-up and demonstration of Indigenous Alkaline Electrolyser technology to MW scale. Further, a 1 MW electrolyser demo plant based on the technology is being constructed. BPCL has

signed an MoU with Cochin International Airport Ltd. for demonstration of Green hydrogen based mobility.



GAIL: GAIL has started India's maiden project of blending Hydrogen in City Gas Distribution grid. Two precent by volume of hydrogen is being blended in CNG network and 5 vol% of hydrogen is being blended into PNG network at City Gas Station of Avantika Gas Limited (AGL), Indore in the state of Madhya Pradesh. GAIL has installed its first Green Hydrogen Plant having a capacity of producing 1.4 KTPA (4.3 TPD) of Green Hydrogen at GAIL Vijaipur in Madhya Pradesh. Initially the hydrogen produced from this unit will be used as a fuel along with Natural Gas for captive purpose in the various processes and equipment running in the existing plant at Vijaipur. Further, this hydrogen is planned to be dispensed to retail customers in the nearby geographies, transported through high pressure cascades.



GAIL's 10 MW Green Hydrogen Plant inaugurated by Secretary, MoP&NG (4.3 TPD PEM Electrolyzer-based plant set up as a pilot project in MP)

10.5. Circular Economy Practices in Used Oil

1. Circular Economy in Used Oil:

Concept of Circular Economy in Used Oil has gained momentum in past two decades, wherein OMCs not only use the re-refined oil, obtained from used oil for manufacture of lubricants, but also conserve the precious petroleum reserves for safer and healthier tomorrow. Moreover, recycling has potential to reduce the rate of global climate change by reducing the extraction and the amount of fossil fuels burnt in the manufacturing processes. This helps in lowering carbon footprints in the ecosystem.

Re-refining of used lubricants could result in both environmental and economic benefits. Re-refining of used oil to manufacture base oil conserves more energy than reprocessing the used oil for use as fuel. The energy required to manufacture re-refined base oil from used oil is only one-third of the energy required to refine crude oil to produce virgin base oil. Therefore, re-refining is considered by many as a preferred option in terms of conserving resources as well as minimizing waste and reducing damage to the environment.

The Indian Lube oil market is about 3.2 MMT, and as per data available with CPCB (Central Pollution Control Board), more than 400 authorized re-refiners (recyclers) are operating in India having a combined capacity of more than 1.5 MMTPA for production of re-refined oil. Thus, India has adequate re-refining capacity to process the used oils.

2. Current status of Used Oil recycling:

The technology used for production of RRBO (Re-refined Base Oil) in India leads to production of Group I RRBO only. Effective 01.04.2024, Extended Producer Responsibility (EPR) for used oil has come into force as per Gazette Notification dated 18.09.2023 issued by the Ministry of Environment, Forest and Climate Change (MOEF&CC) towards implementation of Circular economy in Used (Lubrication) Oil. As per notification, all lubricant producers are mandated to ensure collection & recycling of Used Oil and accordingly EPR targets are affixed for them. The stipulated percentage of EPR Targets required by lube manufacturers will incrementally increase from 5% to 50% based on finished lubricants sold in Indian market. This regulatory push necessitates a comprehensive system for

the collection, processing, and distribution of used lubricating oils to produce high-quality Group I and Group II RRBO to achieve Circular Economy.

3. **Various initiatives towards implementation of Circular Economy in Used Oil taken by OMCs are enlisted as under:**

a. Multiple tenders have been floated for purchase of RRBO and procured product accordingly.

b. Webinars, meetings with various re-refiners to discuss ways and means to kick start circular economy in used oils

c. Initiated dialogue with assorted Automobile OEMs for accepting lubricants formulated with RRBO.

d. OMC took part in BIS Meeting for finalizing and release of BIS specifications of RRBO.

e. Created awareness among channel partners/customers/ Auto OEMs on EPR Used oil

f. Participated in the workshop on "Extended Producer Responsibility Regime: An Innovative Policy Tool for Fostering a Sustainable Circular Economy in the Automotive Industry' Jointly organized by Society of Indian Automobile Manufacturers (SIAM) & Maharashtra Pollution Control Board".

4. **Various grades launched by OMCs based on RRBO are listed as under:**

a. **IOCL:** IOCL had launched four lubricants so far with Re-refined base oils namely-Servo Raftar (for commercial vehicles), Servo Greenmile (for petrol vehicles), Servo 4T Green(four stroke bike engine oil) and Servo Tractor Green(Tractor engine oil) with up to 25% re-refined base oils. Servo 4T Green has got good response from the retail market. Further, new products in hydraulic and gear oil category will be launched in 2024-25. RRBO procured from April, 2023 so far is 1,600 KL and approx. 9,000 KL of RRBO blended lubricants are sold.

b. **HPCL:** HPCL has launched Hydraulic Oil Enklo Green 68, Passenger Car engine oils Meeting API SN, Diesel Engine Oil meeting API C14+, Hydraulic Oils and Industrial Gear Oils. Further, HPCL has also finalised purchase order for 105 KL of product made from RRBO for onward sale in retail market.

c. **BPCL:** BPCL has launched : Engine Oil for Two-wheelers, Engine oil for Passenger Cars, Diesel Engine Oil for Three-wheelers, Engine oil for Heavy Commercial vehicles and Hydraulic Oil. Further, 48 KL of RRBO is purchased for sale of assorted grades of lubricants formulated with RRBO. Total 151 KL of RRBO based lubricants are sold so far.

5. **Additional efforts by OMCs to implement EPR legislation:**

OMCs have started engagements with all stakeholders and meetings have been organized with Bulk generators for proper disposal of Used Oil, with aggregators - for collection of Used Oil and with recyclers for steady flow of RRBO & EPR certificates to OMCs.

10.6. Sustainable Development

Oil PSUs under Ministry of Petroleum & Natural Gas are integrating ESG factors into its future strategies and business operations with a view to enhance competitive advantage, attracting investors, building resilient business models and contributing to a more sustainable and inclusive global economy. Oil PSUs are committed to achieving its ESG objectives by implementing best practices in its operations and activities. The ESG performance is continuously benchmarked with national and international peers. An outline of activities/achievements in this regard is provided below:

1. **IOCL**

- IndianOil is committed to ESG through a multi-faceted approach that encompasses energy efficiency, renewable energy, waste management, biodiversity conservation, amongst others. The company has reduced its GHG emissions during FY 2023-24 by 4.5 MMTCO$_2$e through avoidance / mitigation / offset by implementing energy conservation projects, promotion of natural gas, use of renewable energy, tree plantations, etc.

ESG Performance Highlights of IndianOil

Environment	Social	Governance
IndianOil emerging as the top IndianOil and gas corporate in the Bloomberg NEF global Energy Transition Score	**30,321** Permanent Employees and Workers	IndianOil is a Signatory member of **United Nations Global Compact (UNGC)**
B rating in CDP in 2023	**320.41 million** Man-Hours worked	**99.99%** Customer Complaints Closed
~6% Total Electricity demand was met from Renewable Energy Generation	**₹ 457.71 crore** CSR expenditure during FY 2023-24	**12** Board committees for good governance
100% Energy Efficient Lighting across IndianOil locations	**0.024** Lost Time Injury Frequency Rate (LTIFR) for permanent employees	**2** Female Directors
~60 lakhs trees surviving till date	**117.66 lakhs** CSR Beneficiaries	**12.50%** Women Directors
1,20,000 $MTCO_2e$ Carbon Sequestration Through Tree Plantation	**CSR focus areas includes** Safe drinking water and protection of water resources, Healthcare and sanitation, Education and employment-enhancing vocational skills, Rural development, Environment sustainability, Empowerment of women and socially/economically backward groups etc.	**390** Vigilance Awareness Sessions conducted during FY 2023-24
~41.6 Billion Liters Wastewater Recycled	Internal Committees for **POSH implementation** at every Unit/ Region/Head Office level, headed by senior-level women employee	**30+** average years of experience of the Board of Directors
~7.24 Billion Liters Estimated rainwater harvested in FY 2023-24	**₹ 202 Crore** Expenditure incurred on training	**Grievance Redressal Policy** covering employees & staff members
~₹ 409.5 crores Investment in renewable energy and greening efforts	**Health, Safety and Environment (H,S&E)** Policy implemented across IndianOil to enhance safety culture	**100%** Operation Sites assessed for risk related to corruption
4.5 $MMTCO_2e$+ Avoidance/Reduction/Mitigation in GHG Emissions	**42.46%** Purchases from MSME/MSEs against target of 25%	**Zero cases** Anti-competitive behaviour recorded during FY 2023-24
3,52,299 MT of hazardous waste reused	**9,66,239** Hours invested in training & development	**390** Vigilance awareness programmes conducted
Zero waste to land fill certification by **CII-GreenCo** obtained for Ratlam Terminal, Bijnor Terminal, Mysore and Kalyani Bottling Plants	**95%+** Permanent employees covered various Union/Association	

- IndianOil's renewable energy capacity, comprising wind and solar power, has reached over 247 MW, with upcoming further planned expansions to 1 GW with an investment of over 5,000 crores. IndianOil has formed a Joint Venture with NTPC named IndianOil NTPCGreen Energy Pvt. Ltd. (INGEL) to develop grid and/or off-grid renewable energy-based power projects.In May 2024, a new WoS "Terra Clean Ltd." was incorporated to undertake low-carbon, innovative, clean, and sustainable energy operations, demonstrating its dedication to advancing its green initiatives.
- In the realm of non-conventional energy, IndianOil has made strides with biofuels, including E-100, 2G, and 3G ethanol, and biodiesel from used cooking oil, etc. The company is also advancing in sustainable aviation fuel (SAF) production and compressed biogas (CBG) projects. IndianOil is the first Indian Company to launch a commercial CBG brand, 'IndiGreen'. IndianOil's sales of CBG under this brand reached an impressive 7.8 TMT in 2023-24. During the year, IndianOil has established two CBG plants at Gorakhpur and Hingonia. This brings the total number of commissioned CBG plants to 31. IndianOil has issued over 650 Letters of Intent (LoI) under SATAT in FY 2023-24. In June 2024, another joint venture Company named IOC GPS Renewables Pvt. Ltd. For integrating advanced biogas technologies to convert organic waste into CBG was incorporated.
- During the year, the Company entered into a collaboration with Praj Industries for formation of 50:50 Joint Venture Company in India for setting up of Sustainable Aviation Fuel (SAF) and other Biofuel plants comprising Ethanol, CBG, Biodiesel, Bio-bitumen, etc. Further, IndianOil is setting up 86.8 TMTPA capacity SAF Plant in Panipat, leveraging LanzaJet's Alcohol to Jet (ATJ) Technology. This plant will derive its feedstock also from 1G & 3G Ethanol, which offers supplementary carbon advantages, contributing to its sustainability.
- In its efforts towards hydrogen economy, IndianOil along with L&T and ReNew has formed a joint venture company GH4India Pvt. Ltd., to focus on green hydrogen projects and its derivatives. IndianOil company is developing a 10 kTPA Green Hydrogen plant at its Panipat Refinery. Subsequently by 2030, the Company plans to create 350 KTA of Green Hydrogen capacity, which would be50% of its total hydrogen generation capacity. The Company demonstrated its leadership aspiration in green hydrogen space, by launching India's first Green Hydrogen fuel cell bus during the year and is currently operating 15 fuel cell buses in the Delhi-NCR region.
- In the domain of circular economy, IndianOil has launched "Unbottled" campaign that transforms PET bottles into sustainable garments. Further, IndianOil introduced its brand of recycled plastics known as 'CYCLOPLAST' that integrates recycled petrochemicals with virgin plastics, promoting responsible disposal and reuse in manufacturing and consumption. Additionally, company's innovative waste management practices have resulted in over 90% waste diversion from landfills.
- IndianOil's water management initiatives include the use of treated wastewater, rainwater harvesting, and the establishment of sewage treatment plants, contributing to significant water reuse and conservation. As part of its commitment to reduce freshwater conservation, Mathura Refinery is reutilising treated wastewater from Mathura Sewage Treatment Plant (STP). Mathura STP has helped reduce ~50% consumption of freshwater from the Yamuna River, while Gujarat Refinery is consuming treated wastewater from Rajiv Nagar STP, helping reduce 25% freshwater withdrawal from Mahi river.
- IndianOil's commitment to biodiversity is evident in its efforts to plant millions of trees and support the reintroduction of cheetahs, among other conservation projects. As part of its efforts to contribute to a greener planet, IndianOil has planted more than 15 lakhs trees during 2023-24 and around 60 Lakh trees are estimated to be surviving at the end of FY 2023-24 within and beyond

our organizational boundaries, resulting in emission sequestration of ~0.12 $MMTCO_2e$. Through this Nature-based solution (NBS), tree plantations help absorb carbon dioxide and release oxygen to provide habitat for wildlife and improve the ecosystem's overall health. IndianOil is also pursuing tree plantation on degraded forest land through the Green Credit programme launched by MoEFCC.

- IndianOil complies with the Securities and Exchange Board of India's (SEBI) non-financial reporting requirements through the Business Responsibility and Sustainability Report (BRSR) that transparently communicates non-financial data, plans, and performance to stakeholders. IndianOil's third party assured BRSR 2023-24 can be accessed from https://iocl.com/business-responsibility-report.

2. BPCL

As a leading Maharatna PSU, BPCL's strategy focuses on India's commitment to transition to Net Zero. With myriad developmental challenges in India and increasingly volatile markets, BPCL is cognizant of the need for a "just transition" that takes people along as it collectively moves towards a new energy economy.

ESG Performance Highlights of BPCL

Environment	Social	Governance
#8th Rank Dow Jones Sustainability Index (DJSI) Oil and Gas sector. No 1 rank in India and 8th Globally	**8506** Permanent Employees and Workers	**277** Vigilance Awareness Sessions
B-Management Level ranked by CDP (Formerly Carbon Disclosure Project)	**117.54 million** Man-Hours worked without Lost time Accidents (LTA) in Refineries	**99.82%** Customer Complaints Closed
4.4 % (Out of Total Electricity Consumed) Share of Renewable Energy Generation	**₹ 152.21 crore** CSR Spent	**3** Female Director
71.05 MW Energy Efficient Lighting	**0** Reportable Lost Time Injury Frequency Rate (RLTIFR) for permanent employees	**100 %** Operation Sites assessed for risk related to corruption
10.5 lakhs trees planted till date	**71,52,010** Total Number of CSR Beneficiaries	All board level committees are headed by Independent Director.
23,600 MTCO2e Carbon Sequestration Through Tree Plantation	**CSR on five focus areas which include** 1. Health and Sanitation 2. Education 3. Environment Sustainability 4. Skill Development 5. Community Development	Robust Grievance redressal system is available in public domain
13.49 Lakh sqm Catchment Area for Rainwater Harvesting	**Committee of Posh** available at Corporate, regional and refinery level	Public Interest Disclosure & Protection of Informer Resolution (PIDPI) is implemented across BPCL

Environment	Social	Governance
13.49 Lakh sqm Catchment Area for Rainwater Harvesting	**Committee of Posh** available at Corporate, regional and refinery level	Public Interest Disclosure & Protection of Informer Resolution (PIDPI) is implemented across BPCL
106 Thousand Kilo Liters Wastewater Recycled	**Human Right policy** is framed and published on public domain	
640 TKL (Thousand Kilo Liters) Rainwater Harvested	Corporate Safety Management system is implemented across BPCL to enhance safety culture	
4,891 MT Plastic Disposal Under Extended Producer Responsibility (EPR)	More than 33.7% purchases from MSME/MSEs against target of 25%	
8.64 MMTCO$_2$e Reduction in GHG Emissions		
90,387 MT of hazardous waste reused		
Zero waste to land fill certification for all operating marketing and refinery locations. Kochi Refinery is expected by September 2024		
100% EEL at Mumbai Refinery, Bina Refinery, Pipelines, Retail, LPG, Aviation SBUs. Kochi Refinery and Lubricants business by March 2025		

Energy Management

₹ 1,299.58 crore Approved capex in renewable energy projects sanctioned in 2023-24	**~200.7 thousand TJ Energy Consumed**

	Specific Energy Consumption (in MBN)		
	Bina	**Mumbai**	**Kochi**
FY 2022-23	68.0	62.7	63.9
FY 2023-24	67.2	60.9	62.6
% change	~1.17% decrease	~2.87% decrease	~2.03% decrease

Energy efficiency is a key priority, driven by environmental goals and potential cost reductions in refineries. BPCL's strategic emphasis on energy resource management and shift to sustainable energy sources plays a crucial role in its long-term value creation. By prioritizing efficient energy use, adopting renewables, and moving towards cleaner sources, BPCL ensures environmental sustainability, drive cost savings, boost competitiveness, and position the company for future growth. Energy Conservation (ENCON) schemes are introduced in all three BPCL refineries that have significantly reduced the specific energy consumption.

Energy Transition

The RE business unit is advancing BPCL's cleaner energy goals, aiming to diversify the company's energy mix with greener options and to evolve

into an integrated energy company. A capital outlay of ₹ 1299.58 crore was allocated for the following projects sanctioned in 2023-24.

Projects Sanctioned

- Ground Mounted Solar project at Prayagraj Land in UP
- Windfarm Projects each in the States of Madhya Pradesh and Maharashtra
- Integrated Green Hydrogen Plant and Hydrogen Re-fueling Station in Kochi, Kerala

Water Management

34,685 thousand KL Total Water Consumed	**6.4 lakh KL** Rainwater harvested	**13.49 lakh sq m** Rainwater Harvesting Catchment Area 12.89% yoy increase

Water plays a vital role across BPCL's operations, supporting refining processes and cooling systems. Effective water management enhances BPCL's value creation by reducing environmental impact, lowering costs, increasing productivity, and managing risks related to water scarcity and regulations. This strategic approach optimizes production, enhances efficiency, and bolsters BPCL's financial performance. To bolster the efficient water management, it has continuously invested and worked towards increasing the Rainwater Harvesting (RWH) capacity and reduce the dependency on other sources of water.

Waste Management

1,15,862 MT Hazardous waste recycled	**4891 MT** of plastic waste collected and reprocessed through BPCL's Lubes business unit under EPR as Brand owner

BPCL adheres to the 5R principles (Refuse, Reduce, Reuse, Repurpose, and Recycle) across all operations. It prioritizes efficient waste management to minimize environmental impact, identifying, segregating, recycling, and ethically disposing of operational waste. It ensures the responsible disposal of hazardous waste like spent clay containing oil or residues containing oil, employing safe landfilling methods facilitated by Treatment, Storage, and Disposal Facilities (TSDF). Hazardous and non-hazardous waste undergoes treatment and reuse in compliance with MoEF & CC, CPCB, and SPCB regulations. BPCL is dedicated to earning 'Zero Waste to Landfill' certification for all refineries and marketing locations, with that of Kochi Refinery expected by September 2024.

Biodiversity Management

1,60,000 trees Planted for FY 2024	**23,600 MTCO$_2$e** of total carbon sequestered

BPCL aims to minimize biodiversity impact by planting trees. This year, it planted over 160,000 trees using Miyawaki Technique, Seed Bombing, and conventional methods to enhance green cover and biodiversity. Its cumulative total now exceeds 1.03 million trees across BPCL sites, increasing CO_2 sinks by sequestering 23,600 MTCO$_2$e. Bina Refinery and MP State Forest Department signed an MoU to develop a 90-hectare greenbelt at Kanjia range, Khurai, Vanmandal North Sagar, MP, with a total investment of ₹ 1.96 crore over 5 years, starting in July.

Social : Commitment to Inclusive Future

BPCL prioritizes an inclusive workplace that celebrates diversity and fosters a strong culture of belonging. Its initiatives are designed to ensure the welfare and safety of its employees while actively engaging with the communities it serves. By embracing principles of human rights and ethical labor practices, BPCL is dedicated to initiatives that uplift society. It cultivates a workplace that not only values inclusivity and diversity but also promotes open dialogue and collaboration. Furthermore, its commitment extends to community-driven philanthropic endeavors, allowing it to consistently strive for a meaningful and positive impact on the broader community and contribute to sustainable development.

FY 2023-24 Highlights

8,506 Permanent Employees and Workers	**3,930 man-hours** Trained 2794 participants on HSSE
100% Employees and workers trained on health and safety measures and skill upgradation (including non-permanent workers)	**100%** permanent employees and workers trained on human rights issues and policy
117.54 million Man-hours combined, without LTA in refineries	**0** Reportable Lost Time Injury Frequency Rate (RLTIFR) for employees
₹ 152.21 crore CSR Spent	

10.7. Employee Satisfaction Enhancement (ESE)

BPCL has several key initiatives aimed to support employee well-being. Roshni Plus offers confidential psychological counselling services for employees and their families. AcityLife hosts ActivLife webinars and offline seminars on work-life balance, mindfulness, and healthy habits, benefiting nearly 2,166 participants. Sahkari Mitra engages 68 nominated employees as emotional first-aid providers, promoting mental health awareness and offering support across various BPCL locations. Newly selected SahkarmiMitras receive specialized training to enhance their skills in supporting their peers.

10.8. Occupational Health and Safety

BPCL's motto, "Safety First, Safety Must," underscores its commitment to safety, health, security, and the environment, which remain central to its operations as a responsible company addressing evolving ESG aspects. BPCL's goal is to achieve zero incidents, effective hydrocarbon mitigation, reduction of related dangers, and continuous improvement in operations. Safety and security are deeply ingrained in its culture, and it strives tirelessly to identify and reduce risks to its workers and employees, ensuring a safe and secure working environment. BPCL has established 3-tier Health, Safety, and Environment (HSE) committees at various operational levels (Operating location, Regional/HQ and Corporate level). These committees regularly review safety protocols, investigate incidents, and recommend improvements to enhance safety measures.

10.9. Health, Safety, and Environment (HSE) Initiatives

Training Programs: BPCL conducts comprehensive safety training programs for employees and contractors as per OISD-STD-154, and Statutory/ Regulatory guidelines (MOU targets), covering topics like fire safety, first aid, emergency response, and safe handling of hazardous materials. These programs ensure that everyone is well-equipped to maintain safety standards.

Periodic Health Screenings: BPCL organizes regular health check-up camps for employees, focusing on early detection and treatment of health issues. These camps include general health screenings, specialized tests, and consultations with healthcare professionals

Occupational Health Centres: At major operational sites, BPCL has established occupational health centres staffed with medical professionals to provide immediate healthcare services and monitor employee health.

10.10. Emergency Preparedness and Response

Mock Drills: Regular mock drills are conducted as per PNGRB ERDMP Regulations 2010 to prepare employees for emergency situations such as fires, spills, and natural disasters. These

drills ensure that employees are well-versed in evacuation procedures and emergency response actions.

Emergency Response Teams: BPCL has trained emergency response teams equipped to handle various types of emergencies. These teams are regularly trained and updated on the latest response techniques.

Safety Audits and Inspections: Regular internal/ external safety audits and inspections are conducted to identify potential hazards and ensure compliance with safety standards. These proactive measures help in implementing corrective actions promptly.

Risk Assessments: Detailed risk assessments using various techniques like Hazop, HIRA, QRA etc are performed to identify and mitigate potential safety risks in BPCL's operations. This proactive approach helps in preventing accidents and ensuring a safer work environment.

10.11. Awareness and Communication

Safety Bulletins and Alerts: BPCL disseminates safety bulletins like Directives, advisories, Spot the Hazards, Remembering Series, Scenario Based Learnings and alerts to keep employees informed about safety practices, potential hazards, and lessons learned from past incidents.

Safety Campaigns: Periodic safety campaigns are launched to emphasize specific safety aspects, such as safe driving, use of personal protective equipment (PPE), and workplace ergonomics.

10.12. Safety Awareness Week at BPCL

BPCL celebrates National Safety Day annually on March 4th to promote workplace safety through drills, seminars, and competitions for employees and contract workers. Safety Week extends this focus with workshops, quizzes, poster competitions, and pledge ceremonies to emphasize a safe work environment.

BPCL's commitment to occupational health and safety is evident through its comprehensive and proactive approach in managing safety risks and promoting a healthy work environment. By continuously improving its safety programs and engaging employees at all levels, BPCL aims to achieve a zero-incident workplace and foster a culture of safety excellence.

3. HPCL

HPCL is integrating ESG factors into its strategies and business operations with a view to enhance competitive advantage, attract investors, build resilient business models and contribute to a more sustainable and inclusive global economy. HPCL is committed to achieving its ESG objectives by implementing best practices in its operations and activities. The ESG performance is continuously benchmarked with national and international peers.

ESG Performance Highlights of HPCL

Environment	Social	Governance
21% Rise in S&P Global Rating Score	**8154** Permanent Employees and Workers	**~45,000** Stakeholders engaged during Vigilance Awareness Week
Net Zero by 2040 Scope 1 and 2 Emissions	**3.45%** Voluntary Turnover Rate	**99.5%** Customer Complaints Closed
208 MW Installed Renewable Power Capacity (Solar & Wind)	**0.073** Reportable Lost Time Injury Frequency Rate (RLTIFR)	**15.3%** Gender Diversity across Board
21.52 Cr kWh Total Renewable Energy Generation (Solar & Wind)	**Exceeded MoU compliance parameter** on Occupational Health Safety Training to Employees	**100%** Operational Sites assessed for risk related to corruption

Environment	Social	Governance
3% Share of Renewable Electricity out of Total Electricity Consumed	**1472 Officers** undertook NSC-HPCL-SAT	**ERM Framework** aligned with COSO 2017 and ISO 31000:2018 Standards
~14.4 lakhs trees planted till date	**Corporate Safety Management system** is implemented across HPCL to enhance safety culture	**ISO 27001:2022** Certified Data Centres
490+ Rainwater Harvesting Structures across Refineries and Marketing Locations	**Vulnerability Index** implemented at Refineries	**Zero** Instances of Data Breaches in 2023-24
1204 TKL Wastewater Recycled at Refineries	**59217** Man-days of technical and behavioural trainings imparted to transport workforce	**Robust Grievance redressal system** is available in public domain
1200 TKL Rainwater Harvested	**1,107 Candidates** Engaged as GATs/TATs/DATs under National Apprenticeship Training Scheme	
9.7 TMT Surpassed Government mandated EPR Target for recollection of Plastic Waste	**₹ 111.94 crore** CSR Spent	
8.1 MMTCO$_2$e Avoided GHG Emissions (Scope 1+ Scope 2 + Scope 3)	**₹ 16.14 Crore** CSR expenditure in 13 Aspirational Districts	
370 TPA Pilot Green Hydrogen Plant at Visakh Refinery (in advance stage of completion)	**~32.3 lakh** Total Number of CSR Beneficiaries	
25+ Certified Green Buildings	**Policy on Human Rights** released on public domain	
Bio Diesel used in DG sets at 35 SOD Locations	**41.24 %** purchases from MSEs	
100+ locations ISO 50001-Energy Management System	**12,724** HP SAKHIs added to maximize reach of LPG to rural customers	
150+ locations ISO 14001-Energy Management System	**~1,32,185** Awareness/ Training Programs conducted for Value Chain Partners	
35 Marketing Locations with GreenCo certifications		

Climate Change and Net-Zero Strategy

HPCL has completed its Environmental Strategy with the help of world-renowned consultant. It has drawn a roadmap for de-carbonization of its operations in line with its Net-Zero target of 2040 for Scope-1 & Scope-2 emissions. This roadmap has a strong focus on transitioning towards a multi-energy green and low carbon Corporation. During the year, HPCL's Scope 1 and 2 GHG emissions were 4.72 and 1.06 Million tCO_2e respectively on a standalone basis.

HPCL has identified key levers for achieving net zero, such as enhancing energy efficiencies in its own operations, using renewable power in refineries, replacing hydrogen requirements with green hydrogen, reducing flare gas emissions, CCUS etc. Towards emission intensity reduction, the Corporation is exploring various business areas such as renewable energy and storage, biogas, biofuels, petrochemicals and green hydrogen.

During the year, the total energy consumption in HPCL (Fuels and Electricity) was 63.37 Million GJ; HPCL made about ₹ 407 crore capital investment on Energy Conservation Equipment at Refineries and achieved 1,32,136 SRFT of energy savings at its refineries (including sustenance of previous schemes).

The 370 TPA pilot Green hydrogen plant at Visakh Refinery is in advance stage of completion. Owing to relentless focus maintaining and enhancing green belts, HPCL reached 1,793 acres of green belt are at its locations. The company's renewable power portfolio touched 208.2 MW (107.3 Solar + 100.9 Wind) during the year. In their approach to Net-zero, 35 terminals/ depots of HPCL started using 100% biodiesel for their DG sets.

During FY 24, HPCL has solarised 17,618 (80%) of its retail outlets, blended 12% ethanol in MS, operationalised 9 CBG plants cumulatively under SATAT, installed 3,603 EV charging facilities including battery swapping stations in its value chain.

To accelerate its energy transformation journey, HPCL has established a new 'Energy Transition Cell', which is dedicated to achieving the Corporation's Net-Zero goals. HPCL has received the regulatory approvals for setting up of Wholly Owned Subsidiary for its Renewable & Green Energy portfolio and has incorporated HPCL Renewables & Green Energy Limited. HPCL has ambitious plans to increase its Renewables portfolio to 10 GW by 2030 and Bio-fuels portfolio through new 1G, 2G and CBG Plants.

HPCL is seizing green and emerging opportunities by expanding footprints in advanced/alternative fuels. For expanding footprints in biofuels, various biofuels projects are under execution by HPCL on its own as well as with the participation of entrepreneurs. Expansion in renewables is being done through the solarization of retail outlets, enhanced usage of renewable power for meeting operational requirements of refineries, setting up of infrastructure for power import at both refineries, etc.

Sustainability

HPCL is the first among PSUs to voluntarily opt for CII Green Company (GreenCo) rating in 2014. This system evaluates the performance of an operating unit on parameters of: Management Systems, Energy Efficiency, Water Conservation, Renewable Energy, Greenhouse Gas Emissions, Waste Management, Material Conservation, Recycling and Recyclability, Green Supply Chain, Product Stewardship, Innovation for Environment, Green Infrastructure & Ecology. Total 35 locations have been certified over a period of 10 years. HPCL also has over 25 certified Green Buildings at its various locations.

HPCL has implemented Integrated management system (IMS) (ISO 9001, 14001 & 45001) across HSE functions of its SBUs at organisation level. Both HPCL refineries and over 150 marketing locations have implemented internationally accepted 'Environment Management Systems' based on ISO 14001 Standards. HPCL has also implemented ISO 50001 Energy Management System at its Mumbai Refinery and over 100 marketing locations.

Hazardous waste treatment and disposal systems are available at various locations in line with industry best practices. State-of-the-art effluent treatment plants for treating and recycling effluent water are available at major

locations to ensure the protection of the environment. During the year, HPCL exceeded government mandated 'Extended Producer Responsibility' target of 8,000 MT by recollecting over 9,700 MT of plastic waste.

Best-in-class technologies such as volatile organic compound (VOC) monitoring and the leak detection and repair (LDAR) programme have been adopted for monitoring and controlling fugitive emissions at major installations. Vapour recovery systems (VRS) have been installed at various supply locations and retail outlets.

Gaseous emissions to the environment and ambient air quality are continuously monitored with the use of the latest technologies, including real-time data transfer to regulatory agencies in major locations. Online monitoring of emissions and air quality has a system of alerts in place for monitoring and rectifying deviations.

HPCL employs the techniques of Reduce, Reuse, Recycle and Recharge for conserving water. During FY 24, the fresh water withdrawal at HPCL was 13,130 TKL while HPCL locations harvested over 1,200 TKL of rainwater using various rain water harvesting techniques.

BRSR: HPCL conducts business transparently, following its internal policies and applicable external regulations. The Company conducts its operations in line with the National Guidelines for Responsible Business Conduct (NGRBC) principles

HPCL has been transparently disclosing its sustainability performance in the public domain in the form of GRI based sustainability reports for the last 12 years since FY 2011-12. HPCL Sustainability Initiatives and Reports have won several Awards during the last 12 years.

HPCL started publishing BRSR according to SEBI guidelines since 2022-23. In 2023-24, HPCL is disclosing its performance on the revised BRSR format which is assured by reputed third party. HPCL is also releasing its maiden Integrated Annual Report based on Integrated Reporting Framework to holistically narrate its value creation process in the form of 6 capitals to its stakeholders.

In order to enable the Corporation to deal with enhanced business challenges and risks, an effective and pragmatic Enterprise Risk Management (ERM) Framework has been institutionalised across the organization, with a focus on achieving resilience and sustained value creation. HPCL's ERM framework is aligned with the established and recognized risk management principles such as COSO 2017 and ISO 31000:2018.

At HPCL, stakeholder inputs (collaboration, knowledge and expertise) play a vital role in formulating strategies for addressing the Company's economic social or environmental impact. The Company strives to build continuous and long-term relationships with its stakeholders through structured collaborations and communications.

Social:

During FY 24, HPCL released its Human Rights Policy and also continued to be a signatory to United Nations Global Compact (UNGC). HPCL's strength was 8,154 employees as on March 31, 2024 with 10.38 % female employees. The voluntary turnover rate during the year was 3.54%. Training programs, awareness sessions, sustainability quizzes, newsletters and technical bulletins were conducted on a continuous basis to enhance employee capabilities and also the capabilities of its extended workforce of Contract workfors, TT crew, Retail Outlet CSAs and LPG delivery men.

The corporation exceeded MoU compliance parameter on Occupational Health and Safety trainings to employees. As a notable achievement, 1,472 officers undertook the National Safety Council – HPCL Safety Aptitude Test (NSC – HPCL SAT) which has over 700 pages of content in 10 modules from more than 40 standards / regulations / guidelines on Safety. HPCL achieved 58.3 training hours per person in the year.

HPCL continued with its welfare initiatives for its employees and extended workforce during the year. 100% of the company's employees underwent performance appraisal for objective assessment, career progression and development of individual capabilities based on Balanced Score Card Methodology.

HPCL has always been a Corporation with conscience, firmly believing that customer and

business priorities can co-exist with social commitments and inclusive growth. To foster growth and well-being of the communities, HPCL actively engages in a diverse range of thoughtfully curated social programs.

During the year, HPCL spent ₹ 111.9 crore on CSR of which ₹ 16.14 crore was spent in 13 aspirational districts. These initiatives impacted the lives of over 32 lakh individuals. HPCL also supplied 10.7 crore refills under the Pradhan Mantri Ujwala Yojana thereby supplying clean cooking fuels to society.

HPCL is also collaborating with major industrial customers to imbibe ESG practices in the supply chain through exchange of sustainability best practices. To increase the awareness levels and capabilities of the extended workforce (dealers, distributors, customer service assistants, deliverymen etc.) 1,32,185 training programs and awareness sessions were conducted.

Note: Numbers on Environment and Social performance mentioned in this report are pertain to HPCL on a standalone basis.

4. ONGC

As of March 31st, 2024, ONGC is among the top 20 listed Indian companies by market capitalization. Therefore, the Company has developed a BRSR, including Core KPIs, for ONGC Limited on a standalone basis. Although the company is required to submit the Business Responsibility and Sustainability Reporting, its ESG initiatives surpass mere compliance. In the financial year 2023-24, the company has implemented initiatives for organizational transformation that will support its objective of achieving Net Zero emissions by 2038.

ESG Performance Highlights of ONGC

Environment	Social	Governance
ONGC's **Decarbonization Roadmap** released in the public domain.	**1.81%** of the total revenue spent on measures of well-being for employees and workers.	**31** Patents Granted during FY 2023-24
Net Zero by 2038 For scope 1 & 2-target undertaken by ONGC.	**0.34 & 0.15** Lost Time Injury Frequency Rate (LTIFR) for employees and workers respectively.	**2** Female Directors
0.25 MMTCO$_2$e of emissions saved	**0.21 & 0.39** Total Recordable Work-Related Injury Frequency Rate (TRIFR) for employees & workers respectively.	**Grievance Redressal Mechanisms** available at public domain for external & internal stakeholders.
237.8 million units of renewable energy power generated	**0** Fatalities recorded in FY23-24.	ONGC was recognized with the **Golden Peacock Eco-Innovation Award** for its use of treated effluent water and production of water in the preparation of various water based drilling fluids
3,643,649 GJ of energy savings reported in FY 2024 through different energy efficiency initiatives undertaken.	**100%** employees and workers have been trained on Human Rights issues and policy.	ONGC takes written undertaking from all its vendors and suppliers regarding compliance to all statutory and human rights law such as No-Child Labour, Fair

Environment	Social	Governance
		Wages, No force labour etc. in addition to the above all the project having value more than ₹ 1 crore, has an Integrity Pact wherein the buyer as well as supplier are bound to follow a set of codes in the interest of integrity, fairness and transparency in the procurement process of the given tender and in general.
192.8 MW of total installed capacity of renewable energy as on 31st March 2024 (Solar: 39.8 MW and Wind: 153 MW)	**UNGC Signatory** ONGC is a United Nations Global Compact signatory.	
3,367 TJ of energy savings from flare gas recovery and process optimization at Uran facility.	**58%** of the inputs sourced are directly from MSMEs/small producers including 0.84% from Women MSEs and 0.50% from SC/ST MSEs.	
75.9 million units (MU) of annual electricity savings from 5,049 LED lights installed during FY 2023-24 across various work centres of ONGC. Total of 3.6 lakh LED lights have been installed in ONGC so far.	**35600** beneficiaries through ONGC's CSR initiatives. Majority of the beneficiaries belonged to vulnerable communities.	
100% of the Company's products contain information about environmental and social parameters relevant to the product, and safe and responsible usage.	**₹ 6,13.6 crore** of CSR expenditure in FY 2023-24.	
Collaboration ONGC signed a Memorandum of Understanding (MoU) with NTPC Green Energy Limited (NGEL) on 27th September 2023 to realize its renewable energy objectives towards energy transition. The MoU will primarily explore the feasibility and setting up of renewable energy projects focusing on offshore wind and other domains.	**CSR impact areas of ONGC: Information Security**	

Environment	Social	Governance
Collaboration ONGC signed a Memorandum of Understanding (MoU) with SJVN Green Energy Limited (SGEL) on 9th August 2023 to collaborate in the areas of renewable energy, hydropower and pump storage hydro project development in India	**650,402** hours of trainings imparted to employees and workers	
Energy Transition ONGC intends to invest ₹ 1 lakh crore by 2030 and cumulatively ₹ 2 lakh crores by 2038 in energy transition projects aimed at reducing carbon emissions.	**Great Place to Work Certification**	
ONGC inaugurated a dedicated **Carbon Capture Utilization and Storage (CCUS)** laboratory at KDMIPE and signed a three-year strategic research engagement with the National Centre of Excellence in Carbon Capture & Utilization (NCOE-CCU) at IIT Bombay.	**ISO Certifications** All workplaces across operation plants are ISO 9001 (Quality Management System), ISO 14001 (Environment Management System) and ISO 45001 (Occupational Health and Safety) certified.	
Signatory to the Oil & Gas Decarbonization Charter during COP 28	**Zero** Data breached in FY2023-24	
Net-zero upstream methane emissions by 2030		
Eliminating routine flaring by 2030		
322 Energy Audits were carried out in various rigs/ installations across ONGC through in-house energy auditors in FY 2023-24		
Implemented an e-waste policy to ensure the responsible disposal of electronic equipment and accessories that have reached the end of their useful life.		
Life Cycle assessment was performed for six products for the following 4 impact categories: Climate change, Acidification, Fresh water eutrophication and marine eutrophication.		

Below is an overview of the company's ESG initiatives closely aligned with the nine principles of the NGRBC, which form the basis of the BRSR.

BRSR Core

ONGC has successfully developed the BRSR including the newly introduced 23 Core KPIs bucketed under 09 core attributes, as displayed below:



To adopt BRSR Core, the Company created a comprehensive data collection and management system, comprising of department-wise data templates, ensuring that it includes the most relevant information. The Company also conducted department-wide training on BRSR to improve the data owners' understanding of BRSR Core requirements, streamline the approach, and align internal monitoring systems with the evolving regulatory requirements.

Reasonable Assurance

The Company has obtained Reasonable Assurance on the Business Responsibility and Sustainability Report as per Annexure 1 of the SEBI circular (SEBI/HO/CFD/CFD-SEC-2/P/CIR/2023/122, dated July 12, 2023) BRSR Core KPIs, showcasing commitment to accurate ESG data management. The boundary for Reasonable Assurance includes ONGC Limited on a standalone basis. Beyond this, the Company has also obtained Limited Assurance on IR prepared in accordance with GRI Standards 2021. The reporting boundary for the IR includes, beside ONGC, ONGC Videsh, MRPL, OPaL and OTPC.

Policy Commitment

The Company has undertaken policy commitments that align with the nine NGRBC principles. The Company launched its Human Rights Policy in line with Principle 5: Businesses Should Respect and Promote Human Rights. Along with policy commitments, the Company has well-established systems and procedures for policy implementation and monitoring.

Principle Wise Performance: Summary

PRINCIPLE 1: Businesses should conduct and govern themselves with integrity, and in a manner that is Ethical, Transparent and Accountable.

1. Business Ethics at ONGC is guided by the Company's Code of Conduct for Directors and Senior Management Personnel, Anti-bribery Management Policy and Fraud Prevention Policy. These policies are supported by National and International regulations. The Chief Vigilance Officer has the highest responsibility of ensuring ethical and accountable business practices at the Company.

2. 100% of the Board of Directors at ONGC received technical and managerial training in line with the nine NGRBC principles.
3. There were no instances of business ethics breach requiring disciplinary action against any of the Directors of ONGC Limited in the reporting period.
4. The Company also conducted training on business ethics topics with the value chain partners. The training included topics such as anti-bribery management, vigilance and transparency, and procurement policy initiatives.

PRINCIPLE 2: Businesses should provide goods and services in a manner that is sustainable and safe.

1. In FY 2023-24, the Company utilised 100% of the R&D investments to mitigate the environmental and social impacts of the business. These investments focused on green technology such as Carbon Capture Utilization and Storage, Process improvement, water management etc.
2. The Company has also developed a waste management plan in line with the EPR obligation of the Company as 'Importer of Goods with Plastic Packaging'. The waste management plan focuses on waste minimisation, segregation, monitoring of waste generation and safe disposal initiatives.
3. The Company has undertaken lifecycle assessment of 05 products, that are, Crude Oil, Natural Gas, LPG, Naphtha, and C2-C3. The lifecycle assessment assessed the products impact on following 4 impact categories: Climate change, Acidification, Fresh water eutrophication and marine eutrophication. During the study, all the parameters were found to be within the industry benchmark thus, no significant issues were identified for the selected products pertaining to the identified above impact categories.

PRINCIPLE 3: Businesses should respect and promote the well-being of all employees, including those in their value chains.

1. 100% of the Company's employees and workers (permanent and other than permanent) are covered by health insurance.
2. 100% of the Company's female employees and workers (permanent and other than permanent) receive maternity benefits, while 100% of the permanent male employees receive paternity benefits.
3. In FY 2023-24, the company spent 1.81% of the total revenue on measures of well-being for employees and workers.
4. The Company is an Equal Opportunity Employer and has an Equal Opportunity Policy as per the Rights of Persons with Disabilities Act, 2016.
5. The Company has implemented a Health, Safety, and Environmental (HSE) Management System based on ISO 9001, ISO 45001, and ISO 14001 standards.
6. The Company recorded a Lost Time Injury Frequency Rate (LTIFR) (per one million-person hours worked) of 0.34 for employees and 0.15 for workers in FY 2023-24.
7. The Company recorded a Total Recordable Work-Related Injury Frequency Rate (TRIFR) of 0.21 for employees and 0.39 for workers in FY 2023-24.
8. The Company recorded Zero fatalities in FY 2023-24.

PRINCIPLE 4: Businesses should respect the interests of and be responsive to all its stakeholders.

1. The Company conducted stakeholder engagement by engaging with five (05) key internal and external stakeholder groups. These include employees, customers, shareholders, investors, and communities. Input received from stakeholder consultation is utilized by ONGC to support the identification and management of environmental and social topics.
2. The Company has identified 16 material topics, of which the top five topics are as below:

- Climate change and energy transition
- Energy and emission management
- Waste management
- Low carbon and sustainable products
- Water management

PRINCIPLE 5: Businesses should respect and promote human rights

1. 100% of the Company's employees and workers (permanent and other than permanent) have been trained on Human Rights issues and policy.
2. In FY 2023-24, the Company's gross wages paid to female employees and workers accounted for 7.29 of the total wages paid by the Company.
3. The Company has established a system for preventing instances of sexual harassment at the company in line with the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013. In the reporting year, the Company recorded six (06) instances of sexual harassment, accounting for 0.29% of total female employees and workers.

PRINCIPLE 6: Businesses should respect and make efforts to protect and restore the environment.

a) The Company monitors environmental parameters such as energy, emissions, water and waste in line with the BRSR Core requirements. Below are the intensity rates for the environmental parameters in FY 2023-24:

- Energy Intensity(GJ/INR million): 85.22
- Water Intensity (KL/ INR million): 12.09
- GHG Emission intensity ($MTCO_2$ equivalent/ Mn INR): 6.77
- Waste Intensity (Total waste generated / Revenue): 0.099

b) Net Zero Strategy of ONGC by 2038

- Complete inventorization for Scope-1, Scope-2 and Scope-3 was done for baseline year FY 2021-22.
- Life Cycle Impact Assessment was carried out for Crude Oil, Natural Gas, Processed Natural Gas, C2-C3 Mix, LPG, Naphtha, ATF, Kerosene, Diesel, Ethane, Propane and Butane. LCIA aims to evaluate the environmental impact associated with the entire life cycle of these products. The results of the LCA study are presented in terms of four impact categories- Climate Change, Acidification, Marine Eutrophication and Fresh Eutrophication.
- Based on data from the GHG Inventorization carried put in Phase-1, asset wise emissions have been calculated. The asset wise emissions projection has been further drilled down to identify emission hotspots which were utilized to identify the most efficient decarbonization levers to curb Scope 1 and 2 emissions by 2038. A roadmap has been developed, considering the projected Scope-1 and Scope-2 emissions for ONGC until FY 38. The roadmap incorporates a series of De-carbonization levers strategically spread across short, medium, and long-term horizons. These levers are RE Hybrid, CCUS, Green Hydrogen, Biofuels, BESS and EVs are designed to address various aspects of ONGC's operations, ensuring a comprehensive and phased approach to emission reduction.

c) Methane Leak Detection and abatement

- ONGC is also a signatory of OGDC at COP28. By signing OGDC, ONGC has committed to initiate steps to achieve net-zero operations, and ending routine flaring by 2030, and near-zero upstream methane emissions.
- ONGC has signed a Cooperation Agreement with TotalEnergies to carry out methane emissions detection and measurement campaigns using TotalEnergies' pioneer AUSEA (Airborne Ultralight Spectrometer for Environmental Applications) technology. We are planning to conduct Drone Surveys using Total Energies Patented technology AUSEA to detect particular area in an installation where methane emissions are

occurring. Based on the hotspot identified through Remote Sensing and Arial surveys, ground surveys are conducted to detect specific leaks in pipeline and other instruments which are the source of fugitive methane emissions.

d) Carbon Capture, Utilization and Storage (CCUS)

- The Company is also prioritizing Carbon Capture, Utilization, and Storage (CCUS) as a major lever for decarbonization. By exploring partnerships and initiatives related to CO_2 storage and enhanced oil production from mature fields, ONGC aligns its operations with sustainable practices and strengthens its competitive edge. The proposed CCUS project at Gandhar has the potential of 10% oil gain and cumulative sequestration capacity of 5 to 6 million ton of CO_2 by the year 2040.
- Also, a Lab has been set-up in KDMIPE to undertake R&D work of CCUS. The Lab is also working on gas adsorption studies in coal, which can also act as an excellent trap for CO_2 as it permits higher storage than its pore volume capacity

e) Green initiatives undertaken:

- **Demonstration plant/R&D plant:** Equipment & machinery for green H_2 production plant has been received at Nandasan ETP, Mehshana, Gujarat, in July 2024. Erection & Commissioning work in under progress. This plant will produce green H2 from produced water of HC well.
- **Tatipaka refinery green H_2 plant:** ONGC exploring production of green H_2 through electrolyser route at Tatipaka refinery.
- **40 KTA Green H_2 Green fields projects:** ONGC is engaged in discussions with MRPL regarding a green hydrogen offtake arrangement and the establishment of a greenfield project in Mangaluru. A Joint Working Committee comprising members from both ONGC and MRPL has been formed to assess the feasibility of supplying 10% green hydrogen to MRPL.

f) Energy Efficiency Initiatives

- ONGC undertook the following initiatives in FY 2023-24 to reduce energy consumption through process optimisation, flare gas recovery and energy-efficient equipment. The total annual savings from these initiatives were reported to be 3,643,649 GJ and INR 12 crore
- **Renewable Energy:** The Total solar energy installed during FY 2023-24 is 3 MW at Cambay and Kakinada. Renewable energy produced is 2.82 MU. The total installed capacity of renewable energy as on 31 March 2024 was about 192.8 MW (Solar: 39.8 MW and Wind: 153 MW)
- **Flare Gas Recovery and Process Optimization at Uran:** 86.2 MMSCM of Gas has been saved due to flare gas recovery and process optimization at Uran which has resulted into energy savings of 3,367 TJ.
- **Dynamic Gas Blending System:** A Dynamic Gas Blending system was commissioned in three drilling rigs (Ankleshwar E-1400-7, E1400-3 and EV-2000-2) of the Ankleshwar Asset and is in the final stage of implementation at EV-2000-3 rig, Assam Asset. We recorded a 45% reduction in HSD consumption, along with major reductions in stack emissions. The Jorhat Asset also plans to implement the DGB system in two of its three drilling rigs. The method is being considered for future purchase specifications for all drilling rigs.
- **LED Lighting:** 5,049 LED lights installed during FY 2023-24 across various work centres of ONGC under implementation of LED lighting program. Total of 3.6 lakh LED lights have been installed in ONGC so far. This realizes into an annual Electrical energy savings of around 75.9 million units (MU) and monetary savings to the tune of ₹540 Million.

g) Supplier Engagement and Reduction of Scope-3

- ONGC is deeply committed to the cause of sustainability and environmental

stewardship. Integral to this commitment is the greening of entire supply chain. Collective efforts of all stakeholders, including the valued suppliers, are indispensable in achieving sustainability objectives. ONGC is launching an initiative focused on supplier emission disclosures. While this initiative is voluntary, it will definitely facilitate the Scope-3 emissions reduction.

PRINCIPLE 7: Businesses, when engaging in influencing public and regulatory policy, should do so in a manner that is responsible and transparent

1. **The Company has membership of the following associations through which it advocates public policy:**

- United Nations Global Compact Network India (UNGCNI)
- Federation of Indian Chambers of Commerce and Industry (FICCI)
- Confederation of Indian Industries (CII)
- Standing Conference on Public Enterprises (SCOPE)
- Federation of Indian Petroleum Industry (FIPI)

PRINCIPLE 8: Businesses should promote inclusive growth and equitable development

1. 58% of the inputs sourced by the Company are directly sourced from MSMEs/small producers including 0.84% from Women MSEs and 0.50% from SC/ST MSEs.
2. The Company prioritizes promoting local content in its procurement practices, giving preference to Micro and Small Enterprises (MSEs) and Class I Local Suppliers in accordance with the guidelines outlined in the Public Procurement Policy 2012 (PPP-2012) and the Purchase Preference linked to Local Content policy (PP-LC 2020).
3. 24.81% wages paid by the company were paid to employees and workers employed in semi-urban areas, reflecting job creation in small towns.
4. The Company benefited nearly 35,600 beneficiaries through its CSR initiatives, of which a majority of the beneficiaries belonged to vulnerable communities. In FY 2023-24, the Company's total CSR spend was INR 6,136 million.
5. The Company's CSR initiatives and programs are aligned with the following impact areas:



PRINCIPLE 9: Businesses should engage with and provide value to their consumers in a responsible manner

1. The Company did not receive any consumer complaints pertaining to data privacy, advertising, cyber security, unfair trade practices, etc., in FY 2023-24.
2. ONGC has a well-defined and structured Information Security Policy on Cyber Security.
3. 100% of the Company's products contain information about environmental and social parameters relevant to the product, and safe and responsible usage.

5. GAIL

Being a responsible energy company and to further accelerate its de-carbonization goals, GAIL has developed a science-based Net-Zero action plan to achieve 100% reduction in Scope-1 & 2 emissions and 35% reduction in Scope-3 emissions by the year 2040. Recently, GAIL has further advanced its Net Zero target and aims for 100% reduction in Scope-1 & 2 emissions by the year 2035 itself.

In order to achieve the Net Zero Targets, GAIL has identified the following Abatement Levers:

- Electrification of existing NG based equipment
- Renewable Energy (RE)
- Green Hydrogen
- Compressed Bio Gas (CBG)
- Battery Energy Storage System (BESS)
- Co_2 Valorisation - Direct Sale and Value-added Products
- Energy Efficiency Improvement
- Afforestation
- Offsetting

Green Hydrogen and CCUS

In the areas of Green Hydrogenand CCUS, the following initiatives have been taken to achieve Net Zero Targets:

- GAIL has commissioned a 10 MW PEM Electrolyser to produce 4.3 TPD of Green Hydrogen, at Vijaipur (M.P).
- GAIL has also commissioned a pilot plant for CO2 capture through microalgae of capacity 1 TPD atits Petrochemical Plant at Pata (U.P).
- MoU has been signed with M/s LanzaTech Inc., USAto jointly explore, identify, evaluate, and implement projects for operational decarbonization at GAIL. Further discussions are in progress to set up a CO2 to ethanol plant.

Circular Economy Practices

GAIL ensures that waste materials are disposed of in a way that minimizes their impact on the environment and human health. It strives to implement a circular economy across its operations by deploying resource-efficient technology. GAIL follows effective Waste Management practices which involve Reducing, Reusing, Recycling and responsibly disposing of Hazardous and Non-hazardous wastes at all the sites.

Regular Waste Audits are conducted to identify waste reduction opportunities at source. Waste generation is minimized through operational improvements. GAIL diligently spreads awareness among its employees, value-chain partners, and communities through diverse channels, including social media.

There is no packaging involved in case of Natural Gas & LHC Transmission and Marketing. Regarding polymer packaging, GAIL is fulfilling its responsibility by procurement of EPR certificates as per targets provided by CPCB/UPPCB through Extended Producer Responsibility (EPR).

ESG Efforts and BRSR Initiatives

Sustainability Reporting Journey of GAIL

GAIL has been voluntarily publishing annual Sustainability Reports since 2011, detailing the company's Environmental, Social, and Governance (ESG) performance. GAIL strives to disclose information about its Strategy, Goals, Targets and Performance through Sustainability Reporting. This transparency is part of GAIL's effort to develop a sustainable business model that generates long-term value for its stakeholders.

ESG Performance Highlights of GAIL

Environment	Social	Governance
GAIL operates a network of **16,243 km** of **NG pipeline & 2,040 km of LPG pipelines.** Pipeline transportation helps in emission reduction by eliminating the need for transportation of LHC by trucks/rail.	GAIL spent INR 175.71 Crores under CSR Initiatives, primarily in the below mentioned focus areas: • GAIL Arogya (Healthcare, Sanitation and Clean Drinking Water)	Achieved HSE Score of **95.75%** for FY 2023-24 against an internal target of **93.5%**

Environment	Social	Governance
GAIL's market share in FY 2023-24 was **~65%** in gas transmission and **~48%** in gas trading	• GAIL Ujjawal (Education Centric Initiatives) • GAIL Harit (Environmental Initiatives) • GAIL Sashakt (Women Empowerment Initiatives) • GAIL Kaushal (Skill Training Initiatives) • GAIL Saksham (Initiatives related to PwDs and Elderly) • GAIL Unnati (Education Centric Initiatives)	
GAIL has an installed capacity **118 MW** of Wind Power and **17 MW** of Solar Power	More than **13 Lakh** people benefitted through GAIL's **CSR projects** in FY 2023-24	**Zero** Reportable Lost Time Injury Frequency Rate (RLTIFR) for permanent employees
Commissioned 10 MW PEM Electrolyser to produce 4.3 TPD of Green Hydrogen, at Vijaipur (M.P).	GAIL procured ₹ **1,963 crores** of goods from **MSEs** in FY 2023-24, which is approximately **56.51%** of **total procurement**	In FY 2023-24, GAIL received 214 complaints from internal and external Stakeholders through the CPGRAMS portal, and **100%** of these were promptly resolved
Net Zero strategy aims to achieve **100% reduction in Scope-1 and Scope-2 emissions** by the year 2035 and a 35% reduction in Scope-3 emissions by the year 2040	In FY 2023-24, Purchase from MSMEs owned by Women Entrepreneurs increased to **6.65%** from **3.11%.**	GAIL has received **NIL** comments for 15th year in a row from the Comptroller and Auditor General **(CAG)** in FY 2023-24.
GAIL has set a target to attain **1.7 GW** of Renewable Energy by 2030	In FY 2023-24, GAIL's **Customer Satisfaction Index** increased to **91%** from **89%.**	**Moody's** International, Singapore, assigned Long-Term Corporate Issuer Rating of **'Baa3'** with Stable Outlook equivalent to the Sovereign Rating of India.
Recycled **74,000 Kilo Litre** of Wastewater		
Spent **INR 50 Lakhs** on Environmental awareness and employee development		
Zero Liquid Discharge (ZLD) project is under implementation at Pata, UP to reduce fresh water consumption.		
GAIL planted over **1.85 lakh trees** in FY 2023-24		

GAIL sustainability reports are in accordance with the latest version of the International Petroleum Industry Environmental Conservation Association (IPIECA) guidelines, which is a global oil and gas industry association that focuses on environmental and social issues. The reports also follow GRI Sustainability Reporting Standards; Sustainability Accounting Standards Board (SASB); International Sustainability Standards Board (ISSB), National Guidelines on Responsible Business Conduct (NGRBC) principles, American Petroleum Institute (API) guidelines, ISO 26000:2010, United Nations Global Compact (UNGC) (BRSR) requirements, Task Force on Climate-Related Financial Disclosures (TCFD) & SEBI's Business Responsibility and Sustainability Reporting.

GAIL Sustainability reports are assured by an external assurance agency. The sustainability reports are audited as per type 2 moderate-level following the AA1000AS V3 standard. The assurance process includes physical visits at multiple sites, offices, corporate departments and virtual meetings at multiple locations to validate the data provided. GAIL's Sustainability reports may be accessed at GAIL's website: www.gailonline.com.

SEBI Mandated BRR/ BRSR

GAIL has been publishing the Business Responsibility Report (BRR) since FY 2012-13, as a part of the Annual Report detailing the work being carried out in the area of Sustainability. GAIL's BRSR is also assured by an external Assurance Agency. The Assurance Auditor verifies the data received through Sustainability software at various offices and also visits major sites of GAIL to carry out Reasonable Assurance. The Assurance Certificate is provided by the Auditor after incorporation of applicable assurance points in BRSR.

Adoption of GreenCo Ratings

The Green Company Rating System endorses an approach that is based on sustainable performance. The rating system evaluates the ecological aspects of companies based on criteria such as energy efficiency, renewable energy, GHG mitigation, materiality conservation, etc.

GAIL has implemented GreenCo rating across its operational sites which provides leadership and guidance on how to make products, services and operations more sustainable. The Company's internal and external stakeholders are trained on the latest Green concepts so that they can implement better systems and global best practices in their operations.

The following GAIL sites have been accredited with CII GreenCo rating:

- **Platinum Certification:** Dabhol-Bengaluru Pipeline
- **Gold Certification:** Pata Petrochemical Plant
- **Silver Certification:** Vijiapur Gas Processing Plant, Vaghodia Gas Processing Plant, Gandhar Gas Processing Plant, Jhabua Compressor Station and Vizag-Secundrabad Pipeline
- **Bronze:** Chhainsa Compressor Station

ESG Ratings

In 2024, GAIL has been continuously included in the FTSE4Good Index Series as a part of the London Stock Exchange Group Sustainability Index, which demonstrates strong ESG practices in the Oil & Gas Sector. GAIL has also achieved a significant milestone by being upgraded from "C" to "B" level in the CDP Global ESG Rating under Climate Change category.

6. MRPL

- MRPL has set a Net Zero Target year of 2038 and is in the process Development of Net Zero strategy and its implementation plan.
- MRPL has implemented various energy efficiency improvement measures, resulting in a total fuel savings of 35,387 SRFT in FY 2023-24, which equates to a reduction of 112,885 metric tons of CO_2 emissions.
- In renewable energy initiatives, MRPL has installed a solar capacity of 6.06 MW at the refinery complex, 2.5 MW at the aromatic complex, and 0.2 MW at the Desalination unit. In FY 2023-24, MRPL generated 7,890

MWh of solar energy and consumed a total of 16,241 MWh (including imported solar energy).

- MRPL has invested in infrastructure to utilize LNG as a cleaner fuel in the Refinery and aromatic complex, with a capacity to import 0.8 MMSCMD of RLNG. This includes setting up LNG metering skids and associated facilities within the refinery. Natural gas is now used in the Hydrogen Generation Unit and as fuel for Gas turbines in the refinery and aromatic complex. MRPL has converted a 22 MW Gas turbine to run on natural gas, and another Gas Turbine of 37 MW is already designed for natural gas use.
- In the realm of green energy, MRPL is progressing towards establishing a Electrolyzer based Green Hydrogen unit of 500 TPA capacity. MRPL is going forward with procurement of Green Hydrogen on BOO basis under SIGHT-2B scheme of MNRE.
- The company also aims to significantly augment its grid power infrastructure to import renewable power, increasing capacity from 28 MW to 102 MW by 2027-28. This initiative is estimated to save 1,65,321 MTOE and reduce CO_2 emissions by 5,27,373 metric tons.
- MRPL plans to establish a Bio-ATF plant with a capacity of 20 KLPD within the refinery, using feedstocks such as Palm stearin, used Cooking Oil (UCO), and tree-borne oil. This initiative is expected to reduce GHG emissions by about 77%, resulting in a CO_2 reduction of approximately 25,310 tCO_2 per annum compared to mineral ATF production.
- **Sequestration:** 699 acres of Green Belt including afforestation of 75 acres. CO_2 sequestration equivalent to 5,854 tCO_2 per year

Other sustainability initiatives

Water management:

- MRPL has desalination plant of installed capacity 40MLD. In FY 2023-24 utilised 1,04,86,090 m3 of desalinated water.
- MRPL is focusing on reducing fresh water consumption by utilization of Municipal STP water in MRPL operations. In FY 2023-24, company has utilized 60,12,092 m3 of STP water.
- MRPL is collaborating with agricultural university to study the feasibility of using MRPL's treated effluent for gardening.

ESG Performance Highlights of MRPL

Environment	Social	Governance
Energy • Total energy consumed- 71,638,375.41 GJ • Energy intensity: 4.33 GJ/MT of crude processed and 68.10 GJ/INR million turnover • Energy consumed from renewables: 53,682 GJ • Energy savings achieved-14,80,592 GJ through energy conservation and efficiency initiatives	**Workforce** • Total Workforce: 2,548 **Gender diversity** • % of female work force: 10.19% **Differently abled** • % of differently abled: 1.8 % **CSR** • Total CSR spend: ₹ 204.8 million • No. of beneficiaries: Over 18,762 • % of beneficiaries from vulnerable and marginalized groups: 62%	• Zero complaints with regards to conflict of interest in FY 2023-24 • Zero issues related to anti-competitive conduct in FY 2023-24 • Zero charges of bribery/corruption in FY 2023-24
GHG emission • Scope 1: 55,15,578 tCO_2e • Scope 2: 1,53,542 tCO_2e		

Environment	Social	Governance
• Emission intensity: 0.34 tCO_2e/MT of crude processed and 5.39 tCO_2e/INR million turnover • Reduction in GHG emission: 1.35 lakh tCO_2e from RE usage, energy efficiency measures and green belt development.	**Training** • Total training hours of 54,863.5 hours achieved. • Training hours on occupational Health and Safety training: 35% • Total amount spent on training: ₹288 Lakhs • Amount spent on occupational Health and Safety training: 9.07 Lakhs	
Waste management • Total waste generated: 14,445 MT • Waste recovered through re-cycling and re-using: 64.98% • Achieved zero waste to land fill • Waste intensity: 0.00087 MT/MT of crude processed and 0.014 MT/INR million turnover • Reduction of waste intensity: 7.69% in FY 2023-24 compared to FY 2022-23	**Safety** • Lost Time Injury Frequency Rate* (LTIFR)-0.08 per million hours worked	
Water management • Water consumption: 23,976,074 m^3 • Water intensity: 1.45 m^3/Mt of crude processed and 22.79 m^3/INR million turnover • Desalination plant capacity increased to 40 MLD • Utilized 3.6 MGD of municipal STP water • % recycled and re-used: 68.6% • The EPR target of 2,166 MT has been achieved for FY 2023-2024, compared to 1,304 MT for FY 2022-2023.	**Human rights** • Zero incidents of human rights violations **Value chain partners** • 25% of Value chain partners covered under awareness programs • Procurement from MSMEs: 34.20% • Procurement from Scheduled Caste/Scheduled Tribe (SC/ST) MSEs amounted to 0.67%, • Procurement from Women MSEs was 0.81%.	

7. Balmer Lawrie

- Balmer Lawrie's sustainability objectives are seamlessly integrated with its overall business goals and its sustainability roadmap is focussed on protecting the interests of all stakeholders. The Company has been investing in reducing its carbon footprint in its processes and establishments and designing products and solutions for customers to enable them to lower their carbon footprint. It has taken several initiatives to enhance energy management, emission management, water management, waste management, employee health and safety, community development, and corporate governance. Balmer Lawrie began publishing the Business Sustainability and Responsibility Report (BRSR) in Annual Report from last year (i.e FY 2022-23) which is available in the Company's website.
- Balmer Lawrie has taken various initiatives to promote sustainability across its operations; from investing in solar energy to optimising manufacturing processes and water usage. To reduce carbon footprint, its strategies include replacing conventional energy sources with renewable energy sources, adopting energy-efficient manufacturing processes, VFDs (variable frequency drive), motors, lights and buildings and investing in

carbon offset manufacturing processes. In line with the Sustainability Policy, the Company has installed 1,046 KWp Solar Power Plant till date. This helps in reducing the dependency on fossil fuel based energy and offsets our energy requirement using renewable sources of energy. The 4 plants of SBU-Industrial Packaging across India has replaced use of LDO with PNG/LPG.

- Major steps taken to reduce water usage and minimize waste are use of low flow fixtures, water free urinals, recycling wastewater, treatment via effluent plants and implementing rainwater harvesting systems etc. Treatment and disposal of effluents conform to the statutory requirements.
- Balmer Lawrie strictly adheres to the Air emissions norms laid down in the Environment Protection Act, 1986.
- Disposal of hazardous waste is done strictly as per Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016. All plants and major establishments of the Company are certified to environment standards ISO 14001.
- It is constantly focussing on minimising single-use plastics within our organisation.
- It regularly engages with stakeholders to reduce plastic usage for products and explore sustainable alternatives.
- Beside publishing the BRSR, the Company has an ESG Committee with Board of Directors as Members of the Steering Committee.

ESG Performance Highlights of Balmer Lawrie & Co Ltd

Environment	Social	Governance
3.58 % (Out of Total Electricity Consumed) Share of Renewable Energy Generation	**857** Permanent Employees	**65** Vigilance Awareness Sessions
100% for all BL plants and units Energy Efficient Lighting	**₹ 4.41 crore** CSR Spent	**97.00%** Customer Complaints Closed
30 % Percentage of input material sourced sustainably	**1** Reportable Lost Time Injury Frequency Rate (RLTIFR) for permanent employees	**1** Female Director
758.74 MT Plastic Disposal Under Extended Producer Responsibility (EPR)	**21000** Total Number of CSR Beneficiaries	**100 %** Operation Sites assessed for risk related to corruption
422.77 MTCO$_2$e Reduction in **30% Percentage of input material sourced sustainably** GHG Emissions	**CSR on five focus areas which includes** Health and Sanitation Livelihood Skill Development Community Development	All board level committees are constituted as per the applicable provisions of Companies Act 2013, SEBI regulations and DPE Guidelines.
758.74 MT Plastic Disposal Under Extended Producer Responsibility (EPR) **422.77 MTCO$_2$e** Reduction in GHG Emissions	**Committee of Posh** Constituted at Corporate, Regional Levels Corporate Safety Management system is implemented across BLCL to enhance safety culture	Robust Grievance redressal system is available in public domain Public Interest Disclosure & protection of informer resolution (PIDPI) is implemented across Balmer Lawrie & Co Ltd
	More than 12.28% purchases from MSME/MSEs against target of 25%	

8. CPCL

CPCL is committed to Environmental, Social, and Governance (ESG) principles, which are used to assess the company's sustainability and ethical impact. The Business Responsibility and Sustainability Reporting (BRSR) framework, mandated by the Securities and Exchange Board of India (SEBI), guides Indian companies in disclosing their ESG performance.

ESG Performance Highlights of CPCL

Environment	Social	Governance
1) **Award** of honour for excellence in **occupational health, safety and environment** by National Safety Council 2) **Special Award** in the category of **Energy/Carbon Footprint** by Confederation of Indian Industry-Southern Region (CII-SR) 3) Prestigious **Gold Award** for Excellence in EHS **(Environment, Health, and Safety)** by the Confederation of Indian Industry	1) **Mahatma Award 2023 by the Mahatma Foundation** (Aditya Birla Group) for Outstanding CSR activityin Community Development 2) **Certificate of Appreciation awarded by the Ministry of Micro, Small & Medium Enterprises** (category total procurement between ₹ 100 crores to 1,000 crores for FY 2022-23) for highest procurement from Scheduled Castes-Scheduled Tribes owned micro and small enterprises. 3) **Best Human Resource Leader of the Year-2023** awarded by Tamil Nadu Institute of Labour Studies (TILS), Tamil Nadu	Public Interest Disclosure and protection of informer resolution **(PIDPI)** is implemented across CPCL
22 Windmills, 17.6 MW Meeting power requirements of desalination plant **6 KWh Rooftop windmill** Installed at corporate officer	**54.9 million** Safe man hours	**Women Cell** Actively functioning to handle grievances by women employees **POSH** 0 complaints under POSH
2.3 MW Ground mounted and roof top solar panels in buildings and refinery complex	**1,647** Accident-free days	**79% score** In employee satisfaction survey **1.3%** Low employee attrition rate
5.8 MGD Sea Water Desalination Project	**10,920** Man hours training	**Cyber Security Operation Centre** Launched to enhance digital security.
0.22 MT Reduction in CO_2 By increasing RLNG consumption	**₹ 20.11 crores** CSR expenditure	**11 vendor development programs** conducted to support MSMEs, women-owned, and socially backward enterprises.

Environment	Social	Governance
15,000 Trees Planted during past 5 years **176 acre** Established as green belt	**CSR key focuses areas** 1) Health and sanitation 2) Education 3) Environment sustainability 4) Skill development 5) Infrastructure development 6) Community developments	**0 pending investor's complaints** All 947 complaints were resolved **Public Grievance Management** all 18 received grievances for FY 2023-24 were disposed of on time
Zero Discharge For Treated Trade Effluents	**52.05%** MSME Procurement **6.76% procurement** from SC/ST owned enterprises **3.3% procurement** from women-owned enterprises	**Vigilance and Ethical Governance** Observance of Vigilance Awareness Week, promotion of anti-corruption initiatives, and regular training for vigilance officers to ensure transparency and prevent corruption.
2.5 MGD Asia's first City Sewage Reclamation Plant		**The Risk Management Committee (RMC)** oversees risk management plans and policies, focusing on key risks like climate change, cybersecurity, and regulatory compliance.
87.5 Lowest ever Energy Intensity Index		
Zero Freshwater Dependency In process units and reduction in water usage from 7.1 MGD to 6.6 MGD in FY 2023-24		

CPCL publishes an annual Integrated Report that combines financial and non-financial (ESG) information, reflecting a holistic approach to value creation. This report aligns with international standards such as the International Integrated Reporting Council (IIRC) and the Global Reporting Initiative (GRI), ensuring comprehensive and standardized ESG disclosures. The company's sustainability efforts are also linked to the UN Sustainable Development Goals (SDGs), underscoring its contribution to global sustainability objectives.

Furthermore, the report adheres to the Companies Act 2013 requirements, Indian Accounting Standards, and SEBI regulations, ensuring transparency and legal compliance. CPCL's BRSR disclosures undergo independent assurance, enhancing the credibility and reliability of the reported ESG data. The company conducts a materiality assessment to identify and prioritize the most relevant ESG issues for its business and stakeholders, ensuring focused and effective sustainability efforts. CPCL also actively engages with stakeholders, including investors, employees, customers,

and communities, to understand and address their ESG concerns and expectations.

9. OVL

Biodiversity Conservation

- **MECL, Colombia:** To gather real-time data on fauna and flora, it implemented a technology-driven monitoring project withing the dense forest ecosystem. Designated as the Biosensor area, this zone serves as a vital tool for conserving and protecting forest cover while tracking wildlife variations around our oil field. By monitoring indicators of species diversity, it has achieved encouraging results in 2023, particularly with a notable increase in bird populations over the years.
- **CPO-5, Colombia:** ONGC Videsh conducted an awareness program on the local Gallapagasllaneras turtle species at its CPH location in Caburayo Meta, Colombia. Through focused training sessions on species recognition, care and nest identification, all employees gained valuable knowledge about this endangered reptile species. The Gallapagasllaneras, along with all other podocnemis species, is protected under Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 2017). ONGC Videsh is committed to returning all Gallapagasllaneras to their habitat at the CPH location, as directed by environmental authorities.

Environment Protection

As a leading company in Oil & Gas industry, ONGC Videsh limited Succursal Colombiana, has implemented alternate projects for the reduction of Carbon emissions and flare gas. Micro-turbine has been installed for the use of produced gas.

CPO-5 area is using solar energy based photovoltaic based lighting system for some drilling well pads and reducing water consumption with effective treatment and reuse of the same during drilling activities.

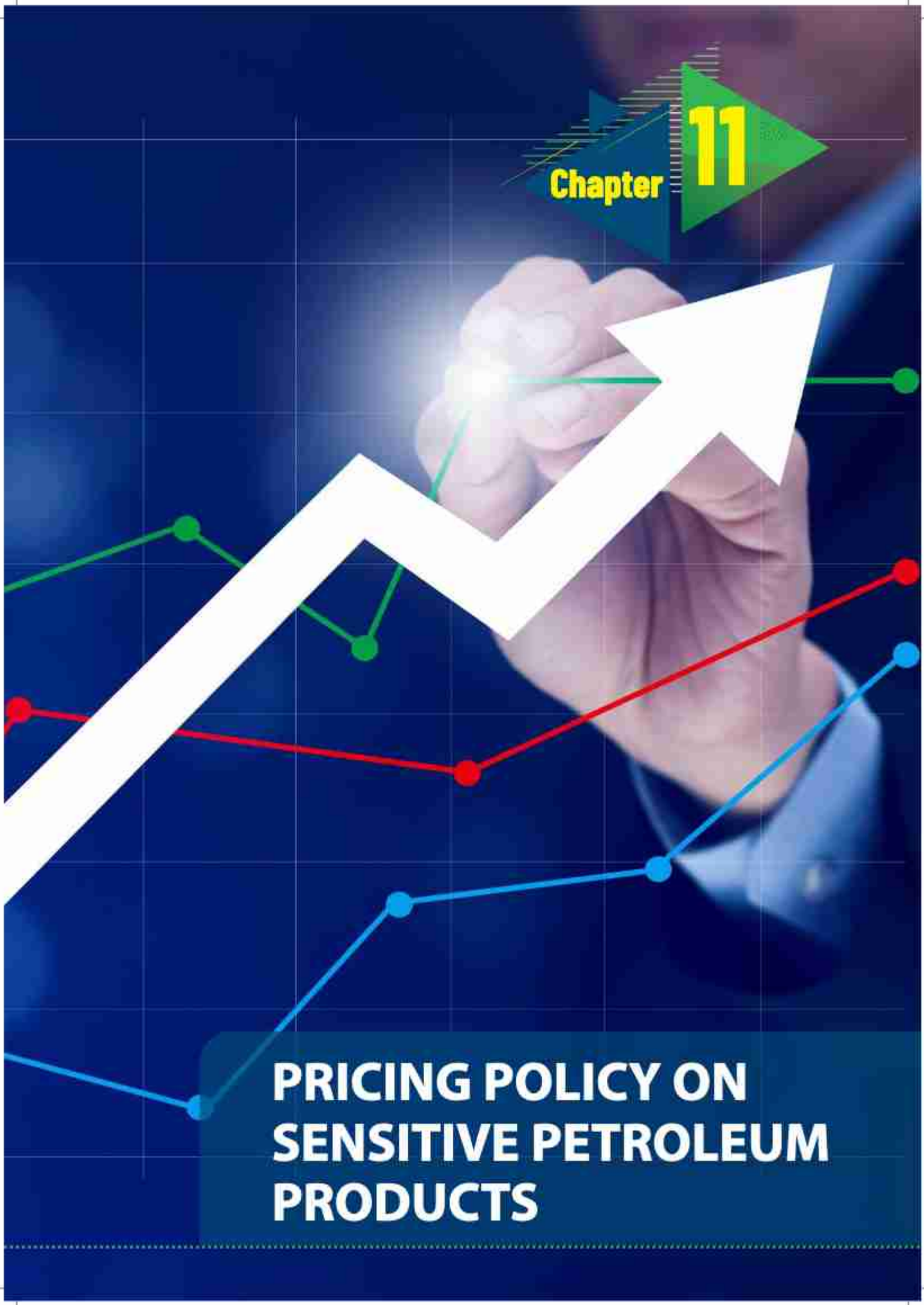
ESG Performance Highlights of ONGC Videsh

Environment	Social	Governance
ONGC Videsh won the **Silver Award** under Public Sector Undertaking category for its project Conservation of Flora and Fauna at Mansarovar Energy Company Limited (MECL), Colombia.	0.07 LTIF for 60.9 millionMan-Hours worked across 16 projects & HQ.	All board level committees headed by Independent Directors.
Total **100%** volume of water recycled and reused at Imperial, Russia	Reportable Lost Time Injury Frequency Rate (RLTIFR) for ONGC Videsh employees	No Customer Complaints
Certificate of HSE Excellence by ARL Sura Colombia for ONGC Videsh operations in CPO-5 Colombia	Medical service to 24,000-30,000 patient a year through CACD primary health care centers around Tharjath Base Camp in Block 5A, South Sudan. Organized Vaccination & ophthalmic camps during the year in South Sudan. Supplied study materials for Schools near Battery 3, Muelle Velásquez, Colombia.	2 Female Directors on Board of ONGC Videsh

Environment	Social	Governance
	around Tharjath Base Camp in Block 5A, South Sudan. Organized Vaccination & ophthalmic camps during the year in South Sudan. Supplied study materials for Schools near Battery 3, Muelle Velásquez, Colombia.	
Monitoring fauna and flora through technology in MECL, Colombia. The variations of wildlife near our operational areas were monitored and the results obtained for 2023 are encouraging since over the years there is an increase in the presence of species in the case of birds.	Committee of POSH Available. Workshops conducted to sensitize employees about POSH.	
Program to spread awareness about local species of turtles being carried out at CPO- 5, Colombia.	Human Right policyframed and published on public domain.	
	Corporate Safety Management system is implemented to enhance safety culture	Board level committee to oversee HSE activities
	5,041 Training manhoursand 20.01average training manhours per employee imparted.	







PRICING POLICY ON SENSITIVE PETROLEUM PRODUCTS

11 Pricing Policy on Sensitive Petroleum Products

Background

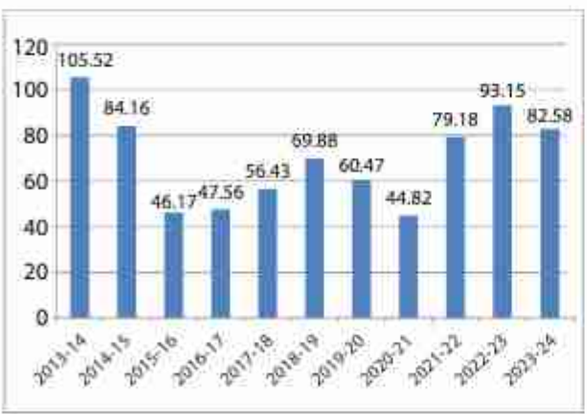
11.1. The pricing of petroleum products was brought under the Administered Price Mechanism (APM) effective July 1975 when the pricing of petroleum products was shifted from import parity principles to cost plus principles. Under APM (1975 to 2002) various oil pool accounts were maintained with the objective to i) ensure stability in selling price; ii) insulate consumers against international price fluctuations; and iii) subsidization of consumer price of certain products like kerosene for public distribution and domestic LPG by cross subsidization from other products like petrol, Aviation Turbine Fuel (ATF) etc.

11.2. Effective 01.04.2002, the APM was dismantled and the Government decided to provide subsidy on sale of PDS kerosene and domestic LPG at specified flat rates. To administer these budgetary subsidies, the Government formulated a 'PDS Kerosene and Domestic LPG Subsidy Scheme, 2002'. Under this scheme, it was decided that these subsidies will be phased out in 3-5 years.

The trend of Indian basket of crude oil during 2013-14 to 2023-24 is given below:

Trend of Crude Oil : Indian Basket

$/bbl



Source: Petroleum Planning and Analysis Cell

Pricing of Crude Oil

Indian basket of crude oil represents the average of crude oil processed by Indian refineries in the ratio of actual processing of sweet crude and sour crude in the immediate preceding year. For sweet crude oil price, the daily Platts assessments for benchmark crude oil "Brent" is considered. For sour crude oil, the average of Platts assessment for benchmark crude oil "Dubai" and "Oman" is considered. During 2020-21, Indian refineries processed 75.62% sour crude and 24.38% sweet crude. Therefore, for 2021-22, Indian basket of crude oil represented the daily price assessment by Platts for benchmark under average of "Dubai" and "Oman" (sour crude) and "Brent" (sweet crude) in the ratio of 75.62:24.38

Domestic crude oil producing companies are also offered international crude oil prices benchmarked to international crude that corresponds to their crude assay. Import of crude oil takes place at international prices.

Natural Gas

The Government has also approved the revised domestic natural gas pricing guidelines vide gazette notification dated 07.04.2023 for gas produced from nomination fields of ONGC/OIL, New Exploration Licensing Policy (NELP) blocks and pre-NELP blocks, where Production Sharing Contract (PSC) provides for Government's approval of prices. The price of such natural gas shall be 10% of the monthly average of Indian Crude Basket and shall be notified on a monthly basis. For the gas produced by ONGC & OIL from their nomination blocks, the Administered Price Mechanism (APM) price shall be subject to a floor and a ceiling of $4.0/MMBTU & $ 6.5/MMBTU respectively. Gas produced from new wells or well interventions in the nomination fields of ONGC & OIL, would be allowed a premium of 20% over the APM price. The reforms have led to significant decrease in prices of Piped Natural Gas (PNG) for households and Compressed Natural Gas (CNG) for transport.

The new pricing guidelines reflect the government's intent to balance consumer interests with the need to stimulate domestic production and are part of a broader strategy to increase the share of Natural Gas in India's energy mix to 15% by 2030.

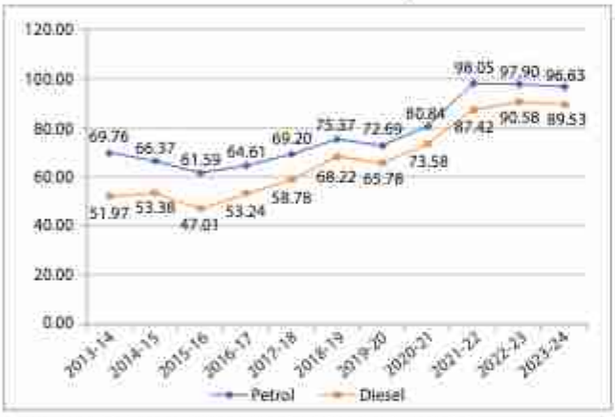
Petrol and Diesel

1. The prices of petrol and diesel are market determined effective from 26th June, 2010 and 19th October, 2014

respectively and since then their prices are being decided by the Public Sector Oil Marketing Companies (OMCs) namely, Indian Oil Corporation Limited, Hindustan Petroleum Corporation Limited and Bharat Petroleum Corporation Limited, in line with the changes in the international market prices and other market conditions.

2. The Public Sector Oil Marketing Companies (OMCs) implemented daily revision of retail selling price of petrol and diesel in the entire country with effect from 16th June, 2017. Daily price revisions of petrol and diesel make the retail prices more reflective of the current market conditions, minimizing the volatility in the retail selling price of petrol and diesel. Also, it leads to increased transparency in the system and enables smoother flow of products from refinery/depots to Retail Outlets.

   The trend of yearly average retail selling prices of petrol and diesel at Delhi since 2013-14 is given below:



Source: Petroleum Planning and Analysis Cell

Domestic LPG

1. In order to insulate the common man from the impact of rise in international oil prices, the Government continues to modulate the effective price to consumer of Domestic LPG (up to cap of 12 cylinders per annum to each household). The prices of non-subsidized Domestic LPG are however determined by the OMCs in line with changes in the international markets.

2. Effective 1st January 2015, the 'PAHAL (DBTL) Scheme 2014' has been implemented in the entire country wherein the subsidy on Domestic LPG is being transferred to the eligible consumers directly to their bank accounts.

   Government is also providing a targeted subsidy of ₹ 300 per 14.2 Kg LPG cylinder for Pradhan Mantri Ujjwala Yojana (PMUY) beneficiaries for upto 12 refills a year. As of 31.03.2024, after a targeted subsidy, the effective cost of domestic LPG for PMUY consumers is ₹ 503 per 14.2 Kg LPG cylinder (in Delhi).

PDS Kerosene

Effective 1st March, 2020 the retail selling price of PDS Kerosene is being maintained at Nil under-recovery level on pan India basis.

Subsidy

The total subsidy/under-recovery on petroleum products and natural gas since 2017-18 is as under:

₹ in crores

Particulars	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24 (P)
Kerosene							
Total Under-recoveries on PDS Kerosene	4,672	5,950	1,833	-	-	-	-
LPG							
Direct Benefit Transfer for LPG (DBTL) subsidy (A)	20,905	31,539	22,726	3,658	242	855	1,227
Pradhan Mantri Ujjwala Yojana (PMUY) subsidy* (B)	2,559	5,670	1,446	76	1,569	6,110	10,217
Pradhan Mantri Garib Kalyan Package (PMGKP) subsidy (C)	-	-	-	8,162	-	-	-
Total Subsidy on Domestic LPG (A+B+C)	**23,464**	**37,209**	**24,172**	**11,896**	**1,811**	**6,965**	**11,444**

*Includes targeted subsidy
Source: Petroleum Planning & Analysis Cell
(P): Provisional
The prices of non-subsidized Domestic LPG are determined by the OMCs themselves in line with changes in the international markets.


AKSHAY
PATRA
IndianOil



Chapter 12

WELFARE OF SCHEDULED CASTES, SCHEDULED TRIBES, OTHER BACKWARD CLASSES AND DIVYANGJAN

12 Welfare of Scheduled Castes, Scheduled Tribes, other Backward Classes and Divyangjan

12.1. The guidelines in respect of reservation for the Scheduled Castes, Scheduled Tribes, Other Backward Classes and Divyangjan issued from time to time by Department of Personnel & Training, Department of Public Enterprises, Ministry of Social Justice & Empowerment and Ministry of Tribal Affairs are being implemented in the Ministry of Petroleum & Natural Gas and the Public Sector Undertakings (PSUs) under the administrative control of this Ministry. The SCT Cell of this Ministry monitors the implementation of reservation policies in the Ministry as well as PSUs and other organizations under the administrative Jurisdiction of this Ministry. The PSUs have also constituted Implementation Cells under the supervision of their Chief Liaison Officers/Liaison Officers to safeguard the interests of SCs, STs, OBCs, EWS, ESM and Persons with the Disability (PWD) employees and to redress their grievances. The Liaison Officers of the PSUs are responsible for ensuring implementation of the Presidential Directives as well as the various orders of the Government of India issued from time to time on the subject. Remedial action on the grievances of the SCs, STs, OBCs, EWS, ESM and PWD employees of PSUs received through Members of Parliament, National Commission for SCs & STs and National Commission for OBCs are taken. The status of appointment of SCs, STs, OBCs, EWS, ESM and PWDs are monitored by the Ministry through report furnished by PSUs.

12.2. In pursuance of the observations of Parliamentary Committee on the Welfare of SCs/STs/OBCs and the Presidential Directives on Reservations for SCs/STs in service, a team lead by the Chief Liaison Officer of this Ministry inspects the Reservation Rosters maintained by the Units of PSUs, annually.

12.3. Various activities have been undertaken by oil and gas PSUs under the Ministry with specific focus on SC/ST/OBC/PwD employees CSR initiatives/schemes have been effectively targeting SC/ST/OBC Community.

12.4. Special Recruitment Drive for Persons with Disabilities (PWDs)

Hon'ble Supreme Court on **28.04.2015** in the Contempt Petition No. 499/2014 in CA No.9096/2013 filed by National Federation of Blind ordered for filling up of posts with Persons with Disabilities. This matter is being monitored by DoPT. 359 posts were identified in Ministry of Petroleum & Natural Gas and PSUs under the administrative control of this Ministry. As on 31.03.2024 the position for the filling up of vacancies for Persons with Disabilities is as under:

S.No.	Step-Wise Details	Posts
1.	No. of posts in the Ministry and Oil PSUs reported to Hon'ble Supreme Court	359
2.	No. of Posts already filled in	326
3.	Remaining posts to be filled up	33

Annexure-I

BACKLOG OF SC/ST/OBC/PWD IN OIL COMPANIES UNDER THE ADMINISTRATIVE CONTROL OF THE MINISTRY AS ON 31.03.2024.

PSU/ MoP&NG	Number of backlog Vacancies in respect of SC, ST, OBC and PWD (Direct Recruitment)															
	Group A				Group B				Group C*				Group D*			
	SC	ST	OBC	PWD	SC	ST	OBC	PWD	SC	ST	OBC	PWD	SC	ST	OBC	PWD
MoP&NG	Not maintained by this Ministry				NIL	NIL	NIL	NIL	0	2	0	0	Not applicable			
CPCL	NIL	NIL	NIL	NIL	NIL	1	NIL	1	1	NIL	2	8	NIL	NIL	NIL	NIL
RGIPT	0	0	1***	0	0	0	0	0	0	1***	1***	0	NA	NA	NA	NA
HPCL	0	0	0	8	--	--	--	--	0	0	0	0	--	--	--	--
IIPE	Presently, no backlog vacancies are existed in IIPE for Direct Recruitment															
MRPL	7	4	11	5	*	*	*	*	-	-	1	3	*	*	*	*
ONGC	36	37	67	22	Not an induction level				31	41	64	85	04	01	09	07
BLL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
BPCL	NIL	5	30	23	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
NRL	0	0	0	0	NA	NA	NA	NA	0	0	0	0	0	0	0	0
IOCL	18	27	42	62	No recruitment done in this group				3	8	14	84	3	2	3	33
OIDB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OIL	1	0	2	1	0	0	0	1	7	6	15	16	N/A	N/A	N/A	N/A
GAIL	19	19	18	28	01	03	01	06	33	24	44	21	-	-	-	-
BCPL	02	0	12	16	0	0	0	0	0	0	0	0	0	0	0	0
EIL	7	1	2	3	-	-	-	1	1	2	-	2	-	-	-	-

RGIPT *** Only admin staff cadre

HPCL * HPCL has no posts classified under Group 'B' & 'D' as the entry in Non-Management grades have been reclassified in Group C'.

MRPL * No direct recruitment in Group B and D at MRPL.

Note: The above backlog vacancies are in induction level where normally recruitments are carried out.

Group A-Out of 7 vacancies in SC, 6 vacancies has already been re-advertised in 2024 and recruitment is in progress.

All 4 ST vacancies has already been re-advertised in 2024 and recruitment is in progress.

Out of 11 vacancies in OBC, 9 vacancies has already been re-advertised in 2024 and recruitment is in progress.

Out of 5 vacancies in PWBD, 3 vacancies has already been re-advertised in 2024 and recruitment is in progress.

Group C-1 vacancy in OBC has already been re-advertised in 2023 and recruitment is in progress.

2 vacancies in PWBD has already been re-advertised in 2023 and recruitment is in progress.

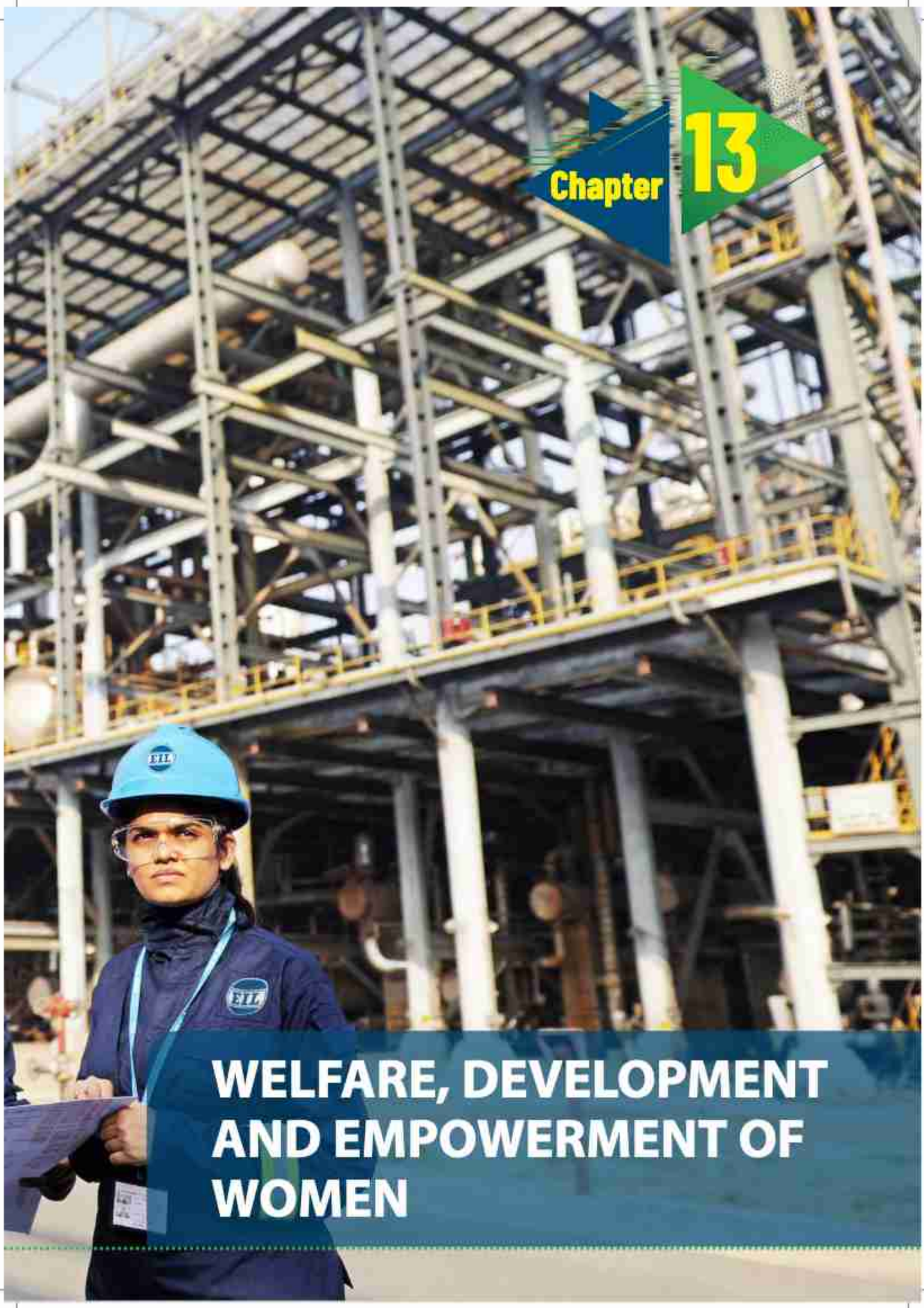
ONGC *** Note:**

(1) There are no backlog vacancies as such in ONGC. However, the vacancies remained unfilled in the previous recruitment exercises are carried forward in the subsequent recruitment exercise.

63 vacancies of Group 'C' & 11 vacancies of Group 'D' are of Andhra Pradesh, which have been held up due to court case since 2014-15.

NRL * NRL has shortfall in reserved vacancies but no backlog. NRL is making all attempts to clear these shortfalls in upcoming recruitment drives.





Chapter 13

WELFARE, DEVELOPMENT AND EMPOWERMENT OF WOMEN

13 Welfare, Development and Empowerment of Women

13.1. Ministry of Petroleum & Natural Gas and Public Sector Undertakings/Organizations under the administrative control of this Ministry have been taking numerous initiatives towards welfare and empowerment of women employees. With a view to deal with gender sensitization and to promote the cause of women empowerment, special programmes are organized focusing on their professional development and welfare activities. These include external and in-house training, programmes on women health, sponsoring them to attend the National Meet of the Forum of Women in Public Sector, etc.

Women Forum has been formed in the PSUs to look after the interest of the women employees. List of Do's and Don'ts prepared by the National Commission for Women circulated for attention of all employees. Committees have been set up for redressal of complaints on 'Sexual harassment at work places.'

Annexure-II

The number of women employees vis-à-vis total number of employees as on 31.03.2024 in the Oil PSUs

Sl. No.	Name of PSUs/MoP&NG	Total No. of Employees	Total No. of Women Employees
1.	MoP&NG	231	56
2.	CPCL	1422	75
3.	RGIPT	107	15
4.	HPCL	8154	847
5.	IIPE	47	5
6.	MRPL	2548	229
7.	ONGC	25847	2043
8.	BLL	863	97
9.	BPCL	8508	674
10.	NRL	1063	82
11.	IOCL	30349	2731
12.	OIDB	12	4
13.	OIL	6492	496
14.	GAIL	5038	344
15.	BCPL	625	53
16.	EIL	2646	307

13.2. In line with the guidelines laid down by Hon'ble Supreme Court in the Case of Vishakha v/s State of Rajasthan and orders issued by Department of Personnel & Training/Ministry of Women & Child Development, an Internal Complaint Committee (Women Cell) is constituted in the Ministry for prevention and redressal of complaints of sexual harassment of working women. Presently Smt. Sujata Sharma, Joint Secretary, MoP&NG is the chairperson of the committee with four other members, including one member from NGO. The Committee holds its meetings on regular intervals.

A Flagship CSR Initiative of Indian Oil Corporation Limited

IndianOil Stree Shakti

অসম অইল কলেজ অব নার্ছিং & অসম অইল স্কুল অব ন

असम ऑयल कॉलेज ऑफ नर्सिंग & असम ऑयल स्कूल ऑफ

Assam Oil College of Nursing & Assam Oil School

Digboi, Assam - 786171

Established in 1986

B.Sc. (N) Course affiliated to Srimanta Sankardeva University of Health Sciences, Guwahati. | Recognised by A





IndianOil





GAIL (India) Limited







ऑयल इंडिया लिमिटेड
(भारत सरकार का उद्यम)
Oil India Limited
(A Government of India Enterprise)



A Navratna Company

Chapter 14

UNDERTAKINGS/ ORGANIZATIONS

14 Undertakings/Organizations

14.1. MAHARATNA COMPANY

14.1.1. IndianOil Corporation Limited (IOCL)



IndianOil is a diversified, integrated energy major with a presence in almost all the streams of oil, gas, petrochemicals and alternative energy sources. The Brand IndianOil leverages high calibre people and state-of-the-art technologies to tap all forms of energy responsibly and delivering them to the consumers affordably. It is India's highest rank Energy PSU in Fortune Global 500 - 2023 list (Rank 94).

IndianOil's business interests encompass the entire hydrocarbon value chain from refining, pipeline transportation & marketing to exploration & production of crude oil & gas, petrochemicals, gas marketing, alternative energy sources and globalisation of downstream & upstream operations. The brand's global aspirations are fulfilled through IndianOil's business forays in Sri Lanka, Mauritius, the UAE, and other countries.

14.1.1.1. Financial Performance:

Indian Oil's turnover (Revenue from Operations) decreased by 7% (₹ 68,608 crore) to ₹ 8,66,345 crore during April 2023-March 2024 from ₹ 9,34,953 crore during April 2022-March 2023. During April 2023-March 2024, IndianOil registered a Net Profi t of ₹ 39,619 crore as compared to ₹ 8,242 crore during April 2022-March 2023 mainly on account of higher marketing margin during current period. GRM stood at US$12.05/bbl during April 2023-March 2024 as against US$ 19.52/bbl during April 2022-March 2023.

14.1.1.2. Contribution to Exchequer:

Over the years, IndianOil has been the largest contributor to the Government exchequer in the form of duties, taxes, and dividend. During April 2023-March 2024, ₹ 2,41,629 crore was paid to the exchequer as against ₹ 2,40,185 crore paid during April 2022-March 2023. An amount of ₹ 1,21,171 crore was paid to the Central Exchequer and ₹ 1,20,458 crore to the States Exchequer during April 23-March 2024 compared to ₹ 1,16,271 crore and ₹ 1,23,914 crore paid during April 2022-March 2023, respectively.

14.1.1.3. Refinery Performance:

IOCL refineries have cumulatively processed highest ever crude of 73.3 MMT and highest ever Naphtha of 3.1 MMT in FY 2023-24 as compared to 72.4 MMT of Crude and 2.1 MMT of Naphtha in last FY 2022-23. Distillate yield of IOCL refineries, also improved from 78.7% in FY 2022-23 to 79.3% in FY 2023-24.

With respect to Operational Availability(OA), IOCL stand at 97.3% in FY 2023-24 (last year 98.1%) and as regards Specific Energy Consumption (MBN) (Lower MBN indicates higher energy efficiency), IOCL refineries have achieved 68.9 MBN in FY 2023-24 as compared to 68.0 MBN in FY 2022-23.

The 'Atmanirbhar Bharat' initiative is further exemplified by the launch of marquee products and plant commissioning. Notable launches include India's first Reference Gasoline (E10, E20) and Diesel Fuel (B7) for vehicle testing and calibration, Non-Ethanol XP100, and Storm-FIM compliant Cat 2 Fuel, catering to the Asian Road Racing Championship. IndianOil is among the 3 companies in the world to manufacture Reference Fuel.

14.1.1.4. Pipeline Performance:

During the FY 2023-24, the crude oil pipelines achieved a throughput of 51.8 MMT as against 53.4 MMT during FY 2022-23, and product pipelines achieved a throughput of 44.0 MMT in FY 2023-24 as against 41.7 MMT during FY 2022-23. Further, gas pipelines achieved throughput of 3,717 MMSCM in FY 2023-24 as against 3,077 MMSCM during FY 2022-23.

With addition of 2,180 km to the cross-country network during the FY 2023-24, IndianOil continued to expand its pipeline network and crossed yet another milestone of 19,744 km with a combined throughput capacity of 124.4 Million Tonnes per annum for crude oil & product pipelines and 48.73 MMSCMD for gas pipelines.

14.1.1.5. Marketing Performance:

Domestic POL sale of 87.32 MMT (Excluding CNG & LNG & Including Own use) was registered during the year 2023-24 as against 87.16 MMT registered in the previous year 2022-23 for the same period.

IndianOil served around 2.85 crore customers daily at its retail outlets and delivered more than 22 Lakhs domestic LPG cylinders per day during FY 2023-24 fulfil the energy requirement of India. During the FY 2023-24, IndianOil commissioned 1,260 retail outlets (ROs), which is the highest among any OMCs. To promote new age fueling trends, IndianOil has also commissioned 26 Door-to-door delivery mobile dispensers for diesel during the FY 2023-24 taking total numbers to 1,187.

As on 31st March 2024, XtraGreen diesel product being sold through 6,948 ROs Pan India. India's first super premium petrol XP100, with an octane value of 100 is being sold through 201 ROs across 98 cities. Also, XP95 (95 Octane Premium Petrol) is being sold through 11,243 ROs Pan India.

To promote alternative fuels, IndianOil added 322 new CNG, 40 Compressed Biogas (CBG), 3,500 electric vehicle (EV) charging and 12 battery swapping stations during the FY 2023-24. IndianOil is currently operating 2,110 CNG, 85 CBG, 8,598 EV charging and 87 battery swapping stations in the country.

IndianOil achieved the total LPG sale of 14.1MMT during the FY 2023-24 and released more than 54.0 lakhs new LPG connections including around 37.5 lakhs under UJJWALA 2.0 scheme. To improve customer reach and customer satisfaction in services, IndianOil commissioned 44 new LPG distributorships, taking their total number to 12,880 as on 31.03.2024. "Chhotu" [5 KG Free Trade LPG (FTL) Cylinder], has registered a growth of 53.8% during FY 2023-24 with a sale of more than 50 lakh cylinders. Further, during FY 2023-24, more than 4.5 lakh Indane composite cylinders were also marketed to customers which were launched in 5 kg and 10 kg units to offer a new-age and lightweight LPG cylinder to customers.

In the aviation sector too, IndianOil maintained its leadership position with a market share of 58% by selling 4.8 MMT during the FY 2023-24. IndianOil commissioned one New AFS at Ayodhya during the year, taking the total number of AFS set up in the country by IndianOil to 129 as on 31.03.2024.

14.1.1.6. Research and Development (R&D)

IndianOil R&D spearheads self-reliance by developing domestic technologies, reducing import dependence, and shaping a sustainable future. The achievements of R&D in FY 2023-24 include commissioning a Catalyst Manufacturing Plant at Panipat Refinery and enabling domestic production of niche products like Reference Gasoline and premium Racing Fuel 'STORM' replacing imports. Moving further in its Atmanirbhar Bharat focus, for the first time 2,711 km oil pipelines inspected using in-house developed inspection gauges. Also, >125 lube formulation released and >45 OEM approvals obtained during the year. Demonstrating environmental commitment, IndianOil R&D successfully piloted an enzyme-assisted CO_2 capture technology 'eCO_2Sorb' for enhanced energy efficiency. Leading the green charge, first green hydrogen fuel cell bus was inaugurated as part of project spearheaded by R&D

Centre. Nurturing innovation, IndianOil Startup Scheme, currently incubating 36 projects yielding over 75 IPRs, is further expanded with selection of 6 more startups through another open innovation round. Strengthened by a robust patent portfolio of 1,736 filed and 1,636 effective patents, IndianOil R&D has been moving ahead strengthening core value of innovation and Nation First while working in emerging fields like nanotechnology, solar, bioenergy, and hydrogen fuel cells with existing research and planning facilities as fast upcoming New Energy Campus in Faridabad for a sustainable tomorrow.

14.1.1.7. Petrochemical Performance:

IndianOil is the 2nd largest petrochemicals player in the country offering Polymers (Polyethylene & Polypropylene), Linear Alkyl Benzene (LAB), Purified Terephthalic Acid (PTA), Glycols and Butadiene. The brand, PROPEL, is a leading brand in the Indian petrochemicals market.

During the year 2023-24, Petrochemical sales, including exports, was 2.9 MMT, the highest ever by IndianOil, as against 2.1 MMT in 2022-23.

The product basket was expanded with the introduction of two new niche PPCP grades 2,300 MX & 5,300 MN at Panipat and a random co-polymer 2,120 MC at Paradip. In a breakthrough, PE 100 Orange & black compound approval received for mandatory MRS 10 rating from reputed and recognized international testing laboratory-Element, Sweden. This would enable IndianOil to roll out PE Orange compounds for CGD gas transportation, thereby shall become first-ever domestic producer in India introducing the material for imports substitution.

14.1.1.8. Natural Gas:

IndianOil clocked sales (Including internal consumption) of 6.5 MMT in 2023-24 as against 4.4 MMT in 2022-23. The increase in sale is due to addition supplies of HPHT Gas to Customer & refineries. IndianOil has added 10 new industrial customers as on 31st March 2024. Sale through IndianOil 'LNG at Doorstep' has recorded highest ever sale of 150.7 TMT during the FY 2023-24 against 66.8 TMT during FY 2022-23. During the year FY 2023-24, 33 LNG cargoes were imported, out of which 18 were spot cargoes, while 15 were against long term contracts.

14.1.1.9. City Gas Distribution (CGD)

IndianOil has significant contribution in moving towards gas-based economy. Along with JVCs, IndianOil has authorization of total of 49 GAs comprising of 114 districts establishing itself as one of the largest CGD company of the country with highest number of GAs among OMCs.

14.1.1.10. Exploration & Production:

IndianOil continues to explore opportunities in the E&P sphere through Participating Interests (PI), joint ventures and other alliances. At present, the upstream portfolio tally stands at 18 domestic & 11 overseas assets, of which 8 assets are producing (1 domestic and 7 overseas). Apart from the producing assets, 6 assets are under development, 4 assets have discovery, 1 asset is under appraisal and 10 assets are under exploration.

During the FY 2023-24, IndianOil's share of production from its producing assets has been 4.2 MMT of oil equivalent (MMtoe) as compared to 4.3 MMToe during the 2022-23.

During the FY 2023-24, IndianOil's domestic acreage area was fortified upon becoming successful in acquiring 100% stake in Mercator Petroleum Limited (MPL) through the Corporate Insolvency Resolution Process run by National Company Law Tribunal.

14.1.1.11. Alternative Energy:

IndianOil is steadily progressing towards harnessing renewable energy to minimize carbon emissions for a green economy. IndianOil has an installed capacity of 246.94 MW of renewable energy, comprising 167.60 MW wind power capacity and 79.34 MW solar energy capacity as on 31.03.2024. IndianOil has achieved highest-ever renewable power generation of 401.5 million units during FY 2023-24, leading to mitigation of 368.98 thousand metric tonnes of carbon dioxide equivalent emissions.

As on 31.03.2024, IndianOil has solarized 31,647 Nos. retail outlets with a cumulative solar power installed capacity of ~165.3 MW. Also, Highest ever retail outlet Solarization achieved in FY 2023-24 is 10,655 Nos. with capacity of ~41.91 MW. This led to a generation of approx. 212.15 GWh during FY 2023-24 leading to mitigation of 194.97 thousand metric tonnes of carbon-dioxide equivalent ($TMTCO_2e$) emission.

IndianOil is the lead implementation agency of SATAT (Sustainable Alternative Towards Affordable Transportation). IndianOil has been issuing Letters of Intent (LOIs) for the production and supply of Compressed Biogas (CBG) from time to time and as of 31.03.2024, IndianOil has 1,596 active Letters of Intent (LOIs) under SATAT initiative. During the FY 2023-24, 8 CBG Plants have been commissioned taking the tally of CBG commissioned plants to 31. CBG is being marketed through 85 Retail Outlets and to 2 Industrial Consumers. The CBG produced is being retailed trough IndianOil's Retail Outlets under brand name 'IndiGreen'. In FY 2023-24, IndianOil sold ~7.8 thousand metric tons (TMT) of CBG and the cumulative sale since inception (September 2019) has crossed 18.8 TMT.

A 200 Tonnes Per Day (TPD) mixed waste (paddy straw, press-mud & cattle dung) based CBG plant has been set up in Gorakhpur providing an eco-friendly solution for paddy straw disposal using in-house technology developed by IndianOil R&D Centre. The Plant has capacity to process 70 TMT paddy straw and 3.5 TMT Cattle dung annually. The Plant was inaugurated by Hon'ble Chief Minister GoUP and Hon'ble Minister P&NG and H&UA on 8th March 2024.

14.1.1.12. Sustainable Development:

In 2023, Bloomberg ranked IndianOil as the top Indian company in its NEF Global Ranking, which recognizes commitment to a sustainable future.

IndianOil was ranked no.1 in Dow Jones Sustainability Index (DJSI) in 2023 among companies of Oil and Gas sector in India.

A Cyclothon event was organized by IndianOil as part of the World Environment Day 2023 celebrations. The event was attended by the officials from the Ministry, and CMDs/senior officers of various Oil & Gas PSUs.

14.1.1.13. Green Energy:

IndianOil is engaged in strategic partnerships with esteemed global technology pioneers such as M/s LanzaJet Inc, USA and M/s Praj Industries Limited, India, aiming to establish Sustainable Aviation Fuel (SAF) facilities in India. IndianOil is setting up of 86.8 TMTPA SAF Plant at Panipat based on LanzaJet ATJ technology. BDEP works have commenced in November 2023 & PMC has been lined up in February 2024. In addition, IndianOil entered into a Term Sheet with Praj Industries on 6th July 2023, for formation of 50:50 Joint Venture Company (JVC) in India for setting up of SAF and other Biofuel plants comprising Ethanol, CBG, Biodiesel, Bio-bitumen, etc.

14.1.2. Oil and Natural Gas Corporation Limited (ONGC)



Oil and Natural Gas Corporation Limited (ONGC) was incorporated on 23.06.1993 with the objective to transform the statutory commission namely Oil and Natural Gas Commission into a Public Sector Company, through an Act of Parliament and to take over the business of the commission w.e.f. 01.02.1994. ONGC is a global Energy company integrated in the entire energy value-chain. ONGC is a Schedule-'A', listed Maharatna CPSE in E&P sector under the

administrative control of Ministry of Petroleum and Natural Gas, which holds 58.89% of its shareholding.

14.1.2.1. Major highlights/initiatives for the year 2023-24

- Oil production commences from KG-DWN-98/2 block: ONGC monetized two nos. of discoveries i.e. KG-DWN-98/2–M-1(Padmawati) and KG-DWN-98/2–M-3 and successfully commenced "First Oil" from 'M' field of the deep-water KG-DWN-98/2 Block, situated off the coast of Bay of Bengal on 7th January 2024.
- Marking a historic achievement in India's energy sector, Hon'ble Prime Minister Shri Narendra Modi flagged off the 'First Crude Oil' tanker 'Swarna Sindhu' from ONGC's Krishna Godavari deepwater block on 2nd March 2024. At its peak production, this project will add 7 percent each to India's oil and gas production.
- The Hon'ble Prime Minister dedicated ONGC Sea Survival Centre to the nation on 6th February 2024 during India Energy Week (IEW) 2024. The Centre located at the ONGC Advanced Training Institute in IPSHEM, Goa has emerged as a pioneering institution aimed at advancing the nation's sea survival training ecosystem to global standards.
- ONGC incorporated a wholly owned subsidiary, ONGC Green, on 27th February 2024. In the future, ONGC Green will be venturing into the various segments of the energy industry value chain. This will include renewable energy sources, biofuels and biogas, as well as green hydrogen and its derivatives like green ammonia and green methanol and other low carbon energy sources.
- Navratna company ONGC Videsh Ltd (OVL) incorporated a wholly owned subsidiary, Overseas IFSC Ltd. (OOIL) in GIFT City, Gujarat, which will function as the Global Treasury Centre to cater to the treasury activities of OVL and its 25 subsidiaries (including step-down subsidiaries) spread across 15 countries.
- ONGC accomplished a historic feat in the fiscal year 2023-24 by drilling a record-breaking 541 wells, marking the highest number achieved in over three decades. Drilling Services successfully drilled 103 exploratory wells and 438 development cum side track wells. The fiscal year witnessed the attainment of the highest-ever cycle speed, reaching ~1042M/RM, reflecting efficiency and operational excellence.
- ONGC Mumbai High celebrated 50 years of successful completion in February 2024.
- **Highest-ever premium realized for sale of naphtha produced from Rajahmundry's Tatipaka Refinery:** On conclusion of the new sale tender, the realization in terms of premium for sale of Naphtha has improved by 2.8 times, over the discounted sale to HPCL, without leading to any containment issue at Tatipaka Refinery.
- **Historic settlement between ONGC, British Gas and Reliance:** A tripartite agreement between ONGC and Panna Mukta Tapti Joint Venture Partners i.e. British Gas Exploration & Production India Limited (BGEPIL) and Reliance India Limited (RIL) signed on 17th April 2023, will resolve long-pending issue related to Gas transportation charges.
- **MoU with IOCL to explore downstream opportunities in petrochemicals:** ONGC signed a MoU with Indian Oil Corporation Limited (IOCL) in New Delhi on 14th June 2023 to jointly search for global opportunities to enhance value creation from exports of refining and petrochemical yields. Both the companies aim to harness

possibilities for collaboration in oil to chemicals and/or niche products through Greenfield projects and acquisitions.

- **Hook up Agreements with IGGL for Gas monetization in NE Region:** ONGC as a promoter of a joint venture (JV), i.e, Indradhanush Gas Grid Limited (IGGL) alongside IOCL, GAIL, OIL & NRL, signed three'Hook up Agreements'with IGGL on 11th July 2023 to connect ONGC fields with North East Gas Grid (NEGG) for facilitating the delivery of gas from ONGC's upstream facilities to IGGL Network at identified 9 Source points located in Jorhat, Silchar and Tripura Assets.
- The central public sector undertakings (PSUs) under the MoP&NG, Government of India, including BPCL, GAIL, HPCL, IOC and ONGC, signed a historic memorandum of understanding (MoU) on 19th June 2023 in the presence of MoP&NG officials for crossing permission of pipelines.

14.1..2.2. Exploration

- During the year 2023-24, ONGC acquired 971.81 LKM of 2D, 8,588 SKM of 3D seismic data and drilled 103 exploratory wells, made 11 new Hydrocarbon discoveries (6 Oil and 5 Gas). Also, monetized 7 discoveries which includes 3 discoveries of FY 2023-24 itself.
- During FY 2023-24, ONGC signed 7 Revenue Sharing Contracts (RSC) under OALP Bid Round-VIII. Out of the seven contracts, six are for Offshore OALP Blocks and one for Onland OALP Block (Cambay Onland). ONGC submitted Expression of Interest (EOIs) for around 2.17 Lakhs sq. km. area covering onland and offshore sectors. New basins targeted for EOI submission are Karewa, Pranhita Godavari etc.
- Two significant Gas discoveries namely "Utkal" & "Konark" in Mahanadi OALP Block of Round-III (MN-DWHP-2018/1) where gas flowed @ more than 3.0 lakhs m^3/day & 4.5 lakhs m^3/day respectively . These discoveries in Pliocene have imbibed new hopes in Mahanadi Offshore area.
- Gas discovery in well TLM#3 in Tulamura area of Tripura where gas flowed from sub-thrust part of middle Bhuban Fm @ around 85,000 m^3/day which is likely to open up sub-thrust exploration in and around the corridor. Further, discovery in East Lakhibari-6 of Assam Shelf has imbibed hope for more concerted exploration for Gondowana play.
- Under Global Outreach initiatives, ONGC signed MoUs with a number of reputed E&P Majors like Chevron, Total Energies, ExxoMobil etc. Technical studies, as per the terms and conditions of MoU are in progress for different sedimentary basin area by these global majors

14.1.2.3. Production Initiatives:

- **Bassein & Satellite (B&S) Asset reverses trend:** NBP field oil production from non-scheme wells reached one of its peak production in recent times. Oil production increased from 18,000 BOPD to 20,010 BOPD after drilling and completion of four wells Mandapeta Field of Rajahmundry Asset crosses 1.0 MMSCMD gas production mark on 5th October 2023, the highest-ever since inception of the field in 1994, through reservoir characterization & proper well placement, high-volume fracking and timely augmentation of production facilities.
- **Successful pigging operation for entire 10" trunk line segment at Cambay Asset:** The initial pigging operation for the entire 10-inch trunk line segment spanning about 65 kilometers at Cambay Asset has been successfully conducted. This pipeline facilitates the transfer of produced crude

oil from Akholjuni, Kathana, and Padra GGS to the tee-off point at Laxmipura for subsequent processing at the KT refinery.

- **Nagayalanka Phase-II**

  Redevelopment: Rajahmundry Asset achieved highest-ever oil production of 245 M^3/d after completion of Phase-II Field Development of Nagayalanka Field with the drilling followed multi-stage high tonnage hydro fracturing jobs in three new development locations and putting them on production.

14.1.2.4. Drilling Initiatives:

- **Side-track, recompletion of Subsea Well VADA:** The side-tracking of the Vada well was carried out with a DP rig based on the report prepared jointly by IRS, IOGPT and DW Mumbai creating a success story of multifarious collaboration, technology induction and deepwater operational excellence.
- Drilling has been started in an area that was earlier classified as a 'no-go' area because of national security interests and two discoveries made in the Mahanadi Block MN-DWHP-2018/1 named Utkal and Konark in water depth of 714 m and 1,110 m respectively.
- ONGC achieved the feat of servicing highest ever wells in a financial year through work over jobs (2110 jobs) and at the same time achieved the highest ever work over index of 28.30 during FY 2023-24.
- A record number of 13,276 well stimulation jobs were carried out which is the highest ever stimulation jobs since inception.
- Well Service EOA successfully revived the production from sub-sea well U-1-B of KG-DWN-98/2 field through well intervention.

14.1.2.5. Technical Services Initiatives:

- **ONGC introduced Asset exchange program for improving equipment availability:** First gas turbine engine installed under the Asset Exchange Policy in Booster Compressor-4 at BPA-Platform of B&S Asset on 9th January 2024.
- **Corporate Visualization Center 'DARPAN' inaugurated:** Hon'ble Minister of Petroleum & Natural Gas and Housing & Urban Affairs inaugurated state-of-the-art digital Corporate Visualization Center, 'ONGC DARPAN', in DUB New Delhi which will enable monitoring of the oil and gas wells and drilling units (including offshore) centrally on a real-time basis.
- **ONGC leverages digital power for B2B integration:** In a major step towards e-governance and ease of doing business, ONGC as first beneficiary of National E-Governance Services Ltd. (NeSL) implemented B2B integration with NeSL for Electronic Bank Guarantees (eBG). In the eBG process, the Digital Document Execution (DDE) platform of NeSL is used for issuance, amendments, and various life cycle stages of bank guarantee.
- **Solar power plant commissioned:** ONGC successfully commissioned a pilot project of 200KW ground-mounted solar power plant at Narimanam-GGS, Cauvery Asset. Additionally, power wheeling also enabled as per new provisions of TN Govt policy.
- **First-ever Cyclic Steam Stimulation completed in Well #LWKI:** ONGC Mehsana, Cementing Services, accomplished the cementation task for the initial well of the Cyclic Steam Stimulation (CSS) project, utilizing HGS-based cement slurry in collaboration with IDT.

- **ONGC connects the Panna Process Platform to its vast network of subsea pipelines:** The Job comprised of laying 2 segments of 37.50 kms of submarine pipeline and installation of 3 MOL (Main Oil Line) and 3 booster pumps besides other items. Commissioning of the PANNA segment brought savings in terms of tanker hiring cost, loss of production during tanker changeovers & demurring of a tanker during bad weather.
- **ONGC developed Next-gen Acidizing Formulation 'SPRAS' for Stimulation of Western Offshore Carbonate Reservoirs:** To overcome the challenges faced by using Hydrochloric acid (HCl) in matrix stimulation in carbonate reservoirs, IPEOT has developed a novel formulation i.e. Single Phase Retarded Acid System (SPRAS) which slows down the rate of reaction by using retarding surfactants and completely eliminates the use of diesel.
- MoU with SJVN Green Energy Limited (SGEL) to collaborate in areas of renewable energy, hydropower & pump storage hydro project development plan in India.
- MoU with NTPC Green Energy Limited (NGEL) to realize renewable energy objectives towards energy transition with prime objective of exploring the feasibility and setting up of Renewable Energy Projects in various domains.
- **Joint Venture Agreement (JVA) with NTPC Green:** During IEW 2024, ONGC and NGEL signed a JVA to develop renewable energy projects focusing on offshore wind.
- **Cooperation Agreement to Detect and Measure Methane Emissions:** During the India Energy Week 2024, ONGC entered into an Agreement with Total Energies to carry out methane emissions detection and measurement campaigns.
- MoU with Iceland Geo-Survey (ÍSOR) in New Delhi on 7th June 2023 for Exploration and Development of geothermal energy in India.
- Implemented Real Time Monitoring System for SRP-PCP (Sucker Rod Pump-Progressive Cavity Pump) wells which is currently able to capture Electrical and Energy Parameters which has helped in identification of SRP-PCP surface unit abnormalities along with down hole problems and helped in reducing the response time for rectification after breakdown and early troubleshooting, thereby reducing downtime hours.
- **Solar and Wind energy initiatives:** The total installed capacity of renewable energy as on 31st March 2024 was about 192.8 MW (Solar: 39.8 MW and Wind: 153 MW)

14.1.2.6. Major Awards & Recognitions:

- Forbes 2000 list 2023: Forbes has ranked ONGC 5th largest in India and 226th worldwide in Global 2000 list based on sales, profit, assets and market value.
- ONGC ranked 158th globally and 4th in India in Fortune Global 500 list 2023.
- ONGC ranked 14th in S&P Global Commodity Insights Top 250 Global Energy Company Rankings 2022.
- The Hon'ble Vice-President of India presented the SCOPE Eminence Awards 2019-20 to ONGC for commendable achievements in Environmental Excellence & Sustainable Development on 18th January 2024.
- ONGC was conferred with the prestigious Golden Peacock Award 2023 for Corporate Governance by the Institute of Directors (IOD) on 17th October 2023.
- ONGC won the Best Maharatna Award and the Crude Oil (Central PSUs) Award at the Dun & Bradstreet PSU & Government Summit 2023 for its unwavering commitment to excellence

and innovation, while acknowledging its leadership in the energy sector.

- ONGC has been conferred with the prestigious 'Award for Excellence in Financial Reporting for the financial year 2022-23,' in the PSU category by the Institute of Chartered Accountants of India (ICAI) on 13th January 2024.
- On 16th February 2023, ONGC conferred with Governance Now 9th PSU Award for its contributions to nation-building & Corporate Communications Team received Award for its outstanding Communication Outreach.
- On 25th March 2023, ONGC received Green Ribbon Champions Award for biodiversity conservation by CNBC, Network 18 Group, in recognition of its commitment to sustainability and consistent efforts in protecting biodiversity surrounding its operational areas.
- ONGC received Gold Award in Risk Management Category by Grow Care India on 03rd April 2023, for recognizing the effectiveness of established Risk Management Process in the governance structure during FY 2022-23.
- ONGC was awarded for being the 'Leading Alternative Dispute Resolution (ADR) User 2023, on behalf of its contributions to ADR by the Asia Pacific Center for Arbitration and Conciliation (APCAM) at its first International ADR Summit in New Delhi during 6-7 May 2023.
- ONGC Director (Finance) Ms. Pomila Jaspal was awarded as "Best Woman CFO 2023 (Large Cap)" by Dalal Street Investment Journal in recognition of her outstanding leadership and ONGC's stellar performance in finance on 12th September 2023.
- ONGC was conferred with the prestigious international Asian Oil and Gas Award for exceptional 'Offshore Initiative of the Year-India' based on a study carried out by the Institute of Production Engineering and Ocean Technology (IPEOT) in Cluster-7 & 8 field of MH asset on 17th November 2023.
- Institute of Drilling Technology (IDT) has been honored with Annual Greentech Environment Awards 2023 in two categories-Innovative Technology Adoption and Eco-Friendly Products at the 23rd Annual Greentech Environment Awards 2023 on 24th November, 2023.



14.1.2.7. Institute of Drilling Technology (IDT) has clinched the prestigious "Business World Recycling for Greener Tomorrow Awards 2024" in the Team of the Year category for IDT's outstanding contributions to the recycling and waste management domain on 30th January 2024.

Financial Performance (ONGC)

₹/crores

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Total Income	1,09,655	96,214	68,141	1,10,345	1,55,517	1,38,402
Net Profit/ Loss	26,765	13,464	11,246	40,306	40,097*	40,526
Plan Outlay-Actual	29,450	29,538	26,859	27,741	30,208	37,494
Plan Target	32,077	32,921	32,502	29,800	29,950	30,125

14.1.3. GAIL (India) Limited



GAIL (India) Ltd. was incorporated in August, 1984 as a Central Public Sector Undertaking (PSU) under the Ministry of Petroleum & Natural Gas (MoP&NG), with the mission of "accelerating and optimizing the effective and economic use of Natural Gas and its fractions for the benefit of the national economy".

GAIL became a Navratna in 1997 and is now one of the thirteen Maharatna Public Sector Undertaking, the highest status conferred to any PSU. GAIL's businesses consist of transmission and marketing of Natural Gas and GAIL is also involved in transmission of LPG, manufacturing of Petrochemicals and Liquid Hydrocarbon. GAIL started as a Gas Transmission Company during the late eighties and has grown organically by setting up a large network of Natural Gas pipelines of ~16,240 km; two LPG Pipeline systems of ~2040 km; five Gas Processing plants for production of LPG and other liquid hydrocarbons with a combined production capacity of around 1.4 MMTPA and a gas based integrated petrochemical plant of capacity 810 KTPA of polymer. GAIL is co-promoter of two other petrochemical projects including 280 KTPA Brahmaputra Cracker and Polymer Limited (BCPL) Complex in Assam and 1.4 MMTPA ONGC Petro-additions Limited (OPaL) project in Gujarat. Petronet LNG (a JV of GAIL) operates two LNG regasification terminals at Dahej & Kochi.

GAIL is also the promoter of Konkan LNG Limited which operates LNG regasification terminal at Dabhol with design capacity of 5 MMTPA. Further GAIL has 14.72% equity stake in Ramagundam Fertilizer and Chemicals Ltd. (RFCL) incorporated along with NFL, EIL & FCIL for producing 2,200 MTPD Ammonia and 3,850 MTPD Urea. GAIL is also in the process of setting up of a Coal Gasification based Fertilizer plant through a JV- Talcher Fertilizer Ltd. (TFL) formed with Coal India Ltd. (CIL), Rashtriya Chemicals & Fertilizers Ltd. (RCF) each having 31.85% equity share and Fertilizer Corporation of India Ltd. (FCI) which has 4.45% equity. GAIL has also acquired 26% stake in ONGC Tripura Power Company and 26% equity stake of M/s Mitsui OSK Lines, Japan in M/s LNG Japonica Shipping Corporation Limited. Further, GAIL has acquired JBF Petrochemicals Limited (JBFPL) of 1.25 MMTPA Purified Terephthalic Acid (PTA) through Corporate Insolvency Resolution Process (CIRP). JBFPL has been renamed as GAIL Mangalore Petrochemicals Limited (GMPL) and is now a wholly owned subsidiary of GAIL.

GAIL is a pioneer in city gas distribution (CGD) business in India. It has presence in 72 Geographical Areas across India after completion of 12th CGD Bidding round. GAIL has 8 JVs and three subsidiaries in India for its CGD business. Further, GAIL has overseas presence in Russia, USA, Singapore, Myanmar, China, and Egypt. It has opened offices in Singapore, Yangon, Houston and Moscow (Bharat Energy Office). It has a wholly owned subsidiary, GAIL Global (USA) Inc. (GGUI) in USA. GGUI has formed subsidiary, GAIL Global (USA) LNG LLC (GGULL) which has booked 2.3 MMTPA capacity in Cove Point LNG liquefaction project. GAIL has another wholly-owned subsidiary company viz. GAIL Global (Singapore) Pte. Ltd., for trading in LNG and for undertaking overseas investments. GAIL's total LNG sourcing portfolio is about 15.5 MMTPA.

GAIL has participating interest in 13 Exploration & Production (E & P) blocks of which 10 blocks are in India, 2 in Myanmar and 1 shale gas JV in Eagle Ford Basin, Texas, USA. Besides, GAIL has 4.17% equity partnership in South East Asia Gas Pipeline Company (SEAGP) which is transporting gas from Myanmar to China. GAIL has made

investments in three companies in downstream business at Egypt and China.

GAIL has renewable portfolio of ~134.72 MW including ~118 MW of wind and ~16.72 MW of solar energy. In addition, GAIL is exploring various business opportunities in the Production and Marketing of Compressed Bio Gas (CBG) from organic waste. Emerging areas including ethanol, hydrogen, coal gasification, Small Scale LNG unit etc. are also being explored for new business opportunities. GAIL has developed its Net Zero strategy target for GHG Emissions of 100% reduction in Scope 1 and Scope 2 emissions and a 35% reduction in Scope 3 emissions by 2040. GAIL is setting up of CBG plant at Ranchi, an electrolyzer plant at its Vijaipur unit having capacity of 10 MW with the production of 4.3 Ton per Day /1.4 Kilo Tons per annum green Hydrogen, Small Scale LNG units at Vijaipur.

The manpower of GAIL as on 31st December, 2023 was ~5,038 Nos.

14.1.3.1. Physical and Financial performance: -

Physical

Parameters	Units	Performance in 2022-23	Performance in 2023-24
Gas Transportation	MMSCMD	107	120
Gas Marketing	MMSCMD	95	98
Liquid Hydrocarbon Production	TMT	933	995
Petrochemical Production	TMT	442	777
LPG Transportation	TMT	4335	4396

Financial

₹ in crore

Description	Performance in 2022-23	Performance in 2023-24
Revenue from Operations	1,44,302	1,30,638
Gross Margin (EBDITA)	9,384	15,563
Profit Before Tax	6,584	11,555
Profit After Tax	5,302	8,836

14.1.3.2. Major Projects/pipelines under execution by GAIL:

A. Jagdishpur Haldia and Bokaro-Dhamra Pipeline (JHBDPL)

With an aim to ensure cleaner and quality energy in Eastern India at an affordable Price, GAIL is executing Jagdishpur-Haldia & Bokaro-Dhamra Natural Gas Pipeline (JHBDPL) Project (2,563 km), popularly known as the Pradhan Mantri Urja Ganga of Eastern India. Further, the pipeline is also being extended from Barauni to Guwahati (via Siliguri & Bongaigaon) (726 km), as an integral part of JHBDPL, to connect North East Region (NER) with the National Gas Grid. Total integrated length of JHBDPL is 3,289 kms.

The entire JHBDPL including BGPL is being executed at an investment of ₹ 17,405 crores. It will pass through Uttar Pradesh (335 km), Bihar (719 km), Jharkhand (500 km), West Bengal (696 km), Odisha (785 km) & Assam (254 km). JHBDPL has revived fertilizers plants of HURL Gorakhpur, HURL Sindri, HURL Barauni & is also meeting the demands of M/s Matix Fertilizers in Durgapur. Further, the network will enable supply of cleaner fuel for domestic & industrial customers in eastern part of India enroute the pipeline.

The entire sections of Integrated ***Jagdishpur - Haldia & Bokaro - Dhamra Natural Gas Pipeline (JHBDPL) have been commissioned (~2,986 km) except Durgapur Haldia Pipeline (~294 km).***

Major Milestones of JHBDPL achieved:

- Phulpur to Varanasi (110 km) Commissioned. **Dedicated to the nation by Hon'ble Prime Minister on 14.07.2018.**
- Varanasi to Dobhi and Patna & Barauni (474 km): **Commissioned on 31.03.2019.**
- Connectivity to Gorakhpur (166 km) **30.06.2019:**
- Dobhi to Durgapur (350 km) including connectivity to Matix Fertilizer. **Dedicated to the nation by Hon'ble Prime Minister of India on 07.02.21.**
- Spur line to HURL Sindri (9.2 km) on **02.06.2021.**
- BokaroAngul Mainline (533 km). **Dedicated to the nation by Hon'ble Prime Minister on 12.07.2022**
- 123.2 km of Jamshedpur spur line & 4.6 km of CGS Ranchi spurline commissioned on **12.09.2022.**
- Dharma-Angul Mainline (206 km): **Commissioned on 16.02.2023.**
- Cuttack-Bhubaneswar Spurline of Dhamra-Angul Section **commissioned on 31.03.2023.**
- Bihar Section (282 km) of Barauni-Guwahati pipeline **commissioned on 31.03.2023.**
- ParadipSpurline (~86 km): **Commissioned on 30.06.2023.**
- Barauni-Guwahati pipeline (717 km) **inaugurated by Hon'ble Prime Minister on 09.03.2024.**

B. Mumbai Nagpur Jharsuguda Pipeline (MNJPL):

Mumbai-Nagpur-Jharsuguda Pipeline is a 1,755 km pipeline originating from Mumbai and ending at Jharsuguda. Also, its spurline will extend from Nagpur (Maharashtra) to Jabalpur (Madhya Pradesh). It is also a part of National Gas Grid (NGG) and will pass through 25 districts in the states of Maharashtra (12 Districts), Madhya Pradesh (3 Districts), Chhattisgarh (9 Districts) & Odisha (1 District). It will originate from Thane (Maharashtra) & will connect to JHBDPL in Jharsuguda (Odisha).

The pipeline shall ensure availability of clean fuel and cater the demand of CGD, industries and anchor load customers. Availability of domestic gas may help in development of major industries like Power, Fertilizer and other industries enroute pipeline in future. PNGRB has also uthorized around 17 GA's covering 53 districts (Maharashtra: 21, Madhya Pradesh: 15, Chhattisgarh: 17) where City Gas Distribution Network would be developed in near future.

Pipeline is passing through several Industrial Zones viz. Mhaskal, Aurangabad, Wardha, Amravati, Jalgaon, Nagpur, Gondia in Maharashtra; Jabalpur & Chhindwara in Madhya Pradesh; Raipur, Durg, Bilaspur, Korba & Raigarh in Chhattisgarh; Jharsuguda in Odisha.

Construction work is in full swing for Mumbai-Nagpur & Nagpur-Jabalpur section and RoU acquisition is under progress in Nagpur-Jabalpur section. 1,174 km lowering was achieved till March 2024.

C. Srikakulam Angul Pipeline (SAPL):

With an aim to supply of clean and quality energy in Odisha & Andhra Pradesh, this pipeline has a strategic importance as a part of national gas grid and it would connect with GAIL's Jagdishpur Haldia Bokaro Dhamra Pipeline (JHBDPL) network at Angul and with Kakinada Srikakulam Pipeline of Andhra Pradesh Gas Distribution Corporation (APGDC) at Srikakulam. The pipeline will act as vital infrastructure for offtake of gas from existing/upcoming LNG terminals like Dahej, Ennore, Dhamra, Gangavaram (A.P.), Gopalpura FSRU etc.

Total length of Srikakulam Angul Pipeline is 744 km (619 km in Odisha and 125 km in Andhra Pradesh) with a capacity of 6.65 MMSCMD and pass through Angul, Dhenkanal, Cuttack,

Khordha, Nayagarh, Gajapati, Ganjam, Raygada, Koraput & Kalahandi Districts of Odisha and Srikakulam & Vizianagaram districts of Andhra Pradesh.

Construction work is in full swing & 613 km lowering was achieved till March 2024.

D. Kochi-Koottanad-Bangalore-Mangalore Pipeline (KKBMPL) Project Phase-II (891 km):

Kochi-Koottanad-Bangalore-Mangalore Pipeline (KKBMPL) Project was conceptualized in the year 2007 by Govt. of India as part of the ambitious National Gas Grid (NGG) and GAIL was authorized by MoP&NG to lay this gas pipeline project in the states of Kerala, Karnataka and Tamil Nadu. This 30"/24" Pipeline with total capacity of 16 MMSCMD was planned to evacuate the re-gasified LNG (RLNG) from Kochi LNG terminal to transport to various consumers in the state of Kerala, Tamil Nadu & Karnataka, thereby connecting these three southern states with National Gas Grid. This pipeline will cater to the needs of house-holds as PNG (Piped Natural Gas) for cooking purpose, hotel industries, CNG (Compressed Natural Gas) to vehicles in the transport sector, Power plants, Fertilizer plants and many other industries.

Project is being implemented and being commissioned on progressive manner. 579 km is commissioned and 322 km Krishnagiri-Coimbatore Section is under implementation. Anticipated completion date is progressively by November, 2024.

E. Dhamra Haldia Pipeline Project:-

Dhamra Haldia Pipeline Project is being laid as an expansion of Pradhan Mantri Urja Ganga (PMUG) pipeline project named as Jagdishpur-Haldia & Bokaro Dhamra Pipeline Project (JHBDPL) to meet the additional gas demand of IOCL Haldia and demand of CGD GA en-route in Odisha and West Bengal. The Pipeline is passing through 03 districts in the states of Odisha (154 km) & 02 districts in the states West Bengal (99 km).

The Dhamra-Haldia Pipeline is being executed at an investment of ₹ 1,030 crores & is anticipated to be completed by June 2024. 154 km of Pipeline section completed in Odisha. Balance 99 km in West Bengal is under implementation.

F. North-East Natural Gas Grid (Indradhanush Gas Grid Ltd (IGGL)

Indradhanush Gas Grid Limited (IGGL), a Joint Venture Company of IOCL (20%), ONGC (20%), GAIL (20%), OIL (20%), and NRL (20%) has been entrusted by the Govt. of India for the implementation of the prestigious North East Gas Grid (NEGG) project, conceived in line with the Hydrocarbon Vision 2030 for North East India. The NEGG is being implemented to supply Natural gas to all the eight North Eastern states i.e., Assam, Arunachal Pradesh, Meghalaya, Tripura, Mizoram, Nagaland, Manipur & Sikkim, at an estimated cost of ₹ 9,265 crores. The 1,656 km long natural gas pipeline grid having a capacity of 4.75 MMSCMD traverses through challenging terrains of North East India and would connect

Guwahati to capital/major cities of the region like Itanagar, Dimapur, Kohima, Imphal, Aizawl, Agartala, Shillong, Silchar, Gangtok and Numaligarh. Various activities are going on in a phased manner and project will be commissioned by March, 2025.

G. Coal Gasification

GAIL is in the process of setting up a coal gasification-based Urea project through a JV-Talcher Fertilizers Limited (TFL) formed with Coal India Limited (CIL), Rashtriya Chemicals and Fertilizers Limited (RCF), each having 31.85% stake and Fertilizer Corporation of India Limited (FCIL) having 4.45% equity. The project with an estimated cost of around ₹ 17,080 crores is envisaged to produce 2,200 MTPD Ammonia and 3,850 MTPD Urea.

H. Petrochemicals

GAIL is setting up 500 KTA PDH-PP unit which is India's First Propane dehydrogenation unit integrated with

Polypropylene unit & Offsite Unit at Usar, Maharashtra along with Usar-Uran Propane Pipeline (New Liquid Hydrocarbon Pipeline). The project is located in the existing LPG recovery plant of GAIL-Usar, Raigarh district in Maharashtra. The Propane feed shall be sourced from existing BPCL Uran terminal and the same will be pumped to the GAIL-Usar plant through a dedicated Liquid Propane Pipeline. The Total project cost is ₹ 11,256 crores. With all major Equipment's & Contracts awarded, Site construction activities are going on full swing and to be completed by October, 2025.

GAIL is setting up 60 KTPA Polypropylene unit at Pata petrochemical complex, Distt. Auraiya U.P. at a cost of approx. ₹ 1,299 crores. The proposed facility is being set-up inside the existing facilities at Pata Petrochemical Complex & will be utilizing the polymer grade propylene produced in the existing Pata Petrochemical Complex, as a feed-stock for the New Polypropylene (PP) Plant. All Equipment's & Works Contracts have been awarded. Construction activity is going on full scale for the targeted completion of the Project by March, 2025.

Achievements for FY 2023-24:-

- GAIL secured and Excellent MoU rating for FY 2022-23 from DPE.
- GAIL achieved highest ever annual Gas Transmission volume of 120.46 MMSCMD.
- Achieved highest ever total annual LPG Transmission volume of 4.395 MMTPA
- For the third time in a row, GAIL achieved pipeline lowering of more than 1000 km, in FY 2023-24 ~1,171 km achieved.
- Hon'ble Prime Minister of India dedicated to the nation below mentioned projects:
  - DhamraAngul Pipeline section of JHBDPL (412 km)
  - Barauni Guwahati Pipeline (BGPL), a part of JHBDPL (717 km)
  - Vijaipur-Auraiya Pipeline (352 km)
- Hon'ble Prime Minister of India laid a foundation stone for Nagpur-Jharsuguda section of MNJPL and Krishnagiri to Coimbatore section (294 km) of KKBMPL-II
- PNGRB granted authorization to GAIL to lay, build, operate and expand natural gas pipeline of 160 km of Gurdaspur-Jammu NGPL.
- Hon'ble Union Minister of Petroleum & Natural Gas and Housing & Urban affairs dedicated 201 CNG stations of GAIL and GAIL group across the country, India's first small scale LNG unit at Vijaipur and inaugurated world's first floating CNG MRU at Ravidas Ghat, Varanasi.
- GAIL has entered into long term LNG agreements with M/s Vitol Asia Pte. Ltd. And M/s ADNOC LNG for an aggregate volume of ~1.53 MMTPA of volume starting 2026.
- GAIL signed an agreement with BPCL for a 15-year supply of Propane for upcoming petrochemical plant at Usar in Maharashtra.
- Qatar Energy LNG and Petronet LNG Ltd. Have signed an LNG SPA of 7.5 MMTPA in February 2024 wherein GAIL will offtake 60% of the volumes starting from 2028 for period of 20 years.
- GAIL's assets and market capitalization surpassed ₹ 1 trillion mark
- Received "NIL" comments from CAG for the accounts of FY 2022-23 (14th year in a row).
- GAIL successfully acquired 100% JBF petrochemicals Limited (JBFPL) through Corporate Insolvency Resolution Process (CIRP) and rechristened it as GAIL Mangalore Petrochemicals Ltd. (GMPL)
- GAIL affirmed 'BBB' by Fitch rating and 'Baa3 stable' by outlook stable, both capped with Sovereign rating. Credit rating of GAIL has been reaffirmed by CARE as 'AAA'.

Major Accolades/Awards received during the year:-

- GAIL has been honoured with the prestigious "Best Natural Gas

Transportation Company of the Year Award" by FIPI.

- GAIL received "Best Managed Project of the year Award" for Vijaipur-Auraiya pipeline Project (36"x352 km) by FIPI.
- GAIL (India) Limited was recognized with the prestigious "International Asian Oil and Gas Awards 2023" for the categories "Midstream Project of the Year" for installation of the world's first floating Compressed Natural Gas (CNG) station at Varanasi and "Innovation Award" for reduction in LNG Shipping cost & emissions through Ship-to-Ship (STS) transfer of LNG with backhauling at the event held in Kuala Lumpur, Malaysia.
- GAIL was conferred with the coveted SAP ACE Award-2023 under the category "The Disruptor-Best Finance Transformation" to recognise the leveraging of technology for finance transformation in GAIL for Vendor Invoice Management [VIM] Systems.
- GAIL received the "15th Vishwakarma Award" 2023 by CIDC in the category "Achievement Award for Best Construction Projects" for Barauni- Guwahati Natural Gas Pipeline Project in New Delhi.
- GAIL won "First Prize" under the "Rajbhasha Kirti Puraskara Yojna" of Department of Official Language, Ministry of Home affairs.
- GAIL won Gold at "GoaFest Abby One Show South Asia Award 2023" for Branded content on Environmental Awareness.
- GAIL has been conferred with the second highest percentage procurement from SC/ST owned MSEs award by Ministry of MSME in the highest category of total procurement above ₹ 1,000 crore for FY 2022-23.
- GAIL Vijaipur has been conferred 1st Place under category, Manufacturing-Public Sector-Medium in 18th National Awards for Excellence in Cost Management 2022 by The Institute of Cost Accountants of India (ICMAI) in the award ceremony held at Vigyan Bhavan.

14.1.4. Bharat Petroleum Corporation Limited (BPCL)



BPCL, a Fortune Global 500 Company, is the second largest Oil Marketing Company and one of the integrated energy companies in India. The company is engaged in refining of crude oil and marketing of petroleum products, with presence in the upstream and downstream sectors of the oil and gas industry. It attained the coveted Maharatna status, joining the club of companies having greater operational & financial autonomy.

Bharat Petroleum's Refineries at Mumbai, Kochi and Bina have a combined refining capacity of around 35.3 MMTPA. Its marketing infrastructure includes a network of installations, depots, energy stations, aviation service stations, LPG and Lubes distributors.

Bharat Petroleum is integrating its strategy, investments, environmental and social ambitions to move towards a sustainable planet. The company has chalked out the plan to offer electric vehicle charging stations at around 7000 energy stations.

With a focus on sustainable solutions, the company is developing an ecosystem and a road-map to become a Net Zero Energy Company by 2040, in Scope 1 and Scope 2 emissions. Bharat Petroleum has been partnering communities by supporting several initiatives connected primarily in the areas of education, water conservation, skill development, health, community development, capacity building and employee volunteering. With 'Energising

Lives' as its core purpose, Bharat Petroleum's vision is to be an admired global energy company leveraging talent, innovation & technology.

14.1.4.1. Financial Performance

BPCL's revenue from operations stood at ₹ 5,06,911 crore during 2023-24. Demonstrating strong operational efficiencies supported with favourable market conditions, BPCL, in FY 2023-24 achieved its highest ever standalone net profit of ₹ 26,673.50 crore, a marked increase from the previous year's net profit of ₹ 1,870.10 crore. In the wake of this resounding performance, the Board paid a final dividend of ₹ 21 per share (pre-bonus), bringing the total dividend for the year, including the interim payout, to ₹ 42 per share-a massive 950% increase compared to FY 2022-23. Sharing the success further, BPCL issued bonus shares in the ratio of 1:1, acknowledging the continued support of its shareholders.

14.1.4.2. Contribution to Exchequer

Over the years, BPCL has contributed to the Government exchequer in the form of duties, taxes, and dividend. During the period April-March 2024, ₹ 1,48,566 crore was paid to the exchequer. An amount of ₹ 77,907 crore was paid to the Central Exchequer and ₹ 70,659 crore was paid to the States Exchequer during April-March 2024.

14.1.4.3. Refinery Performance

Mumbai Refinery

The present installed capacity of Mumbai Refinery is 12.00 MMTPA. Mumbai refinery achieved a crude throughput of 15.05 MMT during the FY 2023-24 (April 2023-March 2024) with a capacity utilization of 125.43 %. For FY 2022-23, crude throughput of 14.55 MMT was achieved with a capacity utilization of 121.25 %.

Kochi Refinery

The present installed crude processing capacity of Kochi Refinery is 15.5 MMTPA. Kochi Refinery processed 17.31 MMT of crude in FY 2023-24 with capacity utilization of 112% against 16.02 MMT in FY 2022-23 with capacity utilization of 103%.

Bina Refinery

The present installed capacity of Bina Refinery is 7.8 MMTPA. Bina Refinery achieved a crude throughput of 7.13 MMT during 2023-24. The capacity utilization during the year was 91.4% in view of Refinery Turnaround 2023 for Maintenance & Inspection (M&I). For FY 2022-23, Crude throughput of 7.84 MMT was achieved, with crude refining capacity utilization of 100.5%.

14.1.4.4. Pipeline Performance

BPCL owns a network of 3537 kms of multiproduct and crude pipelines, with design capacity of 29 MMTPA.

During the FY 2023-24, pipeline throughput was 25.72 MMT. Bharat Petroleum continued to operate pipelines in an efficient and safe way and ensured nil pilferage incidents in its pipeline network. BPCL covered all its major product pipelines with Pipeline Intrusion Detection System (PIDS) which shall help in real time monitoring of third party activities on pipeline network.

14.1.4.5. Marketing Infrastructure and performance

BPCL has a robust distribution network comprising of over 21,800 Energy Stations, over 6,200 LPG distributorships, 525 Lubes distributorships, 121 POL storage locations, 53 LPG Bottling Plants, 63 Aviation Service Stations, 4 Lube blending plants and 4 cross-country pipelines with a network of 3,537 kms of multiproduct and crude pipelines, with design capacity of 29 MMTPA.

Market Sales of BPCL was 51.04 MMT in FY 2023-24 vs. 48.92 MMT in FY 2022-23. Sales has grown by 4.33% with a market share of 27.57% among PSU Oil companies.

BPCL's Retail business segment achieved growth of 1.1% clocking volume of 32.69 MMT and highest absolute market

share amongst PSUs in the last 10 years (during FY 2023-24: 29.68% in MS and 29.83% in HSD).

BPCL launched #silentvoices providing employment to Speech & Hearing Impaired (SHI) individuals at more than 120 Retail Outlets across the country covering over 25 cities.

BPCL is serving over 9.35 crore LPG customers with a strong network of 6,252 distributors. During the year 18.54 lakh new customers were enrolled under Ujjwala 2.0 and 9.26 lakh customers upgraded to double bottling connections. Pilot of "Pure for Sure" initiative launched with tamperproof seals and QR codes to address pilferage and other issues related to LPG cylinders.

In lubricants business segment, highest ever sale of 446 TMT with a growth of 16% was achieved. MAK established its footprint in Africa, entering Kenya, Uganda and Tanzania and commissioned new channel partner in Sri Lanka for Lubricants.

Aviation Turbine Fuel (ATF) sales stood at 1,901 TMT registering a growth of 9.40% and achieving a market share of 25.20% among OMC PSUs.

14.1.4.6. Research & Development

R&D is crucial for business growth and sustainability, with Intellectual Property Rights from R&D offering market differentiation and promoting indigenous technologies for 'Atmanirbhar Bharat'. BPCL's Corporate Research & Development Center (CRDC) focuses on niche Petrochemicals, Biofuels, Alternate Energy, Green Hydrogen and Carbon Dioxide mitigation.

During the year 2023-24, CRDC achieved significant milestones in Green Hydrogen. At India Energy Week, CRDC showcased and demonstrated an indigenous alkaline electrolyzer, jointly developed with Bhabha Atomic Research Center (BARC), for Green Hydrogen production. A Green Hydrogen refueling station for buses is being set up at Cochin International Airport (CIAL). To foster the spirit of collaboration, an MoU was inked with M/s. Kirloskar Oil Engines Ltd. for the joint development of H-CNG and H2-ICE based Gensets.

BPCL's R&D efforts were recognized at various prestigious forums during the year 2023-24. Bharat H_2Sep Technology was named Innovator of the Year by Federation of Indian Petroleum Industry (FIPI). Bharat HiGee Deaeration Technology won second prize at NEEIA-2023 for energy efficiency innovation. The K Model® received the New Product of the Year Award from Asian Oil & Gas Awards. BPCL and Aspen Technology's collaboration received multiple awards for digital transformation and operational excellence. Bharat Hi-Star won the PRSI National Award for R&D efforts in science and technology. The focused R&D efforts during the year 2023-24 resulted in the grant of seven patents. Additionally, six new patent applications were filed during the year.

14.1.4.7. Petrochemical Performance

In order to support GOI's vision of "Aatmnirbhar Bharat" with indigenous production and reduction on import dependency, Propylene Derivative Petrochemical Project (PDPP) was commissioned at Kochi Refinery in September 2021, producing niche petrochemicals viz. Acrylic Acid, Oxo Alcohols and Acrylates which were hitherto being imported. The capacity utilisation of the plant has grown over the years from 28% in first year (FY 2021-22) to 71% in FY 2023-24 with production of 233 KT. Further, a 400 KTPA Polypropylene Project is being set up at Kochi Refinery at a cost of ₹4,460 crore.

BPCL is also setting up a modern petrochemical complex at Bina Refinery at a cost of ₹ 43,367 crore to tap into the synergies of integrating refinery & petrochemical operations and to increase share of petrochemicals in the product portfolio. The capacity of Bina Refinery would be enhanced to 11 MMTPA from current

capacity of 7.8 MMPTA, which would produce around 2.2 MMTPA petrochemical products.

14.1.4.8. Natural Gas

BPCL continued to expand its natural gas business in 2023-24 and clocked sales (including internal consumption) of 1.69 MMT as against 1.48 MMT in 2022-23. BPCL has now a customer base of 65 Patrons with the addition of 6 new customers during the year besides supplies to its own refineries at Mumbai (Maharashtra) and Kochi (Kerala).

14.1.4.9. City Gas Distribution

BPCL has authorization for development of City Gas Distribution (CGD) Networks by Petroleum and Natural Gas Regulatory Board (PNGRB) for 26 Geographical Areas comprising 81 Districts. CGD projects are progressing in full swing to ensure supply of Natural Gas at the earliest. Till March 2024, 671 CNG stations have been established, 3.31 lakhs PNG customers are connected, CGD network laid with 1287 km of steel pipeline and 3387 km of MDPE pipeline.

14.1.4.10. Exploration & Production

Bharat Petro Resources Limited (BPRL), established in October 2006 as a wholly owned subsidiary of BPCL, for undertaking upstream activities. Its portfolio comprises of blocks in different phases of exploration, appraisal, development, and production. Covering approximately 19,824 Square Kilometres, approximately 46%of the acreage owned by BPRL and its subsidiaries is in the offshore expanse.

BPRL holds Participating Interest (PI) in 15 blocks, with 8 located in India and 7 overseas. Additionally, BPRL has equity stakes in two Russian entities, which hold licenses for four producing blocks in Russia. While BPRL directly holds PI in domestic blocks, its stakes with respect to blocks in Brazil, Mozambique, Indonesia, the UAE and equity stakes in Russian entities are held through step-down wholly owned subsidiaries or joint ventures (JVs) of the wholly owned subsidiaries located in the Netherlands and Singapore. Five of the eight blocks in India were acquired under different rounds of New Exploration Licensing Policy (NELP), one block was awarded under Discovered Small Fields (DSF) Bid Round 1 and two blocks were awarded under the Open Acreage Licensing Policy (OALP) Bid Round I

In FY 2023-24, BPRL Group's share of Oil & Gas production was 2.64 MMTOE.

14.1.4.11. Alternative Energy

BPCL has a total installed renewable energy capacity of 78 MW in the year 2023-24. The total installed solar capacity is 66 MW and wind capacity is 12 MW. New solar plants at Kochi and Bina Refineries of total capacity 31 MW have been installed and commissioned. Currently four Renewable Energy Projects of cumulative capacity 176 MW are under various stages of implementation.

BPCL is setting up a 5 MW green hydrogen plant at its Bina refinery in Madhya Pradesh and also setting up an integrated green hydrogen plant and hydrogen refuelling station at Kochi along with CIAL.

BPCL has been awarded a capacity of 2000 MT per annum of Green Hydrogen Production through bio-mass based pathways under SECI Mode-1 Tranche-1 SIGHT scheme tender. Work on all these projects is progressing smoothly, adhering to the planned schedule.

BPCL has partnered with Bhabha Atomic Research Centre (BARC) to scale up Alkaline Electrolyser technology for the generation of green hydrogen production. This is a first of its kind initiative to support India's commitment to achieve renewable energy targets and reduce greenhouse gas emissions. Electrolyser plants are presently imported, and the collaboration is to "scale-up Alkaline Electrolyser technology for Green Hydrogen production".

Bio-Fuel

In line with the Government's Ethanol Blended Petrol (EBP) program, BPCL achieved the highest-ever Ethanol blending percentage of 11.7% (consuming 166.4 crore litres of Ethanol) this year, up from 10.6% in the previous year and aims at exceeding 14% in 2024-25. BPCL has also positioned E20 (MS with 20% Ethanol blending) at its ROs and has so far reached 4,279 ROs.

The Company has been blending 1G Ethanol produced from molasses, sugarcane, damaged food grains and surplus rice in petrol across all its locations pan-India. It has also augmented Ethanol storage capacity at its supply locations, from 112 TKL to 135 TKL in the last financial year. BPCL has ensured Ethanol availability across the length and breadth of the country by carrying out movement of EBMS as well as Ethanol by rail to deficit locations.

BPCL is the Industry Coordinator for Ethanol procurement and is spearheading the EBP Program by procuring 1G Ethanol from multiple sources. The Company's integrated 1G/2G Bio-ethanol refinery at Bargarh, Odisha, of a combined production capacity of 200 KL per day, is under construction and expected to be commissioned in FY 2024-25.

The Company's focus on Biodiesel has gained momentum with procurement of 102.6 TKL (8.21 TKL in the last financial year) of Biodiesel in the year 2023-24 and sales of 1,390 TKL Biodiesel-blended Diesel (116 TKL sold in the previous year), thereby achieving a blending of 0.36% (0.03% last year).

BPCL has also taken initiatives in the field of production of Compressed Bio-Gas (CBG) from biomass waste/biomass sources like agricultural residues, sugarcane press mud, Municipal solid waste, etc. and issued 382 Letters of Intent (LOIs) for a total estimated production capacity of about 7 lakh Tonnes Per Annum (TPA) of CBG. During the year, six CBG plants were commissioned by BPCL LOI holders. The Company added nine more ROs for CBG retailing, increasing the number of outlets to 50 with cumulative sales of 6.5 TMT. BPCL has initiated setting up its own CBG plants and has obtained in-principle sanction from the Government of Kerala for setting up a 150 TPD CBG plant at Kochi based on segregated Municipal Solid Waste.

14.1.4.12. Sustainable Development

As a responsible Business, BPCL has taken a number of initiatives for Sustainable Development across its locations related to energy conservation, energy efficiency, renewable energy, carbon sequestration, water management through effluent treatment, rainwater harvesting, water balance study, and waste management etc. following the ideology of 3Rs i.e., Reduce, Reuse and Recycle. There has been an increase of 13% in the catchment area of Rainwater Harvesting which will make a total of 13.5 lakh sqm of RWH area across BPCL. The total water harvested is approx. 639 TKL by March 2024 which is an increase of 5.28% as compared to last year by BPCL. Mumbai Refinery has conducted adequacy study and potential to increase rainwater harvesting. 29 new locations/cluster of locations were selected with total catchment area of 63,010 m2 and estimated annual RWH potential of 1,64,439 KL (around 10% of fresh water of MR on daily basis). Mumbai, Kochi, and Bina Refineries have also conducted water balance study and are now implementing various initiatives suggested to reduce water consumption. Water balance study is also under process in all Retail Marketing Locations and LPG plants and initiatives are under implementation to save water and make location water neutral.

BPCL has declared to become net zero by 2040 for scope 1 and scope 2 GHG emissions and made a road map for the same. Various projects are being initiated to increase the use of solar, wind, water and green hydrogen usage and also for use of Bio-Fuels, Bio–CNG, Bio–Diesel for energy transition.

BPCL is setting up charging stations at retail outlets and Battery swapping initiatives to increase E- Mobility.

Energy Efficient Lighting (EEL) capacity was increased from 63.52 MW to 71.05 MW during the year 23-24 . All the Retail operating locations, Mumbai Refinery, Pipelines, LPG, Aviation have already transitioned to 100 % EEL.

Seed Bombing: BPCL has planted 5 lakh seed bombs in Maharashtra region which includes retail locations, LPG plants and MMBPL Pipeline.

Miyawaki Technique: Miyawaki technique was also utilized to increase green cover across various marketing locations.

The total number of trees planted were approx. 1.6 lakhs across all business units of BPCL and the total plantation crossed to more than 10.3 lakhs. The total carbon sequestered through plantation drive is approx. 23,600 $MTCo_2e$ in this year. Bina Refinery and Forest Department of Madhya Pradesh State signed an MoU on 18.05.2023 for their partnership to develop greenbelt on 90ha Forest Land at Kanjia range, Khurai, Vanmandal North Sagar, MP with a total investment of 1.96 crores in 5 years project duration.

To ensure that operations in the operating locations does not spoil soil, BPCL has started campaign to take Certification of Zero Waste to Land-Fill (ZWL) across all its refineries and marketing locations. Mumbai Refinery, Bina Refinery, Retail and LPG operating locations, Lubricants, Aviation, Pipeline are already certified for ZWL.

BPCL Lubricant department as brand owner has disposed approx. 4,891 Tons of waste plastic in the year 2023-24 as brand owner. Corporate R & D of BPCL has devised a novel technology of using waste plastic in making road and till now used approx. 250 tons of waste plastic reducing GHG emissions of 750 MTCO2e.

14.1.4.13. Corporate Social Responsibility:

The Corporation's vision 'energizing lives' goes hand in hand with the underlying philosophy of CSR initiatives i.e., empowerment of local communities and building inclusive, equitable and sustainable pathways. The Corporation undertakes its CSR interventions largely in five core thrust areas viz. health & sanitation, education, skill development, community development and environmental sustainability along with the other items enlisted in the Schedule VII of Companies Act 2013.

- The Corporation's CSR activities focused primarily on Health and Nutrition in line with Department of Public Enterprise (DPE) theme for the FY 2023-2024.
- To complement the efforts of NITI Aayog towards National Nutrition Strategy, BPCL has taken up 'Kuposhan Mukht Bharat' programme supporting more than 13,700 undernourished children & mothers based on the results of Nutrition Focussed Physical Examination (NFPE). The programe intends at bringing nutrition to the centre stage of National development Agenda while also laying the roadmap for targeted action to address India's nutritional needs. BPCL also addressing the need for awareness of Malnutrition & Stunting in 7 Govt. schools of Jhabua district in Madhya Pradesh.
- In cancer spectrum, BPCL has taken up cancer care program, promoting preventive care through cancer screening in oral, breast and cervical cancers, while also providing free-of-cost quality cancer treatment to the underprivileged population in 10 Government/charitable hospitals, along with supporting rehabilitation to cancer survivors. More than 1.5 Lakh beneficiaries have been impacted with this PAN-India program so far.
- By harnessing the power of technological advancements, BPCL has taken up initiatives to innovate, collaborate, and scale our CSR efforts to address healthcare challenges in the far flung

rural areas. Futuristic Healthcare Delivery System in the Aspirational District Sonbhadra, Uttar Pradesh in collaboration with IIT, Ropar has been initiated. It is in accordance with the government policy to strengthen and digitalize the primary healthcare systems across the district. Its serves as a comprehensive solution for Non-Communicable Diseases, across age groups and in rural underserved areas with minimal human intervention and interface through on-the-spot teleconsultation with specialists free of cost. A smart vision assistive wearable device using AI mechanism developed by leading IITs has been provided to visually impaired beneficiaries. The device helps in object detection, reading, identification of objects etc.

- BPCL has enabled totally free-of-cost child heart surgeries for needy children with congenital heart disease by way of providing a state of art infrastructure at the Sanjeevani Hospitals at various locations across India. Overall, BPCL has enabled over 30,000 paediatric cardiac surgeries.
- Reaching the unreached is the bottom-line of BPCL CSR, thus our initiatives have been extended to the most hardship locations of Uttarakhand where communities often struggle to access adequate medical services due to geographical & seasonal challenges. A state of art, 50 bedded hospital is being established to cater to the healthcare needs of the underprivileged sections of the local areas.
- Life-line Express (Hospital on Train) which has increased our reach to interior geographies has been one of the key programs supported by BPCL. The mission is to reduce the burden of avoidable disability in communities in rural India through; Screening & Early Identification and Medical and Surgical Intervention. Approx 2 Lakh beneficiaries have been reached out through the program so far.
- A step towards inclusion & diversity, we have provided assistive aids & appliances to the Persons with Disabilities (PwDs) in various locations in India. More than 1500 beneficiaries have been supported by way of this initiative. An intervention for treatment of children with Clubfoot disability have been supported by BPCL through financial assistance.
- Clubfoot is a common type of birth defect that affects muscles and bones in the feet
- BPCL has been contributing massively in upgrading infrastructures at various Govt. District Hospitals, Public Health Centres & Community Health Centres. Critical life saving equipment like Patient Monitors-Ventilators, Fully Automated Biochemistry Analyzer, Operating Microscope, Biometry Machine, MRI CT Scan Machines have been supported under key CSR interventions.
- BPCL is running fully functional hospitals at Kochi and Bina Refineries Bina Refineries to cater to the needs of local communities at large. The hospital provides general facilities of allopathy along with alternate medical system like ayurveda, homeopathy, yoga therapy and local/ indigenous medical system.
- Academic Excellence Scholarship programs like 'Medhaavi', 'BPCL Ratna' have been extended to needy scholars from Top 20 NITs in India. These scholarships have been provided based on Low Income family & Merit criteria. More than 1000 scholars have been supported by way of these programs. To complement our education initiatives BPCL has supported more than 50,000 educational desks & school bags to Govt. School children in Uttar Pradesh & Bihar.

- To promote education initiatives BPCL has partnered with DAV schools to operationalise school for the community in the Refinery premises.
- To uplift the communities at large, BPCL has supported solar lights, Open gyms, drinking water facilities including provision of ROs / Tube wells in various parts of the country in collaboration with District Authorities.
- Skill Development Institutes are one of the flagship initiatives under the directives of MoPNG. BPCL has been supporting various Skill Development Institutes (SDIs) at Kochi, Bhubaneswar, Vishakhapatnam, Raebareli, Ahmedabad, Guwahati with the main objective of providing vocational training to a large section of youth and to enhance their employability in Oil & Gas industries and other sectors. We have also been supporting the livelihood programs through our skilling initiatives. Skill training has been provided to women of Karauli district in Rajasthan & Faridabad in Embroidery, Zari craft, Lac Bangle making etc. enabling self employment.
- The initiatives organised by the Company in connection with Swachhata Pakhwada observance from July 1-15, 2023 covered beneficiaries from multiple walks of life and resonated the messages of Swachhata through multiple projects and initiatives, focusing on spreading awareness on the dangers of one-time use of plastic and motivate people to move on to more sustainable alternatives. The initiatives covered more than 25,000 activities, which will directly or indirectly have lasting impact on more than one lakh people. Stepping towards Environmental Sustainability, BPCL has supported 1,400 benches made of recycled plastics in Govt. Schools of Shravasthi, Aspirational District of Uttar Pradesh.
- Other campaigns like Swachhta hi Seva & Swachhta 3.0 campaign has also been undertaken in which the total scrap disposal was approx. 1,500 MT.
- Nurturing our environment and ensuring a sustainable future as a basic responsibility we have planted approx. 65,000 sapling across the central line railways track of Mumbai. The aim is to plant more than 1 Lakh saplings with this initiative. We believe that act of planting saplings contributes significantly to ecological balance, biodiversity, and mitigating climate change.
- CSR expenditure by BPCL for FY 2023-24 till March is ₹ 158.18 crore.

Appendix-IX

Variation in Profit Before Tax (PBT) and Profit After Tax (PAT)-BPCL

Particulars	2023-24	2022-23
Profit/(loss) before tax	35,548	2,217
Profit/(loss) after tax	26,674	1,870

Increase in PBT and PAT in FY 2023-24 vis-à-vis FY 2022-23 is mainly on account of increase in marketing margins which were subdued in the previous year, reduced foreign exchange losses, lower finance costs etc. offset by higher tax on earnings.

14.1.5. Hindustan Petroleum Corporation Limited (HPCL)



Hindustan Petroleum Corporation Limited (HPCL) is a Maharatna Public Sector Enterprise (CPSE) with annual gross sales of ₹4,59,815 crore during FY 2023-24. HPCL has a strong presence in refining & marketing in India with about 20% market share in the PSU category as on 31st March 2024.

As on March 2024, HPCL owns and operates Refineries at Mumbai & Visakhapatnam with designed capacities of 9.5 MMTPA & 13.7 MMTPA respectively. HPCL also owns the largest Lube refinery in the country at Mumbai for producing Lube Oil Base Stock with a capacity of 428 TMTPA (installed capacity).

In addition, HPCL holds 48.99% equity stake in JV Company, HPCL-Mittal Energy Limited (HMEL) which operates 11.3 MMTPA capacity refinery at Bathinda in the state of Punjab and also has 16.96% equity stake in Mangalore Refinery and Petrochemicals Limited (MRPL) which operates 15 MMTPA capacity refinery at Mangalore in the state of Karnataka.

HPCL has the second largest network of petroleum product pipelines in India with network length of about 5,134 km. HPCL has a vast marketing network consisting of 19 zonal offices in major cities and 145 regional offices facilitated by a supply & distribution infrastructure comprising 44 terminals/installations/tap off points, 55 aviation service facilities, 56 LPG bottling plants, 5 Lube blending plants, 73 depots including lube depots. The customer touch points constitute of 22,022 retail outlets, 1,638 SKO/LDO dealers, 333 lube distributors,141 Industrial Lube Distributors, 1,690 CNG facilities at retail outlets, 817 door-to-door delivery dispersers and 3,603 EV charging stations and 6,349 LPG distributorships with a customer base of above 9.63 crore LPG consumers as of March 2024.

HPCL has its Research & Development Centre named 'HP Green R&D Centre' in Bengaluru. The Centre provides advanced technical support to the Refineries and Marketing SBUs for operational improvement, absorb new technologies, develop innovative & path breaking technologies, license technologies and become a knowledge hub. HPCL also conducts business through 20 JV and Subsidiary companies operating across oil & gas value chain.

14.1.5.1. Financial Performance

Gross sales of HPCL in April 2023-March 2024 period was ₹ 4,59,815 crore as compared to ₹ 4,64,684 crore in April 2022-March 2023 period. HPCL has incurred Profit After Tax (PAT) of ₹ 14,694 crore during April 2023-March 2024 period as compared to Net Loss (PAT) of ₹ 8,974 crore in April 2022-March 2023 period. The Refining Margin (Gross of Export duty) for HPCL averaged at US$ 9.08 per barrel for April 2023-March 2024 period as against US$ 12.09 per barrel for April 2022-March 2023 period.

14.1.5.2. Contribution to Exchequer

During April 2023-March 2024 period, HPCL has contributed a sum of ₹ 97,305.05 crore to the exchequer which includes ₹ 34,963.72 to Central Exchequer and ₹ 62,341.33 to State Exchequer.

14.1.5.3. Refinery Performance

During April 2023-March 2024 period, HPCL refineries have delivered excellent performance, recording refining thruput of 22.33 million Metric Tonnes (MMT), which was the highest ever annual thruput.

During April 2023-March 2024 Mumbai Refinery registered crude thruput of 9.64 MMT and Visakh refinery registered crude thruput of 12.69 MMT.

Vishak Refinery's crude thruput of 12.69 MMT during FY 2023-24 is the highest ever annual thruput.

HPCL's Visakh Refinery Modernization Project (VRMP) for capacity augmentation from 8.3 MMT to 15.0 MMT was dedicated to the Nation by Hon'ble Prime Minister of India in March 2024.

As part of VRMP, following facilities were commissioned during the period April 2023-March 2024:

- 3.05 MMT FCHCU (India's largest VGO hydrocracker with highest conversion)
- Hydrogen Generation Units (largest single train capacity)
- Sulfur Recovery Units (with Oxygen enrichment), Sulfur Forming Unit
- Fuel Gas-PSA (Pressure Swing Adsorption)
- Integrated Effluent Treatment Plant
- New HRSG (Heat Recovery Steam Generator)
- Associated Utilities & Offsites (including 22 storage tanks plus 1 surge mitigation tank).

HPCL Rajasthan Refinery Ltd. (HRRL), achieved financial closure for its 9 MMTPA Integrated Grass Root Refinery cum Petrochemical Project in Barmer, Rajasthan. Rajasthan Refinery and Petrochemical complex is at advanced stage of construction.

14.1.5.4. Pipeline Performance

HPCL is currently operating a petroleum product pipeline network of 5,134 km with mainline capacity of 35.2 MMTPA, which includes branch line capacity of 23 MMTPA. During April 2023-March 2024 period, total pipeline thruput of 25.8 MMT was achieved.

Barmer-Palanpur Pipeline Project costing ₹ 776 crores was mechanically completed. Upon commissioning of Barmer-Palanpur Pipeline Project, operating pipeline network of HPCL will increase to 5,350 kms.

To further expand the pipeline network and capacities for enhanced logistic efficiencies and the associated environmental benefits, Bathinda Sangrur Pipeline Project and Haldia Panagarh LPG Pipeline Project are under execution with an estimated investment of about ₹ 1,377 crores. These pipeline projects are expected to strengthen HPCL's position in key markets. HPCL has also teamed up with IOCL and BPCL in development of India's longest LPG pipeline from Kandla to Gorakhpur (2,805 km) through joint venture route.

14.1.5.5. Marketing Performance

During April 2023-March 2024 period, HPCL has achieved a sales volume of 46.8 MMT including exports & Petrochemical sales.

In Domestic Sales segment, HPCL has recorded a sales volume of 44.6 MMT (including Petrochemical sales) and achieved a market share of about 22.09% amongst public sector Oil Marketing Companies (OMCs).

In the motor-fuel segment, HPCL achieved sales volume of 27.89 MMT in April 2023-March 2024 periods with market share of 26.21% on Total Motor Fuels basis (amongst PSUs). The April 2023-March 2024 period witnessed commissioning of 836 new Retail outlets (taking the number of total retail outlets to 22,022) and commissioning of CNG facilities at 303 Retail outlets (such outlets aggregating to 1,690 Nos). As of March 2024, 817 Nos of door-to-door Mobile Dispensers and 3,603 Nos of EV Charging Stations are operational. During April 2023-March 2024, solarization done at 7,143 outlets taking the total to 17,618 outlets.

During April 2023-March 2024, LPG business vertical of HPCL recorded sales of 8.56 MMT with a growth of 5.5% over the previous year and market share of 27.55%. HPCL achieved Market Share gain in Domestic LPG for the 8th Consecutive year. During April 2023-March 2024, HPCL enrolled 26.83 lakhs new customers and commissioned 66 new regular LPG distributorships (taking the total number of distributors to 6,349). During

April 2023-March 2024, HPCL enrolled 18.3 Lakhs PMUY customers taking the total to 273 Lakhs PMUY customers. As of March 2024, HPCL has customer base of 9.63 crore LPG consumers. HPCL has commissioned LPG Plants at Abu Road and Varanasi with a capacity of 120 TMTPA during FY 2023-24, taking the total number of LPG plants to 56 with total capacity 6,590 TMTPA

HPCL is continuing to be a leading Lube marketer in the country with a sales volume of 652 TMT ('000 Metric Tonne), with export of 4.19 TMT during the period April 2023-March 2024.

In Industrial & Consumer (I&C) business line, HPCL recorded overall sales volume of about 5.39 MMT.

In Aviation business line, HPCL achieved a Sales volume of 878 TMT of aviation turbine fuel. Aviation Service Facility (ASF) network was augmented by commissioning Ayodhya ASF, taking the total number of ASFs to 55.

In Biofuels & Renewables, HPCL generated Renewable energy of 18.45 crore kWh. Foundation Stone was laid for HPCL's first Mega Solar Project of 100 MW Capacity located at Galiveedu, was laid by Hon'ble Chief Minister of Andhra Pradesh in April 2023-March 2024. Also Started construction for a 5 MW (AC) / 6.5 MWp (DC) Solar Power Project at Jhansi in Uttar Pradesh to meet the RE needs of eight different HPCL facilities across Uttar Pradesh.

The Supply, Operations & Distribution Department of HPCL achieved thruput of 59.38 MMT during April 2023-March 2024 period and maintained uninterrupted supplies of petroleum products across the entire supply chain from refineries to the end customers. HPCL has commissioned Hexane facility at Sitarganj Depot (Uttarakhand) during this period.

14.1.5.6. Research and Development (R&D)

Hindustan Petroleum Green Research & Development Centre (HPGRDC) has been set up with an objective to provide advanced technological support to Marketing SBUs and Refineries. HPGRDC aims to provide operational excellence, develop and adopt innovative, path breaking technologies and to become a knowledge hub. The research centre is provided with state-of-the-art infrastructure facilities comprising energy efficient green buildings with built-up area of 6 lakh square feet. The Phase-I of R&D centre has nine laboratories in the areas of FCC/RFCC, Hydro-processing, Catalysis, Bio-processes, Crude Evaluation & Fuels Research, Standard Testing, Analytical, Process Modeling & Simulation and Nano Technology. Phase II has eleven laboratories in the areas of Petrochemicals & polymers, Centre of Excellence Lubes, Corrosion studies, Novel Separations, Resid Upgradation, Engine and Battery research, Digital, Water Research, Combustion Research and Centre of Excellence-Bitumen & Pavement Research.

During FY 2023-24, 17 products/technologies were developed and launched. Besides these refinery products/technologies, during this period, 26 new lube-based formulations have been launched and commercialized.

During FY 2023-24, 104 patents were filed taking the cumulative Indian and International Patent applications to 547 and 51 patents were granted taking the cumulative patents grant to 210 as on 31st March, 2024.

During April 2023-March 2024 period, 2 publications were made taking the cumulative publication number to 65 in various international journals.

14.1.5.7. Natural Gas

HPCL is participating in the entire value chain of Natural Gas Business.

HPCL is building a 5 MMTPA LNG regasification terminal at Chhara port (Gir Somnath District) in Gujarat through a subsidiary company, HPCL LNG Ltd (HPLNG). Terminal is expected to be commissioned in FY 2024-25.

HPCL is also participating in development of three cross-country natural gas pipelines (Mehsana to Bathinda, Bathinda to Srinagar

and Mallavaram to Bhilwara) through Joint Venture companies viz. GSPL India Gasnet Limited (GIGL) and GSPL India Transco Limited (GITL).

HPCL has successfully commissioned its first LNG dispensing Station at HPCL Retail Outlet, Oran in Sabarkantha District, Gujarat and sales has commenced from this Station. Mechanical constructions have been completed for 3 more LNG dispensing Stations at Ajmer, Satara and Prayagraj.

14.1.5.8. City Gas Distribution

In order to increase HPCL's presence in City Gas Distribution (CGD), HPCL is setting up CGD networks in 13 GAs in the states of Haryana, Uttar Pradesh, Uttarakhand, West Bengal, Rajasthan, Bihar and Jharkhand on a standalone basis.

During 12th round of PNGRB bidding, HPCL has successfully secured Sikkim Geographical Area.

HPCL is also operating CNG network in Ahmedabad on a standalone basis.

In addition, HPCL is setting up CGD networks in GAs of Ambala-Kurukshetra (Haryana) and Kolhapur (Maharashtra) districts through joint venture company HPOIL Gas Pvt Ltd (HOGPL). During 12th round of PNGRB bidding, HPOIL Gas Pvt Ltd has successfully secured Nagaland Geographical Area.

HPCL is also operating City Gas Distribution (CGD) networks in 7 Geographical Areas (GAs) in the states of Andhra Pradesh, Telangana and Madhya Pradesh through Joint Venture companies Aavantika Gas Limited (AGL), Bhagyanagar Gas Limited (BGL) and Godavari Gas Pvt. Limited (GGPL).

14.1.5.9. Exploration and Production

HPCL undertakes Exploration & Production (E&P) of hydrocarbons through its wholly owned subsidiary company Prize Petroleum Company Limited (PPCL). HPCL has 15% participating interest (PI) in one producing filed namely, CB-ONN-2002/3 in Gujarat in India and HPCL's share of production is 3861 bbls during April 2023-March 2024 period.

PPCL has a wholly owned subsidiary namely Prize Petroleum International Pte Ltd. (PPIPL), incorporated in Singapore. PPIPL has 11.25% and 9.75% participating interests in two E&P Blocks, T/L1 and T/18P respectively in Australia. Production details of PPIPL's share of production from Yolla producing field (T/L1) in Australia is 95,108 BOE during April 2023-March 2024 period.

14.1.5.10. Alternative Energy

Renewable Energy

HPCL is leveraging Renewable energy sources to reduce the carbon footprints and electricity cost across the value chain and is continuously expanding the wind and solar power generation capacities.

As on March 2024, HPCL has total solar installed power plant capacity of about 107.1 MW. These solar plants are installed in various marketing/operating locations of the company spread across the country.

As part of the Greening Initiative HPCL is nearing completion of Solar Power Plants of capacity 6 MW (AC) at Panipat and 5 MW (AC)/6.5 MWp (DC) at Jhansi to meet the RE needs of HPCL facilities across Haryana and Uttar Pradesh respectively.

HPCL has initiated work on its First Mega Scale Utility Solar Project of 100 MW at Galivedu, Andhra Pradesh.

Additionally, HPCL also has 100.90 MW wind power plant in Maharashtra and Rajasthan. These wind power projects sell generated electricity to Discom of Rajasthan and also for captive locations for MDPL & LPG locations in Rajasthan and for MPSPL location in Maharashtra. Electricity generation from these wind plants was 18.45 crore KWH for April 2023-March 2024 resulting in emission mitigation of 151.3 thousand Metric Tonnes of carbon dioxide equivalent.

Bio Fuels

During April 2023-March 2024 period, HPCL achieved Ethanol blending of 12% by

blending 156 Crore litres of Ethanol in Motor Spirit (MS).

HPCL's First 2G Ethanol Bio Refinery project at Bathinda, having Ethanol Production capacity of 100 KLPD from Biomass is under construction.

Commenced Commercial Sale at its First Biomass-based CBG Plant of 14.2 TPD capacity in Badaun, Uttar Pradesh.

To have a footprint in alternate fuels in transportation sector, HPCL is actively participating in Government of India's SATAT (Sustainable Alternative Towards Affordable Transportation) initiative for promotion of Compressed Bio Gas (CBG). Under the SATAT scheme, commissioned 5 nos. CBG Plants with total capacity of 26.1 TPD CBG in 2023-24, cumulatively 9 Plants with total capacity of 54.65 TPD have been commissioned. Issued 20 new LOIs for CBG plants with CBG production capacity of 112.5 TPD in 2023-24 taking the total number of active LoIs to 107 with total capacity of 606.6 TPD.

Sold 338.6 MT CBG during 2023-24 thru HPCL's dedicated CBG Retail Outlets supplied by plants of HPCL & HPCL SATAT LoI holders against historical CBG sales of 77.3 MT registering 338% growth.

To sensitize and promote SATAT scheme amongst stakeholders Organized Workshop on CBG under aegis of MOPNG for bankers, LOI holders and CBG plant owners at Lucknow on 29.02.2024 which was attended was senior officials of MoP&NG, Dept. of Drinking Water and Sanitation (Ministry of Jalshakti), Dept. of Financial Services (Ministry of Finance), Dept. of Fertilizer (Ministry of Chemicals & Fertilizers) UPNEDA, Indian Biogas Association (IBA), World Bank and Technology providers.

In line with Govt of India vision for "Waste to Energy in Rural India – Gobardhan", HPCL has set up a cow dung based CBG Plant at Pathmeda, Sanchore Rajasthan of 1.6 TPD of CBG capacity thru CSR route.

14.1.5.11. Sustainable Development

HPCL is integrating ESG factors into its future strategies and business operations with a view to enhance competitive advantage, attracting investors, building resilient business models and contributing to a more sustainable and inclusive global economy. HPCL is committed to achieving its ESG objectives by implementing best practices in its operations and activities. The ESG performance is continuously benchmarked with national and international peers.

HPCL has implemented Integrated management system (IMS) (ISO 9001, 14001 & 45001) across HSE functions of its SBUs at organisation level. HPCL refineries and major marketing locations have implemented internationally accepted 'Environment Management Systems' based on ISO-14001 Standards.

Hazardous waste treatment and disposal systems are available at various locations in line with industry best practices. State-of-the-art effluent treatment plants for treating and recycling effluent water are available at major locations to ensure the protection of the environment.

Best-in-class technologies such as volatile organic compound (VOC) monitoring and the leak detection and repair (LDAR) programme have been adopted for monitoring and controlling fugitive emissions at major installations. Vapour recovery systems (VRS) have been installed at various supply locations and retail outlets. Gaseous emissions to the environment and ambient air quality are continuously monitored with the use of the latest technologies, including real-time data transfer to regulatory agencies in major locations.

Online monitoring of emissions and air quality has a system of alerts in place for monitoring and rectifying deviations. Rain water harvesting systems are implemented at operating locations.

HPCL has completed its Environmental Strategy with the help of world-renowned consultant. It has drawn a roadmap for de-carbonization of its operations in line with its Net-Zero target of 2040 for Scope-1 & Scope-2 emissions. This roadmap has a strong focus on transitioning towards a multi-energy green and low carbon Corporation. HPCL, through its customer-oriented approach, is also committed to provide accessible and affordable clean energy to its customers. Expected capex to meet net zero targets will be about ₹ 60,000 crore.

HPCL has identified key levers for achieving net zero, such as enhancing energy efficiencies in its own operations, using renewable power in refineries, replacing hydrogen requirements with green hydrogen, reducing flare gas emissions, etc. Towards emission intensity reduction, the Corporation is exploring various business areas such as renewable energy and storage, biogas, biofuels, petrochemicals and green hydrogen.

To accelerate its energy transformation journey, HPCL has established a new 'Energy Transition Cell', which is dedicated to achieving the Corporation's Net-Zero goals. HPCL has received the regulatory approvals for setting up of Wholly Owned Subsidiary for its Renewable & Green Energy portfolio and has incorporated HPCL Renewables & Green Energy Limited. HPCL has ambitious plans to increase its Renewables portfolio to 10 GW by 2030 and Bio-fuels portfolio through new 1G, 2G and CBG Plants.

HPCL is seizing green and emerging opportunities by expanding footprints in advanced/alternative fuels. For expanding footprints in biofuels, various biofuels projects are under execution by HPCL on its own as well as with the participation of entrepreneurs. Expansion in renewables is being done through the solarization of retail outlets, enhanced usage of renewable power for meeting operational requirements of refineries, setting up of infrastructure for power import at both refineries, etc.

HPCL's Green Research and Development Center (HPGRDC) has developed inhouse technologies for production of Ethanol, CBG, Sustainable Aviation Fuel and Carbon Capture which are at different stages of pilot and commercial implementation as detailed hereunder:

- HPCL has developed a CO_2-free and Water-free process for production of H-CNG. Currently, a pilot has been set up, which also produces Carbon Nano Tubes (CNT) as a valuable by-product.
- HPCL has developed Blue hydrogen technology in which CO_2 will be captured from various streams using rotating packed bed system (HP-HiGAS Technology). Major advantage of this technology is size reduction of tall absorption columns by 10 times. A demonstration plant at HPCL-Visakh Refinery with 24 KTPA CO_2 capture capacity is being set up
- HP-ASAP technology (Assisted Single step Acid Pretreatment) for production of 2G-Ethanol from lignocellulosic biomass.
- Technology called as HP-RAMP (Rapid Acidification for Methane Production) for producing biogas-containing methane from lignocellulosic biomass.
- Technology known as HP-Trijet for production of Green Diesel and Bio-ATF from used cooking oil (UCO).
- Thermic fluids for usage in CSP (Concentrated Solar Power Plants).
- HPGRDC is working on solutions for renewable energy storage which includes development of Sodium Ion batteries, development of Vanadium Redox flow batteries and Super Capacitors, developing materials and technologies for Green H_2 generation, which includes Alkaline and SOEC based electrolysers.

- Development of HPCOAT technology for producing crude to chemicals in single step and demonstration plant of 80 KTPA is being set up at HPCL's Visakh Refinery.
- HPGRDC has signed a MoU with Oil India Limited (OIL) for collaborative research in the areas of Green Hydrogen, Battery Technology, Biofuels, Carbon Capture & Sequestration, and process modelling etc.

HPCL signed an MOU with M/s Gogoro Inc., a global trailblazer in the Electric 2-Wheeler Battery Swapping Sector. Gogoro, with its innovative battery-swapping business model is a pioneer in addressing challenges related to range anxiety, rapid refueling, safety, and affordability.

HPCL is the first among PSUs to voluntarily opt for CII Green Company (GreenCo) rating in 2014. This system evaluates the performance of an operating unit on parameters of: Management Systems, Energy Efficiency, Water Conservation, Renewable Energy, Greenhouse Gas Emissions, Waste Management, Material Conservation, Recycling and Recyclability, Green Supply Chain, Product Stewardship, Innovation for Environment, Green Infrastructure & Ecology. Total 20 locations have been certified over a period of 8 years. HPCL took up GreenCo rating Version 3 for 35 locations during the current year of which 29 locations have been declared GreenCo rated locations. HPCL received GreenCo Champion Award for 2023 for its contribution to environmental sustainability by adopting the GreenCo movement.

HPCL actively participated in the 'Mission LiFE' movement to bring individual behaviours to the forefront of the global climate action narrative, for providing the movement with a greater mass reach and to meet the objectives of the country's sustainable development agenda. HPCL displayed Mission LiFE creatives at 1,250 retail outlets, engaged more than 5,000 Pro-Planet People with Mission LiFE pledges, collected back more than 1,000 MT of waste plastic, planted more than 1,500 trees, sold more than 9,000 high-efficiency thermal LPG stoves with efficiency of more than 74% and organised numerous awareness sessions such as nukkad natak (street plays), school competitions, and more.

HPCL continued to be a signatory to United Nations Global Compact (UNGC). During the year, HPCL Human Rights Policy was released. Capability building initiatives towards sustainability such as training programs, awareness sessions, sustainability quizzes, newsletters and technical bulletins were conducted on a continuous basis to enhance awareness on sustainability. HPCL is also collaborating with major industrial customers to imbibe ESG practices in the supply chain through exchange of sustainability best practices.

HPCL continued to focus on ensuring safety and security across its operations and for its customers. To this effect, myriad initiatives such as Integrated work permit System along with Job Safety Analysis (JSA), Incident Management system in SAP, Live firefighting for Officers, implementation of Lifesaving Cardinal Rules, NEBOSH Process Safety Management Course certification for officers, Animated SOP Videos in vernacular languages, Safety committees at Zonal, SBU level and Corporate level, Video Analytics for ensuring PPE & SOP adherence, Daily Safety Moment on the laptops for officers, Safety Awareness Publications, One to One Management interactions with Contract workmen, Spot the hazard and Do Not Walk Past Deviation Campaign, Safety Vulnerability Index were undertaken.

For the first time among PSUs, HPCL undertook Mandatory HSE Foundation and Competency Assurance Program for assessment through the National Safety Aptitude Test (NSAT Exam) in collaboration with National Safety Council of India and developed comprehensive modules in the areas of Safety, Environment and Sustainability for its field officers.

14.1.5.13. Projects

HPCL along with its JVs are executing various projects towards strengthening of the strengthening & expansion of refineries and marketing infrastructure.

Projects Completed

HPCL's Green R & D Centre (HPGRDC) at Bengaluru further expanded its capacities by adding additional 6 new laboratories making a total of 20 labs by March 2024 for leveraging the R&D capabilities.

To cater to the growing demand of Petroleum Products, revamping of existing HPCL depot was carried out at Indore Madhya Pradesh.

Towards meeting the growing demand of LPG in the country, HPCL has strengthened its LPG supply infrastructure with commissioning of new 120 TMTPA LPG Plant at Abu Road in the state of Rajasthan and 120 TMTPA LPG plant at Varanasi in the state of Uttar Pradesh.

Moving forward towards reducing country dependency on fossil fuel, HPCL commissioned first biomass based compressed biogas plant at Budaun in the state of Uttar Pradesh.

On-Going Projects

Refinery Projects

Visakh Refinery Modernization Project (VRMP) for enhancing the refining capacity from 8.3 MMT to 15.0 MMT is in advanced stage of completion. Once commissioned, the additional capacity will further align HPCL Refining and Marketing portfolio. Execution of Residue Upgradation Facilities (RUF) as part of VRMP is also progressing well.

In addition, HPCL is setting up a new 9 MMTPA capacity greenfield refinery-cum-petrochemical complex at Barmer District of Rajasthan through a joint venture company, HPCL Rajasthan Refinery Ltd (HRRL) which is progressing well.

HPCL is also participating in setting up of Integrated greenfield refinery-cum-petrochemical complex at Ratnagiri district of Maharashtra through a Joint venture company, Ratnagiri Refinery and Petrochemicals Ltd (RRPCL).

Marketing Projects

To cater to the growing demand of petroleum products in country in a cost effective and environment friendly manner, HPCL has undertaken a number of pipeline projects. The major ongoing pipeline infrastructure projects of HPCL include:

(i) Bathinda Sangrur Pipeline

(ii) Haldia Panagarh LPG Pipeline

To meet the growing requirement of LPG in the country and for enhancing the import capacities, construction of 80 TMT LPG cavern at Mangalore is in progress. Further construction of New LPG facilities at Kamardanga (Assam), Tank Wagon & Railway Siding facility at Madurai LPG Plant (Tamilnadu) are in progress. Revamp/ augmentation of the POL depots/terminal at Raipur (Chhattisgarh), Vashi (Maharashtra), New Rail fed POL facility at Kamardanga (Assam) are also in progress. CGD projects in West Bengal, UP/UK, Jind and Sonipat are also in progress. HPCL is also constructing its first Petrochemical Evacuation Marketing Terminal at Barmer (Rajasthan) which will significantly contribute towards further strengthening of the marketing infrastructure.

14.1.5.14. Major Awards & Recognitions

During the year April 2023-March 2024 period, HPCL was conferred with a number of awards and recognitions at various forums. The following is the list of some awards received by HPCL:

1. 'SCOPE Awards' by Standing Conference of Public Enterprises (SCOPE) under the categories:

i. 'SCOPE Eminence Award' for 'Human Resource Management' and for 'Digital Transformation'

ii. 'SCOPE Meritorious Award' for 'Effective Implementation of the RTI Act'

2. 'Innovation Awards for 2022-23' by the Ministry of Petroleum & Natural Gas (MoP&NG) under the categories:

i. 'Best Indigenously Developed Technology' for development and commercialization of indigenous PSA PLC technology.

ii. 'Best Innovation in R&D Institute' for HP-HCNG Technology (technology for carbon-negative Production of Hydrogen Enriched CNG)

3. 'Rajbhasha Keerti Puraskar' (Second Prize) for 'Implementation of Official Language' 2022-23 by the Ministry of Home Affairs, Government of India (GoI).

4. 'National Energy Conservation Award 2023' (2nd Position) to Mumbai Refinery by Ministry of Power, Government of India (GoI).

5. 'Product Innovator of the Year 2023' for the development of FCC catalyst additive (HP-Bottom Cracking Additive) to HP Green R&D Centre team in the 'Chemical Category' by the Ministry of Chemicals & Fertilizers, Department of Chemicals & Petrochemicals (DCPC) and Federation of Indian Chambers of Commerce & Industry (FICCI) Awards 2023.

6. 'Best Use of Technology in Loyalty Program' award for DriveTrack Plus program at 4th Annual Digital Transformation Summit and Awards, 2023.

7. 'Corporate Governance' and 'CSR & Sustainability' awards at the 13th PSE Conclave and Excellence Awards 2023 by the Indian Chamber of Commerce (ICC).

8. 'CII Digital Transformation (DX) Awards' 2023 by Confederation of Indian Industry (CII) under the categories

i. 'Most Innovative Best Practice' in 'Smart LPG Cylinder Delivery System' and 'Robotic Inspection of In-service Tank System'

ii. 'Innovative Best Practices' in 'HPCL's Digital Experience Centre' and 'Augmented & Virtual Reality-based Training Simulation'

9. '10th PSU Awards' under the categories (i) Investment in Start-up and (ii) HR Excellence (Overall) by Governance Now

10. 'Global Marketing Excellence Awards' by World Marketing Congress under the categories:

(i) 'Emerging Brand of the Year' for poWer95 and

(ii) 'Best Experiential Marketing Campaign' for Consumer Outreach Program (COP)

14.1.6 Oil India Limited (OIL)

14.1.6.1. Preamble

OIL, a Government of India Enterprise, and a Maharatna Company under the administrative set-up of MoP&NG, is engaged in the business of exploration, production and transportation of crude oil & natural gas both in-country and overseas. The authorized capital of OIL is ₹ 2,000 crore and the paid up capital is ₹ 1,084.41 crore. As on 31.12.2024, Government of India's shareholding is 56.66% of the paid-up equity share capital of OIL.

14.1.6.2. Domestic Portfolio

The domestic operations of the Company are spread over areas under onshore PEL and PML in the states of Assam, Arunachal Pradesh and Rajasthan. OIL's domestic acreage includes 1 (one) PEL) covering an area of about 23.3 sq.km. granted on nomination basis and 25 (twenty-five) PMLs spread over an area of about 4,829 sq.km. situated in the states of Assam (21 nos.), Arunachal Pradesh (2 nos.) and Rajasthan (2 nos.).

OIL has 2 (two) blocks with 85.88 sq.km. in Assam & Arunachal Pradesh under Pre-NELP JVs as non-operator. The Company has 2 (two) onshore blocks under NELP as Operator comprising of 3,609 sq. km. in Assam and Mizoram. OIL has 2 (two) blocks under NELP as non-operator with

5,301 sq.km. in Gujarat-Kutch (Shallow Offshore), West Bengal (Onshore). The company also holds non-operating participating interest (40%) in AA/ONDSF/ Kherem/2016 awarded under DSF-I Bid round.

The Company has 27 (twenty-seven) OALP blocks with an area of 49,895 sq. km. in Assam, Arunachal Pradesh, Tripura, Nagaland, Odisha, Rajasthan and shallow offshore parts of Andaman and Kerla-Konkan. As an Operator, the company has 3 DSF blocks with an area of 208 sq. km. in Tripura, Krishna-Godavari Offshore and Rajasthan. As an non-Operator, the company holds 1 DSF block. The company.

14.1.6.3. Exploration Activities

OIL is currently, engaged in exploration activities in the 27 (twenty-seven) OALP blocks in onshore areas in Assam, Arunachal Pradesh, Tripura, Odisha and Rajasthan and in shallow offshore in Andaman and Kerela-Konkan basins. During the year 2023-24, OIL acquired 378.72 LKM of 2D, 248.73 SKM of 3D seismic data and drilled 17 exploratory wells.

OIL was allotted a revised total of 6,032 LKM (5,162 LKM of seismic data and 870 LKM of Airborne Geophysical Survey (AGS) for Acquisition, Processing and Interpretation (API) of 2D seismic data under the National Seismic Programme (NSP) campaign of DGH. OIL completed the Seismic API of 5,245.80 LKM (101.62 % of the revised target of 5,162 LKM) by May 2022.

To cover areas where seismic data couldn't be acquired under National Seismic Programme (NSP) due to inaccessible terrain and hostile environment, Airborne Geophysical survey was planned to acquire 49,795 flight LKM Gravity Gradiometry and Gravity-Magnetic data. Accordingly,. a total of 42,943.09 flight LKM (86.24%) of data was recorded against the target of 49,795 flight LKM. The processing and interpretation of the same was completed on 31.03.2024.

14.1.6.4. Physical Performance

Parameter	Unit	2022-23 (Actual)	2023-24	
			Target	Actual (Provisional)
Seismic survey				
2D	GLKM	1333.3	354	378.72
3D	SQKM	680.05	735	248.73
Drilling				
Exploratory	'000 Mtr	59.890	105.255	64.788
	Wells	16	33	17
Development	'000 Mtr	86.330	123.258	105.654
	Wells	29	44	44
Total (Exp+Dev)	'000 Mtr	146.22	228.513	170.442
	Wells	45	77	61
Crude Oil Production				
Assam	MMT	3.114	3.705	3.287
Arunachal Pradesh		0.024	0.037	0.032
Rajasthan (Heavy Oil)		0.017	0.04	0.025
OIL Total		**3.155**	**3.782**	**3.344**

OIL+OIL's share of JV		**3.176**	**3.811**	**3.36**
Natural Gas Production				
Assam	MMSCM	2812	3353	2886
Arunachal Pradesh		48	48.55	34
Rajasthan		181	240	171
OIL Total		**3,041**	**3,641**	**3,091**
OIL+OIL's share of JV		**3,180**	**3,816**	**3,182**
LPG Production	'000T	**32.100**	**29.00**	**31.550**

To cover areas where seismic data couldn't be acquired under National Seismic Programme (NSP) due to inaccessible terrain and hostile environment, Airborne Geophysical survey was planned to acquire 49,795 flight LKM Gravity Gradiometry and Gravity-Magnetic data. Accordingly,. a total of 42,943.09 flight LKM (86.24%) of data was recorded against the target of 49,795 flight LKM. The processing and interpretation of the same was completed on 31.03.2024.

14.1.6.5. Reserves Position (2P) as on 01.04.2023

As a result of continued exploration and development activities, OIL, as on 31.03.2024, has established a total in-place volume (BE) of 804.0802 MMT (oil) & 417.5161 BCM (Gas) (1,166.4709 MMTOE O+OEG) in the domestic sector. The 2P/BE remaining producible oil & gas volume of the company stands at 69.6531 MMT and 139.2098 BCM respectively (190.3455 MMTOE O+OEG).

14.1.6.6. Crude Oil Transportation

OIL operates a total network of 1,243 km of Crude Oil Pipeline which run through the states of Assam, West Bengal and Bihar. The total capacity of OIL's crude oil pipeline is 9.0 MMTPA (F+R). The total thru'put of the pipeline was 6.72 MMT during FY 2023-24.

OIL also operates a 654.3 km long pipeline for evacuation of total 1.72 MMTPA of products from Numaligarh Refinery (NRL) to Siliguri Terminal in West Bengal. During the FY 2023-24, OIL transported 1.16 MMT MMT of finished petroleum products through Numaligarh-Siliguri Product Pipeline (NSPL).

The natural gas produced in Assam is sold to different customers, viz. BVFCL, BCPL, AGCL, APGCL, NEEPCO, IOC (AOD), and APL and nearby Tea gardens. Since March, 2011 OIL is supplying gas to Numaligarh Refinery. The non-associated gas produced by OIL in Rajasthan is sold to Rajasthan Rajya Vidyut Utpadan Nigam Limited (RRVUNL). OIL also produces Liquefied Petroleum Gas (LPG) in its plant at Duliajan, Assam.

14.1.6.7. Alternate Energy

OIL has strategically diversified into the Alternate Energy Domain, with specific focus on Wind Energy, Solar Energy, Green Hydrogen and CBG segments. OIL has successfully established Commercial Renewable Energy (RE) projects totaling 188.10 MW, comprising 174.10 MW of Wind Energy Projects and 14 MW of Solar Energy Projects. Additionally, plans are underway to establish Solar Power Plants in Assam, with a projected capacity of 650 MW, through a newly formed joint venture with Assam Power Generation Corporation Limited (APGCL), a Government of Assam enterprise. The first plant under this JV will be a 25 MW Solar power plant located at Namrup, Assam.

Furthermore, OIL has commissioned the country's first Anion Exchange Membrane (AEM) technology based Green Hydrogen

(GH2) plant of capacity 100 KW in Jorhat, Assam. The plant is currently producing 10 kg of GH2 per day, with potential for scaling up to 30 kg/day. OIL has obtained approval from the Petroleum and Natural Gas Regulatory Board (PNGRB) to blend 2% of GH2 with natural gas in City Gas Distribution (CGD).

In addition to these endeavors, OIL has developed a Hydrogen Fuel Cell e-bus through its startup program "SNEH." Powered by a 60 KW Proton Exchange Membrane (PEM) fuel cell engine, this bus was inaugurated by Hon'ble Prime Minister Shri Narendra Modi at the India Energy Week (IEW) in Bengaluru on 6th February 2023. Moreover, OIL has received permission from the Ministry of Road Transport and Highways (MoRTH) to conduct trial runs of the Hydrogen Fuel Cell e-bus in Jorhat, Assam, which commenced on 10.08.2023.

OIL is also actively involved in supporting the development of Liquid Organic Hydrogen Carrier (LOHC) technology, aimed at enabling the transportation of hydrogen under ambient pressure and temperature conditions over a range of 500 Km. This initiative is being pursued through OIL's startup program "SNEH" in collaboration with M/s Ohm Cleantech Pvt. Ltd., Pune.

In alignment with the GOBARdhan scheme, OIL has established 25 Compressed Bio-Gas (CBG) plants. Progress has been made in setting up seven CBG projects, with Detailed Project Reports (DPRs) currently under preparation.

14.1.6.8. Diversification

OIL has undertaken selective diversification of its portfolio, mainly by acquiring stakes in downstream business. OIL holds 69.63% stake in Numaligarh Refinery Limited, 10% stake in Brahmaputra Cracker and Polymer limited and 23% stake in Duliajan Numaligarh Pipeline Limited (DNPL). OIL acquired 49% equity stake in 500 TPD Methanol and 200 TPD Formaldehyde project of Assam Petrochemical Limited.

OIL's Joint Venture Company (JVC), namely HPOIL Gas Private Limited (HOGPL) has commissioned 11 CNG stations (Kolhapur: 4, Ambala & Kurukshetra: 7), taking total nos. to 51(Kolhapur: 26, Ambala & Kurukshetra: 25) and 3 Bio CNG Outlets (Kolhapur: 1, Ambala & Kurukshetra: 2). Steel pipelines of 1682 inch-km against target of 1,028 inch-km in Ambala-Kurukshetra GA and 1735 inch-km against target of 1,620 inch-km in Kolhapur GA is completed. DPNG connections of 15,465 and 25,211 numbers provided in Ambala-Kurukshetra GA and Kolhapur GA respectively.

OIL's JVC, namely Purba Bharati Gas Private Limited (PBGPL), has completed laying of 113 inch-km of steel pipeline, 231 km of MDPE, 1,221 RFC and completed 3 CNG stations. 2 commercial connections have also been completed for supply of piped gas. In Kamrup GA, PBGPL have completed laying of 144 inch-km of steel pipeline, 299 km MDPE, 1,400 DPNG connections and have completed 9 CNG stations. 06 more CNG stations are in final stage of completion. PBGPL has commissioned 4 CNG stations, including COCO station at Ulubari in Kamrup GA. CGS-I (ONGC CGS) has been operationalized in Cachar GA, while CGS Noonmati and Baihata are nearing completion in Kamrup GA. PBGPL registered 28,000 and 12,000 DPNG consumers in Kamrup GA and Cachar GA, as part of an active participation in the National PNG drive. PBGPL has sold 8,69,668 KG of CNG in the Kamrup GA despite the paucity of gas source in the GA and the 500 KM distance to the closest mother station. PBGPL has been transporting gas through cascades for feeding CNG to 100 nos. of CNG buses procured by Govt of Assam.

In the 11th round of bidding, OIL JVC, North East Gas Distribution Company Limited (NEGDCL) won three GAs (Assam-1 no, Tripura-2 Nos.). NEGDCL proposed to fund the "As-Built" project cost for the first five years construction cost of ₹ 2,081.39 crore for its 3 GAs of North Assam, North Tripura and South Tripura.

OIL also won 2 GAs in the 12th CGD bidding round through its Joint Ventures with HPCL (HOGPL: Nagaland GA) and BPCL (to be incorporated: Arunachal Pradesh GA).

14.1.6.9. Overseas Portfolios

The Company's overseas E&P portfolio as on 31.03.2024 is spread over 07 countries covering Russia, Venezuela, Mozambique, Nigeria, Bangladesh, Libya and Gabon. The portfolio includes:

i. Four (4) Producing assets (Russia-3 and Venezuela-1),

ii. Two (2) Discovered and development assets (Mozambique-1 and Nigeria-1)

iii. Four (4) Exploratory assets (Libya-1, Gabon-1, and Bangladesh-2).

As on 31.03.2024 2P oil & gas reserves position corresponding to OIL's stake in 4 overseas producing and discovered assets namely, Vankorneft & Taas Yuryakh in Russia, Carabobo in Venezuela and Rovuma Area 1 in Mozambique stood at 43.95 MMTOE. During the current financial year 2023-24, OIL's share of cumulative production from overseas assets stood at 2.119 MMTOE. The status of the major developments in the blocks is as under:-

14.1.6.9.1. Producing Assets (4)

i. JSC Vankorneft, Russia (Rosneft: 50.1%, OIL/IOCL/ BPRL: 23.9%, OVL: 26%)

The Company, along with IOCL and BPRL acquired 23.9% stake in JSC Vankorneft, Russia w.e.f 5th October 2016. The asset is held through an SPV Vankor India Pte. Ltd. (VIPL) incorporated jointly by wholly owned subsidiaries of the Company, OIL, IOCL and BPRL in Singapore. As on 31.03.2024, the 2P reserve position corresponding to Company's Participating Interest in this asset has been estimated at 11.94 MMT of oil and 4.56 MMTOE of natural gas. During 2023-24, Company's share of production in asset stood at 1.076 MMTOE. Cumulatively till 31.03.2024, an amount equivalent to USD 444.7 million has been received at the VIPL level as dividend corresponding to OIL's stake in the project.

ii. LLC Taas-Yuryakh Neftegazodobycha (TYNGD): Russia (Rosneft: 50.1%, OIL/IOCL/BPRL: 29.9%, British Petroleum: 20%)

The Company along with IOCL and BPRL acquired 29.9% stake in LLC Taas-Yuryakh Neftegazodobycha (TYNGD), Russia w.e.f 5th October 2016. The asset is held through an SPV Taas India Pte. Ltd (TIPL), incorporated jointly by wholly owned subsidiaries of the Company, OIL, IOCL and BPRL in Singapore.

As on 31.03.2024, the 2P reserve position corresponding to Company's participating interest in this asset has been estimated at 10.66 MMT of oil. During 2023-24, Company's share of production in asset stood at 1.025 MMTOE. Cumulatively till 31.03.2023, an amount equivalent to USD 398 million has been received at TIPL level as dividend and surplus capital repayment corresponding to OIL's stake in the project.

iii. Russia: License 61 [OIL-50% and PetroNeft Resources Limited-50% (Operator)]

OIL acquired 50% stake in WorldAce Investment Limited (WIL) through its WOS Oil India International BV (OIIBV) on 3rd July 2014 from PetroNeft Resources Plc (PR). The remaining 50% of WIL is owned by PetroNeft Resources plc (PR). WIL has a wholly owned subsidiary named LLC Stimul-T in Russia which holds the license of Block License-61 (L-61). Till date, Lineynoye, West Lineynoye, Arbuzovskoye and Tungolskoye fields have been developed.

Since August 2022, Asset is not producing crude oil due to the closure of Nord Imperial Pipeline. Stimul-T has filed for bankruptcy on 10.05.2023 due to adverse operational and financial circumstances.

iv. Venezuela: Project Carabobo [Corporation Venezuelan del Petroleo (CVP)-71%, INDOIL Netherland BV 7% (IOCL-3.5%, OIL-3.5%), OVL-11%, Repsol YPF (Spain)-11%]

The consortium of Repsol (11%), OVL (11%) and INDOIL(7%) (IOCL- 3.5%, OIL-3.5%) (together termed as Minority Shareholders (MSHs)) hold 29% share, and CVP (PdVSA's Subsidiary) hold remaining 71% share, in a Mixed Company called M/s Petrocarabobo SA (PCB) which is the Operator. OIL and IOCL formed a 50:50 JV company at Netherlands named INDOIL Netherlands B.V. (INDOIL) to invest in the project. The mixed company contract was signed on 12th May 2010 for a period of 25 years.

The Project owns and operates 30 KBD crude treatment plant. Currently, the project activities are delayed due to economic and political crisis in Venezuela.

As on 31.03.2024, the 2P reserve position corresponding to Company's Participating Interest in Project Carabobo has been estimated at 0.12 MMT. During 2023-24, Company's share of production in asset stood at 0.018 MMTOE.

14.1.6.9.2. Development Assets (2)

i. Mozambique: Rovuma Area1 (TOTAL (Operator - 26.5%), Mitsui - 20%, ENH-15% (Carried), BPRL-10%, BREML-10%, OVL - 10%, PTTEP - 8.5%)

The Company along with OVL acquired 10% participating interest in Area 1 Mozambique on 7th January 2014, through acquisition of 100% shares in Videocon Mozambique Rovuma 1 Limited [since renamed as Beas Rovuma Energy Mozambique Limited (BREML)- OVL 60%, OIL- 40%].

Due to deterioration of the security situation in Cabo Delgado province of Mozambique, the Operator declared Force Majeure on 22nd April 2021. The project is currently under Force Majeure with discussions continuing between the Operator and Government of Mozambique for restoring the normalcy in the region.

As on 31.03.2024, the 2P reserve position of Golfinho-Atum field of Area 1 corresponding to Company's Participating Interest in Rovuma, Area1 has been estimated at 16.21 MMTOE of natural gas and 0.456 MMT of condensate.

ii. Nigeria: Block OML 142 (Formerly OPL 205) [OIL-17.5%, IOCL-17.5%, and Suntera Resources-35% in JV Suntera Nigeria 205 (70% interest in block), Summit Petroleum-30% (Operator)

Suntera Nigeria 205 Ltd. (SN-205), a company incorporated in Nigeria, acquired 40% Participating Interest (PI) and 30% Economic Interest (EI) from Summit Oil International in May 2006. Subsequently, OIL, together with IOCL, acquired 25% (each) shareholding of Suntera Nigeria 205 Ltd. (SN-205), in which Suntera Resources Ltd. holds the remaining 50%. Hydrocarbon discovery (gas and condensate) in the block dates back to 1991-92 (Otien #1 well). After re-entry in the discovery well Otien #1, Extended Well Test (EWT) production from a single zone (zone #8) and re-workover operation of Otien #1 well were completed.

An Energy Park is coming close to the Otien field which will help in

monetization of gas produced from the field.

14.1.6.9.3. Exploratory Assets (4)

i. Bangladesh: Block SS-04 and SS-09 [OIL-45%; OVL-45%; (Operator)-45%; Bapex: 10%(Carried)]

The shallow offshore blocks were awarded in Bangladesh Bid Round-2012. The Production Sharing Contracts for both blocks were signed on 17th February, 2014 in Dhaka, Bangladesh for an initial exploration period of five (05) years which is valid till 16.02.2025. The consortium has completed the mandatory seismic survey and drilling of 1 (one) onshore well (in block SS-04). Drilling strategy for drilling two offshore wells, 1 (one) each in Blocks SS-04 and SS-09 is being planned.

ii. Libya: Area 95/96 Block [SIPEX (Operator)-50%, IOCL-25%, OIL-25%]

The consortium has completed drilling of five wells against MWP of commitment of drilling 08 (Eight) wells. All the drilled wells have struck oil and gas. Drilling of sixth well was in progress when the unrest began and all operations in Area-95/96 were suspended since May 2014. Due to the unrest, the block was under Force Majeure since May 2014, however, in view of the improving law and order situation in Libya, the Force Majeure have been lifted from 07.11.2023. NOC, Libya has agreed to grant an extension of the exploration period for 30 months with effect from 07.11.2023 till 06.05.2026.

iii. Gabon: Block Shakthi-II [OIL (Operator)-50%, IOCL-50%)

An oil discovery was made in the third well (Lassa-1) in the block during the old PSC (G4-220). Two appraisal wells (Lassa-2 & 3) were also drilled as per the MWP of Phase-I of New PSC (G4-245) and 2D Seismic API of 1,213.04 LKM in Phase-I was completed. Based on the integrated interpretation and prospect evaluations, the Consortium has entered into Phase-II exploration period in the block which was extended upto 15.04.2025 due to statutory delays and COVID-19 pandemic etc. Currently, drilling preparatory activities are being carried out.

14.1.6.9.4. Pipeline

Sudan: Product Pipeline [OIL-10% PI and OVL-90% PI]

The Project involved construction of 12" X 741 Km long Cross country Multi Product Pipeline from Al-Rawyan to Port Sudan. The Pipeline has been built on Build, Operate, Lease and Transfer basis. The consortium engaged M/s Dodsal Pte Ltd. as EPC contractor for the project. Project was completed in record time of 15 months (Target was of 16 months). The pipeline got commissioned in 2005.

14.1.6.10 Financial Performance:

₹/Crores

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Total Income	15,170.00	13,648.71	10,561.45	16,427.65	24,757.85	24,514.28
Net Profit/Loss	2,590.14	2,584.06	1,741.59	3,887.31	6,810.40	5,551.85
Plan Outlay-Actual	3,180.81	4,247.21	13,331.93*	4,366.52	5,534.42	5906.92
Plan Target	4,299.99	4,105.20	3,877.00	4,108.00	4,302.00	4,896.00

Note *: Includes Strategic Investment in NRL ₹8,677.27 crore.

14.1.6.11. Corporate Social Responsibility (CSR)

OIL is a Responsible Corporate Citizen with full commitment to the principles of CSR towards achieving inclusive and holistic development of its areas of operation and the society as a whole.

As specified under Schedule VII of the Companies Act 2013, the company has embarked upon various CSR projects under key thrust areas as follows:

a) Healthcare and Nutrition:

Projects such as OIL Arogya, OIL Sparsha and various projects for augmentation of healthcare infrastructure, providing healthcare facilities to masses and addressing nutritional requirement of infants, children and pregnant & lactating mothers etc

b) Swachh Bharat Abhiyaan (Drinking Water & Sanitation):

OIL is committed towards construction of school toilets, community toilets and individual household latrines, supply of clean drinking water to rural pockets, integrated Solid Waste Management projects and activities like organizing seminars, walkathons, competitions and Shramdaans by OIL employees in its Operational areas.

c) Education:

OIL Super 30 project providing 11 months free residential coaching for JEE and NEET. In additions projects like OIL Dikhya, Sakshyam to promote literacy and rehabilitation for Divyangjans.

d) Sustainable Livelihood Generation:

Projects such as Rupantar, Jeevika and Agriculture Project for sustainable income generation.

e) Skill/ Capacity Building:

Project OIL Swabalamban on Skill/ Capacity Building Project. Additionally OIL has set up Skill Development Institute, Guwahati to cater to the skilling need of the youth of the North East region.

f) Projects on Women Empowerment:

Centre of Excellence for Handloom, Handicraft & Entrepreneurship for training women; OIL Nursing School's three years course in General Nursing & Mid Winery (GNM).

g) Environment and Sustainability:

Mass tree plantation and setting up of a Bamboosetum in Digboi, Assam; other projects like cleaning & rejuvenation of ponds/lakes, tree plantation and Bio Diversity conservation

h) Promotion of Art, Culture and Heritage

At various place of religious and cultural interests

i) Development of Sports:

Coaching programmes for capacity building and construction of Sports training & rehabilitation Centre

j) Augmentation of Rural Infrastructure:

Construction of Roads, bridges, community halls, waiting sheds and other infrastructure.

14.2. NAVRATNA PSUs

14.2.1. Engineers India Limited (EIL)

14.2.1.1. Introduction

Engineers India Limited (EIL) was established in 1965 with its head office in New Delhi to provide engineering and related technical services for petroleum refineries and related projects. Over the years, it has augmented its span of services and excelled in various fields to emerge as a leading Project, Design, Engineering and Turnkey contracting company in the fields of:

- Petroleum Refining
- Petrochemicals, Chemicals & fertilizers
- Crude, Petroleum products & Gas Pipelines
- Offshore/Onshore Oil & Gas
- Terminals & Storage

- Sub Surface Strategic Storage
- Mining & Metallurgy
- Infrastructure & Urban Development

Since its foray in infrastructure sector, EIL has secured several noteworthy and significant assignments related to modernization/ development of international airports, intelligent buildings and water management. EIL execute projects under two major segments of consultancy and turnkey.

An ISO 9001:2015 certified company, EIL has regional offices in Chennai, Vadodara and Kolkata branch office in Mumbai, overseas engineering/marketing office in Abu Dhabi, which is a hub of the company's activities in Middle East. There are Inspection/ Procurement offices at various locations all over India and also in London, Milan and Shanghai with construction offices at different project sites both in India and abroad. Besides, EIL has a wholly owned subsidiary, Certification Engineers International Ltdfor providing certification and inspection services. EIL has joint venture company-Ramagundam Fertilizers and Chemicals Limited (RFCL) with National Fertilizer Limited (NFL) and Fertilizer Corporation of India (FCIL) with a shareholding of 26%. The commercial operation of the RFCL plant has been achieved on March 22, 202. EIL also holds 4.37% stake in Numaligarh Refinery Limited.

EIL provides a comprehensive range of project related technology and engineering services spanning from project conceptualizing to project commissioning which includes revamp, capacity expansion and modernization of plants. The portfolio of services offered by the company include:

Pre-Project Services like Feasibility Studies, Environment Impact Assessment Technology & Process Licensor selection and Cost Estimation.

Complete range of **Project Management** Services from concept to commissioning including Process Design and Front-End Engineering, Basic and Detailed Engineering, Procurement, Inspection and Third-Party Certification, Construction Management, Commissioning and plant start-up Assistance.

EIL is perhaps one of the few consulting organizations which offers Specialist Services in the domain of Heat and Mass Transfer Equipment Design, Environment Engineering, Information Technology, Specialist Materials and Maintenance, Plant Operations & Safety including HAZOPS & Risk Analysis, Corrosion Protection, Plant Integrity and Residual Life Assessment, Refinery Optimization Studies and, Yield & Energy Optimization Studies etc.

EIL has a multi-disciplinary engineering workforce and the company's employee strength at headquarters and in field offices including foreign offices was 2,649 as on 31.03.2024. In addition to pursuing excellence in engineering, EIL is a responsible Corporate Citizen and is committed to good Corporate Governance practices. The Right to Information Act, 2005 has been implemented in the company with a Public Information Officer and an Appellate Authority nominated to address issues under the Act. Information as per provision of the Act is posted in the company's website www.engineersindia.com. Besides, a web-based complaint management system has been implemented for handling complaints/ grievances from public, contractors, vendors, suppliers etc. Further, the Women's Forum of the company has a designated committee for dealing with complaints relating to sexual harassment.

14.2.1.2. PERFORMANCE HIGHLIGHTS of 2023-24

Business Performance

During the FY 2023-24, EIL secured new business worth ₹ 4,747.66 crore which includes business worth ₹ 1,725.44 crore in Consultancy segment (₹ 1,226.97 crore from domestic clients and ₹ 498.47 crore from overseas clients), and ₹ 3,022.22 crore in LSTK segment.

Major assignments secured by company in the **domestic segment** of its business operations include Project Management Consultancy (PMC) for Renovation of living quarter and revamping of HVAC on Mumbai High Assets for ONGC, Coke Drum Replacement at PRPC for IOCL, Construction of Multi-Storied Building for Integrated Office-cum Data Centre Complex for Intelligence Bureau, comprehensive Design Engineering and Project Management Consultancy for Development and Upgradation of Infrastructure at NSEZ Noida, on depository basis, for Noida Special Economic Zone Authority and many others.

EIL also provides its Engineering, Procurement and Construction Management (EPCM) services to various clients and during FY 2023-24 has secured major assignments of providing services for proposed pipeline from Mumbai Refinery, Mahul to Rasayani Complex of BPCL, 50 KTA ISO-Propyl Alcohol (IPA) Plant at Usar for GAIL India Ltd, Biturox Unit at Barauni Refinery (Phase-II) for IOCL, Setting up of Aqueous Ammonia unit at Numaligarh Refinery, on Depository Basis for NRL, Site Enabling Works for Bina Petrochemical and Refinery Expansion Project for BPCL at Bina among various others.

EIL is also entrusted to undertake various pre-feasibility and Detailed Feasibility Reports (DFR) for its clients. Some of the major assignments secured under this category during the year include Preparation of BEDP for ARU, SWS, Utilities and Offsite package, Integrated DFR for Integrated Hydrocracker Catalytic De-waxing and SDA unit at HPCL Mumbai Refinery, DFR and EIA/ \RRA Study for Crude Oil Terminal and Product Tanks at Jawahardweep Island for HPCL, Pre-Feasibility Report for Methylamine production from Methanol for NRL. Feasibility Report for New Petrochemical Project for MRPL, Feasibility Study of Alkylation Unit for Nayara Energy Limited, feasibility for additional facilities at Pata for receiving C2-C3 at GAIL Pata among various others.

Other major assignments secured during the year, under different modes of execution, include consultancy Services for FEED Engineering Services for unloading pipelines, onshore storage tank farm and associated facilities at GCPL Dahej, Independent Engineer Services for PLI Scheme for Advance Chemistry Cell of Ministry of Heavy Industries, Independent Engineer for Development, Construction and Operation of Greenfield International Airport at Bhogapuram, Vizianagaram, Upgrading of The Institute of Petroleum Safety, Health and Environment Management (IPSHEM) to World-Class Facility at Goa, on cost reimbursable basis for ONGC to name a few.





Completion of infrastructure work of IPSHEM Campus, Goa and IEW-2024 related Infrastructure

Major assignments secured by company in the **International territories** during the year includes FEED and PMC Services for

new NHT/CCR-Reforming unit for Sonatrach, Algeria, PMC Services for EPC-1 (LNG Storage) & EPC-3 (Utilities & BOP) Packages of LNG Terminal, for Nigeria Padah LNG, Lower Zakum Facilities Hazop/ Engineering Packages and CS934-Study requirements to put DIYAB Appraisal well ZK420 (WHT ZK-374) on Production for M/s Adnoc Offshore, FEED for AGRP revamp at MAA Refinery from KNPC, Kuwait and various others.

During the year, EIL secured major assignment of providing its EPCM Services for Green-field 4000 TPD Urea and 2,300 TPD Ammonia Complex in Nigeria (Change Order) for Stanch Fertilizer FZE.

Other major assignments in International territories includes FEED for Acid Gas Removal Project (AGRP) revamp at MAA Refinery for Kuwait National Petroleum Company (KNPC),FEED for SARB Produced Water treatment value, UAE for ADNOC Offshore and FEED for Halon Replacement work for ADNOC to mention a few.

Project Performance

EIL with core competency in project management strives to execute and deliver projects to its clients with high level of performance on quality, time, cost and other key performance indicators. Number of these projects have created new industry benchmarks as well.

Some of the major projects that were completed during the year includes Commissioning of SRB in BV-VI Auto Fuels Project of CPCL Refinery, Mechanical Completion of Chhara LNG Terminal Project, Mechanical Completion of Kochi-Palakkad LPG pipelines, Mechanical Completion for LNG Truck Loading Facility (TLF) at Konkan LNG Limited, Completion of LLDPE/HDPE (Swing) Unit of GGSPAP, HMEL Bhatinda, Performance Guarantee Test run of Sour Water Stripper unit & Amine Regeneration Unit of IOCL Aishwarya Project, Commissioning of Jamshedpur Spurline under Dhobi-Durgapur Haldia Pipeline Project, Commissioning and PGTR of Slug Catcher Project (Ph-1) at ONGC, Uran, Completion of Infrastructure works for IEW 2024 and major facilities at IPSHEM Campus, Goa, Completion of world's longest HDD Crossing (26" size) with Intersection Technique for PNCPL Project in Assam, Mechanical completion of Raw Water Treatment Plant (RWTP) having capacity of 6500 m^3/hr at Rajasthan Refinery Project and Completion of PGTR of IOCL-BarauniindJet* Unit.



Chhara LNG Terminal Project



LNG Truck Loading Facility (TLF) at Konkan LNG Limited



Slug Catcher project of ONGC

It is matter of pride for EIL that the indJet®, an indigenous technology, which is commercialized is jointly developed by EIL-R&D and IOCL-R&D for production of ATF and the process is also capable to produce Pipeline Compatible Kerosene (PCK).



Indjet Project at IOCL Barauni Refinery



LLDPE HDPE (Swing Unit) at GGSPAP, HMEL



World's longest HDD Crossing for PNCPL project

14.2.1.3. Financial Performance

During the FY 2023-24, EIL achieved Turnover and Profit before Tax of ₹ 3,232.16 crore and ₹ 470.41 crore respectively.

14.2.1.4. Human Resource Initiatives

EIL is a human resource driven organization and operates through a multi-disciplinary engineering workforce at its headquarters and at construction sites, Gurugram office including foreign offices. The manpower strength of EIL was 2649 as on 31st March 2024. During the year number of initiatives on HR front were undertaken which includes certification as "Great Place to Work" for the period of March 2023-March 2024, Up gradation of HR Software for seamless integration and HR service delivery with Introduction of e-SIGN based Claim Submissions and Transactions, Revisit & Review of HR policies to bring in better Employee Engagement which includes enhancement of employee benefits by way of introduction of 'Sahyog' Loan Scheme which caters to personal exigencies of employees through a simple and agile application process, Focus on Physical wellbeing through 'Aarogyam': Daily Online Yoga Session for Employees and their Families.



Aarogyam - Daily Online Yoga Session

EIL has also introduced long-term learning interventions like 'दक्ष'- A 11 days Management Development Program for Team Leaders and Group Heads, 'ि खर'- A 12-week Advance Leadership Development Program for Senior Executives and Leadership development program-AAROHAN. EIL is also emerging as a Global Learning partner by collaborating with International Technical and Economic Coordination (ITEC) Platform of the Ministry of External Affairs (MEA) and has organized 10-weeks Technical Training to the Officials from Mongol Refinery. Various Employee Engagement activities are also organized

during the year including 'Urjaalekh'- An Industry wide Technical Paper Writing Competition, 'Darpan'-An Inhouse Photography Competition and Expert Lecture Series - "सुविधा व्याख्यान श्रृंखला". Further, inhouse Crèche facility have also instituted at EIL-Gurugram Office Complex for all the employees.



Shikhar - Advanced Leadership Program for Senior Executives



EIL Creche at Gurugram Comples

14.2.1.5. Technology Development and Commercialization

EIL is at the forefront of technology development both inhouse and through collaborative development with various stakeholder. During the year number of technology development projects were initiated which includes Development of process for prevention of SO_3 slippage into TGTU Quench column, Design of new CDU-VDU configuration for improved operations and energy optimization, Development of design capabilities for multi-downcomer trays, Development of De-Oxo reactor technology for green hydrogen purification, Development of design methodology for slurry pipeline for long transportation of coal, Multi- functional tailored heterogenous catalyst development for green hydrogen synthesis from model biomass oil and Development of process for recovering rare gas from natural gas.

Number of EIL developed technologies were also commercialized during the year including setting up of Aqueous ammonia unit at Numaligarh Refinery, Commissioning and PGTR activities of NRL SRU & TGTU licensed by EIL, Supply of Basic Engineering Design Package (BEDP) for EngHOG under CDU-2 revamp at Nayara Energy Limited, Refurbishment of proprietary contactor for LPG treatment technology at HPCL-VR and BEDP for Super Absorbent Polymer (SAP) production plant at Kochi Refinery.

EIL also collaborates with various stakeholders by entering into MoUs and MoAs to further its mission of developing indigenous technologies. Few of these collaborative partnership agreements and technology tieups includes MoU with SUNRISE CSP GROUP to provide complete range of solutions and services in Solar CSP domain by integrating renewable energy in various industrial sectors in India and Overseas, MoU was also entered into with HPCL to exchange scientific information, joint research, encourage demonstration in the field of hydrocarbon, petrochemicals, energy technology and commercialization of HPCL developed technologies/ jointly developed technologies. Another critical MoU was signed with BPCL for Development of Joint Technology for HiGee Deaeration Technology for BFW on knowhow generated by BPCL. EIL also entered into a collaborative partnership with IIT Roorkee for collaborative activities for research in areas of mutual interest like Conversion of CO_2 to valuable chemicals, Catalytic conversion of CO_2 & development of catalytic process for lignocellulosic biomass to chemicals.



EIL's MoU with Sunrise CSP Group

EIL is also holding membership of process Science Technology Center (PSTC), an industry-academia collaborative research program initiated by University of Texas, USA, Fractionation Research Incorporated (FRI), a non-profit cooperative research organization based at Oklahoma, USA and Process Integration Research Consortium (PIRC), University of Manchester UK.

14.2.1.6. Startup Initiative-EngSUI

EIL R&D also remains fully committed to GOI's Flagship program for nurturing the Start-up Eco System within India by steering EIL's startup initiative "EngSUI". Under EngSUI, EIL is providing intellectual, infrastructural and financial support to the Startups. EIL funds the Startup projects working in the field of Hydrocarbon, IT & IIOT, Renewable Energy & Storage, Nano-Materials, Waste to Energy, Health Safety and Environment. 9 IITs and 4 NITs have registered with EIL's Startup India Initiative. Totally 27 number of projects have been funded till date over 6 Rounds. Recently, the seventh-round proposals are under screening procedure.

Patent Portfolio

Filing and grant of patents is critical activity for EIL through which it protects its Intellectual Property. In this endeavour during the year EIL filed13 patents during FY 2023-24 which includes;

- A method and system for treating spent caustic stream generated from H2S rich hydrocarbon system.
- A lining system for a reservoir.
- Novel Tailored Distillation Tower Engineering Design for Second Generation (2G) Ethanol Bio-Refineries to counter suspended Micro-Lignin troubleshooting.
- Solar energy-based process and apparatus for crude processing with reduced fuel consumption.
- A method for underground storage of crude oil under ambient conditions, protected from all sides providing adequate safety levels.
- Utilising Low Grade Heat in vacuum Distillation Unit.
- Repurposing the delayed coker unit to process total unconverted oil from ebullated bed residue hydrocracker.
- Method and system for estimating GHG emissions.
- A system for mounting an industrial heater.
- Distillation column with hanging downcomers.
- A system for externally adjusting inaccessible wall tube hanger supports.
- Novel arc-domed true counter current plate air preheater for efficient heat transfer.
- A Fired Heater.

Further, during FY 2023-24, 16 patents were grantedwhich includes;

- A method and device for above ground liquid sulphur seal with degassing.
- De-foaming cyclonic device in Pre-flash drum.
- Flat plate type distributor for fluidised bed gasifier handling high ash coal.
- A Desalter vessel.
- Novel gas-liquid inlet diffuser for Cocurrent downflow trickle bed Reactor.

- Apparatus for deoxygenation of water and process for the same.
- A device for recovering and separating a low-pressure fluid.
- Method for optimizing energy in a process carried out using a system.
- An apparatus and process for neutralization of Alkaline waste water using CO_2 enriched stream.
- A system and a process for high pressure, temperature and moisture content synthesis gas sampling.
- A system and a process for purification of syngas from high ash Indian Coal for Methanol production along with recovery of high purity CO_2.
- A self-sustaining process and system for heat recovery and improving efficiency by reducing fuel.
- Maximization of power generation from existing gas turbine using a thermodynamic cycle.
- Water conditioning device and method by virtue of hydrodynamic cavitations in presence of magnetic field.
- An air distribution duct system for a fired heater system.
- A visibly leak-tight Explosion door arrangement for a fired heater.

14.2.1.5. CSR Activities:

EIL is committed to operate in an economically, socially and environmentally responsible manner to enhance the company's overall contribution to society. The company's CSR policy aims to enrich the lives of people through the process of social upliftment, by promoting inclusive growth and recharge the environment through sustainable process.

CSR activities are undertaken in compliance with Schedule VII of The Companies Act and circulars/amendments/guidelines/ directives/rules and notifications issued by various ministries/departments of Govt. of India. The main focus areas of EIL's CSR are Healthcare & Nutrition, Education/Skill Development, Drinking Water/Sanitation, Rural Development, Environment Protection/Sustainability, Upliftment of underprivileged, Women Empowerment and Supplement specific government programmes/schemes

The CSR activities are directed towards supplementing/supporting the ongoing and planned initiatives of the local, state or central government, with a focus on backward areas and underprivileged at various locations across the country including our project sites/offices and Head Office. The activities undertaken are in consonance and consultation with State Governments, district administration, local administration as well as Central Government Departments/Agencies, Self Help Groups, etc. to avoid duplication.

As per Companies Act, 2013, the budgetary allocation of at least 2% of the average net profits made during the three immediately preceding financial years has been made in the financial year 2023-24 for CSR activities.

Various thrust areas of our CSR activities with brief detail on type of projects/ activities in FY 2023-24 (up to 31st March, 2024) in each thrust area are mentioned below:-

Healthcare & Nutrition (संजीवनी)- Projects completed under this thrust area include Establishment of 140 nos. of Model Anganwadi Centres in aspirational district Dhubri, Assam; Procurement of medical equipment for Department of Anesthesiology, Ear Nose Throat, Radio Diagnosis & Urology at Indira Gandhi Medical College & Research Institute, Puducherry; Support for Eye check- up camps with 600 cataract surgeries and distribution of spectacles & medicines in aspirational district of Haridwar, Uttarakhand; Conducted eye and health check-up camps in four aspirational districts viz. Baksa, Udalgiri, Barpeta and Hailakandi in Assam; Provided medical equipment to TLM Purulia Leprosy Home and Hospital in Purulia, West Bengal; Provided Advance Life Ambulance for

medical camps & life support treatment in 4 four districts of Assam; Conducted four camps in different locations for distributing aids and assistive devices to poor & needy Divyangjans; financial assistance for programme on children's spine & optical health improvement by distribution of innovative school bags with desks in aspirational district Nandurbar, Maharashtra; and supported running of medical van in areas around Barner district in Rajasthan for primary healthcare services.

Projects under implementation under this thrust area include supporting treatment of 8 under-privileged Cancer Patients in Rajiv Gandhi Cancer Institute and Research Centre, New Delhi and support for 'Jan Arogyam' Community Healthcare Clinic in slums of Ghaziabad, Uttar Pradesh.



Model Anganwadi Centres in Dhubri, Assam



Medical van serving villagers in Barmer district, Rajasthan



Distribution of assistive aids & appliances to Divyangjans in 4 locations Pan India



Distribution of innovative school bags with desks to children in Nandurbar, Maharashtra

Education (प्रज्ञाता)/ Skill Development (प्रवीण)- Projects completed under this thrust area include construction of Government School Building in Kabennur, Dharwad, Karnataka; contribution towards operational funding of Skill Development Institutes in Ahmedabad (Gujarat); Construction of additional classrooms in 2 Govt schools of Karaikal district, Puducherry and in 21 Govt. Schools in Darrang district, Assam; Maintenance of school toilets constructed by EIL in state of Assam, Tamil Nadu and Odisha as part of Swachh Vidyalaya Abhiyan.



Skill Development Training of candidates at SDI-Ahmedabad



Constructed school building in Dharwad, Karnataka

Women Empowerment (शक्ति)- Project completed under this thrust area includes support for health and menstrual hygiene awareness camps for rural girls/women in aspirational district of Giridih district in Jharkhand.



Development of Miyawaki Forest in Gurugram, Haryana



Constructed classrooms in Govt. schools in Darrang, Assam



Constructed classrooms in Govt. schools in Darrang, Assam

Environment Protection (प्रकृति)- Project completed under this thrust area includes installation of 40KW Rooftop Solar Grid at Arogya Sandhan Residential Care Home for differently abled persons in West Bengal.

Project under implementation under this thrust area includes development of Miyawaki forest in Gurugram, Haryana for improving ambient Air quality, Water conservation, flora & fauna and overall Environment & eco system for the benefit of the general population in and around the area.



Installation of Roof-top solar panels at Residential Care home for differently- abled persons in West Bengal

14.2.2. ONGC Videsh Limited

ONGC Videsh Limited (OVL) is a wholly owned subsidiary and overseas arm of Oil and Natural Gas Corporation Limited (ONGC). It was incorporated in 1965 as Hydrocarbons India Limited and was rechristened as ONGC Videsh Limited in 1989. OVL is a Schedule "A" Central Public Sector Enterprise (CPSE) 'Navratna' company under the administrative control of the Ministry of Petroleum & Natural Gas. Primary business of OVL is to prospect for oil and gas acreages outside India, including exploration, development and production of oil and gas. In terms of reserves and production, OVL is the second largest petroleum company of India, next only to its parent ONGC.

The Company has participation, either directly or through its wholly owned subsidiaries/joint venture companies, in 32 projects in 15 countries of which 16 are operated/jointly operated and 16 are non-operated (managed through participating interest). Projects in 15 Countries, viz. 1 project each in Mozambique, Iraq & UAE, 2 projects each in Azerbaijan, Bangladesh, Brazil, South Sudan, Vietnam & Venezuela, 3 projects in Russia, 4 projects in Colombia, 6 projects in Myanmar, and 4 dormant projects in 3 Countries.

OVL adopts a balanced portfolio approach and maintains a combination of producing, discovered, exploration and pipeline assets. Currently, OVL has Oil and Gas production from 14 Assets, 4 Assets where hydrocarbons have been discovered and are at various stages of development, 11 Assets are under various stages of Exploration and 3 are pipeline projects.

OVL is a significant contributor to India's energy security. In 2022-23, OVL produced 10.171 million metric tons of oil equivalent (MMTOE) of oil and gas, which is about 16% of India's domestic Oil and Gas production. During FY 2023-24, ONGC Videsh has produced around 10.518 million metric tons of Oil equivalent (MMTOE) of Oil and Gas.

OVL is a well-managed and professionally run company. It has a strong track record of success in the international Oil and Gas industry. OVL is committed to providing reliable and affordable energy to India and to contribute to the country's economic growth.

14.3. MINIRATNA PSUs

14.3.1. Balmer Lawrie & Co. Limited (BL)

Balmer Lawrie & Co. Limited (BL) is a multi-technology, multi-locational Company headquartered at Kolkata with operations spread through India. The company has significant transnational business interest with joint ventures in Dubai and Indonesia. The Company also has one subsidiary and several joint ventures in India. The Company's business interest spans both Manufacturing and Services. The authorized and paid up capital of the Company were ₹ 300 crores and ₹ 171 crores respectively as on 31st March, 2024. Balmer Lawrie Investments Ltd., a Government Company, holds 10,56,79,350 equity shares of ₹ 10 each (totaling to about 61.80% of paid-up equity capital) of the Company. The Company achieved Net Turnover of ₹ 2,404.16 crores during 2023-24 as against ₹ 2,383.09 crores during 2022-23, registering an increase of approximately 0.88% over the previous year. The Profit before Tax of ₹ 278.65 crores in 2023-24 as against ₹ 211.30 crores in 2022-23, the increase of approximately 32% over the previous year. The increase is attributable to the remarkable performance by all the manufacturing businesses as well as the Travel vertical.

The Reserve and Surplus of the Company increased of ₹ 1,256.21 crores as on 31st March 2024 as compared to ₹ 1,185.24 crores as on 31st March 2023.

14.3.2. Chennai Petroleum Corporation Limited

i. Chennai Petroleum Corporation Limited (CPCL), formerly known as Madras Refineries Limited (MRL) was formed as a joint venture in 1965 between the Government of India (GoI), AMOCO and National Iranian Oil Company (NIOC). AMOCO disinvested CPCL equity in favour of the Government of India in 1985. Later Government of India transferred its equity to IOCL and CPCL became a subsidiary of IOCL in 2001. The present capacity of Manali refinery is 10.5 MMTPA.

CPCL Manali Refinery is one of the most complex refineries in India with Fuel, Lube, Wax and Petrochemical feedstock production facilities. The 5.8 MGD Sea Water Desalination Project to augment the water requirements of its refinery was first of its kind in the industry.

CPCL has a Wax Plant of 30,000 metric tonnes (MT) capacity per annum, to produce paraffin wax for manufacture of candle wax, waterproof formulations and match wax. A Propylene Plant was commissioned in 1988 with an initial capacity of 17,000 MT per annum to supply petrochemical feedstock to neighboring downstream industries. The unit was revamped to enhance the propylene production capacity to 30,000 MT per annum in 2004.

The main products of the Company are LPG, Motor Spirit, Superior Kerosene, Aviation Turbine Fuel, High Speed Diesel, Naphtha, Bitumen, Lube Base Stocks, Paraffin Wax, Fuel Oil, Hexane, Petrochemical feed stocks and Petroleum Coke. CPCL also supplies Linear Alkyl Benzene Feedstock (LABFS) to a downstream unit for manufacture of Linear Alkyl Benzene.

CPCL's second refinery, located at Nagapattinam was commissioned in 1993. This Cauvery Basin Refinery (CBR) was a small well-head refinery processing crudes from nearby ONGC fields, Rawa crude and KG-D6 crude. CBR has been decommissioned with effect from 01.04.2019 due to limitations in meeting product specifications with the existing configuration. Construction of a new refinery of 9.0 MMTPA capacity along with Petrochemical facility is in progress in JV mode with IOCL (IOCL-75% and CPCL- 25%).

CPCL has achieved the Total Distillates of 76.2 % in 2023-24.

Parameter	2022-23	2023-24
Crude Throughput (MMT)	11.316	11.642
Distillate Yield (%)	76.0	76.2

ii. Financial Performance

During the FY 2022-23, CPCL achieved a turnover of ₹ 90,801 crore. For the current FY 2023-24, the turnover is ₹ 97,207 crore. The Details of financial performance are given below:

(₹ in crores)

Parameter	FY 2022-23 Actuals	FY 2023-24
Turnover	90,801	79,207
Profit Before Tax	4,809	3,660
Profit After Tax	3,534	2,711

iii. Projects

A. Major Projects Completed

New Sulphur Recovery Block:

New Sulphur Recovery Block consisting of SWS (Sour Water Stripper of capacity-30 m^3/hr), ARU (Amine Regeneration Unit of capacity-300 m^3/hr) & SRU (Sulphur Recovery Unit of capacity-2x100 TPD) along with associated necessary offsites were commissioned in April 2023.

The cost of the project is approximately ₹600 crore.

B. Major Projects under Implementation

Laying of New Desalination& RO reject water pipeline:

Laying of 22 km length new 28" Desal Water (GRP-Glass Reinforced plastic) Pipeline & new 10" RO Reject water (GRP) Pipeline between CPCL Manali Refinery & CPCL Desalination plant at Ennore.

The estimated cost of the project is ₹ 205 crore ± 10% (incl of GST) and the anticipated completion is by September 2025.

Refinery Expansion at CBR:

a) CPCL along with Indian Oil Corporation Limited (IOCL) is implementing a 9.0 MMTPA Cauvery Basin Refinery & Petrochemicals Project (CBRPL) at Nagapattinam at an estimated cost of ₹31,580 crore.

b) The refinery complex will produce LPG, Petrol, Diesel and ATF meeting BS-VI specifications and Polypropylene as a value added product. This project utilizes many indigenous technologies like INDMAX, OCTAMAX, etc. in line with nation's vision of AatmaNirbhar Bharat.

c) The new refinery will be set up in an area of about 1300 acres. Land acquisition is completed by Govt. of Tamil Nadu and land handed over to CPCL on 31st October 2023.

d) Dismantling of the existing refinery was completed and Site enabling activities like Construction power, Construction water, Site grading, Topographic & geotechnical surveys, Boundary wall and Roads & drain construction are in progress.

e) The foundation stone for the project was laid by Hon'ble Prime Minister on 17th February 2021. The project will not only add to India's energy security, but will also generate employment opportunities (12,000/day of manpower with 25,000 at peak during Project Construction phase, 600 numbers of Direct employment +2000 numbers of Indirect employment during operation phase of the project) and promote economic development of the region.

f) Engineering, Procurement, Construction and Management (EPCM) consultants (Engineers India Limited, McDermott & Tata Consulting Engineers) have been lined up and Detailed engineering, Tendering & Procurement activities are in progress.

g) Enquiries have been floated for all major Equipment, Works Contracts (including LSTK & BOO), Packages and they are in different stages of tendering, evaluation & award.

h) Certificate of incorporation of Joint Venture Company (JVC) was received from Ministry of Corporate Affairs.

i) The project is scheduled to be completed in 39 Months from accordance of statutory approval for infusion of equity by IOCL & CPCL in the JVC.

C. Future Projects

CPCL is planning to implement a project for production of Group II Lube Oil Base Stocks for improved LOBS production. First stage approval has been received from CPCL/IOCL Boards and pre-project activities like BDEP preparation & DFR preparation are completed. Environmental clearance was obtained in January 2024.

iv. Corporate Social Responsibility & Sustainable Development:

CPCL's CSR & Sustainability Policy is formulated conforming to stipulations under Section 135 of the Companies Act, 2013, the CSR Rules issued by the Ministry of Corporate Affairs and applicable Guidelines on CSR and Sustainability issued by the DPE.

The company's CSR policy aims to positively impact economic and social conditions of the communities in which it operates and enrich the lives of people through the process of social upliftment, by promoting inclusive growth and recharge the environment through sustainable process.

The main focus areas of CPCL's CSR are: -

- Education / Skill Training
- Health
- Drinking water & sanitation
- Community Development
- Environment Sustainable Development
- Empowerment of Differently-abled
- Women Empowerment
- Empowerment of Socially & Economically Backward people

Some of the CSR activities carried out by CPCL are:

- Operating Community Health Centre to provide free health care services relating to ophthalmology, dentistry, physiotherapy & hematology to the public in around Refinery through Wockhardt Foundation.
- Operation & Maintenance of Mobile Medical Health Care Unit at Manali near Chennai, Nagapattinam and Ramanathapuram (Aspirational District) in Tamil Nadu through Helpage India to provide general health care services to about 30 villages.
- Mega Eye Care Camp at Nagapattinam through SankaraNethralaya a Unit of Medical Research Foundation, Chennai, covering more than 800 beneficiaries towards vision correction and, 122 cataract surgeries with post-operative review.
- Sponsoring towards distribution of assistive devices to the Persons with Multiple Disabilities in Chennai and Thiruvallur districts of Tamil Nadu through ALIMCO Limited, by organizing multiple camps across various locations.
- Distribution of artificial intelligence enabled smart vision glass, an assistive device, for visually impaired students.
- Adoption and welfare of elephants at Arignar Anna Zoological Park, Chennai.
- Contribution towards curing disability caused by clubfoot through ponseti method (non-surgical) to the babies / kids born with clubfoot problems, through CURE International India Trust, Chennai.
- Contribution towards procurement of Robotic Scavenging Machine for Chennai Metropolitan Water Supply & Sewerage Board (CMSSWB), Chennai through IIT Madras Incubation Cell to minimize & eliminate manual scavenging and contribute towards the health of the people earlier engaged in the manual scavenging activities.
- Running of Polytechnic College through CPCL Education Trust for imparting technical education to the poor and needy surrounding the Manali refinery.
- Sponsorship of six months full-time residential job oriented skill development training programme on Machine Operator Plastics Processing course through CIPET, Chennai, for the poor and under privileged students.
- Procurement and contribution of critical medical equipment for various Government Hospitals.
- Sponsorship towards JEE /NEET coaching class students.
- Women empowerment through education & vocational training by Sri Aurobindo Society, Pondicherry.
- Removal of water hyacinth from the river, channels and drains in vennar sub basin in Nagapattinam to ensure free flow of river water during heavy rainfall in monsoon and thus prevent occurrence of flood in the low lying areas.
- Conservation of ground water, prevention of soil erosion and environmental sustainability through Green Tamil Nadu Mission by undertaking dibbling of One Crore Palmyra seeds along the 14 coastal areas of Nagapattinam District.

- Sponsorship & funding towards infrastructure and smart classroom development of Government Schools and Colleges, construction of Community Hall, Anganwadis, additional class rooms, construction of dining and multi-purpose hall, rest room, scaling up of technology enabled education in Government Schools, etc. in and around the refinery in Chennai.
- CPCL has commissioned 1040 KW solar roof top panels during the year. With this addition the cumulative installed solar roof top capacity is 2255 KW.

14.3.3. Mangalore Refinery and Petrochemicals Limited (MRPL)

14.3.3.1. A brief of the Company:

Mangalore Refinery and Petrochemicals Limited (MRPL) is a Category 1 Miniratna, "Schedule–A" CPSE and a subsidiary of Oil and Natural Gas Corporation Limited (ONGC).

The Refinery has a versatile design with high flexibility to process Crude with 24 to 46 API gravity and has high degree of automation.

The present name plate capacity of the Refinery is 15 MMTPA. MRPL achieved the highest ever crude throughput of 17.116 MMT during the year 2022-23 against 15.04 MMT during the previous year 2021-22 registering 114% capacity utilization. This was the highest throughput by a single location PSU. MRPL earned a Profit After Tax (PAT) of ₹ 2,638 crore during the financial year 2022-23 against the previous year profit of ₹ 2,955 crore during the financial year 2021-22.

14.3.3.2. PROJECTS

Scaling up of Desalination Plant from 30 MLD to 40 MLD

MRPL has set up 30 MLD capacity Desalination plant at Thannirbavi in the New Mangalore Port Authority land to ensure continuous operation of Refinery during summer/weak monsoons to eliminate the risk of Nethravathi river being the only source of fresh water. Further scaling up of Desalination plant capacity from 30 MLD to 40 MLD was taken up. The project is commissioned in February 2024.

Marketing Terminal at Devangonthi

Marketing Terminal at Devangonthi, Bengaluru is being set up at an approved cost of ₹ 304 crore to cater to requirements of petroleum products primarily in the state of Karnataka. The terminal would receive finished petroleum products (MS, HSD and ATF) through the existing PMHBL pipeline from MRPL. The supplies of petroleum products to the retail outlets/customer/ aviation stations would be met through road tankers. M/s. Nauvata Engineering Private Limited is the Consultant for the project. Construction activities are in final stages and the Terminal is expected to be completed by first quarter of FY 2024-25.

CCR-1 Revamp

CCR-1 converts heavy naphtha feedstock into high octane reformate for gasoline blending and produces hydrogen for hydro-treating/hydrocracking. Revamp of Regenerator section of CCR-1 was carried out to increase Regenerator Coke burn capacity thereby resulting in overall capacity increase from 75 m^3/hr to 80m^3/hr. The project was completed and commissioned in May 2023.

Power System Upgradation Project

The project envisages enhancement of Grid Connectivity & Refinery System upgradation which includes implementation of Grid connectivity at 220/33 kV level to Refinery and Grid connectivity at 110/33kV to Aromatics. Refinery Electrical system upgradation, STG and cooling water system modifications along with other enabling activities are part of the scope of this project. M/s. Tractebel Engineering Pvt. Ltd. is the Project Management Consultant. Mechanical Completion of the project is scheduled in third quarter of FY 2025-26.

PFCC Regenerator Stack Wet Scrubber System

The project is conceived to reduce SPM emission in flue gas of PFCC as a pollution control measure. Petrochemical Fluidized Catalytic Cracking (PFCC) unit processes unconverted oil from Hydrocracker units, straight run low sulphur vacuum gas oil and hydro treated heavy coker gas oil and converts into value added products such as propylene, LPG and gasoline. The regenerator stack wet scrubber system ensures meeting emission norms even under adverse situations. M/s. Thyssenkrupp Industrial Solutions (India) Private Limited is the Project Management Consultant and M/s. Kalpataru Project International Limited is the LSTK contractor for the project. Mechanical Completion of the project is expected in first quarter of FY 2024-25.

PFCC LPG + Propylene Amine Scrubber

While processing feed with high Sulphur content in Petrochemical Fluidized Catalytic Cracking (PFCC), higher Hydrogen Sulfide (H_2S) is expected in LPG and Propylene stream. Current system to meet H_2S in LPG and Propylene product is caustic wash. Amine Scrubber System reduces dependency on caustic wash to a large extent. The system removes H_2S in the LPG and Propylene streams and minimizes the spent caustic generation in existing Caustic Treatment System. Mechanical Completion of the project was achieved in December 2023.

New Bitumen Blowing Train as a part of extension of existing Bitumen Blowing Unit

The project envisages setting up of additional Bitumen Blowing train with a capacity of 144 KTPA as a part of extension of existing Bitumen Blowing Unit to cater to the simultaneous demand of VG-30 and VG-40 grades of bitumen to leverage market demand. M/s. Engineers India Limited is the Engineering, Procurement and Construction Management Consultant for the project. Mechanical Completion of the project is expected in first quarter of FY 2024-25.

Iso Butyl Benzene (IBB) Pilot cum Demo Plant

This is MRPL's R&D project. Iso Butyl Benzene(IBB) is an Active Pharmaceutical Intermediate (API) and a key input for pain killers and is also used in perfume industry. MRPL has collaborated with CSIR-National Chemical Laboratory (CSIR-NCL) for developing IBB process technology. MRPL has also got the patent for this process technology. It is planned to set up a Pilot cum Demo plant of 200 TPA capacity. This product, IBB is going to be manufactured with the captive feedstock available within MRPL. Mechanical completion of the project is expected to be in the first quarter of FY 2025-26.

Green Hydrogen

MRPL will be setting up a 500 TPA Green Hydrogen Plant within the refinery based on water electrolysis pathway. The plant is scheduled for completion in Q2 FY 2026-27.

Bio-ATF

MRPL will be setting up a Bio-ATF plant of 20 KLPD capacity based on indigenous technology(EIL/CSIR-IIP). The plant will be set at Mangalore integrated with existing refinery. The plant has been sized based on feed stock availability. The plant is scheduled for mechanical completion by end FY 2025-26.

Human Resources:

Total employee strength was 2,550 including 226 women employees, 332 SC/ST employees and 41 employees with physical disabilities. Out of total employee strength of 2,550, 1,107 employees belong to Management cadre and 1,443 employees belong to Non- Management cadre.

14.3.3.4. Energy Conservation:

Major Energy Conservation measures implemented during the year FY 2022-23:

S.No	Schemes Description
1	Establishment of Steam Trap Management system for reduction in Steam Leakage
2	Optimisation of CPP-1/2 STG's operation
3	APH replacement in 2 No Xylene heater/ 1 No of Toluene heater in Aromatic Complex
4	DCU steam consumption reduction post turnaround
5	Recycle gas ratio reduction in Aromatic complex platformer
6	Xylene column optimisation in Aromatic complex
7	Replacement of HPMV & HPSV lights with energy efficient fixtures in plant area (7,000 Nos)
8	MCN HDS bypassing and stopping of MCN HDS Preheater Exchanger [FGTU] ~HP steam saving of 700 KG/H
9	CHTU Wash water pump capacity enhancement to stop additional operating pump
10	CPP-3 Gas booster compressor performance improvement
11	APH performance improvement in Boiler - 4
12	VSD provision in DCU FD fans

14.3.3.5. Safety Performance:

- MRPL achieved 1003 days for Refinery and 2711 days for Aromatics without Reportable Lost Time Injuries (RLTI).
- External Safety audit by OISD was carried out for Aromatics complex.
- State Level Offsite Mock Exercise was conducted at MRPL on 29th July 2022, in association and in presence of Karnataka State Disaster Management Authority and National Disaster Management Authority
- Seven employees from fire and safety department were felicitated by the Hon'ble Union Minister of State for Petroleum & Natural Gas and Labour & Employment for bravely fighting the fire at an adjacent company in MSEZ under mutual aid agreement.
- MRPL Aromatics complex bagged First place in "Karnataka State Level Safety Award 2023" in the Petrochemical industries category, by Department of Factories Boiler Industrial safety and Health, Govt. of Karnataka.
- MRPL Aromatics complex also achieved 4 star rating from M/s British Safety Council in Apr 2022 and "Prashansa Patra" award in the month of Jun 2022 from National Safety council in recognition for good performance in OSH.
- MRPL Refinery complex was awarded with Prestigious Gold award by (Federation of India Chambers of Commerce and Industries) FICCI – GIZ in recognition to excellence in Industrial Risk Disaster Management.
- In view of Chemical Disaster Prevention Day-2022, MRPL hosted one day workshop on "Disaster Management Strategies- Potential challenges & Interventions" on 15.12.2022.

14.3.3.6. Environment Management:

- Environment Clearance was accorded to MRPL by MOEF&CC for increasing operating capacity of refinery from 16.6 MMTPA to 18.2 MMTPA with existing configuration.
- Subsequently, Consent for Operation (CFO) was granted by KSPCB for Capacity Expansion from 16.6 MMTPA to 18.2

MMTPA with existing configuration (by increasing number of operating days).

- Environmental Clearance was issued by State Environmental Impact Assessment Authority (SEIAA), GoK for proposed 2G-Ethanol project at Davangere.
- 1273.01 MT of oily sludge and 1428.44 MT of PFCC spent catalyst were co-processed in SPCB authorized cement industries.
- 367.65 MT of spent catalysts containing transition metals like Platinum, cobalt molybdenum, Nickel etc were disposed through SPCB authorized recyclers/ re-processors.
- 14.89 MT of waste white oil was disposed to SPCB authorized incineration facility.
- 292.4 MT of non-recyclable/non-reusable hazardous waste was handed over to secured landfill (TSDF).
- 61,09,555 M3 (3.68 MGD average) of tertiary treated municipal sewage water from Mangalore city was utilized in MRPL.
- 21,92,386 M3 (1.32MGD average) of desalinated water was utilized in MRPL.
- MRPL bagged the prestigious "The EEF (Energy and Environment Foundation) Global Water Management and Conservation Company of the Year 2022" award.
- MRPL won "Greentech International EHS Award 2023" for best practices in EHS.

14.3.3.7. Corporate Social Responsibility Initiatives:

- The CSR objective is in line with Schedule VII of the Companies Act, 2013 & DPE guidelines and is promoted under the name of SAMRAKSHAN. This captures the spirit and commitment to protect, preserve and promote the social, cultural and environmental heritage and wealth in and around the area of our business and to usher in sustainable development.
- CSR initiatives: Primary Health Centre in the Rehabilitation Colony, Construction of overhead water tanks, Auditorium, Community Hall, Development of Public Park, construction of Anganwadis, Construction of class rooms at Govt. Schools, Ladies Rest room, Beach development, Scaling up of Technology enabled education in Government Schools, Conducted Artificial Limb Camp at Mangalore, Construction of Toilets at Government Schools as per Prime Minister's Swatch Bharat Abhiyaan as part of the Samrakshan Activities. Medical equipments to Govt. Aayush Hospital-Mangaluru, Financial support to Endosulfan victims, Mid day meals to Govt. Schools in operational areas, Donation of tricycles to Divyangjan, ICU beds to Govt. Hospital, CCTV to Surathkal Police station, Infrastructure facilities to Minority Hostels, Assistance of School vans to Govt. Aided School, Drinking water facilities and seating arrangements at KSRTC bus stand, Drinking water and incinerator facilities to Govt. Schools, Distribution of sewing machines to Karnataka tailor association for women empowerment, Millets distribution to HIV inmates.

14.3.3.8. Awards and Recognition:

During the year, the Company has been conferred with following awards and recognitions:

- MRPL won the award for FY 2022-23 for "Best Innovation in Refinery" in a function held during the Energy Technology Meet
- MRPL was conferred the Dun and Bradstreet PSU Award for being the Best Miniratna CPSE across sectors in the country
- MRPL won award in the "GeM Star Buyers" category in the Kreta- Vikreta Gaurav Samman Samaroh 2023
- MRPL bagged the Energy and Environment Foundation (EEF) Global Water Management Company of the Year Award 2023.
- MRPL won the Occupational Health and Safety Platinum Award from Grow Care India.


Bureau Veritas Certification

MANGALORE REFINERY AND PETROCHEMICALS LIMITED

REGISTERED OFFICE: KUTHETHOOR POST, VIA KATIPALLA MANGALURU, KARNATAKA 575030, India

EN 9100:2018
AS 9100:D - JISQ 9100:2016

PRODUCTION, STORAGE, TESTING AND DISTRIBUTION OF AVIATION TURBINE FUEL



MRPL becomes India's first AS 9100: D certified Refinery



First Cargo of ONGC's New Crude Oil KGD-98/2 receives at MRPL



MRPL "Best Innovation in Refinery" in Energy Technology Meet 2023



MRPL wins Best Miniratna across all sectors



Scaling Capacity of Desalination plant from 30 MLD to 40 MLD

14.3.3.9. Financial Performance Highlights

Period		FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY2023-24
Throughput	MMT	16.43	14.14	11.50	15.04	11.116	16.59
Turnover (Gross)	₹ crore	72,283	60,728	50,796	86,064	1,24,686	105,189.68
EBITDA	₹ crore	1,809	(2,430)	797	5,003	6,711	7,892.54
PBT	₹ crore	581	(3,955)	(915)	2,708	4,239	5,521.41
PAT	₹ crore	332	(2,708)	(761)	2,955	2,638	3,59.93
GRM	$ / Bbl	4.06	(0.23)	3.90	8.73	9.88	10.36

14.3.4. Numaligarh Refinery Limited (NRL)

14.3.4.1. Introduction

Numaligarh Refinery Limited (NRL) was incorporated on 22nd April 1993. NRL's establishment is rooted in the "Assam Accord" signed by the Government of India on 15th August 1985. NRL is a subsidiary of Oil India Limited (OIL) and operates a petroleum refinery at Numaligarh in Golaghat district of Assam. NRL is a Category-I Miniratna PSU. NRL's commercial operations commenced from 1st October 2000. As on 31.12.2023, the share holding pattern of NRL is Oil India Limited (OIL)- 69.63%, Government of Assam-26% and Engineers India Limited (EIL)-4.37%.

NRL has an LPG Bottling Plant at Numaligarh (capacity 42 TMTPA) besides two marketing terminals at Numaligarh and Siliguri. White Oil products, viz. MS, SKO and HSD are transported from Numaligarh to Siliguri through the Numaligarh-Siliguri product pipeline (NSPL) of Oil India Limited.

NRL's refinery has a high complexity factor owing to advanced secondary processing technologies that has enabled achievement of high distillate yield. Product slate of NRL comprises LPG, Naphtha, Motor Spirit, Aviation Turbine Fuel, High Speed Diesel, Superior Kerosene Oil, Paraffin Wax, Raw/Calcined Petroleum Coke and Sulphur. NRL has the largest Wax producing unit in the country.

NRL is certified under ISO 9001 for Quality Management, ISO 14001 for Environment Management, OHSAS 18001 for Occupational Health & Safety, ISO 27001 for Information Security Management System and ISO 50001 for Energy Management.

14.3.4.2. Performance

NRL has been operating with sustained profitability every year. NRL has succeeded in achieving highest Distillate Yield among all PSU oil refineries in the Country. NRL's Specific Energy Consumption (SEC) and Gross Refining Margin (GRM) are among the best in the Industry.

Physical and financial performance indicators of NRL during last three years and April-December 2023 of the current financial year are as follows:

Physical Performance:

Parameter	2020-21	2021-22	2022-23	2023-24
Crude Receipt (TMT)	2,612	2,661	2,934	2,457
Crude Throughput (TMT)	2,707	2,624	3,091	2,510
Capacity Utilisation (%)	90.24	87.47	103.03	98.09
Distillate Yield (%)	86.36	85.69	87.69	86.54
Specific Energy Consumption (MBN)	64.37	63.51	61.66	61.57
Energy Intensity Index (EII)	86.99	84.68	82.31	81.36

Financial Performance:

Parameter	2020-21	2021-22	2022-23	2023-24
Sales Turnover (₹/Crs)	18,543	23,546	29,785	23,731
PBT (₹/Crs)	4,083	4,848	4,953	2,912
PAT (₹/Crs)	3,036	3,562	3,703	2,610
GRM ($/bbl)	4.09	14.33	19.86	13.17
Net Worth	5,596	8,388	11,427	13,926

14.3.4.3. Projects

Projects under Implementation

a) Numaligarh Refinery Expansion Project (NREP):

The expansion project has two major components, namely, a) 6.0 MMTPA refinery at Numaligarh and b) Paradip-Numaligarh Crude pipeline along with crude oil import terminal. The approved cost of the project is ₹ 28,026 crore, out of which, an amount of ₹ 1,020 crore has been approved as capital subsidy for the project.

i. **NREP-6.0 MMTPA Refinery:** Out of the total approved project cost of ₹ 28,026 crores, amount earmarked for the 6.0 million refinery is ₹ 18,968 crores. As on 31.03.2024, overall physical progress is 55.2% and financial progress is 53.33%.

ii. **NREP-Paradip Numaligarh Crude Oil Pipeline (PNCPL) and Crude Oil Import Terminal (COIT):** Amount earmarked for PNCPL and COIT is ₹ 9,058 crores. The length of the pipeline in 1,635 KMs in length and 9 MMTPA in capacity. As on 31.03.2024, overall physical progress is 69.0% and financial progress is 78.33%.

b) Indo-Bangla Pipeline Project:

Hon'ble Prime Minister of India and Hon'ble Prime Minister of Bangladesh inaugurated the India Bangladesh Friendship Pipeline on 18.03.2023.

c) Green Hydrogen Plant-2.4 KTPA:

In line with National Green Hydrogen Mission and to meet the GHCO (Green Hydrogen Consumption Obligation) in coming years, NRL will set up a Green Hydrogen plant of capacity 300 kg/hr. (2.4 KTPA) at Numaligarh on EPC basis. This will replace 5% of the present grey hydrogen being used by the refinery which will reduce approximately 24,000 Tons of CO_2 emission per annum. The approved cost of the project is ₹ 170 crore.

d) DCU Revamp:

The approved cost for the project is ₹ 370 crore which involves revamp of the existing Delayed Coker Unit (DCU) by increasing the capacity from 306 KTPA to 560 KTPA for

processing Un Converted Oil (UCO) to be produced in the Resid Upgradation Facility of the new 6.0MMTPA refinery. The project also includes replacement of critical and ageing equipment like coke chamber, heaters, and switch deck system. As on 31.03.2024, overall physical progress is 28.4% and financial progress is 27.95%.

e) Dabidubi LPG Facility: Numaligarh Refinery is setting up a 15 KM underground LPG pipeline to connect to its LPG facilities being setup at Dabidubi in Golaghat district of Assam. The capacity of the new LPG facility post commissioning of expansion project will be 700 KTPA at an approved project cost of ₹ 338 crore.

f) Power Recovery Turbine in PFCC unit:

A Power Recovery Turbine will be installed in the flue gas section at downstream of reactor-regenerator section of PFCCU as an energy saving initiative. This will generate power from regenerator flue gas to increase the energy efficiency of the unit and will result in reduction of CO_2 emissions from the complex. The approved cost of the project is ₹ 293.50 crore.

g) 2G Bio Refinery (JV project):

NRL, in collaboration with two other foreign investors, have formed the Joint Venture Company-"Assam Bio-refinery Private Limited (ABRPL)' which is setting up a second-generation bio-refinery at Numaligarh, Assam to produce ethanol from non-food grade feed stock bamboo. The approved cost is ₹ 4,200 crore. Financial grant of ₹ 150 crore to ABRPL has been recommended by the high powered committee of CHT. As on 31.03.2024, overall physical progress is 94.0% and financial progress is 80.0%.

h) North East Gas Grid Project (JV project):

NRL is a partner with 20% stake in the JV company -Indradhanush Gas Grid Limited (IGGL) which is executing the North East Gas Grid project to lay Natural Gas Pipeline of 4.75 MMSCMD capacity. The project is approved for implementation by the Govt. of India at a cost of ₹ 9,265 crore which includes a Viability Gap Funding of 60%.

13.3.4.4. Welfare of SC/ST/OBC/PH

NRL's manpower strength as on 31st March 2024 was 1,065 of which 464 were in unionized category and 601 in executive cadre. Of the total staff strength, 122 employees belonged to Scheduled Caste (SC), 114 to Scheduled Tribe (ST), 335 to Other Backward Class (OBC) and 26 were under physically challenged category.

13.3.4.5. Women Employees

Grade-wise breakup of women employees as on 31.03.2024 is as follows:

Group	No. of Women Employees	Total No. of Employees	Women Employees as % of Total
A	60	601	9.98%
C	22	464	4.74%
D	0	0	-
TOTAL	**82**	**1,065**	**7.70%**

Note: NRL has no Group B employees.

14.3.4.6. Implementation of Official Language

NRL continued its focused attention towards promoting and implementing 'Hindi' as official language as per the directives of Official Language Department, Govt. of India, Ministry of Home Affairs, New Delhi. To achieve the annual target set by Official Language Dept, New Delhi, Hindi Workshop and OLIC meetings are being organized periodically. Hindi learning through "Aaj ka Shabd" & "Aaj ka Suvichar" for employees are being displayed on Display Boards daily. "Hindi Fortnight" was celebrated from 16th to 29th September 2023 with various competitions involving employees, their family members, School Children & CISF personnel with a view to increase interest in Hindi and its propagation and implementation. This time Hindi Divas was jointly celebrated with Official Language Department, Ministry of Home Affairs, Govt. of India on 14th September, 2023 at Pune, Maharashtra as per the guidelines of Ministry of Home Affairs, New Delhi. A special Hindi e-Patrika (5th Edition) was released by the Shri Gopal Sarma, RCE on 16th September, 2023 during Inaugural ceremony of Hindi Fortnight. An annual Hindi in-house magazine "Prayas" (13th edition) was released on 19th December, 2023 during the 62nd TOLIC (PSUs) Meeting by the Chairman, TOLIC (PSUs) & Mantri, Assam Rashtrabhasha Prasar Samiti Shri Kshiroda Saikia. An Essay competition on the topics ''हिंदी के प्रचार–प्रसार में सूचना प्रौद्योगिकी की भूमिका'' was organized by Numaligarh Refinery at TOLIC level for various PSUs organisations under the aegis of TOLIC (PSUs), Guwahati in November, 2023 and the five best winners of the competitions were awarded. With a view to increase Hindi correspondence, Hindi Email Competition has been organised amongst employees in every quarter on regular basis during the year under the Hindi Incentive Scheme. A Booklet on small Technical vocabularies in Hindi used for official purposes was published in the form of Table-Top calendar and distributed to all the employees.

Numaligarh Refinery's annual Hindi in-house magazine "Prayas" (Thirteenth Issue) was awarded the First Prize for best publication by TOLIC (PSUs) Guwahati and award was presented during the 62nd TOLIC (PSUs) meeting held at Jubilee Hall Guwahati on 19th December 2023.

Numaligarh Refinery Limited was awarded the "Commendable Certificate" by TOLIC (PSUs), Guwahati for its excellent performance in the implementation of the official language during the year 2023-24 and the said award was given during the 62nd TOLIC (PSUs) meeting held on 19th December 2023.

14.3.4.7. R&D Activities

NRL has been pursuing limited R&D activities through partnership with academia and research organizations to provide technological inputs to meet corporate objectives of technical excellence in all aspects of refinery operations, develop new value-added products and upgrade the quality of the existing petroleum products.

New product development and research Initiatives presently pursued by NRL are as follows:

1. NRL Centre of Excellence for Sustainable Material at IIT Guwahati

NRL set up 'NRL Centre of Excellence for Sustainable Material' (NRL-CoE SM) at IIT Guwahati to carry out R&D activities for development of environmentally sustainable materials from various refinery and bio refinery streams. Recently, a translational facility is set up at NRL CoE for housing a pilot plant on Bio-degradable polymer with a range of equipment related to downstream processing of bio-degradable plastics such as Blown Film Machine, Injection Moulding, Thermoforming, Cast Film Extruder etc. The pilot plant has the facility to manufacture a wide variety of items, including carry bags, toys, cutlery, decorative items etc. both from normal and biodegradable polymers.

A research project on "DEVELOPMENT OF SUSTAINABLE MATERIALS FROM OIL & BIO-REFINERY STREAMS" is being carried out under NRL-CoE. The project is successful so far in inventing a few novel methods or processes.

2. **Research Collaboration with Kaziranga University and Institute of Frontier Science and Application:**

NRL has signed a Memorandum of Agreement (MoA) with Kaziranga University (KU) and the Institute of Frontier Science and Application (IFSA) for collaboration to carry out a research project titled 'Assessment of Wind Energy Potential in North East India'. The collaboration is a first of its kind for systematic exploration of wind energy potential in North East India. As per the MoA, Kaziranga University, in technical collaboration with Institute of Frontier Science and Application (IFSA) and funding from NRL, will implement the project which aims to develop bankable wind energy assessment data over North East India in riverine environment using mobile Lidar observations for a period of three years.

3. **R&D Collaboration with Engineers India Limited (EIL)**

A. **New product development:** NRL and EIL entered into a Memorandum of Agreement (MoA) for joint development and commercialization of technology for production of Aqueous Ammonia from ammonia-rich sour gases of refinery. NRL will set up a plant for Aqueous Ammonia production using EIL's design know-how and NRL's expertise on operating Sulphur Recovery Unit (SRU).

B. **Overground Liquid Sulphur Lock:** Above Ground Sulphur Seal will be designed to handle 70 Kg per hour of liquid Sulfur flow to install at SRU of NRL using EIL's expertise on designing above Ground Sulphur Seal.

4. **R&D Collaboration with CSIR: NEIST**

NRL is carrying out a R&D project on "Removal of Phenol from Sour & Stripped Water, It's Reuse and Value Addition" under a framework of research collaboration with North East Institute of Science & Technology, Jorhat under Council of Scientific & Industrial Research with the objective to reduce water foot print of the refinery and to produce value added chemicals. Lab scale experiments have been conducted successfully by designing and developing hollow fiber membrane modules. A pilot demonstration facility is under development for installation at NRL site.

5. **Research Project at St. Edmund's College, Shillong**

NRL has engaged St. Edmund's College, Shillong for research work on utilization of cyano bacteria in the bio-remediation of crude oil, hydrocarbon storage tank bottom sludge, and ETP hydrocarbon sludge and its environmental biotechnology implications. The objective of this project is utilization of cyano bacteria in the bio-remediation of crude oil, hydrocarbon storage tank bottom sludge, and ETP hydrocarbon sludge.

Significant developments on culture of cyano bacteria samples collected from NRL have been achieved and bio-accumulation study with the cultured bacteria on hydrocarbon sludge is being investigated.

Expected result of above R&D activities:

a. **Production of bio-degradable plastic:**

Development of indigenous technology for production of bio-degradable plastic will help in replacing non-biodegradable polyethylene-based packaging and contribute towards reduction of pollution from solid waste. Bio-degradable plastic will be a value-

added stream from the Bio Refinery, being implemented by Assam Bio Refinery Pvt. Ltd. (ABRPL), a JV of NRL. The aim of the project is to convert the Furfural steam, a by-product of Bio Refinery, to biodegradable polymer, Polycaprolactone (PCL).

The following patents are applied as an outcome of research activities under this project.

a. Novel catalyst (SPEEK) for the conversion of Furfural to Hydroxymethyl Furfural

b. Novel process for the purification of HMF from a mixture of Furfural, HMF, Formalin, Levulinic Acid.

b. Exploring the potential of Wind Energy:

Assessment of Wind-Energy Potential using LIDAR technology through multi-level and multi-site high-frequency observation and Analysis in Riverine Environment at Turbine Level will provide bankable wind-energy database for Assam relevant for viable wind energy installation. The results of the project can be used to catalyze commercial wind energy generation in Assam. The project thus has huge potential for significant socio-economic benefits for Assam. With the present project as a proof-of-concept, it can also be easily scaled up to cover wider areas of the North-East.

c. Production of Aqueous Ammonia:

Production of aqueous ammonia (25%NH_3) from waste stream of NH_3 rich acid gas of sour water stripper, utilizing an indigenous technology jointly developed by NRL and EIL, will meet requirement of aqueous ammonia in Bio Refinery to maintain pH for proper performance of enzymes.

d. Technology development on Overground Sulphur Seal:

Development and commercialization of Overground Sulphur Seal technology will help refineries to improve liquid – gas phase separation of liquid Sulphur in Sulphur Recovery Units. This will also lead to a reduction in SOX emission.

e. Technology for removal of Phenol from sour water and stripped water:

Development of technology to remove phenol from sour and strip water will reduce water footprint as well as produce value added chemical, Phenol from refinery. Lab scale demonstration of technology for phenol removal has been successfully completed and design and fabrication of a pilot plant is ready for demonstration at NRL site.

f. Bio-remediation through Cyano bacterial Culture:

Utilization of cyano bacteria in the bio-remediation of hydrocarbon sludge from storage tank bottom & Effluent Treatment Plant will help in sustainable management of hazardous waste.

14.3.4.8. Conservation of Energy

NRL prioritizes to maintain energy conservation and enhance its efficiency. Refinery closely monitors the key Energy performance indicators viz Specific energy consumption (SEC) and energy intensity index (EII) out of several operations parameters. Unit performance is gauged on a continual basis and efforts are on to introduce best in class technology and global energy efficiency best practices. The SEC at 61.6 MBN and EII 82.7%, against target of 61.9% and 84.0% respectively are well within the firm target set by MoP&NG.

Numaligarh Refinery has a portfolio of 1.05MW of Solar photovoltaic capacity, which is 0.4% of the total captive power generation. The total generation from the project is 983 MWh in 2022-23 which translates to reducing 10 lac lbs CO_2e.

14.3.4.9. CSR Activities

CSR and Sustainability activities of NRL are pursued in line with the activities specified

under schedule VII of the Companies Act 2013. NRL formulated a 'CSR and Sustainability Policy' conforming to stipulations under Section 135 of the Companies Act 2013, the CSR Rules issued by the Ministry of Corporate Affairs and applicable Guidelines on CSR and Sustainability issued by the DPE. Further, NRL has involved itself closely with the district administration of Darrang district which is allotted as an Aspirational District to the Company by NITI Aayog.

NRL has put special emphasis on **a)** Health Care, **b)** Education and Skill Development, **c)** Swachhta Action Plan, **d)** Livelihood Generation, **e)** Infrastructure Development, **f)** Promotion of Arts, Sports, Literature and Culture in line with its CSR policy. Moreover, NRL CSR has also contributed in other areas such as Empowering women, Ensuring Environment Sustainability and Animal welfare etc. in line with the activities specified under schedule VII of the Companies Act, 2013.

A. Health Care:

As per notification issued by Ministry, on 'Health & Nutrition' being the thematic area of CSR activities for FY 2022-23, NRL had extensively focused on improving Community Healthcare in the region. Some of the noteworthy projects are as below:

- NRL has taken initiatives to construct and renovate various Primary Health Centres (PHCs) and Community Health Centres (CHCs) in Golaghat, Assam. The renovation work includes repairing the infrastructure to provide better medical care to patients. Till date, the project covers 7 Health Centres.
- NRL has also been instrumental in promoting nutrition and providing meals to those in need through its partnership with the Hare Krishna Food for Life program and the Akshaya Patra Foundation.
- Mobile medical health camps organized through VKNRL Hospital and Eye camps are continued, in addition to providing subsidized treatment to people belonging to weaker section of the society through VKNRL hospital.
- NRL with its Medical Assistance Scheme for critical ailment such as cancer, lung and heart diseases, kidney problem etc. has been continuously supporting the needy and economically weaker section of the society in terms of healthcare.
- Several numbers of ambulances were provided to different Medical Colleges, PHC of Assam, as well as to outside states like West Bengal, Bihar, and Arunachal Pradesh during the year to ensure access to healthcare facilities in remote areas.

B. Education and Skill Development:

Few projects that impacted the society during the year are:

- Under the continuing "Gyandeep Scholarship" scheme, 295 nos. of students were benefitted based on their performance in Class X and XII. "Prerona scholarship" for promoting girl education has been provided to 298 nos. of top three girl students of class VII to X. 72 nos. of meritorious children of 'Contract workers' were provided scholarship for their good result in class X examination. Additionally, 20 nos. of students were provided scholarship under "Pratibha" scheme to pursue higher education.
- NRL continues to support Coaching Centre through Centre for Social Responsibility & Leadership, New Delhi for students of Class IX & X of nearby Schools. The coaching is for students to make themselves eligible to get enrolled in engineering and medical courses.
- NRL has constructed the plinth plus ground floor and roof slab of the 1st floor of the boy's hostel at North East Military School in Bijni, Assam as well as

providing financial assistance for establishing e-learning infrastructure facilities for the border belt areas of BOP Phansidewa, 176 Bn BSF, Siliguri.

- Skill development initiatives undertaken in Welding, Fitter and Hospitality sector are being continued through Golaghat ITI and presently there are 64 number of students in total Five Trades.
- VKNRL School of Nursing enrolled its 6th batch of 40 students to pursue GNM course from January, 2022. Presently, there are 117 number of Girls studying in the school and 3 batches of students passed out.
- NRL has provided D.G. Set for ITI Majuli and also extended financial assistance for the procurement of furniture for imparting vocational training among the youths of Majuli District.

C. Swachhta Action Plan:

Under this programme mandated by MoPNG, an amount of ₹6.88 crore has been spent against target for₹5.90 crore under different heads of expenditure.

- Project 'Jeevandhara' focusses on providing clean drinking water to villages, schools and other community places. During the year, NRL has carried out the installation and commissioning of two RO drinking water plants in two different districts of Bihar. All these plants were installed with a provision for 3 years Annual Maintenance Contract.
- NRL has provided waste handling equipment to different Municipalities/ Town Committees and provided 45 nos. of industrial dustbins among different town/market committees, viz. Sarupathar Town Committee, Barpathar Town Committee and market committees of Refinery site for effective waste management.

D. Livelihood Generation:

- A Solar cold storage project has been inaugurated at Panbari, Bokakhat in partnership with the Agriculture Department, Govt. of Assam. This initiative aims to provide a sustainable and cost-effective solution for the preservation and storage of perishable agricultural produce in the region.
- Support is given by NRL for the establishment of a dragon fruit village at Jurpukhuri Village, Rajapukhuri that will help the farmers by diversifying their crop portfolio, increasing their income levels, and creating employment opportunities.

E. Infrastructure Development:

Several developmental works were taken up in and around NRL during the Financial Year, which included projects for Village Road construction & renovation and other infrastructure development work in rural areas etc.

- NRL has undertaken the construction of three open air auditoriums at Sarupathar, Sri Sri Uttar Kamalabari Xatra, Majuli and Bokakhat. This initiative will provide a platform for the promotion and preservation of the rich cultural heritage and diversity of the region.
- NRL has undertaken the extension of existing Lobonghat Road from NH-39 to near NRL Township Boundary wall and has provided financial assistance for repairing Golaghat Dimapur Road (Moinapara to Rongajan) under PWD Sarupathar Territorial Road Division under its CSR initiative.

F. Promotion of Arts, Sports, Literature and Culture:

- NRL has initiated the setting up of a High-Performance Sports Training and Rehabilitation Centre at Jorhat, Assam.

This initiative aims to provide a world-class facility for the training and development of sports persons and athletes from the region and to offer specialized services for their injury prevention and recovery.

- NRL has undertaken the installation of flood light at Golaghat District Sports Association (GDSA) Stadium, Golaghat. The installation of flood light will involve the erection of four high mast towers with LED lights and the laying of cables and wiring and will overall improve the lighting and visibility of the stadium and to enable the conduct of sports events and activities during night time.
- NRL has been imparting training to budding Footballers in the NRL Football Academy. After COVID pandemic, NRL has started operating the academy again from November 2021. Presently, it has 69 Numbers of players playing under 13, under 15 and under 18 categories and around 700 players in 7 different Feeder Centres under the Academy.
- NRL undertook 'Har Ghar Tiranga' campaign under the aegis of 'Azadi ka Amrit Mahotsav' under its CSR initiative. The activities under this campaign include cleanliness drives, various competitions etc.
- NRL has undertaken the development of the "Bir Bhumi" a memorial site at Biswanath Chariali, Assam. This initiative aims to honour and commemorate the martyrs and freedom fighters of the region who sacrificed their lives for the nation during the Indian independence movement.

Details of CSR activities are uploaded and continuously updated in NRL's website www.nrl.co.in.

Amount spent by NRL on CSR activities during last four years is as follows:

(Amount in ₹ crores)

	2020-21	2021-22	2022-23	2023-24
CSR Outlay	52.80	59.13	70.92	92.27
Actual Expenditure	53.19	74.14	74.12	94.18

14.3.4.10. NRL's Contribution to Development of the North East Region

NRL was established by the Government under provisions of the "Assam Accord" with the objective of providing the required thrust for socio-economic development of the North East region. Over the years, the company has been able to sustain stakeholders' expectations and is today the biggest operating industrial unit in the Region. Contribution of NRL for development of the North East regions is broadly summarised below.

Investment in Value Added Projects

NRL's refinery project was implemented within the approved project cost of ₹ 3,461 crore. Since commissioning of the refinery, NRL has been implementing several value added projects for ensuring sustenance and growth. All such projects are within the North East region, barring establishment of a marketing terminal at Siliguri at the North East border. NRL's total investment on such is as per details below:

Sl	Project	Investment (₹ in crore)	Remark
1	LPG Bottling Plant of 10 TMTPA capacity	6	Commissioned in 2002-03
2	Coke Calcination Unit	90	Commissioned in 2004-05
3	Motor Spirit Plant of 225 TMTPA capacity	297	Commissioned in 2006-07
4	Siliguri Marketing Terminal	186	Commissioned in 2008-09 as linked project to the Numaligarh-Siliguri Product Pipeline of Oil India Limited
5	Diesel Quality Upgradation Project	435	Commissioned in 2010-11 for production of BS-III HSD at 100% capacity utilization
6	Naphtha Splitter Unit	87	Commissioned in 2013-14 for production upto 160 TMTPA Petrochemical Grade Naphtha
7	Wax Project	676	Commissioned in Mar'15. NRL has emerged as the largest Wax producing unit in the Country with production upto 50 TMTPA Wax
8	Investment in joint venture: Assam Gas Cracker project	142	10% equity participation at Brahmaputra Cracker and Polymer Limited
9	Investment in joint venture: Natural gas pipeline from Duliajan to Numaligarh	43	26% equity participation at DNP Limited.
10	Diesel Hydrotreater Unit (DHT)	1,031	Commissioned in 2018-19.
11	Mounded Bullet Project	122	Mechanical Completion declared on 29.10.18
12	Investment in joint venture: Assam Bio Refinery Private Limited	138	Under implementation (50% equity participation)
13	Investment in joint venture: Indradhanush Gas Grid Limited	198	Under Implementation (20% equity participation)
14	Capacity augmentation of LPG Bottling plant from 10 to 42 TMTPA	10	Commissioned in 2017-18
15	NREP – 6 Million Refinery at Numaligarh	18,968	Under Implementation
16	Paradeep Numaligarh Crude Oil Pipeline	9,058	Under Implementation
17	Green Hydrogen Plant – 2.4 KTPA	170	Under Implementation
18	DCU Revamp	370	Under Implementation
19	Dabidubi LPG Facility	338	Under Implementation
20	Power Recovery Turbine in PFCC unit	293	Under Implementation
21	Petrochemical Project	7,231	Under Implementation
22	Coke Drum Structural Project for NREP	635	Under Implementation
	Total	**40,524**	

Contribution to Exchequer

Since start of commercial operations and upto 2022-23, NRL has contributed over ₹ 51,658 crores to the Central and State Exchequers. NRL's contributions to the Exchequers during the last three years and current year upto December 2023 are as follows:

(Amount in ₹ crores)

	2020-21	2021-22	2022-23	2023-24
Central Exchequer	5,863	5,330	4,358	3,389
State Exchequer	605	480	658	430
Total	**6,468**	**5,810**	**5,016**	**3,819**

Showcase of Industrial Success

Over the years, NRL has emerged as the showcase of industrial success, in the North East, thereby acting as an enabler for drawing in further investments into the region.

14.4. OTHER CPSEs

14.4.1. Bharat Petro Resources Limited (BPRL)

Bharat Petro Resources Limited (BPRL) has participating interest (PI) in seventeen blocks of which eight are in India and nine overseas. Additionally, BPRL has equity stake in two Russian entities holding the license to four producing blocks in Russia.

Five of the eight blocks in India were acquired under different rounds of New Exploration Licensing Policy (NELP), one block was awarded under Discovered Small Fields (DSF) Bid Round 1 and two blocks were awarded under the Open Acreage Licensing Policy (OALP) Bid Round I.

Out of nine overseas blocks, five are in Brazil, two in United Arab Emirates and one each in Mozambique and Indonesia. The blocks of BPRL are in various stages of exploration, appraisal, development, and production. The total acreage held by BPRL, and its subsidiaries is around 21,360 sq. km of which approximately 50% is offshore.

Russia

Indian Consortium ("IC") comprising of BPRL, IOCL, and OIL, through their wholly owned subsidiaries and Special Purpose Vehicles incorporated in Singapore, acquired 29.9% equity stake in LLC Taas-Yuryakh Neftegazdobyacha ("TYNGD LLC") and 23.9% equity stake in JSC Vankorneft from Rosneft in October 2016. In JSC Vankorneft, Vostok LLC holds 50.1% share, ONGC Videsh Ltd. holds 26% share and IC holds the remaining 23.9% share, through Vankor India Pte. Ltd. ("VIPL", a joint venture company of IC' subsidiaries in Singapore). The asset comprises the Vankorskoye field located in East Siberia. BPRL's stake is 7.887%. The investments made for acquisition of 7.887% stake in JSC Vankorneft was USD 589 million. In TYNGD LLC, Rosneft holds 50.1% share, British Petroleum holds 20% share and IC holds the remaining 29.9% share, through Taas India Pte. Ltd. ("TIPL", a joint Venture company of IC' subsidiaries in Singapore). The asset comprises the Srednebotuobinskoye field located in onshore East Siberia. BPRL's stake is 9.867%. The investments made for acquisition of 9.867% stake in LLC TYNGD was USD 430 million.

Lower Zakum

The Lower Zakum field, located in Abu Dhabi Offshore shallow water, has been producing crude oil since 1967. The Indian consortium comprising BPRL, OVL and IOCL, acquired 10% stake in the offshore producing oil asset, Lower Zakum Concession in Abu Dhabi, UAE in March 2018. The Indian Consortium's

share in the Lower Zakum Concession is held through Falcon Oil & Gas B.V, a SPV incorporated in the Netherlands where BPRL holds 30% shares through its step-down subsidiary BPRL International Ventures B.V in the Netherlands. The Shareholders of FOG BV are ONGC Nile Ganga BV, BPRL International Ventures BV, and IndOil Global BV with 40%, 30%, and 30% shareholding respectively. The Concession has a term of 40 years effective from 9th March 2018. The other shareholders in the Lower Zakum concession are Abu Dhabi National Oil Company (60%), JODCO (10%, a wholly owned subsidiary of Japan's INPEX Corporation), China National Petroleum Corporation (10%), Italy's ENI (5%) and France's Total S.A. (5%). Current Producing at an average of 420,000 BOPD Crude Oil of Das blend Grade. During the year 2023-24, BPCL Group Refineries have lifted approx. 4.02 million barrels of Das Blend Crude Oil as its Equity Oil from the Lower Zakum Concession. BPRL has received dividend of USD 13.80 Million for April 2023-December 2023. Long-Term Development Plan-1 Project to enhance & maintain Production is under implementation.

Mozambique

In Mozambique, following discoveries of vast quantities of natural gas in Rovuma Basin, Offshore Area 1 off the coast of Northern Mozambique, Area 1 Concessionaires announced Final Investment Decision (FID) on 18th June 2019 to develop 2 Train (2 X 6.56 MMTPA) onshore initial LNG project for monetization of gas discovered from Offshore Golfinho-Atum discovery area. With announcement of the FID, the Golfinho-Atum field development plan became effective, and development and production period of 30 years commenced. While the Project was on schedule and within budget till March 2021, due to the security incidents around the Afungi Project site during end March 2021, the Operator declared Force Majeure (FM) under JOA, EPCC and all other contracts as they were unable to meet their obligations to conduct safe petroleum operations. The Government of Mozambique is working towards the reestablishment of peace and resolving the security situation. Mozambican military along with Joint Forces from Rwanda and South African Development Community (SADC) continue their operations in the region. The Area 1 project is assisting in the development of local social and economic infrastructure, and is currently implementing various projects in the areas of agriculture, water & sanitation, health, education, capacity building, fisheries, solarization and small business development. While the Project remains in Force Majeure, the relationship with Contractors remains constructive with specific care taken to review the situation with local Mozambican companies given sensitivity of local content, employment, and training, etc. Operator has informed that equipment and infrastructure at the site are preserved and in good condition.

Brazil

IBV Brazil (IBV) was incorporated in 2008 as a 50:50 joint venture company of wholly owned subsidiaries of BPRL (Wholly Owned Subsidiary of BPCL) and VIL through their overseas subsidiary companies viz. BPRL Ventures (Netherlands) and Videocon Energy, British Virgin Islands (VEBL). Brazil is India's largest upstream investment destination in the Americas and the 3rd largest investment destination globally. IBV has already invested USD 1.8 Bn with a further outlay of USD 1.6 Bn approved by CCEA for the entire stake of IBV (40%) towards the development of BM-SEAL-11 Concession under SEAP-I project with Petrobras as the Operator.

The Participating Interests (PI) in Brazil assets are held by IBV. Current status of the interests is as below:

BM-SEAL-11 (40% PI, development phase)

BM-C-30 (35.714%, under dispute as per JOA at ICC London against Operator PetroRio)

BM-POT-16 (relinquished, formal process in progress)

BM-ES-24/24A (relinquished)

Onshore Block 1

BPRL jointly with IOCL, successfully won the Abu Dhabi Block Licensing Bid Round held in 2018 and was awarded with the Onshore Block 1 Concession on 24th March 2019. The Onshore Block 1 Concession is held through a Special Purpose Vehicle (SPV), Urja Bharat Pte Limited (UBPL) Singapore where BPRL holds 50% shares through its step-down subsidiary BPRL International Singapore Pte Ltd. in Singapore. UBPL is the "Operator" of the block during the exploration phase and has 100% Participating Interest (PI) in the block. The exploration period of the block is for 9 years effective from 24th March 2019. As per the minimum commitment of the block, UBPL need to drill five exploration and four appraisal wells till March 2026 with an approved investment limit of USD 179 Mn. Onshore Block 1 covers an area of 6,162 km^2 located in the Al Dhafra region around Ruwais City and the refining complex, including the coastal region to the west.

There are two existing undeveloped oil and gas fields in the area, named Ruwais and Mirfa. As on date, UBPL has completed drilling of 2 appraisal wells for Ruwais discovery and 4 exploratory wells. During testing, the Ruwais appraisal well RW-11 flowed 4,000 bopd @40/64" choke size. The one of the exploratory wells XN-79 flowed ~250 bopd and suspended for future activities. The testing of exploratory well XN-76 targeting unconventional Shilaif reservoir is currently ongoing. The commitment of drilling two appraisal wells of Mirfa discovery and one exploratory well is planned to be carried out in second exploration period valid till 23rd March 2026.

The Field Development Plan (FDP) for Ruwais discovery was submitted for regulator's approval on 4th October 2022. As per the current status, Approvals of Govt. of Abu Dhabi is awaited for signing of concession agreement documents. Signing of PCA may be concluded by end of March 2024. First oil from Ruwais Field is anticipated after 18 months of execution of Production Concession Agreement. The further alignment with ADNOC is under progress on the Asset Utilisation Agreement and Crude Sales Agreement. As per the submitted FDP, the production from the field will be transported to ADNOC's Bu' Hasa processing facilities through a multiphase product pipeline of ~70 km. UBPL has option to either lift its equity crude from one of the export terminals or sell to ADNOC. UBPL Board has already approved Capex of USD 166.8 Mn for the development of Ruwais field.

Indonesia

BPRL farmed in to Nunukan Production Sharing Contract (PSC) in September 2009 and has a Participating Interest (PI) of 16.2%, held through its step-down subsidiary BPRL Ventures Indonesia BV. PT Pertamina Hulu Energi Nunukan Company (PHENC), a wholly owned subsidiary of Pertamina, the National Oil Company of Indonesia, has 83.8%1 PI in the consortium and is the Operator. The Production Sharing Contract (PSC) was signed on 12th December 2004 and is valid for a period of 30 years, i.e. till 2034. The block is located in shallow waters offshore of Bunyu Island in Tarakan basin of North Kalimantan province.

The minimum work programme committed as per the PSC under the exploration phase has been completed. The results of the appraisal drilling program, Geological, Geophysical & Reservoir studies along with an independent reserve certification had indicated significant reduction in recoverable oil and gas resource volume from Parang discovery. Various alternative options are being evaluated to decide the way forward in the block.

CB-ONHP-2017/9 (Onshore Cambay Basin, Gujarat) site

The block CB-ONHP-2017/9 in Cambay basin, Gujarat was awarded to BPRL under Open Acreage Licensing Policy (OALP) Bid Round-I and the Revenue Sharing Contract (RSC) of the block was signed with Govt. of India on 1st October 2018. BPRL is the lead

Operator in the block with PI of 60% and ONGC is the partner with 40% PI.

IPM Tender was floated through GeM portal and awarded to M/s Schlumberger for drilling and testing of three wells. Site construction work for 2 locations is completed and for the third one is ongoing. First exploratory well is expected to be spudding on 20th March 2024.

CY-ONN-2002/2 (Madanam Field, Onshore Cauvery Basin, Tamil Nadu)

BPRL has a PI of 40% in an On-land Block CY-ONN-2002/2 in Cauvery Basin with ONGC being the Operator with 60% PI. During the exploration phase, the consortium has made one oil discovery viz. Madanam Oil Discovery. Based on the discovery, two appraisal wells were drilled. The first appraisal well flowed Gas, which was identified as Thirunagari gas discovery. The second appraisal well flowed Oil/Gas. The consortium has completed drilling of 10 wells under the field development phase.

The block currently has 6 producing wells with a combined monthly average oil production of 5673 tonnes (BPRL's share 2,270 tonnes). During FY 2023-24, 67,880 tonnes of oil (BPRL's share 27,152 tonnes) has been produced from the block.

CB-ONN-2010/11 (Onshore Cambay Basin, Gujarat)

CB-ONN-2010/11, an On-land block was awarded by Government of India to a Consortium consisting of GAIL, BPRL, EIL, BFIL and MIEL. GAIL with 25% PI is the Lead Operator of the block. BPRL with 25% PI is the Joint Operator of the block.

Due to MIEL's cash call payment default under the Joint Operating Agreement (JOA), the other non-defaulting parties have agreed to distribute MIEL's 15% PI in proportion to their existing share for which a request has been submitted to DGH for approval. The Field Development Plan (FDP) of Galiyana#1 was approved on 10th February 2020 and development activities are in progress.

AA-ONN-2010/3 (Assam Arakan Basin, Assam)

AA-ONN-2010/3, an On-land block was awarded by Government of India to a consortium consisting of OIL, ONGC and BPRL. OIL with 40% PI is the Operator of the block. BPRL is having 20% PI and ONGC holds 40% PI in the block. The Petroleum Exploration License for the block was granted by the Government of Assam with effect from 12th December 2013. The Minimum Work Program (MWP) committed by the consortium in the block is completed MWP consisted of 3D API of 101 sq. km and drilling of one exploratory well up to a target of 3,500 m. Based on interpretation of 3D seismic data, well was planned to drill to a depth of 6,450 m to explore the prospectivity of LK+Th formation. While drilling SDYA-1 well, there was a kick at 5,892 m and it was not possible to drill further without redesigning the well for safety reasons. Well was drilled up to 5,892 m against target depth of 6,450 m and is plugged & abandoned. The Exploration Period was valid till 17.05.2023. Operator has applied for 3-year special dispensation in the block from DGH/MoP&NG.

AA-ONHP-2017/12 (Assam Arakan Basin, Assam & Arunachal Pradesh)

Government of India awarded the block AA-ONHP-2017/12 to OIL under OALP I Bid Round. BPRL farmed into the block with PI of 10% in December 2019. The other consortium partners of the block are OIL (60% PI) as operator, IOC (20% PI) and Numaligarh Refineries Limited (10%). The total block is 489 sq. km in area of which 488.50 sq. km is in Assam and 0.5 sq. km is in Arunachal Pradesh.

The exploration period was valid till 23rd November 2023. The Airborne Gravity Gradiometry survey, 2D and 3D seismic data API have been completed in the block. There was a commitment of drilling two Exploratory Wells. NOC from Aviation Research Center is granted for only One MWP well (OWMA). Forest Clearance is awaited for well OWMA.

14.4.2. Balmer Lawrie Investments Limited (BLIL):

The Government of India, in view of its planned deregulation of oil and globalization of the economy, decided to disinvest 33.58%, of its total equity holding of 59.58%, in IBP Company Limited (IBP) to a strategic partner with management control. Consequently, the shareholding of IBP, in its erstwhile subsidiary Balmer Lawrie & Company Limited (BL), was de-merged in favour of Balmer Lawrie Investments Limited (BLIL), which was incorporated on 20th September 2001 under the Companies Act, 1956. The President of India continues to hold 1,32,46,098 Equity shares of ₹ 10 each (aggregating 59.67% of the total paid-up Equity capital) in the Company. BLIL is under the administrative control of Ministry of Petroleum & Natural Gas having its registered office at Kolkata. The Company does not have any business activity, except to hold the Equity shares of its subsidiary, namely, Balmer Lawrie & Co. Ltd. (BL). The major source of income is dividend income received from BL. In addition to the dividend income, the Company earns interest out of its surplus funds deployed in the fixed/term deposit schemes of the Scheduled Banks. Joint Ventures and Subsidiaries of BLIL:

- BLIL does not have any joint venture with any corporate entity.
- BLIL has at present one subsidiary company and one step-down subsidiary company, namely,

i. Balmer Lawrie & Co. Ltd. [as per Section 2(87)(ii) of the Companies Act, 2013] [which is referred to herein as 'BL'] and BL, in turn, has one subsidiary company as enumerated in serial no. ii below.

ii. Visakhapatnam Port Logistics Park Ltd. [as per Section 2(87) (ii) of the Companies Act, 2013].

14.4.3. Oil Industry Development Board (OIDB)

14.4.3.1. Objectives and Functions of the Board

The Oil Industry Development Board (OIDB) was established on 13th January, 1975 under the Oil Industry (Development) Act, 1974 to provide financial and other assistance for the development of Oil Industry. The functions of the Board, as defined in Section 6 of the Act, involve rendering financial assistance including loans and grants for the promotion of all such activities as are, in its opinion, conducive to the development of the Oil Industry.

14.4.3.2. Organizational Setup

Oil Industry Development Board comprises of Secretary, MoP&NG as Chairman & other members namely Secretary, Department of Chemical and Petrochemical, Additional Secretary and Financial Advisor, MoP&NG, Joint Secretary (PFC-I), Department of Expenditure, Ministry of Finance, Joint Secretary (Exploration), MoP&NG, Chairman-IOCL, ONGC, Chairman & Managing Director -GAIL, BPCL, EIL, Director General, Directorate General of Hydrocarbons, Director (R&D), IOCL and Secretary, Oil Industry Development Board as Member Secretary.

14.4.3.3. Resources of the Board

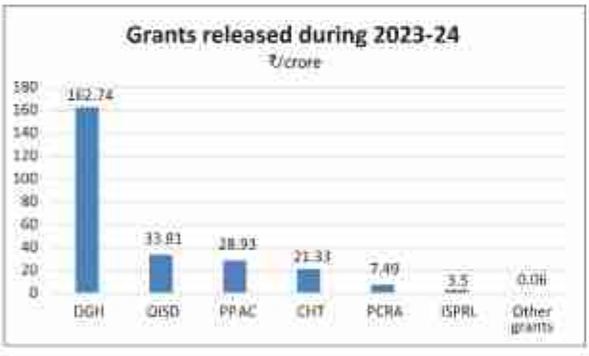
The funds required for various activities as envisaged under the Act, were made available by the Central Government after due appropriation by Parliament from the proceeds of cess levied and collected on indigenous crude oil. So far, OIDB has received an amount of ₹ 902.40 crore

from the Central Government till 1991-92 out of cess collection, which has accumulated to ₹ 12,041.85 crore (provisional) as on 31.03.2024 through internal generation.

14.4.3.4. Deployment of Funds

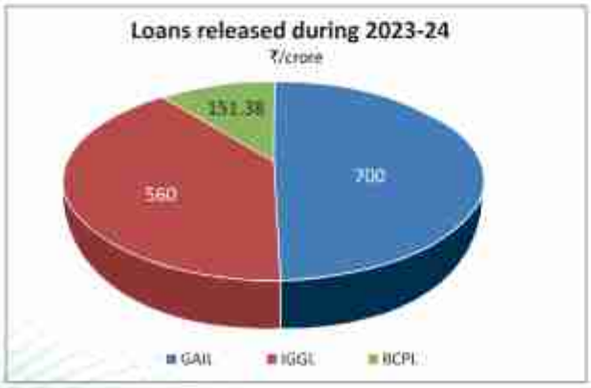
i) Grants

During the year 2023-24, OIDB had released grants to institutions viz. Directorate General of Hydrocarbons (DGH), Petroleum Conservation Research Association (PCRA), Centre for High Technology (CHT), Oil Industry Safety Directorate (OISD), Petroleum Planning and Analysis Cell (PPAC), ISPRL for pre-project activities of Phase-II SPRs and for other R&D projects amounting to ₹ 257.86 crore.



ii) Loans

The financial assistance of ₹ 1,411.38 crore by way of loans was released to Oil and Gas PSUs during the year for Jagdishpur Haldia Dhamra Pipeline Project of GAIL, North East Gas Grid Project of IGGL and Petrochemical project of BCPL.



iii) Equity

Indian Strategic Petroleum Reserves Ltd. (ISPRL), a wholly owned subsidiary of OIDB, has been entrusted with the construction of Strategic Storage for crude oil at three locations. OIDB has so far released an amount of ₹ 3,790.05 crore as equity investment in ISPRL towards capital cost for establishment of crude cavern projects at Visakhapatnam, Mangalore and Padur under Phase-I. Besides, an amount of ₹ 21.97 crore has also been made available to ISPRL as grant for pre-project activities for Phase-II SPRs.

iv) Advance

OIDB had provided total interest free refundable advance of ₹ 965.69 crore to DGH for carrying out seismic surveys in Andaman offshore areas and appraisal of un-appraised offshore basinal areas of Exclusive Economic Zone (EEZ), out of which, ₹ 565.28 crore were released during the financial year 2023-24.

v) Rajbhasha Kirti Purashkar

For the best implementation of the Official Language Policy, the Oil Industry Development Board was awarded the second prize in the category "A" under the category of Boards/Institutions for the Official Language **Kirti Award** during the year 2022-23 by the Department of Official Language, Ministry of Home Affairs.



Besides, the first prize was also awarded to Oil Industry Development Board by the Town Official Language Implementation Committee, Noida, for the implementation of the official language in the year 2022-23.

14.4.4. Oil Industry Safety Directorate (OISD)

Oil Industry Safety Directorate (OISD), the technical directorate under the Ministry of Petroleum and Natural Gas, has been entrusted with the responsibility of formulating standards, overseeing its implementation through safety audits to enhance safety levels and reduce risk inherent with this industry. OISD standards are implemented on self-regulatory basis by the Oil & Gas companies.

Petroleum & Natural Gas (Safety in Offshore Operations) Rules 2008 were notified in the Gazette of India to regulate safety in offshore oil and gas exploration, drilling, production and related activities; and OISD is designated as Competent Authority to exercise the powers and functions as stipulated in these rules vide Gazette notification issued in June 2008. The Directorate, under the provisions of these Rules, accords consent for operation of offshore installations in line with goal setting approach at par with international practices.

14.4.4.1. Safety Audits by OISD in FY 2023-24:

OISD carries out External Safety Audit (ESA) for onshore & offshore E&P installations, refinery, gas processing plant, central tank farm, LNG terminal, petrochemical plant, cross country pipeline, LPG bottling plant, LPG import facility, depot, terminal, aviation fueling station & lube blending plant on periodic basis to monitor their compliance level with the OISD standards and statutory regulations. OISD safety audit performance for January 2023 to March 2023, FY 2023-24 and January 2023 to March 2024 is as detailed below:

Type/Installation	Unit	January 2023 to March 2023	FY 2023-24		January 2023 to March 2024
			Plan	Actual	
Refinery/Petrochemical/GPP/CTF/ LNG Terminal	No.	03	23	29	32
Marketing Installation (POL)	No.	22	78	80	102
Marketing Installation(LPG)	No.	07	42	48	55
E&P Onshore	No.	13	100	115	128
E&P Offshore	No.	05	20	28	33
Safety Audit at Corporate/SBU level	No.	01	05	05	06
Major Port Audit	No.	-	02	05	05
SPM Audit	No.	05	02	06	11
Oil spill emergency preparedness joint inspection with ICG	No.	06	02	06	12
Grand Total	**No.**	**62**	**274**	**322**	**384**
Cross country Pipeline	Km	1,883	11,000	12,362	14,245

Note: This is the highest ever audit conducted by OISD for installations as well as for pipelines during FY 2023-24.

14.4.4.2. Pre-Commissioning Safety Audits

OISD carries out pre-commissioning safety audits for green-field developments and for major additional facilities at existing locations, to ensure compliance to the statutory requirement and OISD standards at the construction stage itself. Status of PCSA carried out during January 2023 to March 2023, FY 2023-24 and January 2023 to March 2024 is as follows:

Pre-Commissioning Safety Audits (PCSA)	Unit	January 2023 to March 2023	Actual 2023-24	January 2023 to March 2024
Refinery/ Petrochemical/ GPP/ CTF/ LNG Terminal	No.	04	18	22
Mktg. Installation (POL)	No.	12	17	29
Mktg. Installation (LPG)	No.	03	10	13
E&P Sector	No.	-	01	01
Pipeline Locations (pipeline length covered in km)	No. (km)	05 (647.55)	17 (1701.7)	22 (2349.25)
Total	**No.**	**24**	**63**	**87**

14.4.4.3. 'Consent to Operate' for Offshore installations:

OISD, as the competent authority to oversee implementation of the Petroleum & Natural Gas (Safety in Offshore Operations) Rules 2008, accords Consent to Operate (CTO) to offshore installations. The status for FY 2023-24 is as under:

Grant of 'Consent to Operate' - Offshore	Unit	January 2023 to March 2023	Actual 2023-24	January 2023 to March 2024
Fixed offshore Installation	No.	09	04	13
Mobile offshore Installation	No.	-	15	15
Total	**No.**	**09**	**19**	**28**

14.4.4.4. Revision of OISD Standards

OISD develops Standards for the oil and gas industry through a participative process involving all the stakeholders by leveraging the experience of the committee members and referring to national and international standards. These standards cover inbuilt design safety, asset integrity and best operating practices in the various facets of oil & gas industry. OISD standards are reviewed periodically to ascertain needs of developing new standards, updating/ amending existing standards to incorporate the latest technological developments as well as current experiences on the ground.

OISD has developed 118 technical safety standards for the oil & gas Industry. 23 of these standards are included in the statutory provisions of the Petroleum Rules, 2002, the Gas Cylinder Rules, 2016, the Static & Mobile Pressure Vessels (Unfired) Rules, 2016, Oil Mines Regulations, 2017 and PNGRB Regulations.

16 revised standards were approved by Safety Council on 30th June 2023 & released for industry by OISD. At present, 03 new safety standards including "Hydrogen Safety" &" Compressed Bio Gas (CBG) safety" are under development and 55 existing standards are under various stages of revision.

14.4.4.5. Training/Seminar/Conference/ Workshop/Webinar

Training/Seminar/Conference/Workshop/ Webinar for the oil & gas industry are conducted by OISD to disseminate the latest technological developments, case studies etc.

OISD conducted 4 nos. of Internal auditor trainings for 163 auditors, 2 nos. of Suraksha Samwad covering 480 participants and other knowledge sharing sessions during January 2023 to March 2023. A total of 1,225 participants attended these programs.

OISD conducted 10 nos. of 'Internal Auditor' trainings during FY 2023-24 to enhance 'Auditing Skills'. A total of 309 internal auditors of various Oil and Gas industries were trained.

During FY 2023-24, OISD organized 12 nos. 'Suraksha Samwad' webinars covering 3,878 participants on various topics including "Mock Drill and Common observations", "Baghjan incident & a movie titled A Land Reborn", "Offshore SPM incident & Onshore Pipeline burst incident", "Solid waste management, Health & hygiene at worksites, environmental protection measures, Good Housekeeping" and "Initiatives to maintain cleanliness", "Case study and analysis on incidents happened in refinery", "Case Study of recent incidents at LPG Plants and inspection of LPG bulk/packed truck" etc. Domain experts of industry shared experiences to learn from mistakes.

Suraksha Samwad was also organized for newly released major OISD standards viz. 178 (Management of Change), 105 (Work Permit System), 206 (Safety Management System) and 227 (Emergency response and preparedness in Oil and Gas industry) with relevant case studies, for the industry to enhance their understanding on the revised standards, key changes and common gaps related to that particular standard observed during audit/accident investigation.

OISD in association with HMEL has successfully organized a "Safety Conclave-2023" on 4th and 5th December 2023 at Bathinda, Punjab which was attended by 128 participants from Oil & Gas industry.

14.4.4.6. Incident investigation & analysis:

OISD investigates major incidents to analyse root cause(s) of the incident. A databank of major incidents of the oil & gas industry is maintained and analysed to assess trends, areas of concern and required corrective action. These are then disseminated to the industry through periodical bulletins 'Suraksha Chetna'; Safety Alerts and Case Studies; Seminars and Workshops.

During January 2023 to March 2023, six major incidents have been investigated by OISD out of which one incident was jointly investigated with PNGRB.

During FY 2023-24 twelve major incidents have been investigated by OISD out of which three incidents were jointly investigated with PNGRB.

From 1st January 2023 till 31st March 2024, OISD investigated 18 major accidents out of which 4 incident were jointly investigated with PNGRB.

Total 13 Case studies uploaded on OISD website and 14 Safety Alerts have been issued during the FY 2023-24. Two editions of "Suraksha Chetna" OISD newsletter have been published.

14.4.4.7. The Safety Council:

Safety Council, the Apex body on safety, reviewed the safety performance in 40th meeting of the Council, on 30th June 2023 under the chairmanship of Secretary MoP&NG. Key issues approved and/or deliberated during the meeting are as under:

- Major activities of OISD undertaken in 2022-23 & activity plan for 2023-24.
- Review of compliance status of OISD safety audit recommendations pending for more than two years and area of concern thereof.
- Approval of 16 revised OISD standards.
- Compliance to the recommendations of HLC related to Baghjan blowout incident.
- Compliance to the recommendations of HLC related to cyclone Tauktae incident.
- Approval of Actual Expenditure of OISD in FY 2022-23 and Budget Estimate for FY 2023-24.

14.4.5. Directorate General of Hydrocarbons (DGH)

Directorate General of Hydrocarbons (DGH) was set up on 8th April, 1993 with an objective to promote sound management of the Indian petroleum and natural gas resources having a balanced regard for the environment, and technological and economic aspects of the petroleum activity. The role and functions of DGH are inter-alia as under:

- A nodal agency for implementation of Exploration and Production activities on behalf of the Ministry of Petroleum & Natural Gas
- To advise Ministry of Petroleum & Natural Gas on Exploration Strategies & Production Policies
- To provide technical advice to the Ministry of Petroleum and Natural Gas on issues relevant to the exploration and optimal exploitation of hydrocarbons in the country
- To review the exploration programs of companies operating under Petroleum Exploration Licenses granted under the Oilfields (Regulation and Development) Act, 1948 and the Petroleum and Natural Gas Rules, 1959 to advise the Government on the adequacy of these programs.
- To evaluate the hydrocarbon reserves discovered and estimated by the operating companies
- To advise the Government on the offering of acreages for exploration to companies as well as matters relating to relinquishment of acreage by companies
- To review the development plans for commercial discoveries of hydrocarbon reserves proposed by the operating companies and advise the Government on the adequacy of such plans and the exploitation rates proposed and matters relating thereto
- To review and audit concurrently the management of petroleum reservoirs by operating companies and to advise on any mid-course correction required to ensure sound reservoir management practices in line with the optimal exploitation of reserves and the conservation of petroleum resources
- To regulate the preservation, upkeep and storage of data and samples pertaining to petroleum exploration, drilling, production of reservoirs etc. and to cause the preparation of data packages for acreage on offer to companies
- All other matters incidental thereto and such other functions as may be assigned by Government from time to time
- Assist the Government in Contract management functions
- Exploration & Development of unconventional hydrocarbon resources like Gas Hydrate, Shale Gas/Oil and Oil Shale

14.4.5.1. Government Initiatives in India's E&P Sector

The Government has opened up the E&P sector to a wider range of players, including small and new entrants, through initiatives like the Discovered Small Field (DSF) Policy, Coal Bed Methane (CBM) Policy, and Hydrocarbon Exploration Licensing Policy (HELP) etc.

Increased exploration activities play a crucial role in boosting the chances of discovering new hydrocarbon reserves, thereby enhancing production capabilities. By venturing into previously unexplored or under explored regions the likelihood of finding significant Oil and Gas deposits increases. This not only contributes to the growth of the E&P industry but also helps in meeting the country's energy demands more effectively. To accelerate the exploration activities in the country,

Government has launched OALP Bid Round-IX on 3rd January 2024 offering 28 Blocks with an area of around 1,36,000 sq.km for Exploration and Development through International Competitive Bidding. This round is much larger than all previous OALP rounds and is expected to significantly boost exploration activities in the country.

Government incentives such as tax holiday, no revenue for Category-II & III basis will make domestic production more viable and cost effective. Streamlined regulations and a single license system under HELP reduce delays and fast track the monetization of discoveries.

Early Monetization scheme will help in monetization of discovery in advance and will increase the domestic oil and gas production.

Further ER (Enhanced Recovery) Policy will encourage the use of enhanced oil recovery (EOR) and improved oil recovery (IOR) techniques to maximize recovery from existing fields.

Release of about 1 Million sq. km. 'No-Go' area in offshore which were blocked for exploration for decades. In these erstwhile 'No-Go' area, after the release now, so far bids/ expression of interests received for 1,52,325 sq. km. area. Two gas discoveries have also been made by ONGC in Mahanadi offshore recently in a block having 94% area in 'No-Go' area. Andaman offshore area has also been opened for exploration and production activities after a long time. Till now, 12 hydrocarbon discoveries have been made in blocks awarded under OALP, one already producing gas (0.44 MMSCMD) and condensate (819 BBL/Day) in Gujarat while other discoveries are under appraisal.

The government is spending about ₹ 7,500 crore for acquisition of seismic data in onland and offshore areas and drilling of stratigraphic wells to make quality data of Indian Sedimentary Basins available to bidders.

Government has also approved acquisition of additional 2D Seismic data of 20,000 LKM in onland and 30,000 LKM in offshore beyond Exclusive Economic Zone (EEZ) of India.

14.4.5.2. Initiatives for Ease of Doing Business

The Government has prioritized the ease of doing business in the Exploration and Production (E&P) sector, with the goal of boosting investment and production. The simplification of procedures and processes results in a more transparent and efficient system, which encourages investment in the sector.

In the era of digital revolution, the government is striving to enhance process efficiency and improve the delivery of government services. A range of measures have been implemented to simplify and digitize the processes throughout the E&P sector's value chain. DGH, under the Ministry of Petroleum and Natural Gas (MoPNG), has taken numerous steps including the 'Self-Certification'. This allows for major processes/approvals to be granted swiftly based on self-certification. A variety of applications and systems such as Production Sharing Contract Management System, Petroleum Exploration Lease/Petroleum Mining Lease Data Management System, Production Database Management System, E-bidding portal etc. have also been launched. These tools assist operators with smooth operations, transparent contract management, expedited approval & clearance grants, and engagement with potential investors.

14.4.6. Centre for High Technology (CHT)

Established in 1987, Centre for High Technology (CHT) acts as the Technical Wing of MoP&NG for implementation of scientific and technological programmes of Govt. of India. Major functions of CHT include

- Performance Benchmarking of Refineries, Petrochemicals and Pipelines
- Performance Improvement in Refineries through Best Practices, Special Studies, Operational Improvement and Process Technology
- Energy Efficiency Improvement in Downstream Hydrocarbon Sector
- Petroleum Product Quality Improvement
- Integration with Alternative Energies and New Initiatives in Downstream Sector for Future Sustainability
- Promoting Innovations and R&D in Downstream Hydrocarbon Sector including Hydrogen Research. Co-ordination of activities of Scientific Advisory Committee (SAC) on Hydrocarbons of MoP&NG
- Development of import substitute fuels, chemicals and catalysts
- Nodal agency for implementation of PM JI-VAN Yojana and SIGHT-2B
- Financial assistance to Compressed Bio Gas (CBG) producers for procurement of biomass aggregation machinery (BAM):
- Sharing of Best Practices and Information & Knowledge Dissemination

14.4.6.1. Major activities undertaken

1. Performance Benchmarking

Performance benchmarking of PSU refineries is being conducted regularly since 2010 and Pipelines & SPMs benchmarking was initiated with 2018 cycle through M/s Solomon Associates (SA), USA. The study for cycle 2022 is completed for both Refinery and Pipe lines.

Tendering Activities for Petrochemical (Cracker and Polymer) benchmarking units is in progress.

2. Refinery Performance Improvement

With a view to improve the performance of the Indian refineries to match the global best refineries, various initiatives targeting Energy Efficiency Improvement, Operational availability, OpeX reduction, etc, are in progress as detailed below:

2.1. PAT (Perform, Achieve and Trade)

The energy reduction Target for refining sector in PAT cycle-2 was set at 5.49% equivalent to 1.01 Million TOE. Against this, the actual energy reduction of 8.05%, equivalent to 1.48 Million TOE was achieved. For the current PAT cycle-6 (2020-21 to 2022-23), the sectoral energy reduction Target of 5.49% has been retained, which is equivalent to energy saving target of 1.17 Million TOE. PAT cycle-6 has been completed and the final validation of energy reduction of refineries is under progress.

2.2. Mission Q1 by 2030 in PSU refineries

A Roadmap on specific energy consumption for PSU Refineries has been prepared for improvement in energy consumption to bring all refineries in Quartile 1 (Q-1) of Solomon Benchmarking. The target is also aligned with India's NDC of 45% reduction in Specific Energy Consumption by 2030 over the base year of 2005.

2.3. Annual audit on furnace efficiency and steam leaks

To improve energy efficiency and reduce energy consumption in refineries, CHT organizes surveys every year in the areas of Furnace/Boiler efficiency or Steam leak taken up every alternate year. Furnace/Boiler efficiency survey was conducted in 2023 whereas steam leak audit was completed during Saksham-2024 (January-2024).

2.4. Development of Water Consumption Norms and Reduction of Water Footprint for Refineries: A savings of 2,369 m^3/hr of water consumption has been achieved against a target of 2,901 m^3/hr in 2019-2022. For further reduction of water consumption by 3,435 m^3/hr by 2025 is in progress. As on date 1,160 m^3/hr saving have been achieved.

2.5. Refinery Performance Improvement Programme (RPIP) of PSU Refineries:

In order to assist the PSU Oil companies to improve product pattern & their qualities, operation excellence, reduce energy consumption and emissions, etc. CHT engaged an experienced consultant undertaking RPIP in two phases-7 PSU refineries (HPC-Mumbai and Visakh, BPC-Mumbai and Kochi, IOC-Panipat, Paradip and Mathura) have participated in the RPIP phase-I. Under RPIP phase-I many schemes targeting the aforesaid objectives has been identified and same being implemented by the oil companies. In the second phase, for balance 8 refineries (IOC-Barauni, Gujarat, Haldia, Bongaigaon, Guwahati, Digboi, CPCL-Manali and NRL), action is being taken up by respective refineries.

3. Strategic Intervention for Green Hydrogen Transition (SIGHT-2B)

SIGHT 2B is a scheme launched by the Ministry of New and Renewable Energy (MNRE) in India as part of their Strategic Interventions for Green Hydrogen Transition (SIGHT) program. It aims to promote the production of green hydrogen by providing financial incentives to manufacturers.

Under the SIGHT 2B scheme, the implementation agency/agencies shall aggregate demand and call for bids for the production and supply of Green Hydrogen at the lowest cost for a single refinery or multiple refineries. Tranche I of Mode 2B offers a bidding capacity of 2,00,000 Metric Tons per annum. MNRE vide its letter dated 16th January 2024 notified that the Scheme under Mode 2B will be implemented by the Oil & Gas companies and the Centre for High Technology (CHT). CHT will be responsible for providing secretarial, managerial and implementation support including examination of beneficiaries' claims, verifying and reconciliation of disbursement claims, monitoring progress, etc. and carrying out other responsibilities as assigned by MoP&NG from time to time.

4. Promotion of innovation and development of Indigenous Technology

CHT coordinates the activities of Scientific Advisory Committee (SAC) on Hydrocarbons of MoP&NG in identifying and funding of research projects for downstream hydrocarbon sector including projects of national importance and facilitating the energy transition.

Hydrogen Research: CHT has funded various projects for production of hydrogen from different pathways, development of fuel cell buses in tie-up with vehicle manufacturer as well as transport operators, storage and dispensing of hydrogen, production of HCNG and demonstration of HCNG fueled buses in Delhi.

5. Implementation of PM JI VAN Yojana

Pradhan Mantri JI-VAN Yojana was announced in March, 2019 for promotion of 2G ethanol technologies and to support rural economy. The financial outlay of the scheme is ₹ 1,969.5 crore. CHT has been appointed as the Nodal agency for the implementation of the Scheme. Steering Committee of PM JI-VAN Yojana has approved financial assistance for 6 commercial projects and 4 demonstration projects. Out of 6 commercial projects IOCL Panipat plant with capacity of 100 KLPD is already producing on spec 2G ethanol and Assam Bio Refinery Private Limited (ABRPL) with a capacity of 185 KLPD based on bamboo feedstock is under commissioning.

6. **Financial assistance to Compressed Bio Gas (CBG) producers for procurement of biomass aggregation machinery (BAM):**

Government of India vide notification F. No. L-16020/02/2023-GP-1 (E-45833), dated 2nd February 2024 has approved the Scheme for providing financial assistance to Compressed Bio Gas (CBG) Producers for procurement of biomass aggregation machinery to support collection of biomass with a total financial outlay of ₹ 564.75 crore for the period FY 2023-24 to FY 2026-27. CHT has been appointed as the Project Monitoring Agency (PMA) for the scheme. CHT has developed a dedicated portal for implementation of the Scheme. The application under the scheme can be submitted w.e.f. 1st April 2024.

7. **Processing & Recommending Global Tender Enquiry Proposals to MoP&NG.**

Purchase of import items through GTE under Rule 161 (iv) of General Financial Rules (GFRs) 2017 up to ₹ 200 crore is allowed only after obtaining necessary approval from competent authority (Cabinet secretariat/Administrative Ministry).

In this regard, CHT has been entrusted to examine & technically recommend the proposals pertaining to Downstream and Midstream sector before submitting to the concerned administrative division of the ministry. During the financial year 2023-2024, a total of 69 proposals have been processed.

8. **Activities transferred From PCRA to CHT:**

Post Dissolution of PCRA, R&D activities of PCRA have been handed over to CHT.

9. **Energy Technology Meet (ETM):**

The 26th ETM formerly known as Refining & Petrochemicals Technology Meet (RPTM) was organized along with EIL & NRL at IECCC (Bharat Mandapam) Pragati Maidan, New Delhi, during 9-11 October, 2023. The theme of the Meet was kept as "Emerging Energy Trends and Future of Refining". The event had presentation of 77 oral papers (including 8 panelist and 58 foreign companies' speakers) spread over 15 Technical Sessions and 66 digital Poster Sessions (including 47 representing foreign companies) along with 27 Exhibition Stalls and was attended by more than 1,300 delegates/invitees from India and abroad.





26th ETM inauguration by Hon'ble Minister of Petroleum and Natural Gas Shri Hardeep Singh Puri.

10. **Activity Committee Meetings (ACM)/ webinars**

With the aim of sharing of best operational practices & improvements and dissemination of information on latest developments, CHT organized 24 Nos. of ACMs/webinars in critical areas/technologies in refining sector and pipelines operations. These meets are attended by large number of participants from the industry, licensors and suppliers.

11. Awards

CHT is actively associated with the following Annual Awards instituted by Ministry of Petroleum & Natural Gas, Government of India

- Refinery Performance Improvement Award
- Saksham Awards (based on Steam Leak and Furnace Efficiency Surveys)
- Innovation Awards in R&D

14.4.7. Rajiv Gandhi Institute of Petroleum Technology, Jais, Amethi

14.4.7.1. New Academic Programmes:

The Rajiv Gandhi Institute of Petroleum Technology (RGIPT) has extended its academic offerings by adding new B.Tech. Programmes such as Chemical Engineering (Major: Petrochemicals and Polymer Engineering), Chemical Engineering (Major: Renewable Engineering) and Petroleum Engineering (Major: Applied Petroleum Geoscience), enhancing its petroleum and energy offerings, and adapting to industry suggestions, expanding its modern offerings.

14.4.7.2. Research & Development:

RGIPT's intellectual resources range from conventional fields to ultra-advanced areas like AI/ML/IoT, making it well-positioned to offer solutions through basic and advanced research works. Faculty members are involved in projects sponsored by various departments, including the Department of Science & Technology, Science & Engineering Research Board, Department of Atomic Energy, Council of Scientific & Industrial Research, Petroleum Conservation Research Association, Ministry of Minority Affairs, Oil India Limited, Oil & Natural Gas Limited, Chennai Petroleum Corporation Limited, Hindustan Aeronautics Limited, and NTPC Energy Technology Research Alliance.

14.4.7.3. Central Instrumentation Facilities with the dedicated portal:

RGIPT established a dedicated Central Instrumentation Facilities (CIF) to provide high-end instrumentation for research and external users this year with an online portal system. The CIF operates under the umbrella of an independent center, catering to in-house R&D activities and external academic institutions, R&D institutions, and industries across India. The CIF offers tests under eight major categories of R&D to understand material behavior, including Analytical Sciences, Chromatography, Corrosion Engineering, Fuel Technology, Geological and Geophysical Sciences, Spectroscopy, Surface and Imaging Science, and Thermal Sciences. External users are charged at reduced rates compared to other organizations, extending the instrumentation facilities to a wider scientific populace in India.

14.4.7.4. DST-NIDHI Inclusive Technology Business Incubation Centre at RGIPT:

The National Expert Advisory Committee (NEAC) has recommended a project entitled "Innovation and Entrepreneurship in Energy, Healthcare, and Agriculture Sectors for Sustainable Development of India" to support under DST-NIDHI Inclusive Technology Business Incubator (i-TBI) program. The aim of the project is to set up an i-TBI at RGIPT for promoting entrepreneurship and start-up ecosystem. The committee recommended Energy, Clean Fuel, Healthcare, Agriculture as primary thrust area for proposed i-TBI. The fund support from DST for this project is ₹ 3.24 crores.

14.4.7.5. Industry-Academia Collaboration:

CPCL and RGIPT signed two agreements to collaborate on the following two areas, (i) corrosion inhibitor formulations for preventing ethanol-blended petrol corrosion and (ii) Setting up of demonstration plant production of microcellulose, nanocellulose, and fuel from rice straw and green coconut shells. Further, ONGC Mehsana Asset and RGIPT agreed to work on a project titled microwave-Assisted Mobilization of viscous crude oil for

improved oil recovery and flow assurance applications. Also, RGIPT signed an MoU with Microsoft India, for joint Academic and Research initiatives.

14.4.7.6. Major Events:

i. UP CST-sponsored One-Day Workshop on Intellectual Property Rights hosted conducted on 9th March 2024.

ii. SERB-sponsored One-Day Workshop on NextGen Spectro(Micro)scopic Method for Energy-Independent Bharat on 18th March 2024.

iii. 2-week Residential Training Program on Petroleum Refining Technology for IOCL officers from 26th February to 9th March 2024.

iv. ICSSR-funded international conference on NetZero and Energy Transition for Sustainable Development, February 17-18, 2024.

v. SERB Sponsored Workshop on Artificial Intelligence for Smart Sensing and Internet of Everything, February 10-14, 2024

vi. RGIPT jointly organized the 76th Indian Chemical Engineering Congress (CHEMCON 2023) December 27-31, 2023

vii. 2-week Residential Training Program on Refining Technology for CPCL officials from 20th November to 2nd December 2023.

viii. Training Program for IOCL on Environmental, Social, and Governance and Responsible Leadership, November 06-08, 2023

14.4.7.7. First Edition of Newsletter (ऊर्जाप्रवाह):

The first Edition of its Newsletter (ऊर्जाप्रवाह) was launched by Shri Rameswar Teli, Hon'ble Union State Minister for MoPNG and Labour and Employment in the presence of Shri Arun Kumar Singh, Chairman and CEO, ONGC, Shri Bhaskar Jyoti Phukan, MD, NRL, on 4th March 2024.

14.4.7.8. Inauguration of New Building:

Smt. Smriti Zubin Irani, Hon'ble Minister for Women & Child Development inaugurated "URJA" Girls' Hostel and Department of Electrical & Electronics Building on 6th March 2024.

14.4.7.9. Construction Activities: Boys Hostel & New Academic Building

A new boys' hostel building for a plinth area of 17,056 m^2 is getting constructed within the existing premises RGIPT Jais Campus and is expected to be completed by December 2025. The expected occupancy after the complete construction of boys' hostel building would be around 950 students & the estimated cost of the construction is 63.50 crores.

Accordingly, a new academic building is coming up in the existing premises of RGIPT for an area of 6,762 m^2. The expected date of completion of the said building is December 2024 & the estimated cost of the said construction is 18.81 crores.

14.4.7.10. Energy Institute, Bengaluru (Centre of RGIPT, Jais, Amethi)

Energy Institute, Bengaluru (EIB), Centre of RGIPT Jais, is a distinguished academic and research centre to foster technology-driven academic and research programmes in the domain of energy. EIB is temporarily operated from a transit campus at Sri Venkateshwara College of Engineering, Vidya Nagar Cross, International Airport Road, Bengaluru.

14.4.7.11. Academic Programmes:

EIB currently offers three M. Tech programmes namely Renewable Energy, Electric Vehicle Technology and Data Science. Ph.D. programmes in the disciplines of Electrical and Electronics Engineering, Material Science & Engineering and Computer Science and Engineering are also offered.

Centre presently hosts a total 15 M. Tech. students and 14 Ph.D. students working in the field of Green Energy, Electric Vehicle Technology, and Applications of Artificial Intelligence in Energy Systems. 38 students graduated in the year 2023-24.

14.4.7.12. Status of Construction:

The Construction of the Permanent Campus of Energy Institute Bengaluru is currently in progress at Survey number 127P, Kambalipura Village, Sullibelle Hobli, Hosakote Taluk, Bengaluru Rural District. The plan of construction involves construction of Boundary wall, Academic Block, two Boy's hostel, one girl's hostel and one dining hall. The construction of Boundary wall lies complete. The construction status of Boys' Hostel 1 is 70% complete and the second amounts to a completion status of 15%. The construction status of Girls' Hostel is 30%. The dining hall accounts for 80 % of its constructed status. The construction progress of Academic Block involving Ground+2 floor stands at a completion of 70%.

14.4.7.13. Assam Energy Institute (AEI), Sivasagar (a Centre of RGIPT Jais)

Inauguration of New Buildings:

Academic Block, Boys' Hostel and Girls' Hostel were inaugurated by Shri Rameswar Teli, Hon'ble Union Minister of State, Petroleum & Natural Gas and Labour & Employment, Government of India, in the presence of Shri Arun Kumar Singh, Chairman and CEO, ONGC, and Shri Bhaskar Jyoti Phukan, MD, NRL, on 4th March 2024.

14.4.7.14. Establishment of a 5 TPD Compressed Biogas (CBG) Plant:

The Oil India Limited commits to establish a state-of-the-art 5 TPD CBG plant at the Assam Energy Institute (AEI) in Sivasagar. The plant will be equipped with modern technology to produce CBG.

14.4.7.15. Ongoing- Construction:

The construction of Boys' Hostel-2 (G+3), Dining Hall, academic building, additional Boys & Girls' Hostel (G+4), and housing (G+6) for faculty members are under progress.

14.4.8. IIPE-Indian Institute of Petroleum & Energy, Visakhapatnam

14.4.8.1. Introduction:

The Government of India has established the Indian Institute of Petroleum and Energy (IIPE), a Petroleum University, under the aegis of the Ministry of Petroleum and Natural Gas (MoPNG) in the year 2016 in Visakhapatnam, as per provisions made in the Andhra Pradesh Reorganisation Act, 2014. The Indian Institute of Petroleum and Energy Act, 2017 enacted by the Parliament declared it as an 'Institution of National Importance'. The main objective for establishing this Institute by the Government of India, is to meet the quantitative and qualitative gap in the supply of skilled engineers for the petroleum and energy sectors and to promote research activities needed for the growth of these sectors. The primary goal of research at IIPE has been to meet the country's fossil and non-renewable energy demands. The institute is co-promoted as an energy domain specific institute by the leading Oil PSUs namely HPCL, ONGC, OIL, GAIL & IOCL.

Programs/ Courses: IIPE is presently offering 4-year B.Tech Programs in Petroleum Engineering, Chemical Engineering, Mechanical Engineering in addition to M.Sc in Applied Geology and Ph.D research courses. The students are admitted to the B.Tech programs based on their JEE (Advanced) rankings and to the M.Sc programs through JAM (Joint Admission Test for Masters). The 4th batch (2019-23) of B.Tech students graduated in the month of June 2023. Presently, 357 students are pursuing various courses in the Institute which includes 71 Ph.D. Research Scholars.

The Institute has initiated the other key academic activities like International

Electives, Global Student Internships, B.Tech-MS Programme with US Universities, Industry-sponsored Master's Programme, Visiting Researchers and Joint MBA with IIM Visakhapatnam.

Placements: As on 31st March 2024, the institute has achieved a placement rate of 70% for the academic year. The remaining eligible students of 2020-24 batch are currently in the final stages of interviews and the results are anticipated to meet the placement target of 100% by 30th April, 2024. A total of 36 companies conducted on-campus/off-campus interviews to the students and the highest CTC so far offered during this present academic year is 20.73 LPA. Many new core companies in Oil & Energy sectors and from Analytics & Consulting have been roped in additionally this year for providing placements such as Halliburton, Reliance BP, Total Energies, HPCL Rajasthan Refinery, Jindal Drilling, Wipro, and Tata Group etc.

Research & Development: The Institute has presently 18 ongoing research projects with a total outlay of ₹ 45.20 crores. During the year 2023-24, 12 projects with an amount of ₹ 38.64 crores have been sanctioned to the faculty by various research sponsoring agencies which includes research project from NTPC for installing a Green Hydrogen Plant for 1 TPD hydrogen generation from sea water. During the year, a total of 43 publications were made as research articles, Book Chapters, Books, and Conference Papers.

To encourage a research culture, the Institute started Institute Research Grant (IRG), which acts as a seed grant for the faculty members. The Institute also introduced the cumulative contingency and sandwich Ph. D program to promote foreign collaboration.

Permanent Campus: The Government of Andhra Pradesh has allotted the land to an extent of 201.80 acres, at free of cost, at Vangali Village, Sabbavaram Mandal, Anakapalli District (Earlier Visakhapatnam District) for construction of permanent campus for IIPE. The Govt. of Andhra Pradesh has transferred the alienated land on the name of the Institute in the month of March, 2023.

The Boundary Wall around the alienated land has been completed by the Andhra Pradesh Industrial Infrastructure Limited (APIIC). The work for construction of buildings in the permanent campus has been entrusted to the Central Public Works Department (CPWD). The construction activities of Eastern Academic Block, Boys Hostels (02 Nos.), Mess Block, Staff Quarters and Guest House are in progress. An overall 22% of the construction activities have been completed in the permanent campus as on 31.03.2024. The expected date of completion of construction activities (Phase-1) is July, 2025. The Institute has released ₹ 165.88 crores to the CPWD, till 31.03.2024, towards the construction of permanent campus (Phase-1).

Bhoomi Pujan (Ground Breaking Ceremony) for construction of permanent campus: To commemorate the construction activity of the world-class Institute in the city of destiny Visakhapatnam, the Bhoomi Poojan (Ground Breaking Ceremony) of the Institute was performed by the Hon'ble Prime Minister Shri Narendra Modi on 02nd March 2024, through video conferencein the presence of the Hon'ble Union Minister for Petroleum and Natural Gas & Housing and Urban Affairs Shri Hardeep S Puri from Ulao, Begusarai, Bihar. Shri. Pankaj Jain, Secretary, MoP&NG, GoI and Prof. Shalivahan, Director, IIPE were present in the event.

MoUs: IIPE, this year, has signed MoUs with University of Houston (UoH), USA;University of Stony Brook, USA; Ufa State Petroleum Technological University; **Sharif University of Technology (SUT), Tehran for academic**

and research purposes and Environmental Management & Systems Engineering Lab (EMSEL), Kyung Hee University, Korea for Environment, Energy Research, Education and Management. The MoU with the University of Houston was signed on 15.01.2024 in the august presence of Shri Pankaj Jain, Secretary, MoP&NG, GoI.

In addition, the Institute signed MoU with M/s. Greenko Foundation to support M. Tech students for Fellowship, internship at their plant and for possible placements; G-TEC, GITAM Deemed to be University for R&D Collaboration; M/s Parking Consultants, Hyderabad for skill development, training and industry collaboration; Oil India Limited for R&D Interactive Programme; CSIR-Central Institute of Mining and Fuel Research for cooperation in the fields of education, training and research in emerging areas of energy sector; Petroleum and Explosives Safety Organization for training for skill development for safety in industries-interaction/co-operation;.

Manpower & Women Employees: IIPE has presently 29 faculty members &17 Non-teaching Staff, on regular basis, of which 05 are women employees.

14.4.8.2. Workshops & Seminars:

Hydrogen Summit: A 3-day Global Energy Environment Summit focussing Hydrogen, namely 'Hydrogen Energy Resource &Opportunity (HERO) 2023' was conducted by the Institute at Visakhapatnam from 24th-26th July, 2023.

REUSG-2023: A 2-day workshop on 'Renewable Energy Utilization for Sustainable Growth' was organized from 25th-26th August 2023 at Institute, with the objective to discuss challenges associated with renewable energy generation and its utilization.

EBLT-2024: The Institute conducted a two-day national level conference on 'Evidence-Based Library Transformations: Quality Services for NextGen Users (EBLT-2024)' from 24th-25th January 2024. More than 80 delegates and experts from various premier institutions participated in the event.

EE&MM-2024: A two-day national conference on 'Earth's Materials for Energy: Mantle to Market (EE&MM-2024) was organised during 1st-2nd February 2024 at the Institute. The key themes of the conference were about natural resources provided by the Earth for energy purposes, encompassing hydrocarbons, nuclear fuels, white hydrogen, and geothermal energy.

ChemEEE-2024: The Institute organised the International Conference on 'Trends in Chemical, Energy and Environmental Engineering(ChemEEE-2024)' conference during 19th-21st February 2024 at Visakhapatnam with emphasis on the importance of the energy transition and role of start-ups in job creation.

Webinar on Unconventional Hydrocarbon Resources: Opportunities and Challenges: The Institute organised a two day webinar on Unconventional Hydrocarbon Resources : Opportunities and Challenges during 28th-29th March 2024 for the students of Khazar University, to provide knowledge on petroleum exploration to production activities in order to provide complete overview of the increasingly complex operations in oil and gas industry.

14.4.8.3. Future Plan:

(i) Started the construction of the new campus from the year 2023 and shifting from the temporary campus to new permanent campus by December 2024

(ii) Implementation of MoUs with world repute institutes/universities and encouraging the quality research for attainment of patents by the year 2024.

(iii) Institute will host foreign Nationals for research courses;

14.4.9. Petroleum Planning & Analysis Cell (PPAC)

14.4.9.1. Introduction: Petroleum Planning & Analysis Cell (PPAC) was established as an attached office of MoP&NG w.e.f. 1st April 2002 after dismantling the Administered Pricing Mechanism (APM) in the petroleum sector and abolition of the erstwhile Oil Coordination Committee (OCC). The Governing Body under the chairmanship of Secretary, P&NG and senior officials of MoP&NG and Chief Executives of major oil and gas PSUs as members, provides necessary supervision and guidelines in the functioning of PPAC. PPAC is expected to assist the Government of India, inter alia, in discharging of the following functions with vision of being authentic source for data & policy analysis on hydrocarbon sector;

a. Maintenance of an information data bank on Oil and Gas Sector

b. Analysing trends in the international oil market & domestic prices

c. POL demand forecasting

d. Conducting studies in the Oil & Gas and Energy Sector

e. Forecasting and evaluation of petroleum import and export trends

f. To provide inputs to Government particularly on pricing of petroleum products and administration of subsidy schemes including PMUY

g. Determination & notification of Domestic Natural Gas price and HT HP Gas price ceiling on six monthly basis as per Government guidelines

14.4.9.2. Important Database and dissemination of regular MIS Reports on oil and gas sector: PPAC maintains data related to production, consumption, import and export of crude and petroleum products and oil infrastructure. It also maintains data related to production of natural gas, import of LNG and consumption of natural gas and on the CGD sector. Under the mandate of PPAC, many daily, fortnightly, monthly, six-monthly and annual reports are published on PPAC's website http://ppac.gov.in as well as on the mobile app "PPACE" available on Apple App store and Google Play store. These reports pertain to daily prices of crude oil and petroleum products, Consumption of POL products and Industry Sales Review, LPG Sales, crude oil processing and production, POL products imports & exports, consumption and import of Natural Gas etc. Besides the regular Reports and inputs on Petroleum products, PPAC also carries out many studies on the Demand, Supply, Transportation and Pricing of MS, HSD, LPG, Gas etc. The Reports by the PPAC assist the Policy makers and are also much demanded and appreciated by the Industry as well as other institutions and organisation in oil and gas sector.

14.4.9.3. Important Activities: Some of the important activities during 2021-22 undertaken by PPAC were as follows:

1. Domestic natural gas pricing and ceiling price for gas produced from discoveries in deep water, ultra- deep water and high pressure-high temperature areas: for notification and issuance under the provisions of the New Domestic Natural Gas Pricing Guidelines, 2014:

Domestic Natural Gas prices were notified for the periods 01.04.2022 to 30.09.2022, 01.10.2022 to 31.03.2023 and 01.04.2023 in line with the New Domestic Natural Gas Pricing Guidelines, 2014.

Ministry of Petroleum & Natural Gas allowed marketing freedom including pricing freedom subject to the ceiling price on the basis of landed price of alternate fuels for the gas produced from discoveries in Deep-water, Ultra deep

water and High pressure-High Temperature areas vide notification dated 21st March 2016. Gas price ceiling was notified by PPAC for the period April 2022 to September 2022 and October 2022 to March 2023 under the said notification.

Period	Domestic Gas price (US$/MMBTU)	Deep Water/ Ultra Deep Water (Ceiling Price) (US$/MMBTU)
01 Nov'2014 - 31 Mar'2015	5.05	-
01 Apr'2015 - 30 Sept'2015	4.66	-
01 Oct'2015 - 31 Mar'2016	3.82	-
01 Apr'2016 - 30 Sept'2016	3.06	6.61
01 Oct'2016 - 31 Mar'2017	2.5	5.3
01 Apr'2017 - 30 Sept'2017	2.48	5.56
01 Oct'2017 - 31 Mar'2018	2.89	6.3
01 Apr'2018 - 30 Sept'2018	3.06	6.78
01 Oct'2018 - 31 Mar'2019	3.36	7.67
01 Apr'2019 - 30 Sept'2019	3.69	9.32
01 Oct'2019 - 31 Mar'2020	3.23	8.43
01 Apr'2020 - 30 Sept'2020	2.39	5.61
01 Oct'2020 - 31 Mar'2021	1.79	4.06
01 Apr'2021 - 30 Sept'2021	1.79	3.62
01 Oct'2021 - 31 Mar'2022	2.9	6.13
01 Apr'2022 - 30 Sept'2022	6.1	9.92
01 Oct'2022 - 31 Mar'2023	8.57	12.46

Further, Monthly domestic Natural Gas prices were notified for the period 08.04.2023 onwards, on last day of every month in accordance with MOPNG's resolution L-12015/1/2022-GP-II dated 7th April 2023, while Gas price ceiling (HP-HT price) was notified by PPAC for the period April 2023 to September 2023 and October 2023 to March 2024 under the notification dated 21st March 2016.

Period	Domestic Gas calculated price in US$/MMBTU	Domestic Gas ceiling price for ONGC/OIL in US$/MMBTU	Period	HP-HT Gas Price ceiling in US$/MMBTU
8 April 2023 - 30 April 2023	7.92	6.50	April 2023 - September 2023	12.12
1 May 2023 - 31 May 2023	8.27	6.50		
1 June 2023 - 30 June 2023	7.58	6.50		
1 July 2023 - 31 July 2023	7.48	6.50		
1 Aug 2023 - 31 Aug 2023	7.85	6.50		
1 Sept 2023 - 30 Sept 2023	8.60	6.50		
1 Oct 2023 - 31 Oct 2023	9.20	6.50	October'2023 - March 2024	9.96
1 Nov 2023 - 30 Nov2023	9.12	6.50		
1 Dec 2023 - 31 Dec 2023	8.47	6.50		
1 Jan 2024 - 31 Jan 2024	7.82	6.50		
1 Feb 2024 - 29 Feb 2024	7.85	6.50		
1 Mar 2024 - 31 Mar 2024	8.17	6.50		
1 April 2023 - 30 April 2023	8.38	6.50		
01 Oct'2022 - 31 Mar'2023	8.57	12.46	April 2024- September 2024	9.96

Natural Gas prices are on GCV basis

2. Roadmap to Reduce Import Dependence in Energy: PPAC has prepared a Draft Strategy document on Roadmap to Reduce Import Dependency In Energy, basis the inputs provided by the working groups constituted by the Integrated Monitoring & Advisory Committee. Earlier, working on he clarion call given by the Hon'ble Prime Minister at the Urja Sangam in March 2015, a committee submitted its report in April 2016 on 'Roadmap to reduce import dependency in energy', outlining five broad strategies to achieve reduction in import dependency in the Oil & Gas sector. However in view of the current global scenarios, changing dynamics and to add new spheres that may help reduce import dependency in Oil & Gas sector, the revised draft Strategy document has been prepared as per the directions of IMAC (Integrated Monitoring & Advisory Committee) under the chairmanship of Hon'ble Minister, MoP&NG and submitted to MoP&NG for review.

The re-assessed strategies are the inputs from the six working groups constituted by the IMAC for studying, analysing and quantifying the impact of various initiatives taken by the concerned Ministries/Departments from FY 2016 to FY 2020 towards achievement of the roadmap of reducing import dependency of oil/gas/coal and in the overall energy sector. These reports have been aggregated and compiled and being presented in a unified view on India's strategy for import reduction of Oil & Gas. The report is a holistic reassessment of policies/steps as envisaged in the import reduction

roadmap and mapping all actionable points because of these strategies/ initiatives in terms of their impact on energy demand and savings with timelines to roll out the reassessed roadmap in reducing import dependence by the year 2024-25. Price waterhouse Coopers (PwC) was engaged by Petroleum Planning & Analysis Cell (PPAC) in October 2021 for providing external support for the preparation of the comprehensive report. Based on the Strategy document prepared, Key Performance indicators (KPIs) will be identified and a dashboard created for further monitoring. MoP&NG has sought nominations from various Ministries & Departments for appointing nodal for the dashboard monitoring.

3. **Energy Demand Projections Model (EDPM):** PPAC as part of 'demand for petroleum products' subgroup of the Working group on 'Enhancing Refining capacity by 2040' has developed long term projections of the Total Final consumption of the Petroleum products in the six end-use demand sectors (viz. transport, cooking, industry, agriculture, telecom and buildings) taking 3 different scenarios (Baselines, Transition and Transformation depending on the Energy transition to cleaner fuels). The model has also considered an "Optimum" scenario for oil demand by considering various phases of three main scenarios for different periods and sectors. It is designed to reflect the levels of transition in different time frames. The earlier model with base year of 2020 was updated with base year of 2022 and has been recalibrated in line with the current dynamics and energy policies of the Country. (2022 – 2047 with a 5-year interval). Based on the demand projections, PPAC has worked on the draft report of the Refining capacity for the period.

4. **Visual Analytics module for Oil & Gas data:** The Vision of PPAC is to be the most authentic official source for data and in the country. PPAC takes oil and gas data from various OMCs, government departments and ministries and prepares reports, which helps in analyzing the trends and making decisions & policies.

   To strengthen its process, PPAC uses latest technologies, software, and methodologies. In line with this, PPAC has deployed SAS Visual Analytics platform on top of data collected from various OMCs. The visual analytics capabilities with modern graphical ways of expressing information, helps users at PPAC create reports & identify insights efficiently & quickly.

   Complete process of data collection, storage & dissemination has been standardized; and with various checks & validations, clean & accurate data is used in preparing a wide variety of statistical reports & for meaningful insights and trends. The process has become easier, efficient and more stream-lined with the availability of data & reports anytime, anywhere

14.4.9.4. Involvement of PPAC in many Strategic Committees/Study Groups for the Oil & Gas Sector: PPAC is involved in various studies/activities like, Rating of Retail Outlets & LPG Distributorships network, verification of remote retail outlets, measures for continued viability of Natural Gas production from nomination fields in the context of 2014 guidelines and strategies to increase the share of Gas consumption in the primary energy mix. PPAC was also involved in the multi-agency study on "Rerouting of shipping during hostilities", carried out under the aegis of National Security Council Secretariat (NSCS) and also member of Diversion Committee headed by Secretary Port, Shipping & Waterways and Working Level Diversion Committee headed D G, Naval Operation for regular updation of situation. PPAC submitted a report to MoP&NG under the chairmanship of DG PPAC on "Assessment of Domestic Demand, Fuel Ex orts and Refinin Ca acit b 2047".

14.4.10. Petroleum and Natural Gas Regulatory Board (PNGRB)

The Petroleum and Natural Gas Regulatory Board (PNGRB) was constituted under the PNGRB Act, 2006, notified via Gazette Notification dated 31st March, 2006. The Act provides for the establishment of PNGRB to protect the interests of consumers and entities engaged in specified activities relating to petroleum, petroleum products and natural gas and to promote competitive markets and for matters connected therewith or incidental thereto. The Board under the Act has to regulate the refining, processing, storage, transportation, distribution, marketing and sale of petroleum, petroleum products and natural gas excluding production of crude oil and natural gas so as to ensure uninterrupted and adequate supply of petroleum, petroleum products and natural gas in all parts of the country. The vision of PNGRB is as under:

"To create a vibrant energy market with rapid and orderly growth through facilitation of flow of investments into the basic infrastructure for efficient transportation and distribution of petroleum, petroleum products and natural gas at minimum cost and high level of protection of consumer interests through fair trade practices and competition amongst the entities so as to ensure the enhanced competitiveness of Indian economy and customer satisfaction"

PNGRB has authorised 33,478 Km Natural Gas Pipeline network across the Country till 31st March 2024. 22,481 Km pipelines are operational which includes Common Carrier Tie-in Connectivity, dedicated pipelines & sub transmission pipelines and the remaining are under construction.

PNGRB has also authorised 13,596 Km Petroleum and Petroleum Product Pipelines across the Country till 31st March 2024, out of this 9,223 Km pipelines are operational and the remaining are under construction.

In order to expand the coverage of CGD Networks, PNGRB has granted authorization for 7 GAs under 12th and 12A CGD Bidding Round. So far 307 GAs have been authorised for development of CGD Network across the country. Providing Piped Natural Gas connections is part of the development of City Gas Distribution (CGD) Networks and the same is carried out by the entities authorized by PNGRB. As on 31st March 2024, these entities have provided 1.29 crore Domestic PNG connections and established 6,861 CNG Stations across the country.

PNGRB organised inaugural edition of the International Conference of Petroleum and Natural Gas Regulators between 5-8th February 2024 during the India Energy Week ("IEW") 2024, Goa. The conference was aimed at regional collaboration between South & Southeast Asian countries for knowledge sharing to formulate effective regulatory frameworks for natural gas development. It was attended by Energy Regulatory Authorities from Bangladesh, Indonesia, Malaysia, Sri Lanka and Thailand, as well as international industry leaders.

PNGRB has also constituted three High-Level Committees in order to:-

i. Review the Extant Safety Framework in downstream Oil and Gas sector.

ii. Review the Extant consumer protection provisions and recommend a way forward to ensure comprehensive consumer protection framework.

iii. To prepare Vision 2040- Natural Gas Infrastructure in India.

Along with the same, PNGRB is undertaking an important study on "Pathways for Transmission of Hydrogen in Natural Gas pipelines and City Gas Distribution networks" in association with the World Bank. PNGRB has also notified amendments in Technical and Safety regulations for City Gas Distribution networks and Dispensing of Automotive fuels.

14.4.11. Brahmaputra Cracker & Polymer Limited (BCPL)

The Assam Gas Cracker Project (AGCP) was initiated in pursuance of the Memorandum of Settlement signed between Central Government and All Assam Students Union (AASU) and All Assam Gana Sangram

Parishad (AAGSP) on 15th August 1985. The AGCP, located at Lepetkata, Dibrugarh dist., was approved by the Cabinet Committee on Economic Affairs (CCEA) on 18th April, 2006 at a total project cost of ₹ 5460.61 crore (fixed cost). A joint venture company namely M/s Brahmaputra Cracker & Polymer Limited (BCPL), was incorporated on 8th January 2007 to implement the project. The project witnessed time and cost overruns twice. The CCEA considered the Revised Cost Estimates-I (RCE-I) for AGCP on 16.11.2011 and approved the revised cost estimate to ₹ 8920 crore, which was further revised in RCE-II to ₹ 9965 crore in July, 2016. The Project was finally commissioned on 2nd January, 2016 and was dedicated to the nation by the Hon'ble Prime Minister, on 5th February, 2016.

GAIL (India) Limited is the main promoter of BCPL having 70% of equity participation and the remaining 30% equity is equally shared by Oil India Ltd (OIL), Numaligarh Refinery Limited (NRL) and Government of Assam. The feedstock for the complex is Natural Gas from M/s OIL and M/s ONGC and Naphtha from M/s NRL. The complex is designed to process Natural Gas and Naphtha to produce 2,20,000 Tons per annum (TPA) of LLDPE/ HDPE (Linear Low Density Polyethylene/ High Density Polyethylene) & 60,000 Tons per annum (TPA) of PP (Poly-propylene). The main complex of BCPL is located at Lepetkata, Distt. Dibrugarh. BCPL has associated units at Duliajan, Distt. Dibrugarh and Lakwa, Distt. Sivasagar.

The Cabinet Committee on Economic Affairs on 24th December 2019 has approved the feedstock subsidy to BCPL for 15 years of plant operation at an estimated cost of ₹ 4600 crore and has also approved the transfer of administrative control of BCPL from Department of Chemicals & Petrochemicals to Ministry of Petroleum & Natural Gas to give impetus to the development of north-eastern region of the country.

BCPL has operated at 91% capacity in 2023-24. BCPL has also observed Annual Turnaround during first quarter of the financial year. GAIL(India) Limited is main marketer of the BCPL products. BCPL has extended its product sales to Bhutan in addition to Bangladesh. During FY 2023-24, the Company has generated revenue of ₹ 2978.55 crore incurred loss of ₹ 160.22 crore. The net worth of the company is ₹ 3001.36 crore as on 31.03.2024.

BCPL's two projects Butene-1 and 2nd stage Hydrogenated Pyro gasoline are under construction phase with a revised cost estimation of ₹ 817.92 cores with mechanical completion schedule of Aug'2025, which will help to produce value added products and by-products leading to realization of better margins and product slate in the times to come.

14.4.12. Indradhanush Gas Grid Limited (IGGL)

IIndradhanush Gas Grid Limited (IGGL), a Joint Venture Company of IOCL, ONGC, GAIL, OIL, and NRL with equal equity contribution, was incorporated on 10.08.2018 for the implementation of the prestigious North East Gas Grid (NEGG) project. The NEGG is an approximately 1656 Km long natural gas pipeline network with a design capacity of 4.75 MMSCMD and is being implemented at an estimated cost of ₹ 9,265 crores.

The project was conceived in line with the Hydrocarbon Vision 2030 for the Northeast for connecting the eight Northeastern states i.e. Assam, Arunachal Pradesh, Meghalaya, Tripura, Mizoram, Nagaland, Manipur & Sikkim to the National Gas Grid and the indigenous gas sources of the Northeast. The foundation Stone of the NEGG was laid by the Hon'ble Prime Minister Shri Narendra Modi on 09.02.2019. The Cabinet Committee on Economic Affairs (CCEA) approved Viability Gap Funding/Capital Grant of ₹ 5,559 crore (60% of the estimated total cost of the Project i.e. ₹ 9,265 crore) for the NEGG project on 08.01.2020. Final Authorization for implementation of the NEGG project was received from PNGRB on 17.11.2020.

The NEGG project is a project of strategic importance and on implementation of the project, it will ensure reliable and uninterrupted natural gas supplies to the consumers viz. industrial, City Gas Distribution networks in North East region which are expected to boost industrial as well as economic growth of the region while conserving the environment and supplementing efforts of the Government for development of a Gas based economy in the North East. The construction activities of the NEGG project are in full swing with scheduled completion by March 2025.

14.4.13. Indian Strategic Petroleum Reserves Limited (ISPRL)

Government of India (GoI) in the interest of meeting the strategic objective of country's energy security, decided on 7th January 2004 to construct Strategic Petroleum Reserves (SPRs) facilities. As India is heavily dependent on import of crude oil to support the economic activities and growth and to meet the energy needs of its citizens, these SPRs would serve as buffer to deal with any situation of supply chain disruptions, especially due to external reasons. Such emergency reserves would enable the country to keep its refineries fed with crude oil even in the face of disruption of crude oil imports and ensure uninterrupted supplies of petroleum products across the country. In exceptional circumstances, the buffer stock of crude oil could be used to partially absorb an abnormal spike in the global oil prices.

To implement the decision of GoI to construct SPR facilities, a Special Purpose Vehicle (SPV) Indian Strategic Petroleum Reserve Limited (ISPRL) was established on 16th June 2004 as a subsidiary of Indian Oil Corporation Limited. Subsequently in January 2006, ISPRL became a wholly owned subsidiary of Oil Industry Development Board (OIDB).



View of underground strategic cavern

ISPRL Phase-I

Under Phase-I of SPR program, ISPRL completed the construction of crude oil in underground rock caverns with 5.33 MMT capacity at three locations namely Visakhapatnam (1.33 MMT) in Andhra Pradesh and Mangalore (1.5 MMT) & Padur (2.5 MMT) in Karnataka.

All the three facilities i.e. Visakhapatnam, Mangalore & Padur were commissioned in June 2015, October 2016 and December'2018 respectively and were dedicated to the Nation by Hon'ble Prime Minister on 10th February'2019.

The release/sale of strategic crude oil is carried out through an Inter-ministerial Empowered Committee chaired by Secretary, MoP&NG with Secretary, Department of Expenditure, MOF; and Secretary, Ministry of Shipping as Members.

The COVID-19 pandemic that gripped the world, and effected lockdowns globally, impacted the crude oil demand world over and India was no exception. The refineries operated at a bare minimum capacity, as a result of drastic reduction in the demand for petroleum products. This coupled with increase in supply of crude, resulted in a demand supply imbalance which saw the crude oil prices nosedive across the globe. To take advantage of the prevailing low crude oil prices, the Strategic Reserves were filled with purchase of crude oil from Middle East countries.

ISPRL operates the storage facilities as custodian of core critical sovereign crude oil reserves. It also coordinates the release and replenishment of strategic crude oil stock during supply disruptions.

14.4.13.1. Agreement with Abu Dhabi National Oil Company (ADNOC)

An agreement was signed between ADNOC and ISPRL on 10th February 2018, permitting ADNOC to use one compartment at Mangalore. As per the agreement, ADNOC filled approx. 5.8 Million Barrels of crude in ISPRL's Mangalore cavern in the year 2018. ADNOC can use 50% portion of this oil as commercial supply to its customers in India, while the rest will remain as strategic storage to be released on directions of G.O.I. to meet emergencies such as supply disruptions due to natural disaster or geopolitical factors.

ADNOC successfully dispatched its first commercial consignment to HPCL, Vizag in December 2019 as per the terms of Agreement between ADNOC and ISPRL. Thereafter ADNOC has been regularly selling crude consignments from the Mangalore SPR to various Indian Refineries and replenishing as per the contractual terms.



JS (IC), MoPNG visit to Padur

14.4.13.2. Commercialization

Cabinet on 8th July 2021 has approved the proposals to utilize part of the petroleum reserves created under Phase-I of Strategic Petroleum Reserve (SPR) for commercialization operations.

ISPRL released crude to State run Refiners HPCL and MRPL from August 2021 to June 2023 to create space for renting. ISPRL deposited cumulative amount of ₹ 5,372 crore in Bharat-kosh account of Govt of India realized as revenue from Crude Oil sale.





Signing of Agreement with HPCL on 07.02.2024 at IEW Goa



Mangalore (Storage Capacity: 1.5 MMT)



DCMP Drill at ISPRL Mangalore



View of underground strategic cavern

14.4.13.3. Status of Commercialisation of Phase-I

Cavern A at Vishakhapatnam: ISPRL has given on rent 300 TMT (2.17 Million bbls) capacity to HPCL w.e.f. 19th January 2024 at Vishakhapatnam. A formal agreement was signed on 7th February 2024 in the back drop of IEW 2024 at Goa by CEO & MD, ISPRL & ED (IT), HPCL in presence of Addl. Secy. MOPNG, Secy. OIDB, C&MD, HPCL and other seniors officials from ISPRL and HPCL. The leased capacity will be used by HPCL for storage of Basrah Medium Crude oil. In case of an emergency, GOI shall have first right on use of this crude. With this ISPRL has started generating revenue as a first step towards self-reliance.

Cavern B-Mangalore: It is also proposed to rent about 750 TMT capacity available in cavern- B of Mangalore and about 200 TMT capacity available in Vizag cavern B. ISPRL is in the process of obtaining necessary approvals for floating EOI.

ISPRL is also exploring modalities of sale / purchase of 20 % capacity with the stake holders.

PHASE-II PROJECTS

Cabinet approved proposal for development of Commercial cum Strategic reserves under Phase II at Chandikhol (4MMT) and Padur (2.5 MMT) along with dedicated SPM's and associated pipelines on PPM mode on 8th July 2021.

M/s Deloitte has been appointed as Transactional Advisor for RFP preparation and Legal Advisor M/S AZB and Partner for preparing concessionaire agreement of Phase II required for PPP model.

I. 2.5 MMT STRATEGIC PETROLEUM RESERVES UNDER PHASE II AT PADUR, DISTRICT UDUPI, KARNATAKA

For land acquisition for Padur project, ISPRL had submitted requirement of acquiring 210 acres land to KIADB in November 2020.

KIADB issued final gazette notification for 214.79 Acres Padur land on 22nd February 2023. Total of ₹ 160.67 crore has been paid to KIADB in June 2023 based on demand note after fixing of the land rate. KIADB in consultation with DC, Udupi are in the process of Finalization of R&R package and compensation to landowners.

After Finalization of R&R package and compensation to land owners, Land is expected to be acquired by June 2024. Providing encumbrance free land is a condition precedent for concessionaire agreement.

In view of acquisition of land expected in a few months, RFP for Padur Phase II has been published on 21.02.2024

II. 4.0 MMT STRATEGIC PETROLEUM RESERVES UNDER PHASE II AT CHANDIKHOL, DISTRICT JAJPUR, ODISHA

Application for 400 Acres of land at Chandikhol, District Jajpur, Odisha was submitted to Govt of Odiesha, while evaluating the application for land allotment for the Chandikhol project has advised ISPRL to explore alternate sites for construction of SPR's.

ISPRL engaged EIL to identify alternate site in Odisha. Subsequently after desktop studies by EIL, a joint visit was carried out to evaluate the alternate sites. EIL submitted their report on

6th July'2023 to ISPRL recommending Sidha Gumpha Hill site for carrying out feasibility studies. Survey of site by ASI (Archaeological Survey of India) is in progress.

After getting ASI clearance, ISPRL shall seek in principle approval from Govt. of Odisha for the alternate land and proceed with feasibility study.

III. PHASE I EXTENSION

Delegated Invested Board (DIB) on 17th February 2023 approved proposal for Acquisition of land (154.9 Acres) by Indian Strategic Petroleum Reserve Limited (ISPRL) from Mangalore Special Economic Zone Limited (MSEZL) for construction of SPR and associated facilities at Mangalore MSEZL. ISPRL has signed an MoU with MSEZL on 17th March 2023 for plot size of 154.90 Acres land at MSEZL area Mangalore. ISPRL has paid an amount of ₹ 22.69 crore as 10% of the total lease premium amount towards the land as per the terms of MoU.

EIL has been awarded the job to carry out detail feasibility report for the above site. Various surveys and geotechnical investigation are nearing completion.



Signing of an MoU with MSEZL for Phase-I extension land of Mangalore

14.4.13.3. Engagement with Oman Tank Terminal Company (OTTCO)

Oman is presently building a Sustainable Energy Security Project in Ras Markaz near Duqm Port in Oman. Oman Tanking Terminal Company (OTTCO), established in 2014, which is a wholly-owned subsidiary of OQ, a commercial company and wholly-owned by the Government of the Sultanate of Oman is key company involved in developing the above project.

OTTCO owns, operates and maintains a network of storage and pipeline assets in Oman. OTTCO's growth strategy is focused on being Oman's independent storage partner and to provide storages services to the local, regional and international customer portfolio.

OTTCO has offered to ISPRL an opportunity to participate in Ras Markaz project through Indian Embassy in Muscat. OTTCO has already build 5.2 Million bbls capacity in above ground crude oil storage tanks in Ras Markaz and commissioned them in 2022. Dedicated SPM and associated pipelines have been also commissioned.

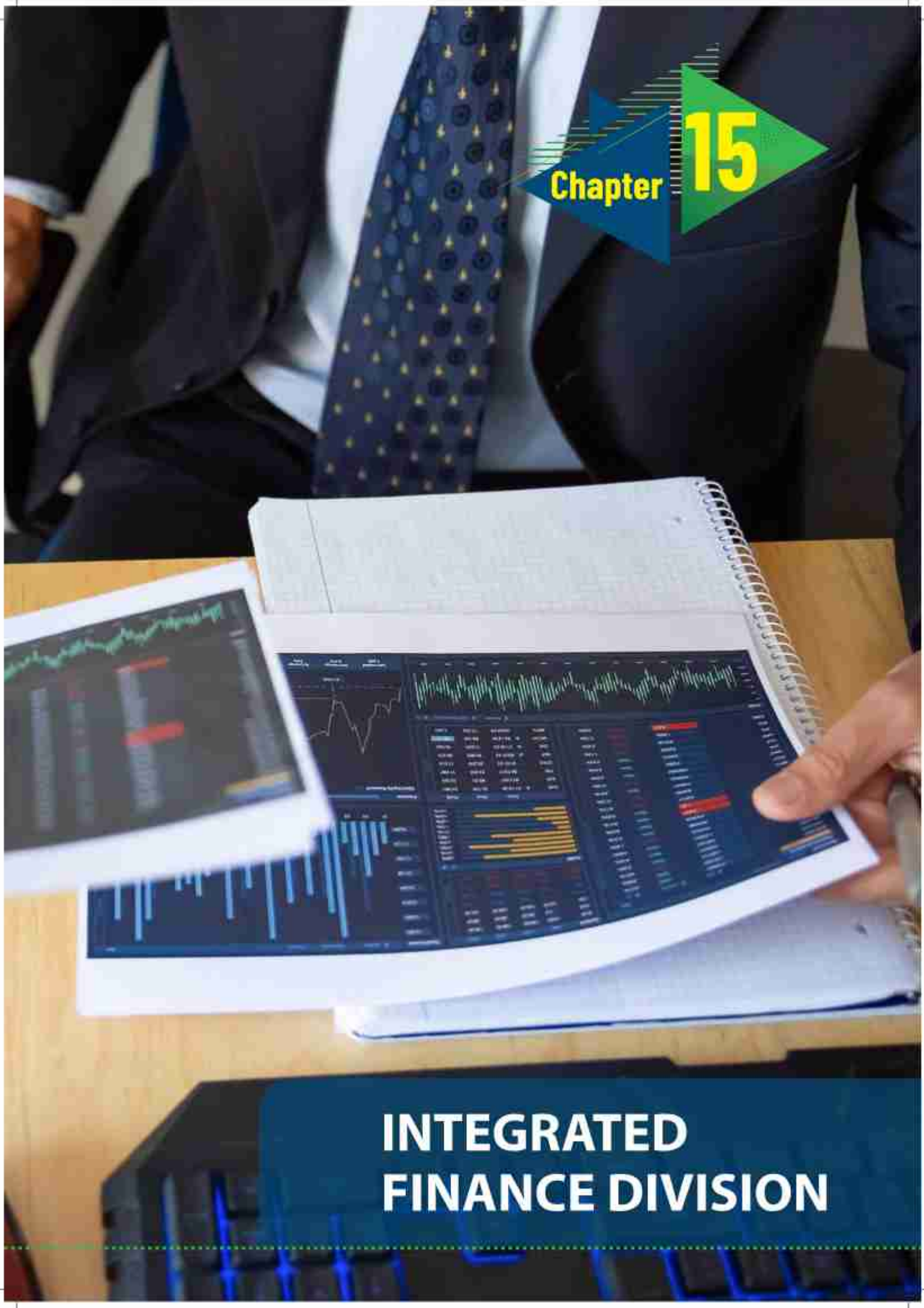
The ISPRL team of CEO&MD and Dy CEO along with Indian Embassy Official visited OTTCO terminal in Raz Markaz to see the recently commissioned facilities of Tank Storage (5.2 Million bbls) and SPM on 21st February 2023. After the site visit, discussions were held with OTTCO CEO Mr Ard Van Hoof for ISPRL participation in 2nd Phase of Ras Markaz Project.

An MoU has been signed with OTTCO by ISPRL for carrying out Feasibility studies for construction of above ground storage tanks on 25th June 2023.









INTEGRATED FINANCE DIVISION

15 Integrated Finance Division

IFD, headed by AS&FA is mandated with the dual responsibility of supporting the Secretary of the administrative Ministry/Department as well as representing the Ministry of Finance.

Financial Advisers are expected to advise administrative Secretaries in :-

i) Policy formulation with a focus on the financial implications of the policy.

ii) Make recommendations in accordance with departmental goals and objectives with in the overall macro-framework laid down by Ministry of Finance.

Due to this, IFD is expected to have a complete appreciation of the policies and priorities of the Ministry/Department and should guide the Secretary in taking transactional decisions on a day to day basis. Within the ambit of financial propriety defined by Ministry of Finance, this Division should factor in the sectoral priorities/ goals/objectives/outcomes without compromising the budgetary integrity.

Discharge of this responsibility is done through two Sections, as per following work allocation:-

(i) Budget Related Work regarding formulation and finalization of Main Budget of the Ministry

(ii) Policy related Advice

(iii) Parliament Related Work

(iv) Advice on Exploration Policy Matters

(v) Audit Matters

(vi) Financial Concurrence/vetting of Administrative, Establishment & Personal Matters of MoP&NG

(vii) Advice on CPSE related Policy Matters

(viii) Advice on Other Policy Matters



BPCL MAK Lubricant

Inputs for Annual Report 2023-24 of MoP&NG (Budget Estimates)

(₹ in Crore)

Name of Scheme/Item	Actual 2022-23	BE 2023-24	Actual 2023-24
Revenue Section			
Secretariat - Economic Services	46.07	51.90	43.83
Payment of differential royalty to State Governments	1.11	0.00	20.31
Payment to ISPRL for Strategic Crude Oil Reserve (O and M)	123.27	202.81	152.93
Pradhan Mantri JI-VAN Yojna	37.88	227.26	75.75
National Bio-Fuel Fund	0.00	0.00	0.00
Direct Benefit Transfer - LPG	180.00	180.00	1460.00
LPG Connection to Poor Households	5663.38	0.01	8500.00
Other subsidy payable including for North Eastern Region (Domestic Natural Gas)	810.99	1633.02	1633.00
Feedstock Subsidy to BCPL/Assam Gas Cracker Complex	131.00	392.06	563.00
Project Management Expenditure	32.00	52.00	84.00
Indradhanush Gas Grid Limited(IGGL)-part of the North East Natural Gas Pipeline Grid (Programme Component)	1528.50	1800.00	1043.38
Numaligarh Refinery Expansion Project	245.00	500.00	475.50
One-time Grant to PSU OMCs for under recoveries in Domestic LPG	22000.00	0.00	0.00
Scheme for promotion of flagging of merchant ships in India	84.04	290.44	87.75
Global Biofuels Alliance	0.00	0.00	60.00
Scheme for providing financial support for collection of biomass	0.00	0.00	0.00
Indian Institute of Petroleum Energy	29.25	168.00	90.00
Society for Petroleum Laboratories	0.22	1.24	0.00
Total (Revenue)	**30,912.71**	**5,498.74**	**14,289.46**
Capital Section			
Payment to ISPRL for purchase of land (Extension of Phase-I Strategic Petroleum Reserves)	0.00	0.00	40.00
Indian Strategic Petroleum Reserve Limited (ISPRL) Phase II (Construction of Cavems)	0.00	508.00	0.00
Payment to Indian Strategic Petroleum Reserve Limited (ISPRL) for Crude Oil Reserve	0.00	5000.00	0.00
Capital Support to Oil Marketing Companies	0.00	30000.00	0.00
Secretariat - Economic Services	0.00	0.98	0.76
Total (Capital)	**0.00**	**35,508.98**	**40.76**
Grand Total (Revenue + Capital)	**30,912.71**	**41,007.72**	**14,330.22**

16.2. Revenue Capital Receipts*

(₹ In thousand)

Total Receipts of 6 months		upto Detailed Heads	Total Receipts			2023-2024		2024-2025
Apr-Sept 2022-2023	Apr-Sept 2023-2024		2020-2021	2021-2022	2022-2023	Budget Estimates	Revised Estimates	Budget Estimates
32220068	15288113	Profit Petroleum	37458596	86749572	77328163	90406807	29933877	42889500
41933333	39483200	Royalty	35585349	57194897	100640000	81533062	91959297	91634023
107125	144851	PEL Fees	330000	204600	257100	150000	144851	217277
16208	111423	PLP	30200	26200	38900	27000	222846	222846
74,276,734	**5,50,27,587**	**Total**	**7,34,04,145**	**14,41,75,269**	**17,82,64,163**	**17,21,16,869**	**12,22,60,871**	**13,49,63,646**

*information/data taken upto 30.11.2022



Revenue Receipts-DIVIDEND

(₹ In thousand)

Sl No.	Name of the CPSE/Bank	Long Term Borrowings as on 31/3/2023	Debt Equity Ratio as on 31/3/2023	Dividend paid to Government for 2022-2023		Total dividend paid for 2022-23 (sum of columns a+b)	Interim Dividend for 2022-23 to be paid in 2023-24	Total Dividend paid during 2023-24 (sum of columns b+d)	Cash/Cash equivalent as on 31/03/23	General Reserves on 31/03/23	Capital expenditure during 2023-24	Estimated capital expenditure for 2024-25
				Interim Dividend in 2022-23	Final Dividend paid/to be paid in 2023-24							
				a	b	c=a+b	d	e				
1	Engineers India Ltd.			576917	288549	865466	576917	865466	10588719	18246392	980000	500000 (#)
2	GAIL (India) Ltd.	78370833	0.22	13550320	0	13550320	0	0	1737750	0	100110000	81300000 (@)
3	HPCL	497529600	1.8	0	0	0	0	0	5385700	0	120000000	125000000 ($)
4	IOCL	738945000	0.98	0	21816599	21816599	36360999	58177598	7730000	988932600	303950000	309090000
5	ONGC	39499320	0.03	79641974	3704263	83346237	81632165	85336428	216340460	2377898270	356400000	358500000
6	OIL	111613300	0.32	8908462	3379072	12287534	7162100	10541172	13511500	332808500	48960000	52040000
7	BPCL	194415961	0.69	0	4596734	4596734	13741544	18338278	18813165	339106488	100000000	130000000
8	Balmer Lawrie Investment Ltd			0	437121	437121	0	437121	7271	531603	0	0
	Total	**1,66,03,74,014**	**4.04**	**10,26,77,673**	**3,42,22,338**	**13,69,00,011**	**13,94,73,725**	**17,36,96,063**	**27,41,14,565**	**4,05,75,23,853**	**1,03,04,00,000**	**1,05,64,30,000**

(#) Cash and Cash Equivalent are as appearing in Balance Sheet as on 31.03.2023 which includes amount held on behalf of client, income received in advance, advance from clients, unpaid dividend, Unspent CSR etc. amounting ₹ 7797888 thousands.

(@) Dividend estimates (interim & Final) for 2023-24 and 2024-25 is subject to Board approval/recommendation and shareholders' approval.

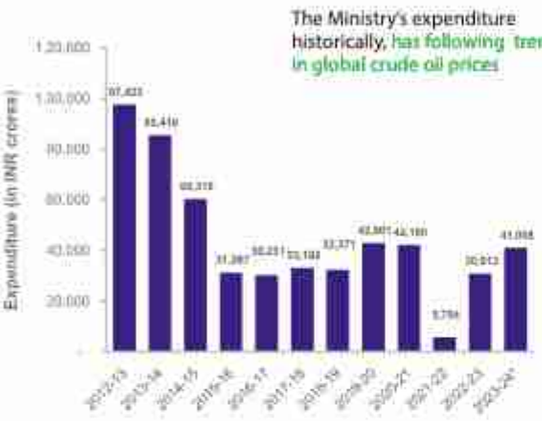
($) In context of "Nil" amount, as per Share Purchase Agreement on 31.01.2018 between GoI and ONGC, 51.11% equity shares of HPCL have been acquired by ONGC and due to this change in Shareholding pattern, dividend for FY 2017-18 and onwards is paid/payable to ONGC only.

Ministry of Petroleum and Natural Gas
CS Budget Allocation & Trend Analysis

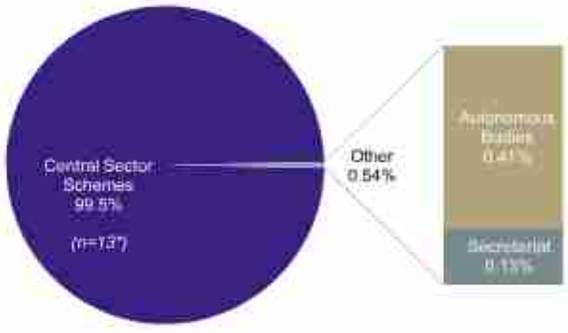
In FY 22-23 MoP&NG actual expenditure was 0.74% of Government of India actual expenditures
In FY 23-24, 97.7% of MoP&NG budget has been allocated to 11 CS Schemes

Ministry Expenditure FY 2012-13 to 2022-23
MoP&NG

In INR cr



Demand for Grants 2023-24
MoP&NG



₹ 41007.72 cr

*Note: Figure for 2023-24 is Budget Estimates**
Sources: Union Budget 2022-23; PRS.

**Zero budget schemes are excluded from the count of schemes*
Source: Demand for Grants, Budget (2023-24)

Ministry of Petroleum and Natural Gas
CS Budget Allocation & Trend Analysis

Top 4 schemes contribute to over 94% of the MoP&NG 2023-24 CS budget allocations

In INR cr

Demand for Grants 2023-24
MoP&NG | By Scheme



₹ 41007.72 cr

CS Budget Trend (FY19-23)
MoP&NG | 5 Year Trend | By Schemes



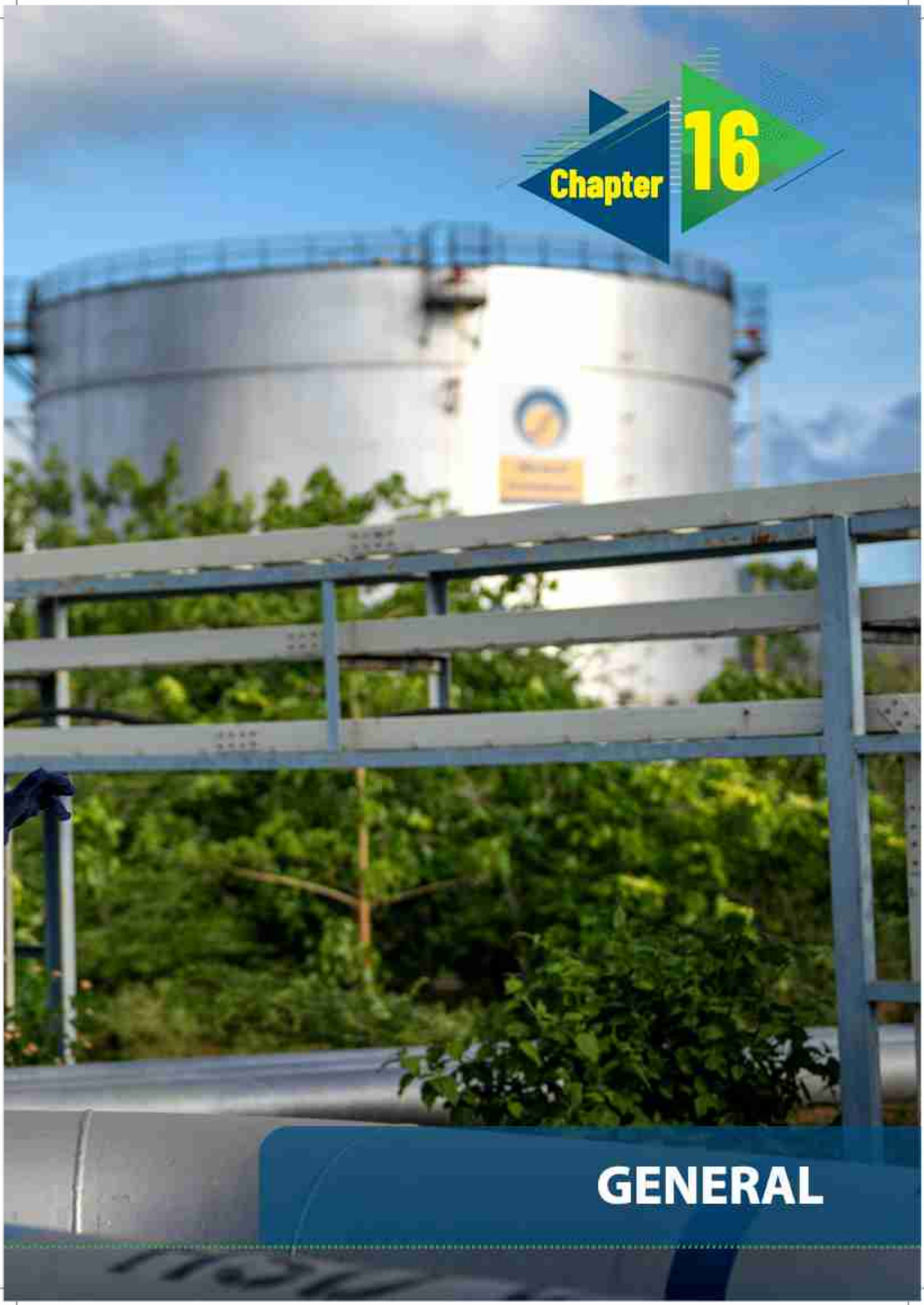
- Top 4 schemes, **Capital support to Oil Marketing Companies, Payment to ISPRL for Crude Oil Reserve, Indradhanush Gas Grid Ltd, Other Subsidy Payable including NE Region** contribute to 94% of CS 2023-24 Budgetallocations
- *Others includes ISPRL Phase II (construction of caverns), Payment to ISPRL for Strategic Crude Oil Reserve (O and M), PM Ji-VAN Yojna, Direct Benefit Transfer - LPG, LPG Connection to Poor Households, Feedstock Subsidy to BCPL/Assam Gas Cracker Complex, Project Management Expenditure, Numaligarh Refinery Expansion Project and Scheme for promotion of flagging of merchant ships in India*

- The budget on **Direct Benefit Transfer- LPG FY 23-24 BE** was equal to FY 22-23 Actuals
- The **BE 23-24 of LPG Connection to Poor Households** has decreased significantly as compared to FY 22-23 Actuals.
- The budget on **Other subsidy payable including for NE Region in BE 23-24** has significantly as compared to FY22-23 Actuals.
- **Feedstock subsidy** to BCPL/Assam GCC was recently transferred from M/o Chemicals & Fertilizers to MoP&NG
- The budget on **Indradhanush Gas Grid Ltd has also increased in FY 23-24 BE as compared to FY 22-23 Actuals.**

RE - Revised Estimates BE - Budget Estimates
Source : Demand for Grants, Budget (2018-19, 19-20, 20-21, 21-22, 22-23, 23-24)






Chapter 16
GENERAL

16 General

Progressive use of Hindi in Official Work

16.1.1. With a view to promote official language Hindi in the official work in the Ministry and its undertakings, the Ministry of Petroleum & Natural Gas took a number of steps so as to increase its usage. These steps include organizing of Hindi Workshops, on the spot inspections of the sections of the Ministry and its undertakings, organizing Hindi fortnight, organizing meetings of Hindi Advisory Committee, Official Language Implementation Committee etc.

16.1.2. There is a Hindi Advisory Committee functioning in the Ministry under the Chairmanship of Hon'ble Minister for Petroleum and Natural Gas. Hon'ble Minister of State for Petroleum and Natural Gas is Vice Chairman of this committee. The Committee consists of Six Members of Parliament, Nine non-official members as its members, besides senior officers of the Ministry and PSUs of the Ministry as its official members. The function of the committee is to render advice to the Ministry for promotion of official language in official work.

16.1.3. Similarly, an Official Language Implementation Committee is also functioning in the Ministry under the Chairmanship of Joint Secretary (G & Admn.). The function of this committee is to review the progress of official language in the Ministry and its undertakings and give suggestions for the promotion of the same. Regular meetings of the committee were organized during the year under review and follow up action was taken on the suggestions of the committee.

16.1.4. The Committee of Parliament on Official Language visited around 47 offices of our PSUs which includes offices of OIL, ONGC, IOCL, BPCL, HPCL, GAIL, Balmer Lawrie and EIL etc and reviewed the progress of official language in these offices. A number of times, the Committee appreciated the efforts taken by these offices for the promotion of Hindi. Follow up action has been taken on the assurances given to the Committee by these offices. Senior officers of the Ministry also took part in these meetings.



IOCL Jaisalmer RO

16.1.5. During the year under review, the Ministry notified a few Offices of our PSUs under Rule 10(4) of Official Language Rules, 1976. With a view to assessing the progress of official language in our PSUs and in pursuance of the targets fixed in the Annual Programme 2023-24 issued by the Department of Official Language, senior officers of the Ministry inspected more than 36 offices of our PSUs and reviewed the progress of Hindi in these offices. On the spot suggestions were given to the officers concerned for removing the deficiencies.

16.1.6. With a view to assist the officials to do their maximum work in Hindi and to remove their hesitation to do the same, regular Hindi workshops were conducted in the Ministry. Large number of officials attended these workshops and benefitted from the suggestions given in these workshops. As a result of this, percentage of Hindi correspondence in the Ministry has increased considerably.

16.1.7. In pursuance of the directions of the Department of Official Language, Hindi Fortnight was organized in the Ministry from 14th September to 28th September, 2023. During this occasion, a Message from the Hon`ble Minister was issued to all our officers as well as to all the PSUs. Various activities including different Hindi Competitions were conducted during this fortnight. Large number of officials of the Ministry participated in these competitions and successful candidates were given awards.

16.1.8. Fourth Petroleum Rajbhasha Sammelan was successfully organized under the Chairmanship of Joint Secretary (Gen. & Admn.) on 22-23 December, 2023 in Ooty. A number of Rajbhasha Officers of all PSUs/ Organisations under the administrative control of MoP&NG participated in this event.

16.1.9. One of the important tasks assigned to the Hindi Division of the Ministry is of translation of various documents of the Ministry. The Hindi Division successfully carried out these responsibilities. The translation of various documents including the Parliament Questions, Cabinet Notes and Parliamentary Standing Committee material, MoUs etc was done well in time.

16.2. Right to Information

Right to Information (RTI) Act-2005 has been implemented in the Ministry of Petroleum & Natural Gas as per Gazette Notification of Government of India dated 15th June, 2005. RTI Act is inter-alia designed to promote transparency and accountability in the functioning of public authorities.

As per provision of the Right to Information Act-2005, the Under Secretary/Assistant Director in the Ministry of Petroleum & Natural Gas have been designated as Central Public Information Officers (CPIO) in respect of their work allocations. Accordingly, the Director/Deputy Secretary/Economic Adviser in the Ministry of Petroleum & Natural Gas have been designated as First Appellate Authority (FAA). The list of CPIO/FAA of this Ministry is being updated regularly in view of change in allocation of work.

Information under Section 4(2) of RTI Act 2005 i.e. to provide information Suo Motu to the public at regular interval is being regularly updated on the Ministry's website.

An on-line system called RTIMIS has been introduced by DoP&T. With the aid of this online system, applications and appeals received from public are being speedily disposed of within the stipulated time frame. To provide information to people in timely and trouble free manner and to promote transparency, all Oil & Gas PSUs and other organisations under the administrative control of this Ministry are now on DoP&T's online RTIMIS portal.

In order to ensure digitalization of records, RTI applications and appeals received in physical form are being scanned, uploaded and forwarded to concerned CPIO and FAA of the Ministry for speedy and timely disposal.

During January, 2023 to March, 2024, 2920 applications/receipts and 101 appeals have been received under RTI Act, 2005 in the Ministry.

16.3. Startup India

Under the Startup India initiative of Oil and Gas Sector, proposals/applications are invited through open advertisements by the individual PSUs for funding and mentoring. The themes for the proposals include leveraging Internet of Things (IoT) in Upstream/Midstream/Downstream operations of Oil PSUs, Digitization of business processes, Green Fuels, Alternative Energy, Improved technologies for Hydrocarbon industry besides topics of societal relevance. Before the round of receiving Start-up applications, Oil PSUs also organize Hackathon/iDEATION challenges periodically for the Start-ups to showcase their talents and provide innovative ideas.

The PSUs under the Ministry of Petroleum and Natural Gas have created startup funds aggregating to ₹ 495 Crore. At present, a total no. of 270 Startups are being funded by oil and gas PSUs with disbursed fund value of approximately ₹ 262 crores. Some startups supported by Oil and Gas PSUs have already matured.

16.4. Skill Development

Under Skill India initiative, Hydrocarbon Sector Skill Council (HSSC) was set up under Societies Registration Act, 1860 on 26th April, 2016. An MoU for collaboration in the area of skill development was signed between Ministry of Petroleum & Natural Gas and Ministry of Skill Development & Entrepreneurship on 28th November,2016.

Several high priority trades were identified in consultation with the Industry members for National Occupational Standard (NOS)/Qualification Pack(QP) development. Till date, 44 QPs have been approved by National Skill Qualification Committee (NSQC).

Skill Development Institutes (SDIs) for hydrocarbon sector have been setup at six cities viz Bhubaneswar, Vizag, Kochi, Ahmedabad, Guwahati and Raebareli. Till March, 2024, more than 34,773 trainees have been trained in these SDIs.

The permanent campus of Skill Development Institute (SDI), Bhubaneswar, which envisages providing world class industry based skill training using state of the art infrastructure and technology to create an industry ready talent pool was dedicated to the Nation on 20th August, 2021.

16.5. Public Grievances

In accordance with guidelines of the Cabinet Secretariat, Government of India, the Public Grievance Cell has been functioning in the Ministry of Petroleum & Natural Gas (MoP&NG). The Cell has been attending to the grievances of members of the public against the Public Sector Oil & Gas Companies and other organizations under the administrative control of this Ministry.

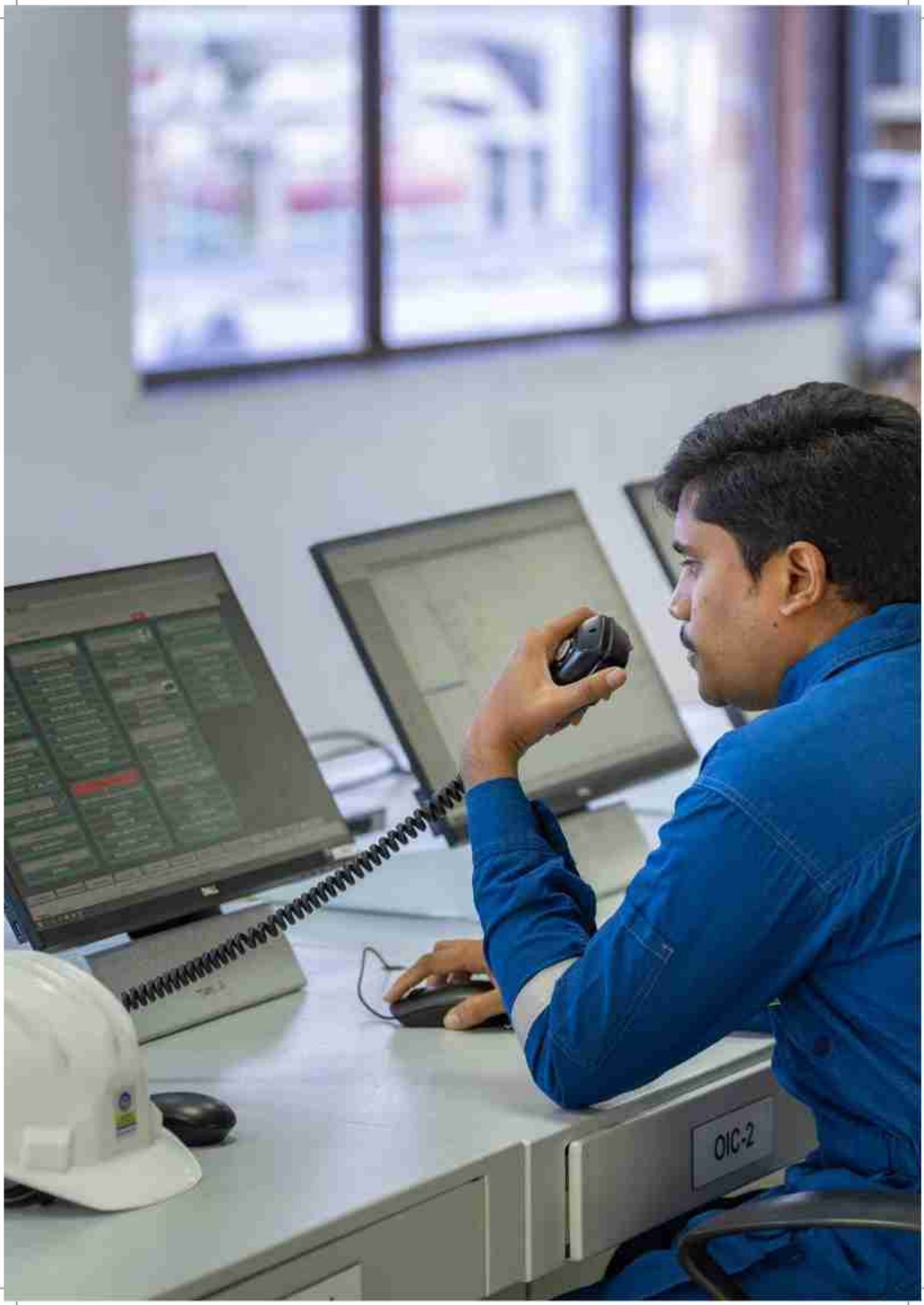
All possible efforts are being taken to ensure the regular monitoring of the public grievances received through Department of Public Grievances (DPG), Department of Administrative Reforms and Public Grievances (DARPG) and other Departments of the Government as well as the members of the public.

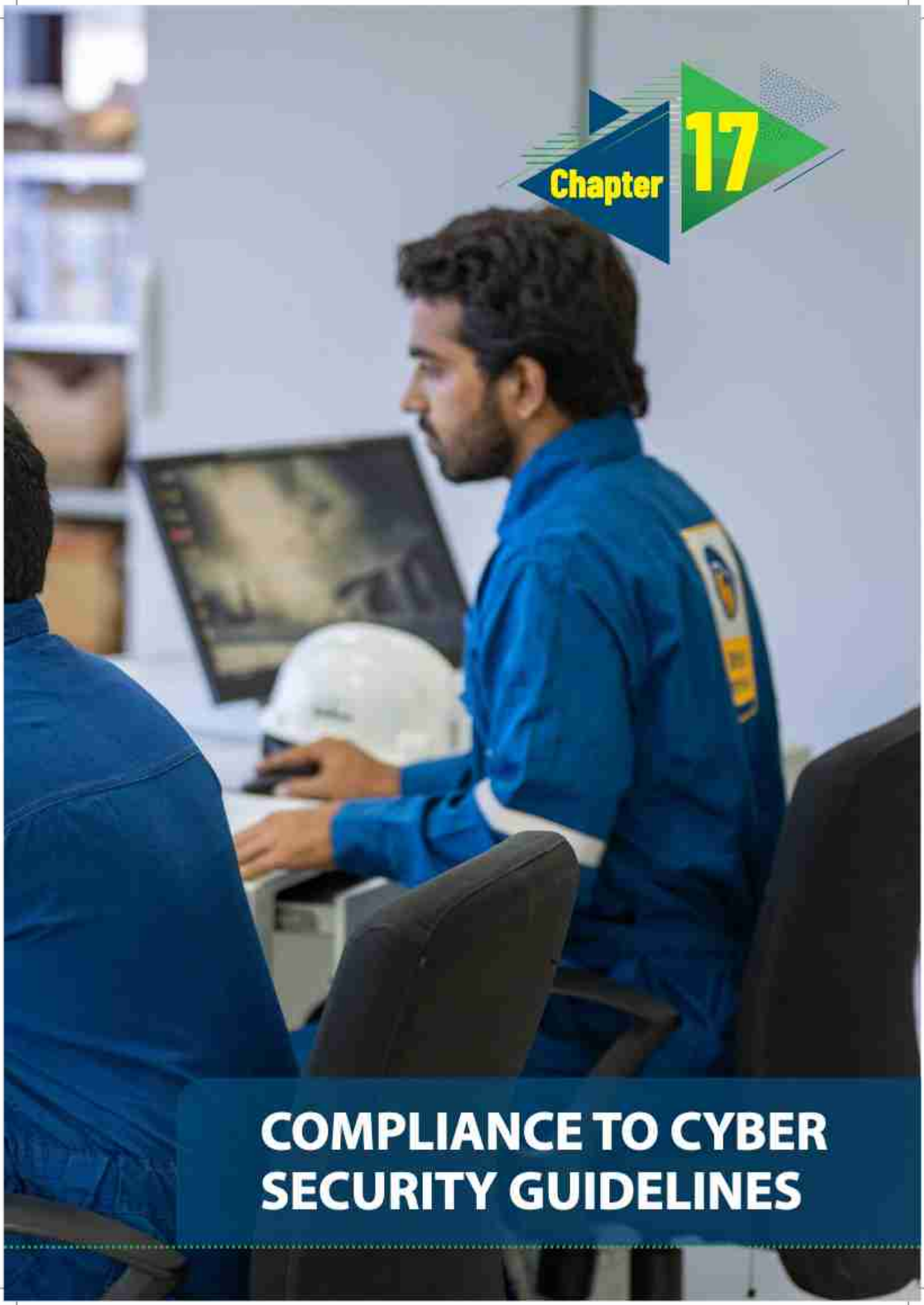
An online system called "Centralized Public Grievance Redressal and Monitoring System (CPGRAMS) has been introduced in the month of June, 2008. With the aid of CPGRAMS, public grievances from the public and others are received speedily, analysed promptly according to its subject and forwarded to the concerned for faster resolution.

In addition, a systematic mechanism in MoP&NG has also been evolved so as to ensure speedy and expeditious redressal of the public grievances. The review of pendency of PGs in the MoP&NG and Oil & Gas PSUs is undertaken regularly by Senior Officers.

During January, 2023 to March, 2024 out of total number of 23,112 PGs received, 96% stands disposed of as on 31st March, 2024.


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Chapter 17

COMPLIANCE TO CYBER SECURITY GUIDELINES

17 Compliance to Cyber Security Guidelines

01. Oil Sector has been identified as one of the critical sectors by National Critical Information Infrastructure Protection Centre (NCIIPC). Critical infrastructure protection is vital to keep essential services and economy of the country running. Oil Sector is increasingly using Information and Communication Technologies (ICT) and Operational Technology for their operations and governance to enhance productivity, improve efficiency in working. The adoption of increasing ICT has increased the risk of cyber security threats and attacks. This Ministry understands the need of cyber security within the Ministry and its associated PSUs to ensure that their system is secure and resilience.

02. This Ministry and its associated PSUs has appointed CISO/Dy. CISO in their respective organization. To ensure a structured mechanism, in accordance with best information security system practices, a "Cyber Crisis Management committee for Petroleum" has been constituted with Secretary, MoP&NG as its chairman and CISOs of Ministry and its associated PSUs as its members. The Committee reviews the state of CCMP/cyber security systems of oil PSUs and identifies gaps.

03. In order to ensure that cyber security is considered as a management issue and not merely a technical issue, a presentation by CISO to the Board of Directors of the PSU, once in a quarter, has been made mandatory. Quarterly meetings of CISO, MoP&NG with CISOs/IT heads of all Oil PSUs/Attached Offices and representatives of NCIIPC/I4C/CERT-In/NIC are now being held to discuss the status of preparedness for cyber security, constraint being faced by PSU in cyber security implementation.

04. The guidelines issued by MeitY and MHA for departments and employees on creating a working environment which is not prone to cyber-attacks and security in respect of networks and applications, have been compiled and circulated in the Ministry for compliance.

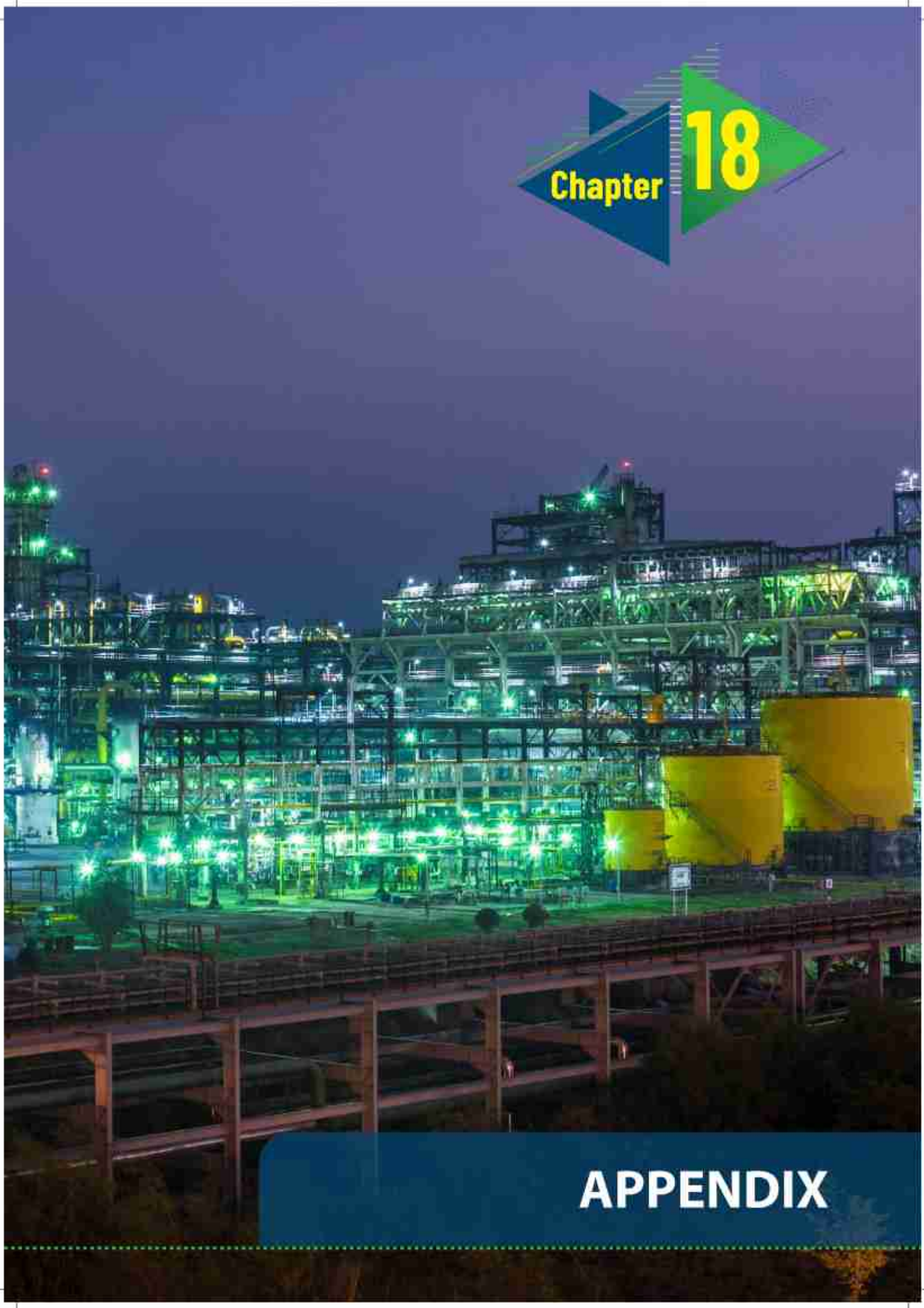
05. Hardware inventory of all desktop machines in the Ministry is prepared. EDR (Endpoint Detection Response) solution (to safeguard the network from malware attacks) as well as Unified Endpoint Management (UEM) tool (both provided by NIC) is now implemented in desktops of the Ministry.

06. All the guideline by CERT-IN for Server security is being taken care of, which include deployment of firewall, EDR client recommendations, maintaining of server log, provisioning of VPN access, restriction of server access, disabling of default user, implementation of SSL etc. All the PSU under this Ministry has been instructed to implement all the guideline and adhere to the advisory issued by the CERT-IN and other Government agency.

07. Training and awareness program for officials and staff of this ministry as part of Cyber Jagrookta Diwas to minimize the risk of cyber security is being organized from time to time.






Chapter 18
APPENDIX

18 Appendix

Appendix-I

Mnistry of Petroleum & Natural Gas

(Petroleum aur Prakritik Gas Mantralaya)

1. Exploration for, and exploitation of petroleum resources, including natural gas and Coal Bed Methane, gas hydrates and shale gas.
2. Production, supply, distribution, marketing and pricing of petroleum, including natural gas, Coal Bed Methane and petroleum products.
3. Oil refineries, including Lube Plants.
4. Additives for petroleum and petroleum products
5. Blending and blending prescriptions for bio-fuels including laying down the standards for such blending.
6. Marketing, distribution and retailing of bio-fuels and its blended products.
7. Overall coordination concerning bio-fuels, National Policy on Bio-fuels, policy of Bio-fuels, policy/scheme for supporting manufacturing of bio-fuels, setting up of a National bio-fuels Development Board and strengthening the existing institutional mechanism and research, development and demonstration on transport, stationary and other applications of bio-fuels.
8. Lube blending and greases.
9. Conservation of Petroleum products.
10. Planning, development, control and assistance to all industries dealt with by the Ministry.
11. Strengthening energy security by acquiring oil and gas equity abroad and participation in transnational oil and gas pipeline projects.
12. Creation and administration of strategic petroleum reserve through Indian Strategic Petroleum Reserves Limited (ISPRL).
13. Petroleum Planning and Analysis Cell (PPAC).
14. All attached or subordinate offices or other organization concerned with any of the subjects specified in the list, including Directorate General of Hydrocarbons (DGH), Centre for High Technology (CHT), Oil Industry Development Board (OIDB), Petroleum Conservation Research Association (PCRA), etc.
15. Planning, development and regulation of oil field services.
16. Administration of Engineers India Limited, including their subsidiaries and joint ventures.
17. Public sector project falling under the subject included in this list except such projects which are specifically allotted to any other Ministry / Department.
18. The Oil Field (Regulation and Development) Act, 1948 (53 of 1948).
19. The Oil and Natural Gas commission (Transfer of undertaking and Repeal) Act, 1993 (65 of 1993).
20. The Petroleum Pipeline (Acquisition of right of User in Land) Act, 1962 (50 of 1962).
21. The ESSSO (Acquisition of Undertaking in India) Act, 1974 (4 of 1974)
22. The Oil Industry (Development) Act, 1974 (47 of 1974).
23. The Burmah-Shell (Acquisition of Undertaking in India) Act, 1976 (2 of 1976).
24. The Caltex (Acquisition of Shares of Caltex Oil Refining (India) Limited and of the undertaking in India of Caltex (India) Limited Act, 1977.
25. Administration of the Petroleum Act, 1934 (30 of 1934) and the rules made there under.
26. Administration of Balmer Lawrie Investment Limited and Balmer Lawrie and Company Limited.
27. Petroleum & Natural Gas Regulatory Board Act, 2006.
28. Matters pertaining to Brahmputra Cracker and Polymer Limited
29. Matters pertaining to SATAT initiatives
30. Matters pertaining to Gas Authority of India Limited (GAIL)
31. Matter pertaining to natural gas pipelines.
32. Matter pertaining to LNG terminals.
33. The Rajiv Gandhi Institute of Petroleum Technology (RGIPT) Act, 2007.
34. Matter pertaining to Indian Institute of Petroleum & Energy (IIPE), Act 2017 (3 of 2018)
35. Liquefied Petroleum Gas (Regulation of Supply and Distribution) Order, 2000.
36. Matter pertaining to Direct Benefit Transfer of LPG (DBTL) PAHAL.
37. Matter pertaining to Direct Benefit Transfer in Kerosene (DBTK).
38. Matter pertaining to Pradhan Mantri Ujjwala Yojana (PMUY).

Appendix-II

List of Public Sector Undertakings and other organizations under the administrative control of the Ministry of Petroleum& Natural Gas.

I. Oil Companies in which Government of India has shareholding as on 31.03.2024

1. Oil & Natural Gas Corporation Limited 58.89%
2. Indian Oil Corporation Limited (IOCL) 51.50%
3. Bharat Petroleum Corporation Limited 52.98%
4. GAIL (India) Limited 51.52%
5. Engineers India Limited 51.32%
6. Oil India Limited 56.66%
7. Balmer Lawrie & Co Limited

There is not direct holding by Govt of India in Balmer Lawrie & Co Ltd Balmer Lawrie Investments Ltd (BLIL), a Government Company holds 61.8% of shares in Balmer Lawrie & Co Ltd Central Govt. holds 59.57% in Balmer Lawrie Investments Ltd.

II. Subsidiaries and other Companies.

1. ONGC Videsh Limited- wholly owned by ONGC
2. Mangalore Refinery & Petrochemicals Limited Subsidiary of ONGC
3. Hindustan Petroleum Corporation Limited (HPCL) subsidiary of ONGC
4. Petronet MHB Limited (PMNBL) subsidiary of ONGC.
5. ONGC Green Ltd- wholly owned by ONGC
6. Bharat Petro Resources Limited – Subsidiary of BPCL
7. BPCL-KIAL Fuel Farm Facility Pvt. Ltd.- Subsidiary of BPCL
8. Numaligarh Refineries Limited – Subsidiary of OIL India Ltd.
9. Chennai Petroleum Corporation Limited- Subsidiary of IOCL
10. IOC Global Capital Management IFSC Ltd. - Subsidiary of IOCL
11. Certification Engineers International Limited : Wholly owned Subsidiary of EIL
12. GAIL Gas Limited- Wholly owned by GAIL
13. Brahmaputra Cracker and Polymer Limited- Subsidiary of GAIL
14. Konkan LNG Limited – Subsidiary of GAIL
15. Tripura Natural Gas Company Limited- Subsidiary of GAIL
16. Bengal Gas Company Limited - Subsidiary of GAIL
17. GAIL Mangalore Petrochemicals Limited- Wholly owned Subsidiary of GAIL

III. Other Organisations

1. Oil Industry Development Board
2. Oil Industry Safety Directorate
3. Centre for High Technology
4. Petroleum Planning & Analysis Cell
5. Directorate General of Hydrocarbons
6. Rajiv Gandhi Institute of Petroleum & Technology
7. Petroleum and Natural Gas Regulatory Board
8. Indian Institute of Petroleum Energy
9. Indian Strategic Petroleum Reserves Ltd.

Appendix-III

Production of Crude Oil and Natural Gas

State/Region	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24 (P)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I. Production of Crude Oil (TMT)						
Andhra Pradesh	296	243	195	202	236	250
Arunachal Pradesh	43	56	53	48	47	52
Assam	4309	4093	3902	3988	4164	4359
Gujarat	4626	4707	4651	4627	4850	4950
Rajasthan	7667	6653	5891	5887	5074	4421
Tamil Nadu	395	415	410	367	324	294
Tripura	-	-	-	3	3	2
West Bengal	-	-	-	0.05	0.01	0.00
Offshore	16868	16003	15391	14569	14480	15027
Total Crude Oil Production	**34,203**	**32,170**	**30,494**	**29,691**	**29,179**	**29,357**
of which						
ONGC-Nomination	21042	20627	20183	19451	19493	19210
OIL-Nomination	3293	3107	2937	2987	3156	3344
Pvt/JVs-PSC + RSC/CBM	9868	8436	7374	7253	6530	6803
II. Production of Natural Gas (MMSCM)						
Andhra Pradesh	1081	912	827	809	710	722
Arunachal Pradesh	28	46	55	58	53	40
Assam	3289	3141	2995	3371	3557	3489
Gujarat	1402	1342	1138	1017	923	926
Jharkhand (CBM)	4	5	2	4	10	5
Madhya Pradesh (CBM)	357	345	334	290	264	234
Rajasthan	1483	1883	2040	2619	2340	2199
Tamil Nadu	1208	1097	911	1067	1109	1016
Tripura	1554	1473	1634	1531	1675	1525
West Bengal (CBM)	350	306	307	389	399	411
Offshore	22117	20635	18429	22869	23409	25871
Total Natural Gas Production	**32,873**	**31,184**	**28,673**	**34,024**	**34,450**	**36,438**
of which						
ONGC-Nomination	24675	23746	21872	20629	19969	19316
OIL-Nomination	2722	2668	2480	2893	3041	3090
PSC Regime	5477	4770	4321	10502	11440	14032

P: Provisional

Note: 1. Production of Crude oil includes Condensate

2. Figures may not tally due to rounding off

Source: ONGC, OIL & DGH

Appendix-IV

Installed Capacity and Refinery Crude Throughput (Crude Oil Processed)

(Figures in TMT)

Refinery	Installed Capacity	Refinery Crude Throughput					
	01.04.2024	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24 (P)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) PUBLIC SECTOR	**1,57,316**	**1,56,692**	**1,52,629**	**1,33,693**	**1,45,491**	**1,61,500**	**1,65,751**
1. IOCL, Guwahati, Assam - 1962	1200	863	892	849	730	1080	1000
2. IOCL, Barauni, Bihar - 1964	6000	6661	6516	5469	5620	6785	6618
3. IOCL, Koyali, Gujarat - 1965	13700	13505	13075	11603	13474	15567	15202
4. IOCL, Haldia, West Bengal - 1975	8000	7965	6463	6759	7305	8506	8060
5. IOCL Mathura, Uttar Pradesh - 1982	8000	9737	8948	8926	9123	9573	9191
6. IOCL, Digboi, Assam - 1901	650	676	664	605	708	713	710
7. IOCL, Panipat, Haryana - 1998	15000	15281	15038	13181	14849	13810	14305
8. IOCL, Bongaigaon, Assam - 1974	2700	2513	2045	2450	2639	2775	3009
9. IOCL, Paradip, Odisha-2016	15000	14616	15778	12508	13217	13599	15213
Total IOCL	**70,250**	**71,816**	**69,419**	**62,351**	**67,665**	**72,408**	**73,308**
10. BPCL, Mumbai, Maharashtra - 1955	12000	14773	15017	12941	14437	14546	15052
11. BPCL, Kochi, Kerala - 1963	15500	16051	16515	13282	15402	16017	17314
12. BORL, Bina, Madhya Pradesh - 2011	7800	5716	7913	6190	7410	7841	7133
Total BPCL	**35,300**	**36,539**	**39,445**	**32,412**	**37,248**	**38,404**	**39,499**
13. HPCL, Mumbai, Maharashtra - 1954	9500	8671	8065	7374	5558	9804	9505
14. HPCL, Visakh, Andhra Pradesh - 1957	13700	9773	9115	9050	8410	9287	12689
Total HPCL	**23,200**	**18,444**	**17,180**	**16,425**	**13,968**	**19,091**	**22,194**
15. CPCL, Manali, Tamil Nadu - 1965	10500	10271	10161	8243	9040	11316	11642
16. CPCL- CBR, Narimanam Tamil Nadu - 1993	0	423	-	-	-	-	-
Total CPCL	**10,500**	**10,695**	**10,161**	**8,243**	**9,040**	**11,316**	**11,642**
17. NRL, Numaligarh, Assam-1999	3000	2900	2383	2707	2624	3091	2510
18. MRPL, Mangalore, Karnataka- 1996	15000	16231	13953	11475	14871	17116	16533
19. ONGC, Tatipaka, Andhra Pradesh - 2001	66	66	87	81	75	74	66
(b) Private & JVs Sector	**99,500**	**1,00,513**	**1,01,757**	**88,080**	**96,213**	**93,733**	**95,660**
20. RIL, Jamnagar, Gujarat - 1999	33000	31752	33019	34100	34757	34433	34390
21. RIL, Jamnagar (SEZ), Gujarat - 2008	35200	37393	35876	26841	28264	27872	28300
Total RIL	**68,00**	**69,145**	**68,895**	**60,941**	**63,021**	**62,305**	**62,690**
22. NEL, Vadinar, Gujarat - 2006	20000	18896	20620	17067	20164	18692	20322
23. HMEL, Bhatinda, Punjab - 2012	11300	12473	12242	10072	13027	12735	12648
Grand Total (a+b)	**2,56,816**	**2,57,205**	**2,54,386**	**2,21,773**	**2,41,704**	**2,55,233**	**2,61,411**

Note: Totals may not tally due to rounding off figures.

P: Provisional.

Source: CPSEs

Appendix-V

Production of Petroleum Products

(Figures in TMT)

Products	2018-19	2019-20	2020-21	2021-22	2022-23 (P)	2023-24 (P)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
LPG	12786	12823	12072	12238	12831	12779
Motor Spirit	38039	38616	35779	40238	42817	45081
Naphtha	19600	20577	19381	19994	17036	18274
ATF	15479	15238	7092	10294	15039	17124
Kerosene	4056	3211	2393	1913	941	983
HSD	110556	111120	100441	107176	113776	115943
LDO	681	620	729	805	646	657
Total Fuel Oils	**9,968**	**9,253**	**7,431**	**8,921**	**10,263**	**10,442**
of which						
a) Furnace Oil	9534	8858	7071	8509	9590	9698
b) LSHS/HHS/RFO	434	395	360	412	673	744
Lube Oils	949	932	1069	1173	1445	1352
Bitumen	5564	4892	4902	5111	4914	5240
Petroleum Coke	13663	14650	12040	15508	15387	15054
Others	31015	31008	30185	30934	31444	33129
Total Production of Petroleum Products	**2,62,356**	**2,62,940**	**2,33,513**	**2,54,306**	**2,66,539**	**2,76,058**
of which						
Refineries	**2,57,425**	**2,58,181**	**2,29,301**	**2,50,254**	**2,63,047**	**2,72,576**
Fractionators	**4,931**	**4,760**	**4,212**	**4,051**	**3,492**	**3,482**

Note: Totals may not tally due to rounding off figures.

P: Provisional.

Source: CPSEs

Appendix-VI

Consumption of Petroleum Products

(Figures in TMT)

Products	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
(1)	(2)	(3)	(4)	(5)	(6)	(7)
LPG	24907	26330	27558	28330	28504	29664
Motor Spirit	28284	29975	27969	30849	34976	37219
Naphtha	14131	14268	14100	14277	12127	13812
SKO	3460	2397	1798	1494	490	479
ATF	8300	7999	3698	5008	7378	8247
HSDO	83528	82602	72713	76687	85900	89626
LDO	598	628	855	1020	726	782
Fuel Oil (FO+LSHS)	6564	6302	5586	6255	6958	6520
Lubes/Greases	3668	3833	4097	4570	3737	4087
Bitumen	6708	6720	7524	7874	8041	8807
Petroleum Coke	21346	21708	15605	15772	18343	20319
Others	11723	11365	12791	12099	15842	14696
Total Consumption	**2,13,216**	**2,14,127**	**1,94,295**	**2,04,233**	**2,23,022**	**2,34,259**

Notes: Consumption includes sales by oil companies, own consumption & direct private imports.

P: Provisional

Source: PPAC

Imports/Exports of Crude Oil and Petroleum Products

Appendix-VII

ITEM	2018-19			2019-20			2020-21			2021-22			2022-23			2023-24 (P)		
	TMT	₹ Crore	Million USD	TMT	₹ Crore	Million USD	TMT	₹ Crore	Million USD	TMT	₹ Crore	Million USD	TMT	₹ Crore	Million USD	TMT	₹ Crore	Million USD
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Imports																		
1. Crude Oil Import	2,26,498	7,83,183	1,11,915	2,26,955	7,17,001	1,01,376	1,96,461	4,59,779	62,248	2,12,382	9,01,262	1,20,675	2,32,700	12,60,372	1,57531	2,33,118	11,00,589	1,32,838
2. LNG Imports	21,545	73,888	10,558	24,417	68,467	9,663	25,055	58,329	7,881	23,417	1,00,521	13,472	19,852	1,37,210	17,114	23,334	1,09,785	5,45,631
3. Petroleum Product Import	33,348	1,13,665	16,341	43,788	1,25,742	17,689	43,248	1,09,430	14,770	39,017	1,76,835	23,656	44,598	2,15,854	26,912	48,668	1,90,914	23,046
Petroleum Product Imports																		
LPG	13235	49939	7178	14809	50347	7070	16476	53752	7242	17043	91468	12235	18335	107191	13344	18475	87144	10517
MS	670	3104	445	2146	9610	1357	1351	4950	674	671	3895	519	1069	8846	1094	717	5494	662
Naphtha	2082	9665	1391	1662	6678	941	1199	3844	518	237	1499	199	897	4781	593	1244	6811	822
ATF	259	1392	200	65	309	45	0	0	0	0	0	0	0	0	0	0	0	0
SKO	0	0	0	0	0	0	3	12	2	0	0	0	0	0	0	0	0	0
HSD	555	2486	360	2796	11619	1632	648	1960	265	43	253	34	322	3584	454	42	315	38
LOBS/ Lube oil	2457	13349	1910	2675	11869	1673	2693	12170	1647	3058	19704	2642	2152	18449	2301	2400	19045	2301
Fuel Oil	1419	4782	696	4583	11791	1650	6454	14312	1936	8980	32815	4379	8563	33474	4202	9055	33669	4061
Bitumen	877	2149	309	1630	3634	510	2055	4325	586	2581	7678	1029	2797	9945	1237	3234	10838	1310
Petcoke	7926	10350	1494	10674	9713	1374	8256	6410	861	4213	8203	1097	8664	18157	2263	10956	14310	1729
Others	3869	16449	2358	2749	10172	1438	4112	7695	1038	2189	11319	1521	1799	11425	1425	2544	13288	1607
Total Import (1+2+3)	2,81,391	9,70,736	1,38,814	2,95,159	9,11,209	1,28,728	2,64,763	6,27,537	84,899	2,74,815	11,78,618	1,57,803	2,97,151	16,13,435	2,01,557	3,05,120	14,01,288	7,01,515
Exports																		
LPG	417	1976	283	463	1970	277	452	1797	241	513	3214	430	540	3891	486	525	3213	388
MS	12885	60419	8641	12710	54512	7708	11606	36530	4977	13482	81649	10879	13127	102800	12868	13461	92875	11238
Naphtha	6963	28893	4137	8897	31509	4439	6509	18643	2530	6861	37231	4984	5714	33357	4184	5251	26856	3245
Aviation Turbine Fuel	7389	34030	4867	6906	28458	4021	3544	9377	1287	5186	27112	3661	7264	58598	7285	8579	57961	6995
Kerosene	19	98	14	176	560	78	15	48	7	14	77	10	11	100	13	11	82	10
Diesel	27931	123882	17675	31653	123919	17481	30576	81611	11132	32407	164741	22088	28496	230826	28861	28193	182281	22047
Lubes	8	106	15	8	96	13	15	93	12	10	114	15	14	205	26	8	254	30
Fuel Oil	2197	6537	923	1527	3811	537	1177	2318	313	1757	6633	890	1841	7834	973	2015	7746	936
Bitumen	23	72	10	25	89	13	7	23	3	6	28	4	9	42	5	8	34	4
Petcoke/CBFS	1124	3255	463	465	1096	155	577	292	39	187	553	74	284	648	81	28	23	3
Others	2140	8429	1208	2854	7998	1128	2290	6436	865	2330	10449	1402	3717	20427	2542	4357	22828	2756
Export of Petroleum Products	61,096	2,67,697	38,236	65,685	2,54,018	35,848	56,769	1,57,168	21,406	62,755	3,31,801	44,438	61,015	4,58,729	57,323	62,437	3,94,153	47,653
Net Import	2,20,295	7,03,040	1,00,578	2,29,474	6,57,192	92,880	2,07,995	4,70,369	63,493	2,12,061	8,46,817	1,13,365	2,36,136	11,54,707	1,44,234	2,42,683	10,07,135	6,53,862
Net Petroleum Product Export	27,747	1,54,031	21,895	21,898	1,28,276	18,159	13,521	47,738	6,636	23,738	1,54,966	20,782	16,417	2,42,875	30,411	13,768	2,03,239	24,607

P: Provisional

2: Other exports include VGO, Benzene, MTO & Sulphur.

Source: Petroleum Planning & Analysis Cell.

Appendix-VIII

Internal & External Budgetary Resources

(Figures in ₹ Crore)

CPSEs	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
	Actual	Actual	Actual	Actual	Actual	Actual
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CPSE-wise Internal & Extra Budget Resources						
ONGC	29450	29538	26859	27741	30208	37494
OVL	5827	5435	5734	4681	2704	3259
OIL	3181	4247	13332	4367	5534	5390
GAIL	7143	4562	6253	7148	9099	11426
IOCL	28208	31421	28684	30391	37287	42236
BPCL	10993	11064	11064	11860	12120	11702
HPCL	12438	16311	14700	16771	14084	14412
MRPL	1072	1318	2179	674	625	1600
CPCL	1314	961	583	636	654	611
NRL	465	529	1029	3605	6596	7984
BL	132	46	43	22	52	59
EIL	87	171	733	70	62	132
Total (I&EBR)	**1,00,309**	**1,05,603**	**1,11,194**	**1,07,968**	**1,19,027**	**1,36,304**
Exploration & Production Sector	49613	44769	52994	46376	48125	55417
Refining & Marketing Sector	46990	56668	51446	54948	61822	69763
Petro-Chemicals Sector	3487	3949	5979	6551	8966	10933
Engineering Sector	219	217	776	93	114	191
Total (I&EBR)	**1,00,309**	**1,05,603**	**1,11,194**	**1,07,968**	**1,19,027**	**1,36,304**

Source: Central Public Sector Enterprises.

Appendix-IX

PSU- WISE VARIATION Profit Before Tax (PBT) and Profit After Tax (PAT) 2023-24 vis-à-vis 2022-23

Oil & Natural Gas Corporation (ONGC)

The PBT of ONGC for FY 2023-24 has increased to ₹ 53,016 crore as compared to ₹ 52,089 crore in FY-2022-23 (restated). ONGC's PAT for FY-2023-24 has also increased to ₹ 40,526 crore, against ₹ 40,097 crore in FY-2022-23 (restated). Increase in PBT & PAT is primarily due to increase in interest & dividend income and reduction in exploration cost written off during FY 2023-24 which has been partially offset due to increase in operating expenditure and increase in DD&I (depreciation, depletion and impairment) cost.

Indian Oil Corporation Limited (IOCL)

Profit before Tax (PBT) of IOCL was ₹ 52,344 crore in 2023-24 as compared to ₹ 9,698 crore in 2022-23 and Profit after Tax (PAT) was ₹ 39,619 crore as compared to ₹ 8,242 crore in previous financial year. The increase in PBT and PAT for Financial Year 2023–24 vis-a-vis 2022–23 is primarily due to improved marketing margins on certain petroleum products as compared to last year. However, increase in marketing margins were offset to some extent by decrease in refining margins as a result of decrease in product cracks in international market from previous year. Further, decrease in exchange losses have also contributed towards increase in profitability.

Gas Authority India Limited (GAIL)

GAIL Profit Before Tax (PBT) increased by 75.5% to ₹ 11,555 crore in FY 2023-24 as against ₹ 6,584 crore in FY 2022-23. The Profit After Tax (PAT) increased by 66.6% to ₹ 8,836 crore in FY 2023-24 as against ₹ 5,302 crore in FY 2022-23. The robust performance during FY 2023-24 is primarily driven by better physical performance across all major segments.

Oil India Limited (OIL)

Profit Before Tax (PBT) for the year 2023-24 is ₹ 6,745.40 crore as compared to ₹ 8,857.04 crore in the year 2022-23. The decrease is primarily due to lower crude oil and Natural Gas prices at USD 83.03/BBL & USD 6.50/MMBTU respectively in 2023-24 as compared to USD 95.47/BBL & USD 7.34/MMBTU respectively in 2022-23. Further the company has made provision for Service tax and GST on Royalty during the year 2023-24 amounting to ₹ 3079.33 crore. The Profit After Tax (PAT) for the year 2023-24 is ₹ 5,551.85 crore.

Bharat Petroleum Corporation Limited (BPCL)

Variation in Profit Before Tax (PBT) and Profit After Tax (PAT) 2023-24 vis-à-vis 2022-23 for BPCL:

(Figs. in ₹ crores)

Particulars	2023-24	2022-23
Profit / (loss) before tax	35,548	2,217
Profit / (loss) after tax	26,674	1,870

Increase in PBT and PAT in FY 2023-24 vis-à-vis FY 2022-23 is mainly on account of increase in marketing margins which were subdued in the previous year, reduced foreign exchange losses, lower finance costs etc. offset by higher tax on earnings.

Engineers India Limited (EIL)

During the FY 2023-24, the PBT & PAT were ₹ 470.41 crore & ₹ 356.99 crore respectively in comparison to ₹ 440.04 crore & ₹ 342.15 crore in FY 2022-23. The increase in profitability is primarily on account of increase in other income, settlement of contracts with clients, enhanced focus on reduction in debtors and increased revenue from international operations.

ONGC Videsh Limited (OVL)

The company's profitability declined between FY 2022-23 and FY 2023-24. Profit Before Tax (PBT) dropped from ₹ 2,125 crore to ₹ 1,579 crore, and Profit After Tax (PAT) attributable to owners fell from ₹ 1,700 crore to ₹ 690 crore. This effect was mainly due to non-accounting of revenue from Sakhalin-1, higher impairment and lower crude price realization by 4% in FY 2023-24 as compared to FY 2022-23.

Hindustan Petroleum Corporation Limited (HPCL)

For the financial year 2023-24, HPCL has reported Profit Before Tax (PBT) of ₹ 19,153 crore as compared to Net Loss Before Tax of ₹ 11,915 crore for FY 2022-23. The crude oil and petroleum products prices softened during FY 2023-24 which were exceptionally high and volatile during FY 2022-23. The marketing margins on select motor fuels were higher during FY 2023-24 as compared to supressed marketing margins during FY 2022-23. The Gross Refining Margins (GRMs) for FY 2023-24 were also higher as compared to that of FY 2022-23 on account of increased thruput and operational efficiency.

HPCL has reported Profit After Tax (PAT) of ₹ 14,694 crore during FY 2023-24 as compared to Net Loss of ₹ 8,974 crore during FY 2022-23.

Mangalore Refinery & Petrochemicals Limited (MRPL)

MRPL has reported Profit Before Tax (PBT) of ₹ 5,521 crore as compared to ₹ 4,239 crore for FY 2022-23. This was mainly due to robust operations and improvement in refinery margins. The Gross Refining Margin (GRM) for FY 2023-24 was 10.36 $/ bbl as against 9.88 $/bbl for FY 2022-23. Profit After Tax (PAT) for FY 2023-24 was ₹ 3,596 crore as compared to ₹ 2,638 crore for FY 2022-23.

Balmer Lawrie & Co. Ltd. (BL)

The positive variance of 31.87% in PBT and 32.24% in PAT for the year 2023-24 as compared to 2022-23 is attributable due to better performance (increase in turnover and profitability) of the manufacturing business (SBU-Greases & Lubricants, SBU-Industrial Packaging) and SBU-Travel and Vacations.

Chennai Petroleum Corporation Limited (CPCL)

CPCL posted a turnover of ₹ 79,207 crore, Profit Before Tax of ₹ 3660 crore and Profit after tax of ₹ 2711 crore in FY 2023-24 as compared to turnover of ₹ 90,801 crore, Profit Before Tax of ₹ 4809 crore and Profit after tax of ₹ 3534 crore in FY 2022-23.

CPCL continued its excellent financial performance in the year 2023-24 due to stellar operating performance with highest ever Crude throughput of 11.642 MMT and focused improvement on reliability coupled with feed optimization which enabled secondary units to surpass the previous best.

For the fiscal year 2023-24, the Gross Refining Margin (GRM) was recorded at US$ 8.64 per barrel (Singapore GRM: $6.61 per barrel), compared to US$ 11.91 per barrel (Singapore GRM: $8.96 per barrel) in the previous financial year. CPCL consistently outperformed Singapore GRMs over the last two years, largely due to optimized refinery production, enhanced product distribution, crude procurement strategies and efficient secondary units processing capabilities.

Numaligarh Refinery Limited (NRL)

Profit Before Tax (PBT) of the year 2022-23 was higher by 2.17% at ₹ 4,953.23 crore as compared to ₹ 4,847.85 crore of the previous financial year mainly due to increase in overall gross margin and higher inventory gains. Accordingly, the Company posted record profits for the year 2022-23 with Profit After Tax (PAT) of ₹ 3,702.79 crore as compared to ₹ 3,561.56 crore of the previous year registering an increase of ₹ 141.23 crore.

Brahmaputra Cracker and Polymer Limited (BCPL)

The Profit before Tax (PBT) of Brahmaputra Cracker and Polymer (BCPL) reduced by 206% in 2023-24 to ₹ (-) 204.44 crore as compared to ₹ 192.69 crore in 2022-23. The Profit After Tax (PAT) reduced by 219% in 2023-24 to ₹ (-) 160.22 crore as compared to ₹ 134.23 crore in 2022-23. The profits reduced due to lower production, subdued prices and high cost of feedstock.

Appendix-X

There were 80 CAG Audit Paras upto FY 2023-24. After the settlement of 7 CAG Audit Parasduring FY 2023-24, 73 CAG Audit Parasare pending in the Ministryas on 31.03.2024. Out of these 73 CAG Audit Paras, replies of 70 Audit Parashave been submitted to CAG. Out of 70 CAG Audit Paras,vetting remarks have been received on 28 Audit Paras on which further action is being taken. Further, in year 2017, 1 PAC Report No. 34 contains 5 Paras on which replies have been sent by the Ministry to PAC. However, vetting remarks on the same has been received from PAC on which necessary action is being taken.

Year wise position of ATN of CAG Audit Paras received upto FY 2023-24

(As on 31.03.2024)

Sl. No.	Year	No. of CAG paras on which ATNs have to be submitted to CAG for settlement	Details of the CAG paras on which ATNs are pending		
			No. of CAG paras on which 1st ATN is yet to be taken	No. of ATNs sent but returned with observations by CAG	No. of ATNs sent by Ministry but vetting remarks have not been received from CAG
	(i)	(ii)	(iii)	(iv)	(v)
1	2008	1	-	1	-
2	2009	1	-	1	-
3	2011	2	-	2	-
4	2012	2	-	2	-
5	2013	4	-	2	2
6	2014	2	-	1	1
7	2015	3	-	1	2
8	2016	7	-	4	3
9	2017	5	-	2	3
10	2018	5	-	2	3
11	2019	10	-	3	7
12	2020	4	-	-	4
13	2021	9	-	5	4
14	2022	9	-	2	7
15	2023	9	3	-	6

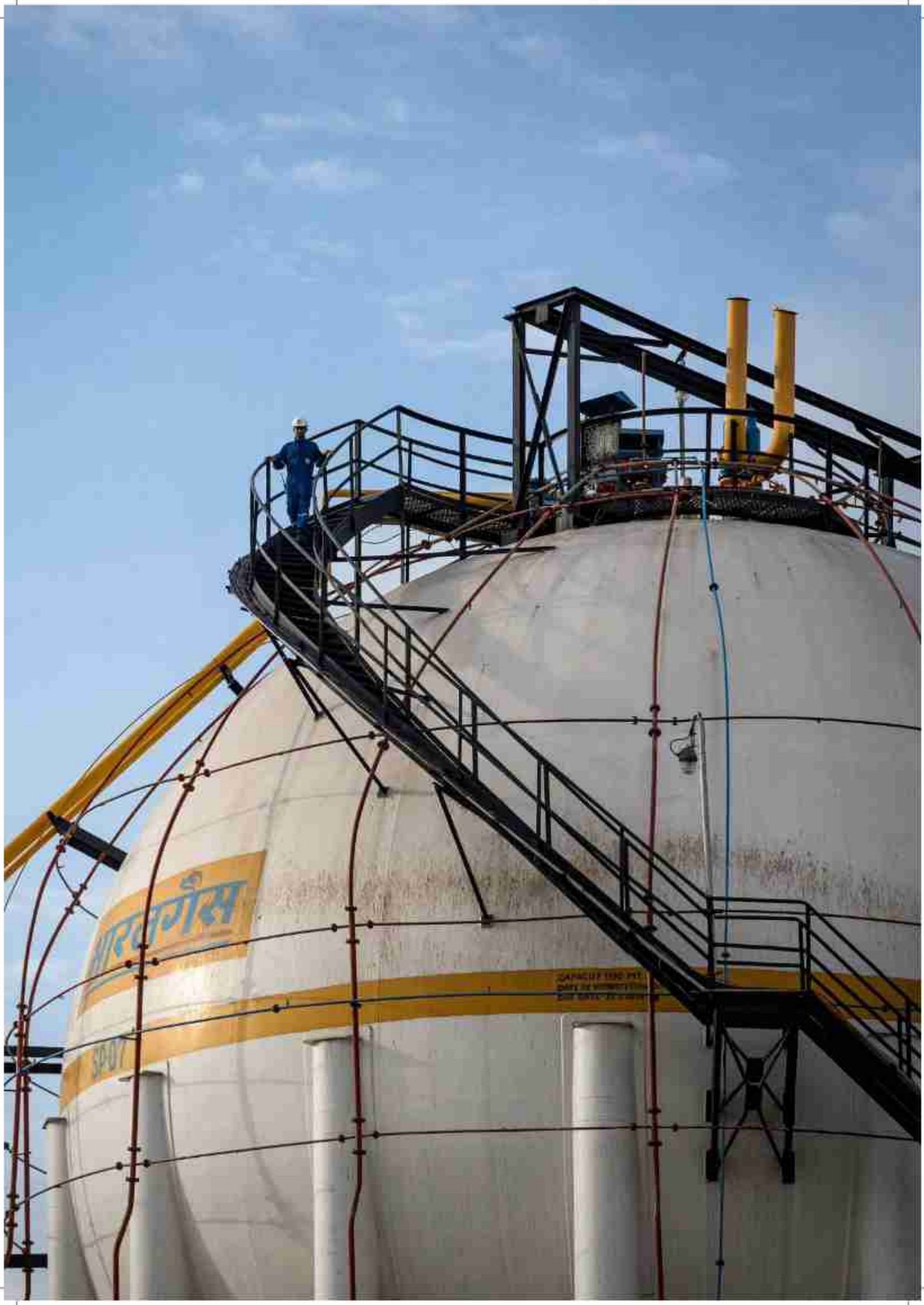
Appendix-XI

List of Assets acquired by Indian PSU's Abroad

Sr. No.	Country	Name of Asset	Company Name	Participating Companies
1.	Australia	Production License T/L1 (Yolla Field)	Prize Petroleum Company Limited (Through its 100% subsidiary Prize Petroleum International Pte Ltd in Singapore)	Beach Energy (Operations) Limited, Beach Energy (Bass Gas) Limited, Beach Energy Limited, Prize Petroleum International Pte Ltd.
2		Retention Leases T/RL 2, 4 & 5 (Trefoil & Others)		Beach Energy (Operations) Limited (Operator), Beach Energy Limited, Prize Petroleum International Pte Ltd
3	Azerbaijan	ACG	OVL	ONGC Videsh Limited, BP (Operator), AzACG, MOL, INPEX, Equinor Apsheron AS, ExxonMobil, TPAO, Itochu
4		BTC Pipeline	OVL	ONGC BTC Limited, BP (Operator), AzBTC, MoL, INPEX, Equinor Apsheron AS, TPAO, Itochu, TOTAL, ENI, Exxon
5	Bangladesh	SS-04	OVL OIL	ONGC Videsh Limited (Operator), Oil India Limited, BAPEX (Carried)
6		SS-09	OVL OIL	ONGC Videsh Limited (Operator), Oil India Limited, BAPEX (Carried)
7	Brazil	BC-10	OVL	ONGC Videsh Limited, Shell (Operator), Qatar Energy
8		BM-SEAL-4	OVL	ONGC Videsh, Petrobras (Operator)
9		BM-SEAL-11 (2 blocks)	BPRL	Petrobras, IBV
10		BM-C-30 (1 block)	BPRL	PetroRio, IBV
11	Canada	PNW Project	IOCL	Petronas Energy Canada Ltd. (PECL) (Operator), Sinopec Huadian, IndOil Montney Ltd. (IML), Petroleum Brunei Montney Holdings Limited
12	Colombia	MECL	OVL	ONGC Videsh, SIPC
13		CPO-5	OVL	ONGC Videsh (Operator), Geopark
14		RC-10	OVL	ONGC Videsh (Operator), Ecopetrol
15		SSJN 7	OVL	ONGC Videsh; Canacol Energy Ltd (Operator)
16	Gabon	Block Shakthi- II	IOCL OIL	OIL (Operator), IOCL

Sr. No.	Country	Name of Asset	Company Name	Participating Companies
17	Indonesia	Nunukan	BPRL	Pertamina , BPRL VI BV
18	Iran	Block Farzad-B	OVL	ONGC Videsh Limited (Operator), IOC, OIL
19	Iraq	Block 20 (Erstwhile Block 8)	OVL	ONGC Videsh Limited
20	Libya	Contract Area 43	OVL	ONGC Videsh Limited
21		Area 95/96	OIL IOCL	OIL, IOCL, SIPEX (Operator)
22	Mozambique	Offshore Area 1, Rovuma Basin	OVL OIL BPRL	ONGC Videsh Rovuma Limited, BREML (consortium of ONGC Videsh Limited, OIL), Total Energies (Operator), ENH, Mitsui, BPRL, PTTEP
23	Myanmar	Blocks A-1	OVL	ONGC Videsh, MOGE, Posco International (Operator), Kogas, GAIL
		Blocks A-3	OVL	
24		Blocks A-1 & A-3	GAIL (India) Limited	
25		Offshore Mid-stream Gas Pipeline (Pipeco 1)	OVL GAIL (India) Limited	ONGC Videsh, MOGE, POSCO International (Operator); Kogas, GAIL
26		Onshore Gas Pipeline (SEAGP) (Pipeco 2)	OVL GAIL (India) Limited	ONGC Nile Ganga B.V., CNUOC(O), MOGE, POSCO International, GAIL, KG-SEAGP
27		Block B-2	OVL	ONGC Videsh (Operator), M&S (Carried)
28		Block EP-3	OVL	ONGC Videsh (Operator), M&S (Carried)
29	Nigeria	OML 142	IOCL OIL	Summit Oil (Operator), Suntera Nigeria Ltd, (JV Partners: Suntera, IndianOil, OIL)
30	Oman	Mukhaizana	IOCL	IOCL Singapore Pte. Ltd. (ISPL), Occidental Mukhaizna LLC, Oman Oil, Liwa Energy Limited (Mubadala), PTTEP (Partex (Oman) Corporation
31	Russia	Sakhalin -1	OVL	ONGC Videsh Limited, SODECO, Rosneft subsidiaries (SMNG and RN Astra)
32		Vankorneft	OVL OIL IOCL BPRL	ONGC Videsh Vankorneft Pte Ltd, Vonkor India Pte Ltd. (consortium of IOCL Singapore Pte. Ltd., Oil India International Pte. Ltd., BPRL International Singapore Pte. Ltd.), Vostok Oil LLC
33		Imperial Energy	OVL	ONGC Videsh Limited
34		Taas Yuryakh	IOCL OIL BPRL	Rosneft, Taas India Pte Ltd (TIPL), BP Russian Investment Ltd
35		Licence-61	OIL	Oil India International B.V. Netherlands, Petroneft Resources

Sr. No.	Country	Name of Asset	Company Name	Participating Companies
36	South Sudan	GPOC	OVL	ONGC Videsh Limited, CNPC, Petronas, Nilepet
37		SPOC	OVL	ONGC Videsh Limited, Petronas, Nilepet
38	Syria	AFPC	OVL	SSPD (Operator), HESBV (Partners of ONGBV & CNPC)
39		Block 24	OVL	ONGC Videsh Limited, IPRMEL (Operator), TOM
40	UAE	Lower Zakum Concession	OVL IOCL BPRL	OVLFOGBV- Falcon Oil & Gas B.V. (Consortium of ONGC Videsh, IOC, BPRL), ADNOC, INPEX- JODCO, CNPC, TOTAL, ENI
41		Onshore Block 1	IOCL BPRL	UBPL (a JV of BPRL and IOCL)
42	USA	Niobrara Shale Project	IOCL	IOCL USA Inc., Verdad Resources LLC; Haimo Oil & Gas LLC
43		Eagle Ford Joint Venture (JV)	GAIL Global (USA) Inc. (GGUI)-100% Subsidiary of GAIL	Texas American Resources II, LLC, ("TAR"), Ridgemar, GAIL Global (USA) Inc.
44	Venezuela	San Cristobal	OVL	ONGC Videsh Limited, CVP-PDVSA, PDVSA Social
45		Carabobo Project-1	OVL OIL IOCL	ONGC Videsh Limited, PDVSA, Repsol, IOCL, OIL
46	Vietnam	Block 06.1	OVL	ONGC Videsh Limited, Zarubezhneft EP Vietnam B.V, Petro Vietnam
47		Block 128	OVL	ONGC Videsh Limited


भारतगैस



Ministry of Petroleum and Natural Gas
Government of India

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय

भारत सरकार



विकास
सहयोग
परिवर्तन

वार्षिक रिपोर्ट
2023-24

भारत पर्यावरणीय सूझबूझ के साथ ऊर्जा स्रोतों के विकास पर बल दे रहा है ताकि हम विभिन्न उर्जा स्रोतों के साथ काम कर सकें। हम न केवल अपनी ज़रूरतों को पूरा कर रहे हैं, बल्कि विश्व को नई दिशा भी दे रहे हैं।



भारत की ऊर्जा कार्यनीति के सात प्रमुख कारक

- गैस आधारित अर्थव्यवस्था बनने से संबंधित प्रयासों में तीव्रता लाना
- जैव ईंधन को प्रचालित रखने के प्रयोजनार्थ घरेलू स्रोतों पर अधिक निर्भरता
- जीवाश्म ईंधन विशेषकर पेट्रोलियम और कोयले का स्वच्छ उपयोग
- गतिशीलता को डी-कार्बोनाइज करने के लिए विद्युत के योगदान को बढ़ाना
- 2030 तक 450 जीडब्ल्यू के नवीकरणीय लक्ष्य की प्राप्ति
- सभी प्रकार की ऊर्जा प्रणालियों में डिजीटल नवाचार
- हाइड्रोजन सहित उभरते ईंधनों की ओर बढ़ते जाना



विषयवस्तु

अध्याय 1: परिचय	7
अध्याय 2: अन्वेषण और उत्पादन	35
अध्याय 3: पाइपलाइन और प्राकृतिक गैस	61
अध्याय 4: रिफाइनरी	67
अध्याय 5: विपणन और वितरण	79
अध्याय 6: अंतर्राष्ट्रीय सहयोग और संबंध	87
अध्याय 7: पूर्वोत्तर–क्षेत्र का विकास	109
अध्याय 8: अनुसंधान एवं विकास और नई तकनीकें	119
अध्याय 9: जैव ईंधन	153
अध्याय 10: संधारणीयता और नेट जीरो पहलें	159
अध्याय 11: संवेदनशील पेट्रोलियम उत्पादों के संबंध में मूल्य निर्धारण नीति	195
अध्याय 12: अनुसूचित जाति, अनुसूचित जनजाति, अन्य पिछड़े वर्ग और दिव्यांगजन का कल्याण	199
अध्याय 13: महिलाओं का कल्याण, विकास और सशक्तिकरण	203
अध्याय 14: उपक्रम/संगठन	207
अध्याय 15: एकीकृत वित्त प्रभाग	305
अध्याय 16: सामान्य	313
अध्याय 17: साइबर सुरक्षा दिशा–निर्देशों का अनुपालन	319
अध्याय 18: परिशिष्ट	323

संगठनात्मक संरचना

1.1. श्री हरदीप सिंह पुरी दिनांक 11 जून, 2024 से पेट्रोलियम एवं प्राकृतिक गैस मंत्री का कार्यभार संभाल रहे हैं।

1.2. श्री सुरेश गोपी दिनांक 11 जून, 2024 से पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में राज्य मंत्री का कार्यभार संभाल रहे हैं।

1.3. श्री पंकज जैन, आईएएस (एएम:1990), दिनांक 30 दिसंबर, 2021 से पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में सचिव का कार्यभार संभाल रहे हैं।

1.4. श्री प्रवीण मल खनूजा, आईए एंड एएस:1994, दिनांक 12 अगस्त, 2022 से पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में अतिरिक्त सचिव का कार्यभार संभाल रहे हैं।

1.5. सुश्री कामिनी चौहान रतन, आईएएस (यूपी:1997), दिनांक 22 नवंबर, 2022 से पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में अतिरिक्त सचिव और वित्तीय सलाहकार का कार्यभार संभाल रही हैं।

1.6. सुश्री सुजाता शर्मा, आईएएस (एपी:2006), दिनांक 12 दिसंबर, 2022 से पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में संयुक्त सचिव का कार्यभार संभाल रही हैं।

1.7. श्री आशीष जोशी, आईएएस (यूडी:2006), दिनांक 19 जुलाई, 2023 से पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में संयुक्त सचिव का कार्यभार संभाल रहे हैं।

1.8. सुश्री ईशा श्रीवास्तव, आईएफएस: 2004, दिनांक 8 जनवरी, 2024 से पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में संयुक्त सचिव का कार्यभार संभाल रही हैं।

1.9. श्री रोहित माथुर, सीएसएस, दिनांक 17 जनवरी, 2020 से पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में संयुक्त सचिव (इन–सीटू) का कार्यभार संभाल रहे हैं।

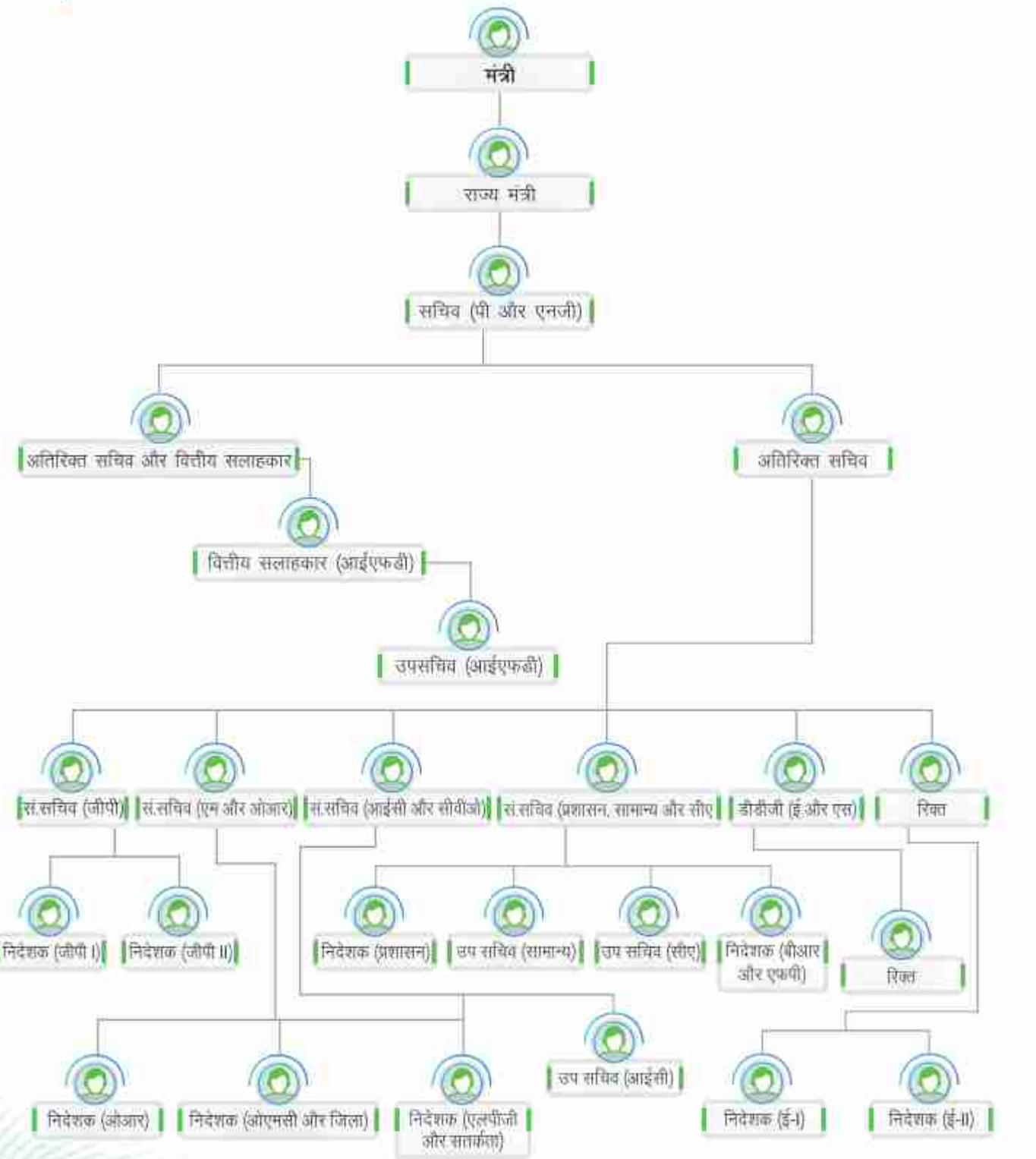
1.10. श्री धीरज कुमार ओझा, आईएसएस: 1999, दिनांक 10 दिसंबर, 2021 से पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में उप महानिदेशक का कार्यभार संभाल रहे हैं।

1.11. श्री राजिंदर कुमार, आईईएस: 2003, दिनांक 11 मार्च, 2022 से पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में आर्थिक सलाहकार का कार्यभार संभाल रहे हैं।

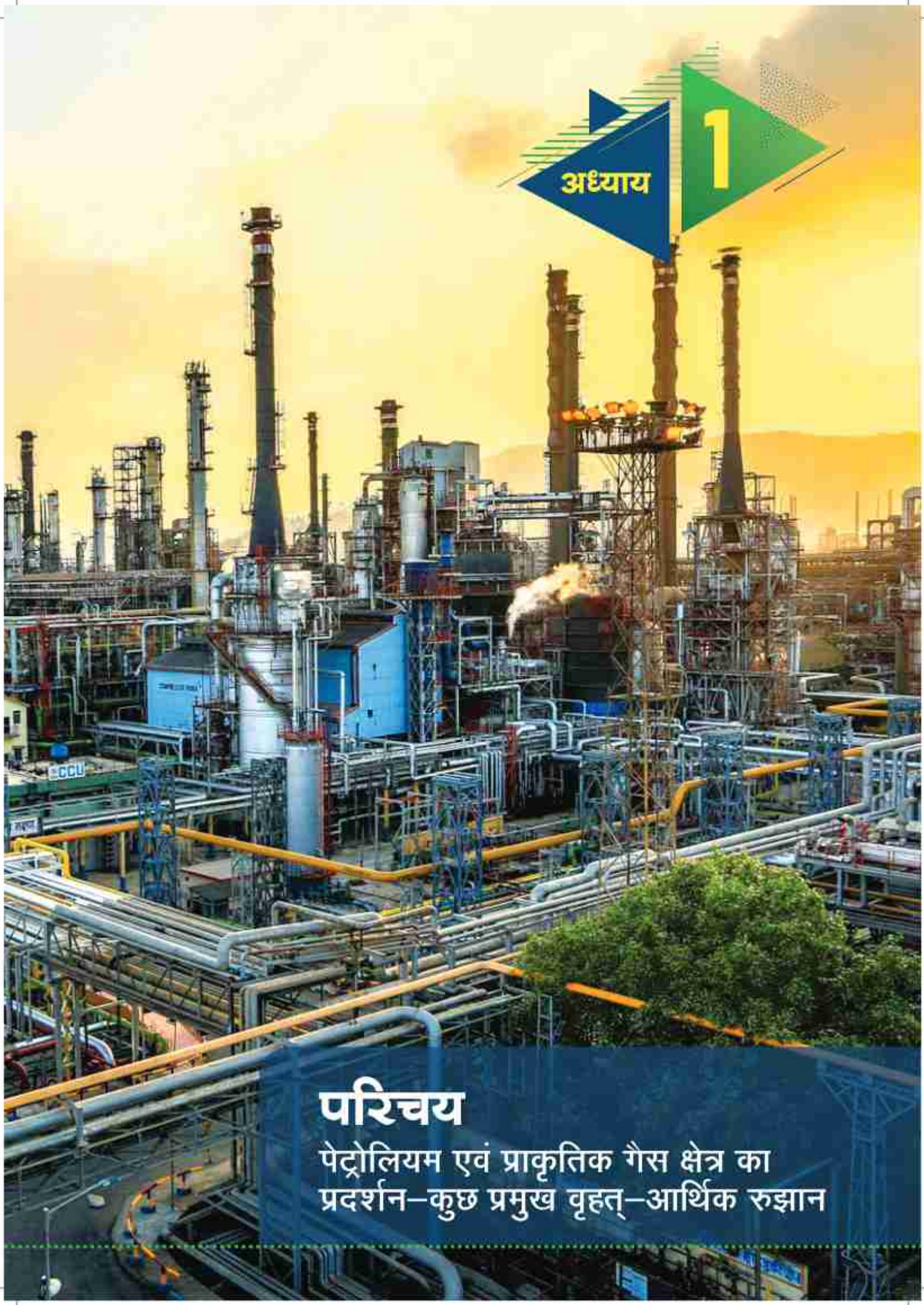
माननीय उच्चतम न्यायालय द्वारा विशाखा एवं अन्य बनाम राजस्थान राज्य एवं अन्य के मामले में निर्धारित दिशा–निर्देशों और कार्मिक एवं प्रशिक्षण विभाग/महिला एवं बाल विकास मंत्रालय द्वारा जारी आदेशों के अनुसरण में, कार्यस्थल पर महिलाओं के यौन उत्पीड़न की शिकायतों की रोकथाम और निवारण के लिए मंत्रालय में एक आंतरिक शिकायत समिति (महिला प्रकोष्ठ) का पुनर्गठन किया गया है। वर्तमान में, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय की संयुक्त सचिव सुश्री सुजाता शर्मा इस समिति की अध्यक्ष हैं तथा चार अन्य सदस्य (एनजीओ से एक सदस्य सहित) इस समिति में शामिल हैं।



पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय का संगठनात्मक चार्ट







परिचय

पेट्रोलियम एवं प्राकृतिक गैस क्षेत्र का प्रदर्शन–कुछ प्रमुख वृहत्–आर्थिक रुझान

1 परिचय

1.1. पेट्रोलियम एवं प्राकृतिक गैस क्षेत्र का प्रदर्शन–कुछ प्रमुख वृहत्–आर्थिक रुझान

भारत वर्तमान में विश्व का तीसरा सबसे बड़ा प्राथमिक ऊर्जा उपभोक्ता है, जबकि यहां प्रति व्यक्ति ऊर्जा खपत वैश्विक औसत का केवल एक तिहाई है. ऐसे देश में सामाजिक–आर्थिक वृद्धि और विकास के लिए ऊर्जा निश्चित रुप से सर्वोपरी आधार है। तेल और गैस क्षेत्र भारत के आठ प्रमुख उद्योगों में शामिल है और ये अर्थव्यवस्था के अन्य सभी महत्वपूर्ण क्षेत्रों के निर्णय निर्धारण को प्रमुखता से प्रभावित करते हैं। विभिन्न संस्थाओं द्वारा यह आकलन किया गया है कि भारत की ऊर्जा खपत की बढ़ती मांग में योगदान देने वाले प्रमुख कारकों में पिछले कुछ वर्षों से हमारा निरंतर आर्थिक विकास करना शामिल है, जिसके परिणामस्वरूप औद्योगीकरण, नगरीकरण, परिवहन की आवश्यकताएं, अवसंरचनात्मक विकास, आय में वृद्धि, जीवन स्तर में सुधार, आधुनिक ऊर्जा का उपयोग करने की हमारी क्षमता में वृद्धि के साथ–साथ निजी खपत और सकल स्थिर पूंजी निर्माण में वृद्धि आदि हुई है।

भारत उपलब्धता और वहनीयता में सुधार करके ऊर्जा न्याय सुनिश्चित करने की दिशा में प्रयास कर रहा है, जो निकट भविष्य में प्रति व्यक्ति ऊर्जा मांग बढ़ाने का प्रमुख कारण होगा। माननीय प्रधानमंत्री ने भारत के ऊर्जा भविष्य के चार रतनों की परिकल्पना की है– ऊर्जा की उपलब्धता, ऊर्जा दक्षता, ऊर्जा स्थिरता और ऊर्जा सुरक्षा। भारत दुनिया में एक आर्थिक महाशक्ति बनने की महत्वाकांक्षा के साथ आगे बढ़ रहा है ऐसे में ये चार स्तंभ इसके लिए महत्वपूर्ण हैं। हमारी ऊर्जा प्रणाली को अधिक विश्वसनीय, पर्यावरण अनुकूल और लागत प्रभावी बनाने के लिए परिवर्तन लाना हमारी आज की ऊर्जा नीति का एक केंद्रीय लक्ष्य है। भविष्य की ऊर्जा प्रणालियों को डिजाइन करने और एक प्रभावी राष्ट्रीय ऊर्जा नीति तैयार करने में नए ईंधन स्रोतों और वैकल्पिक ऊर्जा पर ध्यान केंद्रित करना प्रमुख चालक और लीवर के रूप में कार्य करेंगे। ऊर्जा परिवर्तन, ऊर्जा बास्केट का विविधीकरण, ऊर्जा स्वतंत्रता और ऊर्जा सुरक्षा का मुद्दा आने वाले वर्षों में भारत के ऊर्जा स्रोतों के मिश्रण को प्रभावित करेगा।

ऊर्जा की मांग ज्यादातर जीवाश्म ईंधन से पूरी होती है क्योंकि जीवाश्म ईंधन भारत की प्राथमिक ऊर्जा आवश्यकता का 89% हिस्सा है। ऊर्जा स्रोतों के मिश्रण में 56% हिस्सा कोयला का है, तेल और गैस का क्रमशः 27% और 6% हिस्सा है। वित्तीय वर्ष 2023–24 के दौरान घरेलू कच्चे तेल का उत्पादन लगभग 29.36 मिलियन मीट्रिक टन (एमएमटी) था जबकि प्राकृतिक गैस का उत्पादन 36.44 बीसीएम था।

यह उल्लेख करना आवश्यक है कि लगभग 77% कच्चे तेल का उत्पादन नामांकन व्यवस्था के माध्यम से राष्ट्रीय तेल कंपनियों (ओएनजीसी और ओआईएल) द्वारा किया जाता है और शेष 23% कच्चे तेल का उत्पादन संविदा व्यवस्था में निजी/संयुक्त उद्यम कंपनियों/एनओसी द्वारा किया जाता है। जहां तक प्राकृतिक गैस के उत्पादन का संबंध है, 62% प्राकृतिक गैस नामांकन



बीपीसीएल पम्प, पुणे



ओएनजीसी पश्चिमी ऑफशोर

व्यवस्था से राष्ट्रीय तेल कंपनियों द्वारा उत्पादित किए गए, 39% प्राकृतिक गैस संविदा व्यवस्था से निजी/संयुक्त उद्यम कंपनियों/एनओसी द्वारा उत्पादित किए गए (जिसमें लगभग 2% कोल बेड मीथेन से था)।

वर्तमान में तेल और गैस का जितना उत्पादन हो रहा है वह देश की ऊर्जा मांग को पूरा करने के लिए पर्याप्त नहीं है और इसके कारण कच्चे तेल और प्राकृतिक गैस का आयात करना पड़ता है। वर्ष 2023–24 में पेट्रोलियम उत्पादों की खपत के आधार पर कच्चे तेल और प्राकृतिक गैस पर आयात निर्भरता क्रमशः 87.7% और 47.1% थी।

सरकार ने ऊर्जा सुरक्षा में सुधार करने और तेल तथा गैस की बढ़ती मांगों को पूरा करने के लिए एक बहुआयामी कार्यनीति अपनाई है जिसमें घरेलू स्तर पर तेल और गैस का उत्पादन बढ़ाना, ऊर्जा दक्षता और संरक्षण उपायों को बढ़ावा देना, मांग प्रतिस्थापन पर बल देना, जैव ईंधन और अन्य वैकल्पिक ईंधन/नवीकरणीय स्रोतों को बढ़ावा देना, ईवी चार्जिंग सुविधाएं और रिफाइनरी प्रक्रिया में सुधार करना आदि शामिल है। इसके अलावा, सरकार ने देश में जैव ईंधन की उपलब्धता को बढ़ाने और एथेनॉल ब्लेंडिंग, बायो–डीजल ब्लेंडिंग और वहनीय परिवहन के लिए किफायती परिवहन के लिए दीर्घकालिक विकल्प का उपयोग करने जैसी स्कीमों के माध्यम से एथेनॉल, बायो–डीजल और बायो–सीएनजी जैसे वैकल्पिक स्वच्छ ईंधन के उपयोग को बढ़ावा देने के लिए राष्ट्रीय जैव ईंधन नीति, 2018 लागू की है। सरकार ने विकास उन्मुख नीतियों के माध्यम से आर्थिक स्थिरता की दिशा में कई पहल की हैं, जिनमें अन्य के साथ–साथ कैपेक्स–आधारित विकास कार्यनीति, प्रत्यक्ष विदेशी निवेश में व्यापक सुधार, मुद्रास्फीति का नियंत्रण, वस्तु एवं सेवा कर सुधार, कॉर्पोरेट कर की दर में कटौती, मेक इन इंडिया और स्टार्ट–अप इंडिया कार्यनीतियां और उत्पादन से जुड़ी प्रोत्साहन योजनाएं आदि शामिल हैं।

1.2. तेल, गैस और पेट्रोलियम उत्पादों का उत्पादन

वर्ष 2023–24 के दौरान 29.36 (एमएमटी) कच्चे तेल का उत्पादन हुआ जबकि वर्ष 2022–23 में 29.18 एमएमटी उत्पादन हुआ था, जो 0.62% की वृद्धि दर्शाता है। ओएनजीसी के पश्चिमी अपतटीय क्षेत्र से कच्चे तेल का अधिकतम उत्पादन हुआ जो लगभग 13.196 एमएमटी था, यहां से 2023–24 के दौरान कुल 44.95% कच्चे तेल का उत्पादन हुआ है। वर्ष 2023–24 में कुल 29.36 एमएमटी कच्चे तेल और कंडेनसेट उत्पादन में से 65.43% (19.21 एमएमटी) उत्पादन ओएनजीसी (नामांकन क्षेत्र) से, 11.39% (3.344 एमएमटी) उत्पादन ओआईएल (नामांकन क्षेत्र) से और 23.18% (6.8 एमएमटी) पीएससी/आरएससी व्यवस्था से उत्पादन हुआ था।

वित्त वर्ष 2023–24 के दौरान 36.44 बिलियन क्यूबिक मीटर (बीसीएम) प्राकृतिक गैस का उत्पादन हुआ था, यह 2022–23 में 34.45 बीसीएम उत्पादन से 5.8% अधिक था। 2023–24 में कुल 36.64 बीसीएम प्राकृतिक गैस उत्पादन में से 53.02% (19.32 बीसीएम) ओएनजीसी (नामांकन क्षेत्र) से, 8.44% (3.091 बीसीएम) ओआईएल (नामांकन क्षेत्र) से और 38.54% (14.03 बीसीएम) पीएससी/आरएससी/सीबीएम व्यवस्था से हुआ था। प्राकृतिक गैस का अधिकतम उत्पादन ओएनजीसी के पश्चिमी अपतटीय क्षेत्र से हुआ जो लगभग 14.761 बीसीएम है, जो 2023–24 के दौरान प्राकृतिक गैस के कुल उत्पादन का 40.51% है।

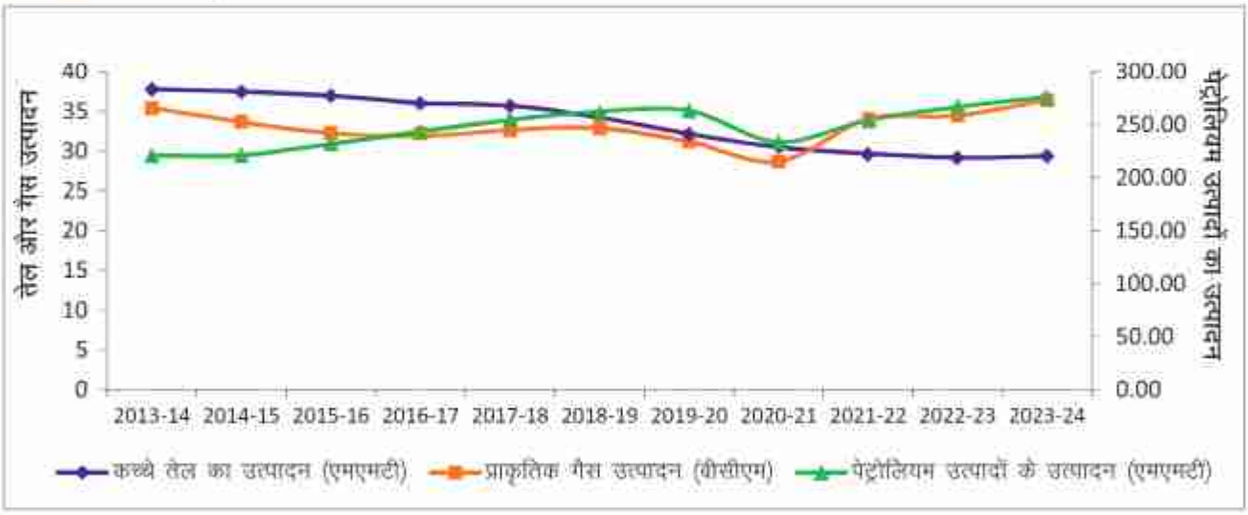
वर्ष 2023–24 के दौरान 276.09 एमएमटी पेट्रोलियम उत्पादों का उत्पादन हुआ, जो पिछले वर्ष के 266.54 एमएमटी उत्पादन से 3.6% अधिक था। कच्चे तेल, प्राकृतिक गैस और पेट्रोलियम उत्पादों के उत्पादन के रुझान नीचे दिए गए हैं:–

तालिका 1: कच्चे तेल, प्राकृतिक गैस और पेट्रोलियम उत्पादों में उत्पादन के रुझान

वर्ष	कच्चे तेल का उत्पादन (एमएमटी)	कच्चे तेल के उत्पादन में % वृद्धि	प्राकृतिक गैस उत्पादन (बीसीएम)	प्राकृतिक गैस उत्पादन में % वृद्धि	आयात किया गया कच्चा तेल (एमएमटी)	कच्चे तेल के आयात में % वृद्धि
2013-14	37.79	-0.19	35.41	-12.96	220.76	1.39
2014-15	37.46	-0.87	33.66	-4.94	221.14	0.17
2015-16	36.94	-1.39	32.25	-4.18	231.92	4.88
2016-17	36.01	-2.53	31.90	-1.09	243.55	5.01
2017-18	35.68	-0.90	32.65	2.36	254.40	4.46
2018-19	34.20	-4.15	32.87	0.69	262.36	3.13
2019-20	32.17	-5.95	31.18	-5.14	262.94	0.22
2020-21	30.49	-5.21	28.67	-8.05	233.51	-11.19
2021-22	29.69	-2.63	34.02	18.66	254.31	8.90
2022-23	29.18	-1.72	34.45	1.25	266.54	4.81
2023-24 (पी)	**29.36**	**0.61**	**36.44**	**5.77**	**276.09**	**3.58**

पी: अनंतिम

ग्राफ 1: कच्चे तेल, प्राकृतिक गैस और पेट्रोलियम उत्पादों में उत्पादन के रुझान



1.3. रिफाइनिंग क्षमता और रिफाइनरी क्रूड थ्रूपुट

भारतीय रिफाइनिंग उद्योग ने स्वयं को विश्व स्तर पर एक प्रमुख खिलाड़ी के रूप में स्थापित करने के संदर्भ में उत्कृष्ट प्रदर्शन किया है। भारत, जो विश्व का चौथा सबसे बड़ा रिफाइनर है और चीन के बाद एशिया में दूसरा सबसे बड़ा रिफाइनर है, एक रिफाइनिंग हब के रूप में उभर रहा है, जिसकी रिफाइनिंग क्षमता मांग से अधिक है। 31 मार्च 2024 तक, भारत की तेल रिफाइनिंग क्षमता 31 मार्च 2023 के 253.92 एमएमटीपीए की क्षमता से बढ़कर 256.82 मिलियन मीट्रिक टन प्रति वर्ष (एमएमटीपीए) हो गई है।

वित्त वर्ष 2023–24 के दौरान संसाधित कच्चा तेल वित्त वर्ष 2022–23 में संसाधित 255.2 एमएमटी की तुलना में 261.5 एमएमटी था, जो 2.47% की वृद्धि दर्शाता है। वर्ष 2023–24 के दौरान रिफाइनरी क्षमता उपयोग 102.99% (अनंतिम) था। रिफाइनिंग क्षमता और कच्चे तेल थ्रूपुट का रुझान नीचे दिया गया है:

तालिका 2: रिफाइनरी क्षमता और संशोधित रिफाइनरी कच्चे तेल का रुझान

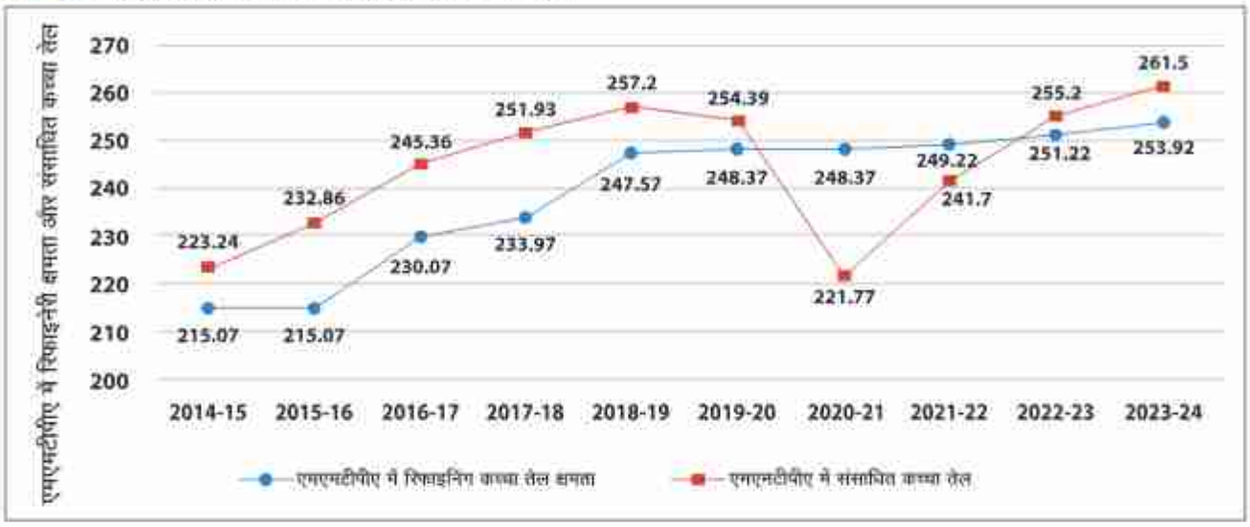
वर्ष	रिफाइनरी क्षमता (एमएमटीपीए)	रिफाइनरी क्षमता में वृद्धि का %	संसाधित कच्चा तेल	संसाधित कच्चे तेल में % वृद्धि	रिफाइनिंग क्षमता की उपयोगिता
2014-15	215.07	0.00	223.24	0	103.80
2015-16	215.07	0.00	232.86	4.31	108.27
2016-17	230.07	6.97	245.36	5.37	106.65
2017-18	233.97	1.70	251.93	2.68	107.68
2018-19	247.57	5.81	257.2	2.09	103.89
2019-20	248.37	0.32	254.39	-1.09	102.42
2020-21	248.37	0.00	221.77	-12.82	89.29
2021-22	249.22	0.34	241.70	8.99	96.98
2022-23	251.22	0.80	255.20	5.59	101.58
2023-24 (पी)	**253.92**	**1.07**	**261.50**	**2.47**	**102.99**
01.04.2024 तक	256.82	1.14			

(पी: अनंतिम, @: प्रारंभिक वर्ष में 1 अप्रैल की स्थिति के अनुसार)



बीपीसीएल कोची रिफाइनरी

ग्राफ 2 : रिफाइनरी क्षमता और संसाधित कच्चे तेल का रुझान



1.4. पेट्रोलियम उत्पादों और प्राकृतिक गैस की खपत

देश ने पिछले कुछ वर्षों में निरंतर आर्थिक विकास किया है, जिसके परिणामस्वरूप औद्योगीकरण, नगरीकरण और अवसंरचनात्मक विकास के साथ–साथ वाहनों की कुल बिक्री में वृद्धि हुई है। ये प्रमुख कारक हैं जिनसे परिवहन, ऊर्जा और ईंधन की समग्र मांग बढ़ी है, जिसके परिणामस्वरूप ईंधन की खपत बढ़ रही है। वाहन स्वामित्व और सड़क परिवहन के उपयोग में वृद्धि के कारण तेल की खपत और आयात में तेजी से वृद्धि हुई है। प्रधानमंत्री उज्ज्वला योजना (पीएमयूवाई) के तहत गरीबी रेखा से नीचे रहने वाले परिवारों को एलपीजी कनेक्शन प्रदान की जाती है। ग्रामीण क्षेत्रों में एलपीजी के बढ़ते उपयोग के साथ–साथ नगरी क्षेत्रों में भी पाइपलाइन प्राकृतिक गैस (पीएनजी) के उपयोग में वृद्धि हुई है। परिवहन क्षेत्र में भी हाल के वर्षों में उल्लेखनीय वृद्धि हुई है, जो सबसे तेजी से विकसित होने वाला अंतिम–उपयोक्ता के रूप में उभरा है। भारत अपने परिवहन संबंधी अवसंरचनाओं के महत्वपूर्ण विस्तार की ओर अग्रसर है जिनमें राजमार्गों, रेलवे और मेट्रो लाइनों से लेकर हवाई अड्डे और बंदरगाह तक शामिल है।

वित्त वर्ष 2023–24 के दौरान लगभग 234.3 एमएमटी की मात्रा के साथ पेट्रोलियम उत्पादों की खपत, वित्त वर्ष 2022–23 के दौरान लगभग 223.0 एमएमटी की मात्रा की तुलना में 5% की वृद्धि दर्शाता है। प्राकृतिक गैस की हमारी मांग का लगभग 52.9% हिस्सा स्वदेशी स्रोतों से पूरा होता है और इस मांग का 47.1% आयात पर निर्भर



बीपीसीएल पेट्रोकेमिकल कॉम्प्लेक्स, नेपेटकंडा

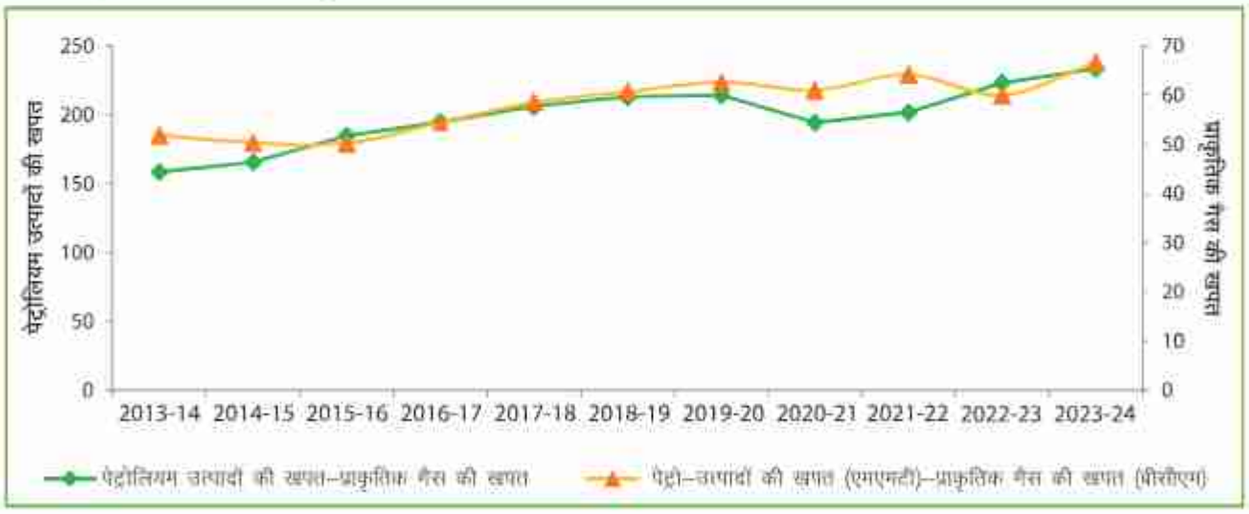
है। वर्ष 2023–24 में प्राकृतिक गैस की कुल खपत 67.51 बीसीएम है जो 2022–23 (59.97 बीसीएम) के दौरान हुए खपत से 12.58% अधिक है। ऊर्जा उद्देश्यों के लिए ईंधन के रूप में प्राकृतिक गैस की खपत 62.3% है, जबकि गैर–ऊर्जा उद्देश्य के लिए फीडस्टॉक के रूप में इसकी खपत 37.7% है। वर्ष 2023–24 के दौरान, प्राकृतिक गैस की सबसे अधिक खपत 31% उर्वरक उद्योग में हुई, इसके बाद नगर और स्थानीय प्राकृतिक गैस वितरण नेटवर्क (सड़क परिवहन सहित) में 20%, विद्युत क्षेत्र में 13% और रिफाइनरी में 8% हुई।

तालिका 3: पेट्रोलियम उत्पादों और प्राकृतिक गैस की खपत

वर्ष	पेट्रो–उत्पादों की खपत (एमएमटी)	पेट्रो–उत्पादों की खपत में % वृद्धि	प्राकृतिक गैस की खपत (बीसीएम)	प्राकृतिक गैस की खपत का % वृद्धि
2013-14	158.41	0.86	51.83	-9.33
2014-15	165.52	4.49	50.30	-2.94
2015-16	184.67	11.57	50.18	-0.24
2016-17	194.60	5.37	54.41	8.43
2017-18	206.17	5.95	58.47	7.45
2018-19	213.22	3.42	60.60	3.66
2019-20	214.13	0.43	62.61	3.31
2020-21	194.30	-9.26	60.98	-2.60
2021-22	201.70	3.81	64.16	5.21
2022-23	223.02	10.57	59.97	-6.53
2023-24 (पी)	**234.30**	**5.00**	**67.51**	**12.58**

(पी–अंतिम)

ग्राफ 3: पेट्रोलियम उत्पादों और प्राकृतिक गैस की खपत



1.5. संवेदनशील पेट्रोलियम उत्पादों और कच्चे तेल के संबंध में मूल्य निर्धारण नीति

भारत के घरेलू मांगों को पूरा करने के लिए आयात पर निर्भर होने से अंतर्राष्ट्रीय बाजारों में कच्चे तेल और पेट्रोलियम उत्पादों की कीमतें पेट्रोलियम उत्पादों की घरेलू कीमतों पर निर्णायक प्रभाव डालती हैं। भारतीय बास्केट के कच्चे तेल की कीमतें तीन वर्षों से अधिक समय तक लगातार 100 डॉलर प्रति बैरल से अधिक थीं परंतु 2014 की दूसरी छमाही के दौरान ये कीमतें तेजी से

गिरने लगीं। परिणामस्वरूप, वर्ष 2015–16, 2016–17 और 2017–18 के दौरान भारतीय बास्केट के कच्चे तेल की औसत कीमत क्रमशः 46.17 डॉलर प्रति बैरल, 47.56 डॉलर प्रति बैरल और 56.43 डॉलर प्रति बैरल हो गई। वर्ष 2018–19 के दौरान ये कीमतें बढ़कर 69.88 डॉलर प्रति बैरल हो गई और वर्ष 2019–20 में फिर ये गिरकर 60.47 डॉलर प्रति बैरल हो गई। अप्रैल 2020 के दौरान कीमतें +19.90/बीबीएल के निचले स्तर से बढ़कर मार्च 2021 के दौरान +64.73/बीबीएल के उच्च स्तर पर पहुंच गईं और 2020–21 के लिए औसतन +44.82/बीबीएल रहीं और 2021–22 के दौरान ये बढ़कर +79.18/बीबीएल हो गईं। कच्चे तेल की भारतीय बास्केट की कीमतें वर्ष 2022–23 और 2023–24 के दौरान क्रमशः +93.15/बीबीएल और +82.58/बीबीएल औसतन रही है।

1.6. कच्चे तेल और प्राकृतिक गैस (एलएनजी) का आयात:

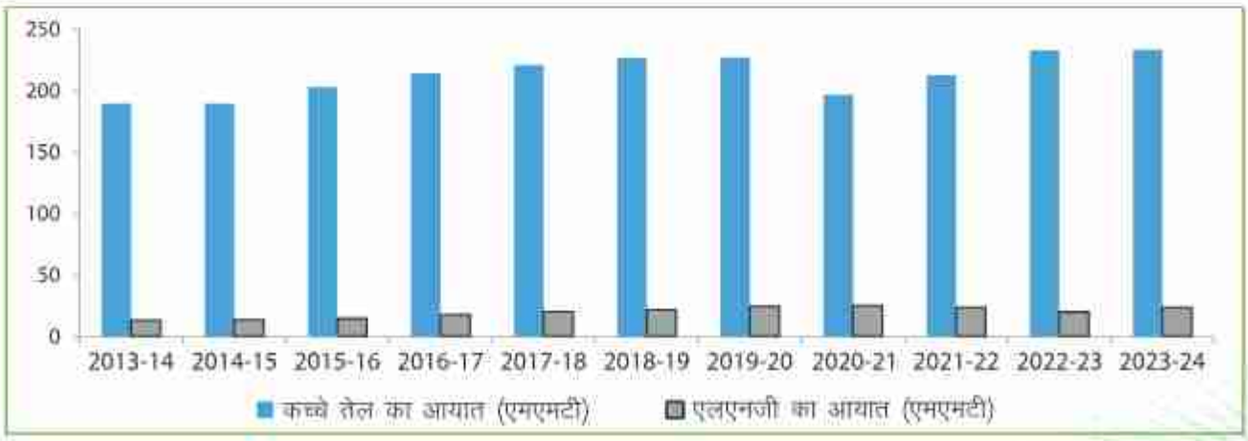
वर्ष 2023–24 के दौरान 233.1 एमएमटी कच्चे तेल का आयात हुआ, जिसका मूल्य ₹ 11,00,589 करोड था, जबकि 2022–23 में 232.7 एमएमटी का आयात हुआ, जिसका मूल्य ₹ 12,60,372 करोड़ था, यह वर्ष 2022–23 की तुलना में मात्रा की दृष्टि से 0.2% अधिक और मूल्य की दृष्टि से 12.7% कम है। वर्ष 2023–24 में 24.00 एमएमटी (पी) प्राकृतिक गैस (एलएनजी) आयात हुआ, जिसका मूल्य ₹ 1,10,994 करोड़ (पी) था, जबकि 2022–23 में ₹ 1,37,210 करोड़ मूल्य के 19.85 एमएमटी का आयात हुआ, जो 2022–23 की तुलना में मात्रा की दृष्टि से 17.5% (पी) अधिक और मूल्य की दृष्टि से 20.0% (पी) कम है। कच्चे तेल और प्राकृतिक गैस (एलएनजी) की वृद्धि का रुझान तालिका–4 और ग्राफ–4 में दिखाया गया है।

तालिका 4: कच्चे तेल और एलएनजी के आयात का रुझान

वर्ष	कच्चे तेल का आयात (एमएमटी)	कच्चे तेल के आयात में % वृद्धि	एलएनजी का आयात (एमएमटी)	एलएनजी के आयात में % वृद्धि
2013-14	189.24	2.40	13.02	-0.88
2014-15	189.43	0.10	13.29	2.06
2015-16	202.85	7.08	14.38	8.19
2016-17	213.93	5.46	17.78	23.69
2017-18	220.43	3.04	20.18	13.46
2018-19	226.50	2.75	21.54	6.78
2019-20	226.95	0.20	24.42	13.33
2020-21	196.46	-13.44	25.05	2.61
2021-22	212.38	8.10	23.42	-6.54
2022-23	232.70	9.57	19.85	-15.22
2023-24(पी)	**233.12**	**0.18**	**24.00**	**20.9**

(पी: अनंतिम)

ग्राफ 4: कच्चे तेल और प्राकृतिक गैस (एलएनजी) का आयात



1.7. पेट्रोलियम उत्पादों का आयात और निर्यात

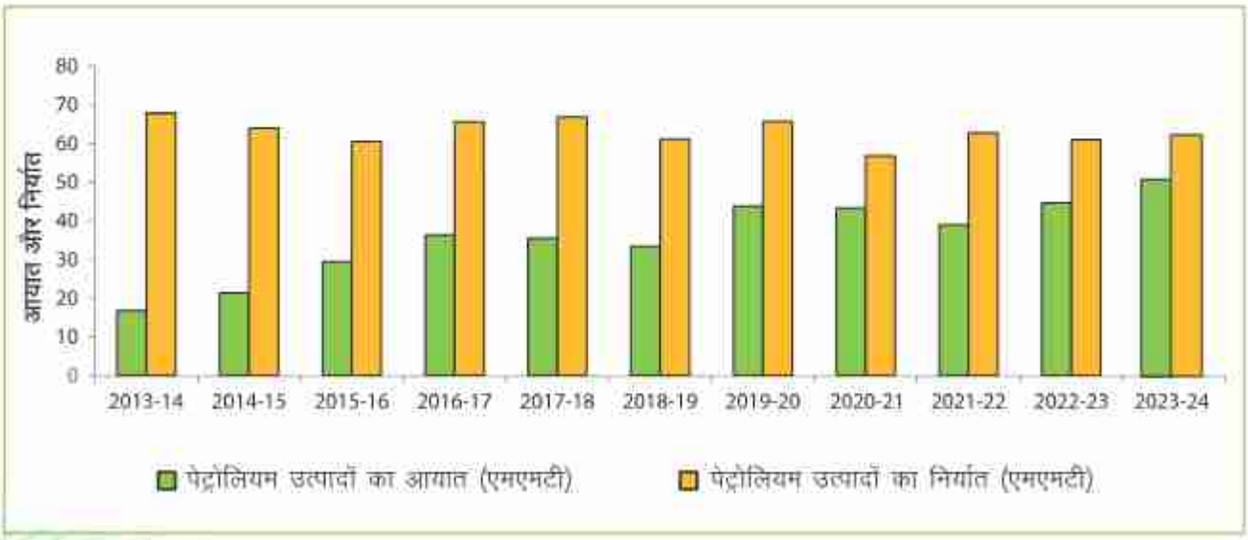
वर्ष 2023–24 के दौरान 48.67 एमएमटी (अनंतिम) पेट्रोलियम उत्पादों का आयात किया गया, जिसका मूल्य ₹ 1,90,914 करोड़ (अनंतिम) था, जबकि वर्ष 2022–23 में 44.6 एमएमटी आयात हुआ, जिसका मूल्य ₹ 2,15,854 करोड़ था, जो कि वर्ष 2022–23 की तुलना में मात्रा की दृष्टि से 9.1% अधिक और मूल्य की दृष्टि से 11.6% कम है। इसके अलावा, 2023–24 के दौरान 62.4 एमएमटी (अनंतिम) पेट्रोलियम उत्पादों का निर्यात हुआ था, जिसका मूल्य ₹ 3,94,153 करोड़ (अनंतिम) था, जो मात्रा की दृष्टि से 2.3% की वृद्धि और मूल्य की दृष्टि से 14.1% की कमी दर्शाता है, जबकि 2022–23 के दौरान 61.0 एमएमटी निर्यात हुआ जिसका मूल्य ₹ 4,58,729 करोड़ था। मात्रा की दृष्टि से पेट्रोलियम उत्पादों के आयात और निर्यात का रुझान नीचे दिया गया है:

तालिका 5: पेट्रोलियम उत्पादों का आयात और निर्यात

वर्ष	पेट्रोलियम उत्पादों का आयात (एमएमटी)	पेट्रोलियम उत्पादों के आयात में वृद्धि का %	पेट्रोलियम उत्पादों का निर्यात (एमएमटी)	पेट्रोलियम उत्पादों के निर्यात में वृद्धि का %
2013-14	16.70	2.10	67.86	7.03
2014-15	21.30	27.57	63.93	-5.79
2015-16	29.46	38.28	60.54	-5.31
2016-17	36.29	23.19	65.51	8.22
2017-18	35.46	-2.28	66.83	2.01
2018-19	33.35	-5.96	61.10	-8.58
2019-20	43.79	31.30	65.69	7.51
2020-21	43.25	-1.23	56.77	-13.57
2021-22	39.02	-9.78	62.75	10.54
2022-23	44.60	14.30	61.01	-2.77
2023-24 (पी)	**48.67**	**9.13**	**62.44**	**2.33**

(पी: अनंतिम)

ग्राफ 5: पेट्रोलियम उत्पादों के आयात और निर्यात का रुझान



1.8. विदेश से इक्विटी तेल और गैस

वित्त वर्ष 2023–24 के दौरान, भारत ने अपनी मांग की पूर्ति के लिए कच्चे तेल का ~87.7% और प्राकृतिक गैस का ~47.1% आयात किया। किसी एक भौगोलिक क्षेत्र पर अत्यधिक निर्भर होने से हमारी ऊर्जा सुरक्षा पर प्रतिकूल प्रभाव पड़ सकता है। कच्चे तेल और प्राकृतिक गैस की आपूर्ति के संभावित खतरे से बचने और ओपीईसी पर अपनी निर्भरता को कम करने के लिए, सरकार तेल और गैस के आपूर्ति स्रोतों के विविधीकरण पर बल दे रही है। पिछले कुछ वर्षों में, यूएसए, कनाडा, अंगोला और गुयाना जैसे कच्चे तेल के नए आपूर्तिकर्ता से संबंध बनाए गए हैं। इसी प्रकार से, एलएनजी आयात भी जो कतर से होता था अब ऑस्ट्रेलिया, यूएसए, रूस जैसे नए स्रोतों से होने लगा है।

विदेशी परिसंपत्तियों के अधिग्रहण के अपने रुख में आमूलचूल परिवर्तन करते हुए भारत धीरे–धीरे शुद्ध लाभांश–आधारित निवेश मॉडल के स्थान पर इक्विटी तेल मॉडल की हकदारी की ओर बढ़ रहा है। इससे हमें अपनी बढ़ती ऊर्जा जरूरतों के लिए महत्वपूर्ण तेल सुरक्षित करने में मदद मिलेगी। वित्त वर्ष 2023–24 के दौरान, तेल और गैस का विदेशी उत्पादन लगभग 19.9 एमएमटीओई था, जो भारत के घरेलू उत्पादन का एक बड़ा हिस्सा है।



1.9. अन्वेषण और लाइसेंसिंग नीति में सुधार

सरकार ने अन्वेषण गतिविधियों को तेज करने, विदेशी और घरेलू निवेश आकर्षित करने और घरेलू उत्पादन बढ़ाने के उद्देश्य से विभिन्न नीतिगत पहलें की हैं। सरकार द्वारा तेल और गैस के घरेलू उत्पादन को बढ़ाने और आयात पर निर्भरता को कम करने के लिए की गई प्रमुख नीतिगत पहलें निम्नानुसार हैं:

दीर्घकालिक पहलें:

i. हाइड्रोकार्बन खोजों के शीघ्र मौद्रिककरण के लिए प्रोडक्शन शेयरिंग कॉन्ट्रैक्ट्स (पीएससी) व्यवस्था में छूट, विस्तार और स्पष्टीकरण से संबंधित नीति, 2014

ii पता लगाए गए लघु क्षेत्र संबंधी नीति, 2015

iii हाइड्रोकार्बन एक्सप्लोरेशन और लाइसेंसिंग पॉलिसी, 2016

iv ओपन एकरेज लाइसेंसिंग पॉलिसी (ओएएलपी) हाइड्रोकार्बन एक्सप्लोरेशन और लाइसेंसिंग पॉलिसी (एचईएलपी) के संचालन की पद्धति का निर्धारण, 2017

v प्रोडक्शन शेयरिंग कॉन्ट्रैक्ट्स के विस्तार की नीति, 2016 और 2017

vi कोल बेड मीथेन के शीघ्र मौद्रीकरण की नीति, 2017

vii राष्ट्रीय डेटा कोष की स्थापना, 2017

viii तलछटीय बेसिन में गैर मूल्यांकित क्षेत्रों का मूल्यांकन, 2017

ix हाइड्रोकार्बन संसाधनों का पुनर्मूल्यांकन, 2017

x पेट्रोलियम संचालन के लिए स्थल के पुर्नउत्थान और परित्याग संबंधी दिशानिर्देश, 2017

xi प्री–एनईएलपी और एनईएलपी ब्लॉक में प्रोडक्शन शेयरिंग कॉन्ट्रैक्ट्स के कामकाज को कारगर बनाने का ढांचा, 2018

xii पेट्रोलियम एवं प्राकृतिक गैस नियम के नियम–3 के खंड (के) के तहत 'पेट्रोलियम' की परिभाषा में संशोधन, 2018

xiii तेल और गैस के लिए उन्नत पुनर्प्राप्ति विधियों को बढ़ावा देने और प्रोत्साहन देने की नीति, 2018

xiv मौजूदा प्रोडक्शन शेयरिंग कॉन्ट्रैक्ट्स, कोल बेड मीथेन कॉन्ट्रैक्ट्स और नामांकित क्षेत्रों के तहत अपरंपरागत हाइड्रोकार्बन के अनुप्रयोग और अन्वेषण के लिए नीतिगत ढांचा, 2018

xv कोल इंडिया लिमिटेड (सीआईएल) और उसकी सहायक कंपनियों को आवंटित कोयला खनन पट्टे के तहत क्षेत्रों के लिए कोल बेड मीथेन (सीबीएम) के अनुप्रयोग और अन्वेषण के लिए नीतिगत ढांचा, 2018

xvi प्री–एनईएलपी और एनईएलपी ब्लॉक के संबंध में प्रोडक्शन शेयरिंग कॉन्ट्रैक्ट्स के कार्यान्वयन को सुव्यवस्थित करने के लिए नीतिगत ढांचा, 2018

xvii तेल और गैस के घरेलू अन्वेषण और उत्पादन को बढ़ावा देने के लिए हाइड्रोकार्बन अन्वेषण और लाइसेंसिंग नीति में सुधार, 2019

xviii विवाद समाधान समिति, 2019

xix प्राकृतिक गैस विपणन सुधार, 2020

xx ई–बिडिंग के माध्यम से घरेलू उत्पादित प्राकृतिक गैस के लिए बाजार मूल्य की खोज, 2020

xxi घरेलू स्तर पर उत्पादित कच्चे तेल की बिक्री पर नियंत्रण, 2022

xxii विपणन और मूल्य निर्धारण स्वतंत्रता के साथ डीपवाटर, अल्ट्रा डीपवाटर और उच्च दबाव–उच्च तापमान क्षेत्रों में की गई खोजों से उत्पादित गैस का बाजार मूल्य और बिक्री और पुनर्विक्रय का पता लगाना, 13 जनवरी, 2023

xxiii भारतीय नौसेना के साथ विशेष व्यवस्था के तहत, लगभग 99% गैर–गमनीय क्षेत्रों को अन्वेषण और उत्पादन गतिविधियों के लिए खोल दिया गया है।

अल्पकालिक पहल:

i. मौजूदा खोजों का शीघ्र मुद्रीकरण

ii आईओआर/ईओआर तकनीकों के कार्यान्वयन और मौजूदा परिपक्व क्षेत्रों के पुनर्विकास के माध्यम से रिकवरी फैक्टर में वृद्धि।

iii इनफिल तेल/गैस कुओं की ड्रिलिंग

iv सेवा संविदाओं और आउटसोर्सिंग के माध्यम से ऑनशोर लघु और छुटपुट खोजों का मुद्रीकरण

v मौजूदा परिपक्व क्षेत्रों का पुनर्विकास और नए क्षेत्रों/छोटे क्षेत्रों का विकास

vi चुनिंदा क्षेत्रों में उपयुक्त प्रौद्योगिकियों का समावेश

vii उत्पादन संवर्द्धन संविदों का कार्यान्वयन।

viii आईओआर/ईओआर तकनीकों का कार्यान्वयन।

ईज ऑफ डूइंग बिजनेस को बढ़ावा देना:

i डीजीएच की पुनर्परिभाषित भूमिका: अनुपालन/नियामक, विकास और समन्वय भूमिका को शामिल करते हुए डीजीएच की भूमिका को और सुदृढ़ करने के लिए अक्टूबर 2019 को अतिरिक्त शक्तियों और कार्यों का प्रत्यायोजन।

ii सरकार/डीजीएच/प्रबंधन समिति की मंजूरी में कटौती और शीघ्र मंजूरी दिए जाने पर बल देने के साथ सरलीकृत संविदात्मक शर्तें।

iii निम्नलिखित के लिए आईटी वर्कफ्लो के आधार पर अनुमोदन प्रदान करने के लिए और इसकी प्रक्रिया निर्धारित करने के लिए डीजीएच में इलेक्ट्रॉनिक सिंगल विंडो क्लीयरेंस सिस्टम बनाया गया:

क. पीईएल/पीएमएल एप्लीकेशन प्रणाली

ख. पीडीएमएस प्रणाली

ग. पीएससी प्रबंधन प्रणाली

घ. ईसीएमएस एप्लीकेशन

ङ. पोत निकासी प्रबंधन प्रणाली (वीसीएमएस)

च. एक्सपैट क्लीयरेंस प्रणाली

छ. पर्यावरण मंजूरी

iv. 37 पीएससी प्रक्रियाओं के लिए स्व–प्रमाणन के आधार पर दस्तावेज प्रस्तुत करने के लिए मानक संचालन प्रक्रिया (एसओपी) सहित प्रक्रियाओं और कार्यप्रणालियों का सरलीकरण।

1.10. हाइड्रोकार्बन अन्वेषण लाइसेंसिंग नीति (एचईएलपी)

सरकार द्वारा 30 मार्च, 2016 को हाइड्रोकार्बन एक्सप्लोरेशन लाइसेंसिंग पॉलिसी (एचईएलपी) को अधिसूचित किया गया था और दिनांक 1 जुलाई, 2017 को ओपन एकरेज लाइसेंसिंग पॉलिसी (ओएएलपी) की

अधिसूचना के साथ इसे औपचारिक रूप से शुरू किया था। हाइड्रोकार्बन एक्सप्लोरेशन लाइसेंसिंग पॉलिसी (एचईएलपी) प्रोडक्शन शेयरिंग कॉन्ट्रैक्ट (पीएससी) व्यवस्था से रेवेन्यू शेयरिंग कॉन्ट्रैक्ट (आरएससी) व्यवस्था में एक आदर्श बदलाव है, जो 'ईज ऑफ डूइंग बिजनेस' के सिद्धांत के आधार पर नियामक बोझ को कम करके भविष्य में अन्वेषण और उत्पादन (ई एंड पी) गतिविधियों के लिए नियामक व्यवस्था को पूरी तरह से खत्म करता है। यह नीति अन्य बातों के साथ–साथ ईएंडपी ऑपरेटरों को एक समान लाइसेंसिंग के माध्यम से तेल क्षेत्र विनियमन और विकास (ओआरडी) अधिनियम, 1948 और पेट्रोलियम एवं प्राकृतिक गैस (पीएनजी) नियम, 1959 के तहत कवर किए गए सभी हाइड्रोकार्बन संसाधनों (पारंपरिक और अपरंपरागत) का पता लगाने और उनके दोहन के लिए उन्हें सक्षम बनाती है। एचईएलपी नीति की मुख्य विशेषताएं इस प्रकार हैं:

- सभी प्रकार के हाइड्रोकार्बन के लिए एक लाइसेंस
- राजस्व साझाकरण मॉडल
- ब्लॉक बनाने की स्वतंत्रता
- वर्ष भर रुचि प्रकटन प्रस्तुत करना
- मूल्य निर्धारण और विपणन स्वतंत्रता
- कम रॉयल्टी दरें

इस नीति को बेहतर बनाने के लिए, सरकार ने 28 फरवरी 2019 को नीतिगत सुधारों को अधिसूचित किया, जहाँ "ईज ऑफ डूइंग" को बढ़ावा देने के लिए कई प्रक्रियाओं और अनुमोदनों में ढील दी गई। ये सुधार उपरोक्त लाभों के अतिरिक्त कई अन्य लाभ भी प्रदान करते हैं, जिनमें से कुछ निम्न हैं:

- राजस्व अंश की तुलना में कार्य संबंधी कार्यक्रम को अधिक महत्व देना।
- मात्र एक वित्तीय वर्ष में 2.5 बिलियन अमरीकी डालर के अप्रत्याशित लाभ के मामले को छोड़कर श्रेणी II और III प्रकार के बेसिनों से राजस्व अंश को हटा दिया गया।
- ओएएलपी ब्लॉकों में शीघ्र उत्पादन के लिए रॉयल्टी दरों में रियायत।
- एफडीपी में संशोधन करने का लचीलापन
- ब्लॉकों को हस्तांतरित/बाहर निकालने की स्वतंत्रता
- ड्रिल स्टेम टेस्ट चलाने की बाध्यता हटाना

इसके अलावा, अल्प–शोधित श्रेणी–II और III बेसिनों में और अधिक प्रोत्साहन देने की आवश्यकता को पहचानते हुए, ओएएलपी बोली दस्तावेजों में 2023 में बदलाव करके कई अतिरिक्त प्रोत्साहन शामिल किए गए हैं।

इसके अलावा, अल्प–शोधित श्रेणी–II और III बेसिनों में और अधिक प्रोत्साहन देने की आवश्यकता को पहचानते हुए, ओएएलपी–VIII और आगामी दौरों के लिए कई अतिरिक्त प्रोत्साहन शामिल किए गए हैं:–

- केवल भूकंपीय कार्य से जुड़े कार्यक्रम के लिए प्रतिबद्धता और बोली के समय कुआं संबंधी प्रतिबद्ध शामिल नहीं करना।
- स्थिरीकरण अवधि में वृद्धि, शीघ्र मौद्रीकरण योजनाएँ।
- क्षम्य विलम्ब का प्रावधान।
- बोली और ईओआई जमा करने की प्रक्रिया को तर्कसंगत बनाना।

एकरेज क्षेत्रों को अन्वेषण और विकास के लिए प्रदान करने हेतु एचईएलपी/ओपन एकरेज लाइसेंसिंग नीति (ओएएलपी) के तहत निम्नलिखित कदम उठाए गए हैं:

i. ओएएलपी बोली प्रक्रिया के आठ राउंड के माध्यम से सभी बेसिन श्रेणियों में 2,42,056 वर्ग किलोमीटर क्षेत्र में फैले कुल 144 अन्वेषण ब्लॉक सफल बोलीदाताओं को सौंपे गए हैं।

ii. अन्वेषण और विकास के तहत एकरेज को और बढ़ाने के लिए, सरकार ने 03 जनवरी, 2024 को अंतर्राष्ट्रीय प्रतिस्पर्धी बोली के लिए 28 ब्लॉक पेश करते हुए ओएएलपी बोली राउंड–IX शुरू किया है। बोलीकर्ता राष्ट्रीय डेटा रिपॉजिटरी (एनडीआर) में उपलब्ध डेटा का अध्ययन कर सकते हैं और बोली के लिए ब्लॉक का चयन कर सकते हैं। बोलियां 29 फरवरी, 2024 तक एक समर्पित ऑनलाइन ई–बिडिंग पोर्टल के माध्यम से प्रस्तुत की जा सकती हैं। कुल 9 (नौ) ऑनलैंड ब्लॉक, 8 (आठ) शैलो–वाटर ब्लॉक और 11 (ग्यारह) अल्ट्रा डीप–वाटर ब्लॉक पेश किए गए हैं।

iii. ओएएलपी (एससीवीएम–2021) के तहत विशेष सीबीएम बोली राउंड 2021: भारत सरकार ने 22 सितंबर 2021 को ओपन एकरेज लाइसेंसिंग पॉलिसी (ओएएलपी) के तहत विशेष सीबीएम बोली राउंड–2021 का शुभारंभ किया, जिसमें 700 बीसीएम पूर्वानुमानित सीबीएम संसाधन के साथ 8,458 वर्ग किमी को कवर करने वाले 15 सीबीएम ब्लॉक पेश किए गए। अंतर्राष्ट्रीय प्रतिस्पर्धी बोली (आईसीबी) और प्राप्त बोलियों के बाद किए गए मूल्यांकन के आधार पर, 3,862 वर्ग किमी को कवर करने वाले 4 ब्लॉक जिनमें लगभग 120 बीसीएम सीबीएम संसाधन मौजूद थे तीन कंपनियों को सौंपे गए, जिनमें एक एनओसी (ओएनजीसी) और 2 निजी कंपनियां (वेदांता और इनवेनेरे पेट्रोडाइन एनजी) शामिल हैं और 9 सितंबर 2022 को भारत सरकार के साथ राजस्व साझाकरण संविदा (आरएससी) पर हस्ताक्षर किए गए।

iv. ओएएलपी (एससीबीएम–2022) के तहत विशेष सीबीएम बोली राउंड 2022: भारत सरकार ने एससीबीएम–2022 के तहत अंतर्राष्ट्रीय प्रतिस्पर्धी बोली ('आईसीबी') के माध्यम से ओपन एकरेज लाइसेंसिंग नीति ('ओएएलपी') के तहत 5,817 वर्ग किमी क्षेत्र को कवर करने वाले 16 सीबीएम ब्लॉकों की पेशकश की घोषणा की। एससीबीएम–2022 के लिए बोली लगाने की समयसीमा 01 मई, 2023 से 30 जून 2023 तक थी। 3 सीबीएम ब्लॉकों (717 वर्ग किमी) के लिए बोलियां प्राप्त हुईं और दिसंबर, 2023 में सफल बोलीकर्ताओं को ब्लॉक सौंपे गए और 03 जनवरी 2024 को संविदा पर हस्ताक्षर किए गए।



1.11. खोजे गए लघु क्षेत्र नीति (डीएसएफ)

दिनांक 14.10.2015 के राजपत्र संकल्प द्वारा अधिसूचित सीमांत क्षेत्र नीति (एमएफपी) और जिसे बाद में दिनांक 05.04.2018 की अधिसूचना के माध्यम से खोजे गए लघु क्षेत्र संबंधी नीति (डीएसएफ) के रूप में पुनर्नामित किया गया था, जिसका उद्देश्य तेल और गैस के घरेलू उत्पादन को बढ़ाने के लिए समयबद्ध चरणों में वर्षों से बंद हाइड्रोकार्बन संसाधनों का मौद्रीकरण करना है। डीएसएफ बोली दौर–I (2016) और डीएसएफ बोली दौर–II (2018) और डीएसएफ बोली दौर–III (2022) के तीन संपन्न डीएसएफ बोली दौर के तहत, सफल बोलीदाताओं को कुल 85 राजस्व शेयरिंग कॉन्ट्रैक्ट्स (आरएससी) जिसमें 175 डिस्कवरी/फील्ड शामिल हैं सौंपे गए थे।

1.12. प्राकृतिक गैस विपणन सुधार

i. गैस आधारित अर्थव्यवस्था की ओर बढ़ते हुए एक अन्य महत्वपूर्ण कदम उठाते हुए सरकार ने हेनरी हब (यूएसए), अल्बर्टा (कनाडा), एनबीपी (यूके), रूस आदि जैसे प्रमुख अंतर्राष्ट्रीय केंद्रों में प्रचलित कीमतों के आधार पर अक्टूबर, 2014 में 'नए घरेलू प्राकृतिक गैस मूल्य निर्धारण दिशानिर्देशों' को मंजूरी दी ताकि उत्पादक और उपभोक्ता दोनों की आवश्यकताओं के बीच संतुलन रखा जा सके। प्राकृतिक गैस की कीमतों का हर छह महीने में संशोधन किया जाता है जिसे पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के तहत पेट्रोलियम योजना और विश्लेषण सेल (पीपीएसी) द्वारा अधिसूचित किया जाता है। ये दिशानिर्देश नामांकित क्षेत्रों और एनईएलपी, पूर्व–एनईएलपी ब्लॉकों/क्षेत्रों से उत्पादित प्राकृतिक गैस पर लागू होते हैं, जहां सरकार द्वारा उत्पादन साझेदारी संविदा (पीएससी) के अनुसार मूल्य निर्धारण अनुमोदित किया जाता है।

ii तदनुसार, 2015 के बाद से सरकार ने डीएसएफ, ओएएलपी, सीबीएम व्यवस्थाओं के तहत गैस के

लिए तथा 28.02.2019 के बाद उत्तर–पूर्वी क्षेत्र (एनईआर) से उत्पादित गैस और नई गैस खोजों के लिए सभी व्यवस्थाओं के तहत विपणन और मूल्य निर्धारण स्वतंत्रता प्रदान की।

iii उच्च दबाव–उच्च तापमान (एचपी–एचटी) जलाशयों और गहरे पानी और अत्यधिक गहरे पानी वाले क्षेत्रों जैसे दुर्गम क्षेत्रों में गैस उत्पादन को प्रोत्साहित करने के लिए सरकार ने 23 मार्च, 2016 को प्राकृतिक गैस उत्पादन पर मूल्य निर्धारण स्वतंत्रता सहित विपणन करने की छूट प्रदान की जिसमें पेट्रोलियम आयोजना और विश्लेषण सेल (पीपीएसी) द्वारा घोषित अर्धवार्षिक आधार की मूल्य सीमा लागू है।

iv इसके अलावा, दिनांक 15.10.2020 के अधिसूचना के माध्यम से एक पारदर्शी और प्रतिस्पर्धी प्रक्रिया के माध्यम से गैस के बाजार मूल्य की खोज करने और सहयोगी कंपनियों को बोली में भाग लेने की अनुमति देने के लिए मानक प्रक्रिया तैयार की गई। गैस आधारित अर्थव्यवस्था की ओर बढ़ने के एक अन्य महत्वपूर्ण कदम उठाते हुए दिनांक 15.10.2020 की अधिसूचना के माध्यम से 'प्राकृतिक गैस विपणन सुधार' की घोषणा की गई ताकि पारदर्शी और प्रतिस्पर्धी प्रक्रिया से गैस उत्पादकों द्वारा बाजार में बेची जाने वाली गैस के बाजार मूल्य का पता लगाने के लिए मानक प्रक्रिया निर्धारित की जा सके; गैस की बिक्री के लिए सहयोगी कंपनियों को बोली प्रक्रिया में भाग लेने की अनुमति दी जा सके और कुछ क्षेत्र विकास योजना (एफडीपी) के लिए विपणन स्वतंत्रता की अनुमति दी जा सके जहां उत्पादन साझाकरण संविदा पहले से ही मूल्य निर्धारण स्वतंत्रता प्रदान करते हों। इसके बाद, दिनांक 03.12.2020 की अधिसूचना के द्वार ई–बोली के माध्यम से घरेलू रूप से उत्पादित प्राकृतिक गैस के लिए बाजार मूल्य की खोज के लिए विस्तृत दिशानिर्देश जारी किए गए थे। ई–बिडिंग करने के लिए डीजीएच द्वारा सूचीबद्ध एजेंसियों को भी अधिसूचित किया गया है।

v इसके अलावा, दिनांक 19.08.2021 के कार्यालय ज्ञापन द्वारा मूल्य निर्धारण और विपणन स्वतंत्रता वाले गैस उत्पादकों को पीएनजीआरबी द्वारा प्राधिकृत गैस एक्सचेंजों के माध्यम से कम मात्रा में गैस बेचने की अनुमति दी गई है।

vi गैस सुधारों और पर्यावरण के रक्षण के लिए एक अन्य कदम के रूप में, सरकार ने दिनांक 22.11.2021 के कार्यालय ज्ञापन द्वारा तेल और गैस कुओं के परीक्षण के दौरान उत्पादित एज–हॉक/परीक्षण गैस के मौद्रीकरण के लिए विस्तृत दिशानिर्देश जारी किए।

vii दिनांक 13 जनवरी, 2023 की अधिसूचना के माध्यम से सरकार ने विपणन और मूल्य निर्धारण स्वतंत्रता के साथ गहरे पानी, अत्यधिक गहरे पानी और उच्च दबाव/उच्च तापमान वाले क्षेत्रों में किए गए खोजों से उत्पादित गैस की बाजार मूल्य की खोज और बिक्री तथा पुनर्विक्रय पर स्पष्टीकरण प्रदान किया है।

viii ओएनजीसी/ओआईएल के नामांकन क्षेत्रों, नई अन्वेषण लाइसेंसिंग नीति (एनईएलपी) ब्लॉकों और प्री–एनईएलपी ब्लॉकों से उत्पादित गैस के मूल्य निर्धारण के संबंध में संशोधित दिशानिर्देश अप्रैल, 2023 में जारी किए गए थे, जिसमें उत्पादन साझाकरण संविदा (पीएससी) के तहत कीमतों के निर्धारण के लिए सरकार की मंजूरी का प्रावधान शामिल है। दिशानिर्देशों के अनुसार, प्राकृतिक गैस की कीमतें भारतीय क्रूड बास्केट के मासिक औसत का 10% होनी चाहिए और इसे मासिक आधार पर अधिसूचित किया जाना चाहिए और इसकी उच्च तथा निम्न सीमा निर्धारित होनी चाहिए। इसके परिणामस्वरूप नामांकित क्षेत्रों से एपीएम/एनएपीएम गैस की कीमतें 8.57 अमेरिकी डॉलर प्रति एमएमबीटीयू से घटकर 6.5 अमेरिकी डॉलर प्रति एमएमबीटीयू हो गई है।

1.13. नो–गो क्षेत्रों में कमी

सरकार अप्रैल 2022 में 'नो गो' क्षेत्रों को लगभग 99% तक कम करने में सफल रही है, जो अब तक ईएंडपी गतिविधियों के लिए उपलब्ध नहीं थे। इससे लगभग 1 मिलियन वर्ग किमी का क्षेत्र अन्वेषण के लिए भारत के ईईजेड में उपलब्ध हो गया है।

1.14. डाटा सृजन के माध्यम से संभाव्य धारणा में विस्तार

i. **राष्ट्रीय डाटा कोष (एनडीआर):** एनडीआर 28 जून, 2017 को शुरू किया गया था और संपूर्ण अन्वेषण और उत्पादन (ईएण्डपी) डाटा को वाणिज्यिक अन्वेषण, अनुसंधान और विकास तथा शैक्षणिक उद्देश्यों हेतु उपलब्ध कराने के लिए इसे डीजीएच में स्थापित किया गया था। यह देश के भू–वैज्ञानिक डाटाबेस के भंडार के रूप में कार्य करता है और संभावित बोलीदाताओं को ओएएलपी के तहत बोली लगाने के लिए अपनी पसंद के ब्लॉक चुनने में मदद करने में महत्वपूर्ण भूमिका निभाता है। ईएंडपी डाटा की लगातार बढ़ती मांगों को पूरा करने के लिए, एनडीआर को क्लाउड–सक्षम हाइपर–कन्वर्ज्ड इंफ्रास्ट्रक्चर में अपग्रेड किया जा रहा है ताकि उद्योग को सार्थक उपयोग के लिए आसानी से डाटा की सुविधा मिल सके।

31 मार्च 2022 तक एनडीआर में अपलोड किया गया कुल डाटा 2डी भूकंपीय डाटा के रुप में 3.667 मिलियन लाइन किलोमीटर (एलकेएम), 3डी भूकंपीय डेटा के रूप में 1.139 मिलियन वर्ग किलोमीटर (एसकेएम) और 23,436 कुएं और लॉग डेटा तथा 49,603 उनकी रिपोर्ट हैं।

ii. **हाइड्रोकार्बन संसाधनों का पुनर्मूल्यांकन:** देश में हाइड्रोकार्बन संसाधन क्षमता के अद्यतन प्राक्कलन के लिए देश में सभी 26 तलछटी बेसिनों के हाइड्रोकार्बन संसाधनों का पुनर्मूल्यांकन 2017 में इसके पहले के प्राक्कलन के लगभग दो दशक पहले के बाद पूरा किया गया था। इसके परिणामस्वरूप 41.87 बिलियन टन (तेल और तेल के समतुल्य गैस) के ऑडर के पारंपरिक हाइड्रोकार्बन संसाधनों का अनुमान लगाया गया, जो कि 28.08 बिलियन टन (गैस के तेल और तेल के बराबर) के पहले के अनुमान की तुलना में लगभग 49% अधिक है।

iii. **राष्ट्रीय भूकंप कार्यक्रम (एनएसपी):** राष्ट्रीय भूकंप कार्यक्रम (एनएसपी) को वर्ष 2016 में अमूल्यांकित तलछटी घाटियों के 2डी भूकंपीय सर्वेक्षण के लिए शुरू किया गया था। इसमें 2,932.99 करोड़ रुपये की स्वीकृत लागत के साथ ऑनलैंड क्षेत्रों के मूल्यांकन के लिए 48,243 लाइन किलोमीटर (एलकेएम) 2डी भूकंप डाटा की परिकल्पना की गई थी और इसे ओएनजीसी और ओआईएल द्वारा इसे क्रियान्वित किया गया था। भूकंप संबंधी डाटा का 97% (~46,960 एलकेएम) अधिग्रहण, प्रसंस्करण और व्याख्या पूरा हो चुका है। शेष भौगोलिक दुर्गम क्षेत्र, जहां से दुर्गम भूभाग और प्रतिकूल वातावरण के कारण डेटा प्राप्त नहीं किया जा सका, के डाटा को हवाई भूभौतिकीय सर्वेक्षण के माध्यम से प्राप्त करने का प्रस्ताव था।

लंबे फैलाव (12 से 18 किलोमीटर) और आधुनिक तकनीक उपयोग करके एनएसपी के तहत सृजित डाटा ने कई अप्रयुक्त क्षेत्रों में महत्वपूर्ण उप–सतही भूवैज्ञानिक जानकारी प्रदान की है जो इन घाटियों के भूवैज्ञानिक सेट–अप को समझने में मदद करेगी। कुछ क्षेत्रों में उप–ट्रेपियन मेसोजोइक अवसादों की उपस्थिति का भी संकेत दिया गया है। यह डाटा मौजूदा उत्पादक बेसिनों के विस्तार की दिशा में महत्वपूर्ण जानकारी प्रदान करते हैं क्योंकि टेक्टोनिक्स फ्रेमवर्क के बारे में प्राप्त जानकारी में सुधार हुआ है। ऐसे कई बेसिनों जैसे कि महानदी, कच्छ–सौराष्ट्र, विंध्य, गंगा, बंगाल, हिमालयी फोरलैंड, केजी, राजस्थान, गंगा, छत्तीसगढ़, कडप्पा, डेक्कन सिंक्लीज आदि के 2डी रेखाओं में भूगर्भीय रुचि की विशेषताएं देखी जा सकती हैं।

iv. **एयरबोर्न ग्रेविटी और ग्रैडियोमेट्री (एजीजी) सर्वेक्षण:** एनएसपी परियोजना के तहत दुर्गम और प्रतिकूल भौगोलिक क्षेत्रों को शामिल करने के लिए, ₹80 करोड़ के अनुमानित लागत के साथ 49,000 फ्लाइट एलकेएम एयरबोर्न जीयोफिजिकल सर्वेक्षण करने की भी योजना बनाई गई है। मंत्रालय की ओर से, एयरबोर्न ग्रेविटी एंड ग्रैडियोमेट्री (एजीजी) सर्वेक्षण करने के लिए ऑयल इंडिया लिमिटेड को नोडल एजेंसी के रूप में चुना गया है। एजीजी सर्वेक्षण दिनांक 27.05.2023 को शुरू किया गया था और 15 मार्च, 2024 को 42,943 एलकेएम के कुल डेटा अधिग्रहण के साथ पूर्ण हो गया है। डाटा का प्रसंस्करण और व्याख्या की जा रही पर है।

V. **अंडमान बेसिन का पूर्ण मूल्यांकन:** अंडमान के ऑफशोर क्षेत्रों के व्यापक मूल्यांकन के लिए, लगभग 2,81,613 वर्ग किमी के बेसिनल क्षेत्र को कवर करते हुए 22,500 एलकेएम 2 डी ब्रॉडबैंड भूकंपीय डेटा अधिग्रहण, प्रसंस्करण और उसकी व्याख्या करने की योजना बनाई गई थी। इस परियोजना को मेसर्स ऑयल इंडिया लिमिटेड द्वारा कार्यान्वित किया गया है। अंडमान के गहरे ऑफशोर से कुल 22,500 एलकेएन भूकंपीय डाटाका अधिग्रहण किया गया था। अधिग्रहण और प्रसंस्करण का कार्य अक्टूबर 2022 में पूरा हो गया और पूरे डेटासेट की व्याख्या मार्च 2023 में पूरी हो गई। संपूर्ण डाटा एनडीआर को सौंप दिया गया है।

vi. **विशेष आर्थिक जोन (ईईजेड) तक अपतटीय बेसिन क्षेत्र का मूल्यांकन:** देश के विशेष आर्थिक जोन (ईईजेड) तक फैले अपतटीय बेसिन क्षेत्र का संपूर्ण आकलन करने के लिए लगभग 80,000 एलकेएम क्षेत्र को कवर करते हुए 2 डी ब्रॉडबैंड भूकंपीय सर्वेक्षण करने का प्रयास किया गया। ईईजेड सर्वेक्षण के लिए ओएनजीसी को नोडल एजेंसी बनाया गया था। परिणामस्वरूप, जून 2023 में सफलतापूर्वक लगभग 79,540 एलकेएम 2 डी भूकंपीय डेटा का अधिग्रहण किया गया (अतिरिक्त 20% के प्रावधान के साथ 70,000 एलकेएम के अनुबंधित लक्ष्य की तुलना में) जिसमें सभी तीन क्षेत्रों यथा पूर्वी तट, पश्चिमी तट और अंडमान क्षेत्र, को शामिल किया गया था। अधिग्रहित 2डी भूकंपीय डाटा की व्याख्या का प्रसंस्करण पूरा हो चुका है और संसाधित आउटपुट डीजीएच में प्राप्त हो चुका है।

vii. **मिशन अन्वेषण:** भारत की तलछटी घाटियों का और अन्वेषण करने और भूकंपीय कवरेज की कमी को दूर करने के लिए, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने 792 करोड़ रुपये के बजटीय परिव्यय के साथ 20,275 लाइन किलोमीटर के 2डी भूकंपीय

अधिग्रहण, प्रसंस्करण और व्याख्या के संचालन के लिए "मिशन अन्वेषण" को मंजूरी दी है।

viii. **भारत के विस्तारित महाद्वीपीय शेल्फ (ईसीएस) में क्षेत्रों का मूल्यांकन:** 200 समुद्री मील की वर्तमान ईईजेड सीमा के आगे महाद्वीपीय शेल्फ क्षेत्र की हाइड्रोकार्बन क्षमता का पता लगाने के लिए, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने 410 करोड़ रुपये के बजटीय परिव्यय के साथ लगभग 30,000 लाइन किलोमीटर के 2डी ब्रॉडबैंड भूकंपीय डेटा अधिग्रहण, प्रसंस्करण और व्याख्या (एपीआई) के संचालन के लिए "भारत के विस्तारित महाद्वीपीय शेल्फ (ईसीएस) के क्षेत्रों का मूल्यांकन" करने के प्रस्ताव को मंजूरी दी है।

ix. पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने पहली बार 3,200 करोड़ रुपये की अनुमानित लागत के साथ श्रेणी–II और श्रेणी–III बेसिन में चार स्ट्रेटीग्राफिक कुओं की ड्रिलिंग के प्रस्ताव को मंजूरी दी है। यह शोध न किए गए क्षेत्रों में गहन अन्वेषण करने की मंत्रालय की प्रतिबद्धता को दर्शाता है।

1.15. मंजूरी/अनुमोदन प्राप्त करने की प्रक्रिया को सुविधाजनक बनाने तथा समन्वय बढ़ाने के लिए लाई गई पहलें:

- **सशक्त समन्वय समिति (ईसीसी):** यह समिति हाइड्रोकार्बन क्षेत्र से संबंधित रक्षा, पर्यावरण, लाइसेंस आदि से संबंधित मुद्दों पर चर्चा करने के लिए मंत्रिमंडल सचिव की अध्यक्षता में गठित की गई है।
- **'हाइड्रोकार्बन क्लीयरेंस प्रकोष्ठ' (एचसीसी) का निर्माण:** डीजीएच के अंतर्गत एक समर्पित 'हाइड्रोकार्बन क्लीयरेंस प्रकोष्ठ' स्थापित किया गया है। यह प्रकोष्ठ त्वरित मंजूरी/अनुमोदन प्राप्त कराने के लिए केंद्र/राज्य सरकार के अधिकारियों के साथ मिलकर काम करता है।
- **पूर्वोत्तर समन्वय समिति (एनईसीसी) का गठन:** डीजीएच के एचसीसी के तहत ईसीसी का गठन सितंबर 2021 में किया गया था और असम, अरुणाचल प्रदेश तथा त्रिपुरा राज्य सरकारों के विभिन्न विभागों के 18 समन्वयकों को इसमें नियुक्त किया गया है, ताकि विभिन्न पर्यावरणीय विनियमों के तहत मंजूरी और अनुमोदन प्रस्तावों को संसोधित करने में सुविधा हो और साथ ही तेल और गैस ईएंडपी गतिविधियों से संबंधित अन्य मुद्दों का तेजी से समाधान निकाला जा सके जिनके लिए राज्य सरकार से प्रशासनिक/नियामक समर्थन की आवश्यकता हो।
- **ऊर्जा प्रगति पोर्टल (अप्रासक्रिय शासन और समय पर कार्यान्वयन के लिए संयुक्त कार्यवाई द्वारा अपस्ट्रीम प्रतिक्रिया):** ईएंडपी ऑपरेटरों को सुविधा प्रदान करने और अनुमोदन/मंजूरी प्रक्रिया पर निगरानी रखने के लिए, डीजीएच द्वारा हाल ही में ऊर्जा प्रगति वेब–आधारित इंटरैक्टिव पोर्टल लॉन्च किया गया है, ताकि ऑपरेटरों, केंद्रीय मंत्रालयों और राज्य सरकारों जैसे विभिन्न हितधारकों से जुड़े अपस्ट्रीम हाइड्रोकार्बन क्षेत्र से संबंधित लंबे समय से लंबित मुद्दों को प्राथमिकता दी जा सके और उन्हें चिह्नित किया जा सके। इस पोर्टल के माध्यम से जिन मुद्दों का समाधान किया जा सकता है उनमें पीईएल (पेट्रोलियम अन्वेषण लाइसेंस), पीएमएल (पेट्रोलियम खनन पट्टा), एफसी (वन मंजूरी), डब्ल्यूएलसी (वन्यजीव मंजूरी), सीटीई (स्थापना के लिए सहमति)/सीटीओ (संचालन के लिए सहमति), ईएसजेड (पारिस्थितिकी संवेदनशील क्षेत्र) और सीआरजेड (तटीय विनियमन क्षेत्र) से संबंधित मंजूरी शामिल हैं।
- **अपस्ट्रीम इंडिया पोर्टल:** ईएंडपी ऑपरेटरों को सहायता प्रदान करने के लिए 'अपस्ट्रीम इंडिया' पोर्टल लॉन्च किया गया था। यह डीजीएच में उपलब्ध सुविधाओं और अवसंरचना को साझा करने, ज्ञान साझा करने वाले प्लेटफॉर्म का निर्माण करने और नियमित कार्यशालाओं, सेमिनारों, सम्मेलनों, प्रशिक्षण सत्रों और नवीनतम सरकारी नीतियों, प्रौद्योगिकियों और इन्वेंट्री के उपयोग पर चर्चाओं के आयोजन जैसी सेवाएं प्रदान करता है।
- **ऊर्जा सुरक्षा समन्वय:** सूचना का त्वरित आदान–प्रदान के लिए जीआईएस आधारित निगरानी और निर्णय समर्थन प्रणाली।

1.16. प्राकृतिक गैस ग्रिड और नगरी गैस वितरण (सीजीडी)

नगरी गैस वितरण (सीजीडी) नेटवर्क एक निर्दिष्ट भौगोलिक क्षेत्र (जीए) में स्थित घरेलू, औद्योगिक या वाणिज्यिक परिसरों और सीएनजी स्टेशनों को प्राकृतिक गैस की आपूर्ति करने के लिए पाइपलाइनों का परस्पर जुड़ा हुआ नेटवर्क है। सीजीडी नेटवर्क को जीए में ट्रंक गैस पाइपलाइन कनेक्टिविटी या गैस स्रोतों और तकनीकी–व्यावसायिक व्यवहार्यता की उपलब्धता के आधार पर विकसित किया जा रहा है।

सीजीडी नेटवर्क यह सुनिश्चित करता है कि पर्यावरण अनुकूल खाना पकाने का ईंधन पाइप्ड नेचुरल गैस (पीएनजी) के रूप में घरेलू परिवारों के लिए स्वच्छ ईंधन के साथ–साथ संपीड़ित प्राकृतिक गैस (सीएनजी) के रूप में उपलब्ध हो। परिवहन क्षेत्र में सीएनजी के उपयोग से नगरी क्षेत्र में वाहनों से होने वाले उत्सर्जन को रोकने में मदद मिलती है और इससे वायु की गुणवत्ता में सुधार होता है।

- मई 2014 तक, देश के विभिन्न हिस्सों में 53 जिलों (आंशिक / पूर्ण) में फैले लगभग 33 भौगोलिक क्षेत्रों (जीए) में सीजीडी नेटवर्क उपलब्ध था।
- वर्ष 2014–18 (मई 2018 तक) के दौरान, सीजीडी नेटवर्क के विकास से 113 जिलों (आंशिक / पूर्ण) में फैले 92 जीए को सुविधा दी गई थी।
- वर्ष 2019 में 9वें और 10वें सीजीडी बोली राउंड के सफलता पूर्वक समाप्त होने पर, सीजीडी नेटवर्क का कवरेज 298 जिलों (आंशिक / पूर्ण) को शामिल करते हुए अतिरिक्त 136 जीए तक बढ़ा दिया गया।
- वर्ष 2022 में, पीएनजीआरबी ने 11वें और 11ए सीजीडी बोली राउंड करवाया और 67 अतिरिक्त भौगोलिक क्षेत्रों को अधिकृत किया। इस राउंड के पूरा होने के साथ, सीजीडी नेटवर्क का संभावित कवरेज देश की लगभग 98% आबादी तक फैल गया है, जो भारत के 88% क्षेत्र में फैले हैं।
- पेट्रोलियम एवं प्राकृतिक गैस नियामक बोर्ड (पीएनजीआरबी) ने 12वें और 12ए राउंड के सीजीडी बोली के तहत सफल बोलीकर्ताओं को 103 जिले अंतिम रूप से सौंपे गए है, जिसमें 6 पूर्वोत्तर राज्य अर्थात अरुणाचल प्रदेश, मेघालय, मणिपुर, नागालैंड, सिक्किम और मिजोरम और 2 संघ राज्य क्षेत्र जम्मू और कश्मीर और लद्दाख शामिल हैं। तदनुसार, दिनांक 04.03.2024 को 7 भौगोलिक क्षेत्रों के लिए सफल बोलीकर्ताओं को आशय पत्र जारी किए गए हैं। इसके अलावा, सीजीडी प्राधिकरण विनियमों के अनुसार पीएनजीआरबी द्वारा संबंधित संस्थाओं से अपेक्षित प्रदर्शन बैंक गारंटी प्राप्त होने के बाद सफल बोलीकर्ताओं को प्राधिकार प्रदान किया जाएगा।
- घरेलू परिवारों को पीएनजी की आपूर्ति 25.4 लाख (मई 2014) के स्तर से बढ़कर 123.66 लाख (जनवरी 2024 तक) हो गई है। कुल मिलाकर, 6,348 सीएनजी स्टेशन (31.01.2024 तक) देश भर में लगभग 55 लाख सीएनजी वाहनों को स्वच्छ और किफायती परिवहन ईंधन उपलब्ध करा रहे हैं।

नगरी गैस नेटवर्क के विस्तार को बढ़ावा देने और नगरों में प्राकृतिक गैस के उपयोग को बढ़ाने के लिए, सरकार ने निम्नलिखित कदम उठाए हैं–

i. घरेलू गैस, जो आयातित गैस से किफायती है, को सीजीडी क्षेत्र के पीएनजी (डी) और सीएनजी (टी) खंडों की संपूर्ण आवश्यकता को पूरा करने के लिए आवंटित किया गया है और इसे नो कट श्रेणी में रखा गया है।

ii. श्रम और रोजगार मंत्रालय (एमओएलई) द्वारा सीजीडी परियोजनाओं को सार्वजनिक उपयोगिता का दर्जा प्रदान किया गया है।

iii. रक्षा मंत्रालय (एमओडी) ने अपने आवासीय क्षेत्रों / यूनिट लाइनों में पीएनजी के उपयोग के लिए दिशानिर्देश जारी किए हैं।

iv. लोक उद्यम विभाग (डीपीई) ने सार्वजनिक क्षेत्र के उद्यमों (पीएसई) को अपने आवासीय परिसरों में पीएनजी का प्रावधान शामिल करने के लिए दिशानिर्देश जारी किए हैं।

v. आवासन और नगरी कार्य मंत्रालय (एमओएचयूए) ने राज्य सरकारों को निम्नलिखित पहलुओं पर परामर्शी जारी की है–

क. स्थानीय परिस्थितियों के अनुसार समयबद्ध अनुमति के साथ–साथ सड़क जीर्णोद्धार / अनुमति शुल्क को मानकीकृत करना।

ख. नगर / कस्बों के नियोजन चरण में सीएनजी स्टेशनों के विकास के लिए भूखंड चिह्नित करना और संशोधित मास्टर प्लान में इसका उल्लेख करना।

ग. वास्तुशिल्प डिजाइन चरण में आवासीय और वाणिज्यिक भवनों में गैस पाइपलाइन अवसंरचना प्रदान करने के लिए भवन उपनियमों में प्रासंगिक संशोधन।

vi. इसके अलावा, एमओएचयूए ने सीपीडब्ल्यूडी और एनबीसीसी को सभी सरकारी आवासीय परिसरों में पीएनजी का प्रावधान जोड़ने का निर्देश दिया है।

vii. डीआईपीपी ने मौजूदा ओएमसी आरओ में सीएनजी वितरण सुविधाएं स्थापित करने की प्रक्रिया को आसान बनाने के लिए संशोधित नियम 2018 अधिसूचित किया है।



1.17. देश में पुनर्गैसीकरण अवसंरचना

देश ने वर्ष 2004 में दाहेज (गुजरात) में स्थित अपने पहले पुनर्गैसीकरण एलएनजी (आरएलएनजी) टर्मिनल की स्थापना के साथ तरलीकृत प्राकृतिक गैस (एलएनजी) का पहला आयात शुरू किया। एलएनजी का आयात ओपन लामान्य लाइसेंस (ओजीएल) मद के रूप में किया जा रहा है। आयातित आरएलएनजी की आपूर्ति देश भर में आपूर्तिकर्ताओं और खरीदारों के बीच संविदात्मक समझौते के अनुसार बाजार निर्धारित कीमतों पर की जा रही है। एक अवसंरचना परियोजना के रूप में एलएनजी टर्मिनलों की स्थापना को भी अनुमति दी गई है और इसके लिए 100% प्रत्यक्ष विदेशी निवेश (एफडीआई) की भी अनुमति है।

वर्तमान में, देश में लगभग 47.7 एमएमटीपीए (172 एमएमएससीएमडी) की क्षमता वाले सात (7) परिचालन एलएनजी पुनर्गैसीकरण टर्मिनल क्रियान्वित हैं। इनका टर्मिनल–वार विवरण निम्नानुसार है:

स्थान	धारक और प्रचालक	क्षमता (एमएमटीपीए)
दाहेज (गुजरात)	पीआईआई	17.5
हजीरा (गुजरात)	शेल	5.2
कोच्ची (केरलद्ध	पीआईआई	5
ढबोल (महाराष्ट्र)	गेल (केएलपीएल)	5.0
मुंद्रा (गुजरात)	जीएसपीएस एलएनजी लिमिटेड	5
धामरा (ओडिशा)	अडानी एलएनजी प्राइवेट लिमिटेड	5
इन्नौर (तमिलनाडु)	आईओसीएल	5
	कुल क्षमता (एमएमटीपीए)	**47.7**

उपर्युक्त के अतिरिक्त, निम्नलिखित एलएनजी टर्मिनलों का निर्माण हो रहा है।

स्थान	धारक और प्रचालक	क्षमता (एमएमटीपीए)
दाहेज विस्तार (गुजरात)	पीआईआई	5
गोपालपुर (ओडिशा)	पीआईआई	4
जाफराबाग (गुजरात)	स्वान इनर्जी	5
छारा (गुजरात)	एचपीएलएनजी	5
	कुल क्षमता (एमएमटीपीए)	**19**

1.18. ऊर्जा कूटनीति:

भारत सरकार परस्पर जुड़े विश्वपटल पर ऊर्जा के क्षेत्र में अपनी वैश्विक भागीदारी को आकार देने और अपनी ऊर्जा जरूरतों की पूर्ति सुरक्षित करने के लिए सक्रिय रूप से प्रयास कर रही है। भारत की ऊर्जा कूटनीति न केवल हाइड्रोकार्बन समृद्ध देशों और ऊर्जा मामलों से निपटने वाले प्रमुख अंतर्राष्ट्रीय संगठनों के साथ ऊर्जा संबंधी साझेदारी में प्रवेश करने, उसे बनाए रखने और उसे बढ़ाने तक सीमित है, बल्कि ग्लोबल साउथ और पड़ोसी देशों के साथ हाइड्रोकार्बन और स्वच्छ प्रौद्योगिकियों पर सहयोग को बढ़ावा देना भी इसमें शामिल है।

भारत ग्लोबल साउथ के सभी तेल–उपभोक्ता देशों के लिए जिम्मेदार मूल्य निर्धारण और वैश्विक तेल बाजार को स्थिर करने के लिए आवाज उठाता रहा है। यह भारत को एक अनूठे देश के रूप में स्थापित करता है जिसकी ऊर्जा कार्यनीति अब दुनिया भर में व्यावहारिक और संतुलित माना जा रहा है। भारत ने समय–समय पर प्रमुख उत्पादकों के साथ द्विपक्षीय रूप से और संयुक्त अरब अमीरात के अबू धाबी में आयोजित अबू धाबी अंतर्राष्ट्रीय पेट्रोलियम प्रदर्शनी और सम्मेलन–2023 (एडीआईपीईसी–2023), बेंगलुरु, भारत में आयोजित भारत ऊर्जा सप्ताह–2023 सहित विभिन्न अंतर्राष्ट्रीय

मंचों पर उपभोक्ता देशों के समक्ष आने वाली समस्याओं जैसे कि उच्च मूल्य, अधिक अस्थिरता, एशियाई प्रीमियम आदि को उठाया है।

भारत तेल और गैस संसाधनों के ज़िम्मेदार मूल्य निर्धारण का समर्थन करने के लिए पेट्रोलियम निर्यातक देशों के संगठन (ओपेक), अंतर्राष्ट्रीय ऊर्जा मंच (आईईएफ), अंतर्राष्ट्रीय ऊर्जा एजेंसी (आईईए) आदि जैसे तेल और गैस के क्षेत्र में काम करने वाले प्रमुख अंतर्राष्ट्रीय संगठनों के साथ भी कार्य कर रहा है।

भारत की ऊर्जा सुरक्षा की खोज चार 'ए' के ढांचे के तहत काम करती है: उपलब्धता, पहुंच, वहनीयता और स्वीकार्यता, जिसका उद्देश्य सभी वर्गों और क्षेत्रों को किफायती मूल्य पर आसानी से ऊर्जा उपलब्ध कराना है। यद्यपि तेल और गैस आने वाले भविष्य में भारत के प्राथमिक ऊर्जा मिश्रण में महत्वपूर्ण भूमिका निभाते रहेंगे, भारत अपने नागरिकों को किफायती मूल्य पर और संधारणीय रूप से ऊर्जा की उपलब्धता सुनिश्चित करने के लिए सौर, पवन, जैव ईंधन और हाइड्रोजन सहित सभी प्रकार की ऊर्जा को बढ़ावा दे रहा है। उल्लेखनीय है कि भारत ने जी–20 शिखर सम्मेलन में वैश्विक जैव ईंधन गठबंधन के लॉंच की अगुआई की है, जो संधारणीय भविष्य के लिए ऊर्जा स्रोतों में परिवर्तन किए जाने की भारत की प्रतिबद्धता को रेखांकित करता है।

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय, विदेश मंत्रालय और विदेशों में स्थित हमारे दूतावासों के साथ मिलकर काम कर रहा है, ताकि न केवल देश के लिए ऊर्जा संबंधी सुरक्षा सुनिश्चित की जा सके, बल्कि विदेशों में हमारे तेल और गैस से जुड़े सार्वजनिक उपक्रमों के हितों की रक्षा और सवर्धन की जा सके। भारत की विदेश नीति में ऊर्जा संबंधी कूटनीति को एकीकृत करना ऊर्जा सुरक्षा सुनिश्चित करके और संपूर्ण मूल्य श्रृंखला में तेल और गैस निवेश के लिए एक गंतव्य के रूप में भारत के महत्व को उजागर करके देश के लिए लाभप्रद है।

ऊर्जा संबंधी कूटनीति की निम्नलिखित मुख्य विशेषताएं उल्लेखनीय हैं:

- कच्चे तेल की निर्बाध और समय पर आपूर्ति सुनिश्चित करने के लिए भारतीय रिफाइनरों को समर्थन देना।
- भारतीय पीएसयू द्वारा ई एंड पी परिसंपत्तियों के अधिग्रहण सहित भौगोलिक विविधीकरण और तेल और गैस के स्रोतों का विस्तार।
- ऊर्जा गलियारों और ऊर्जा पुलों का निर्माण करके तेल और गैस के क्षेत्र में 'नेबरहुड फर्स्ट पॉलिसी' को बढ़ावा देने के लिए पहलें शुरू करना।
- दीर्घ कालिक तेल और एलएनजी सौदों पर समझौता करना।
- भारत को वैश्विक ऊर्जा कार्यक्रमों के लिए एक प्रमुख स्थान के रूप में विकसित करना–प्रथम भारत ऊर्जा सप्ताह का उद्घाटन, एशियाई मंत्रिस्तरीय ऊर्जा गोलमेज सम्मेलन की नौवीं बैठक और शंघाई सहयोग संगठन की ऊर्जा मंत्रियों की तीसरी बैठक का आयोजन।
- अंतर्राष्ट्रीय संगठनों के साथ घनिष्ठ संबंध विकसित करना और संवादों को संस्थागत बनाना।
- ओपीएसी, आईईएफ और आईईए जैसे बहुपक्षीय ऊर्जा संगठनों के साथ भारत के संबंधों को बेहतर बनाना और उनकी विशाल हाइड्रोकार्बन की जरूरतों का लाभ उठाना, जहां भारत उत्पादक और उपभोक्ता देशों की जरूरतों को संतुलित करने की दिशा में अंतर ला सकता है।
- ऊर्जा स्रोतों के डीकार्बोनाइजेशन और चक्रीयता को बढ़ावा देने के लिए ग्लोबल बायोफ्यूल एलायंस के गठन की घोषणा।

1.19. किफायती परिवहन के लिए दीर्घकालिक विकल्प (सतत):

सरकार ने 1 अक्टूबर 2018 को "वहनीय परिवहन के किफायती परिवहन के लिए दीर्घकालिक विकल्प विकल्प (एसएटीएटी)" पहल शुरू की है, जिसका उद्देश्य विभिन्न अपशिष्ट/बायोमास स्रोतों से संपीड़ित बायो गैस (सीबीजी) के उत्पादन के लिए एक पारितंत्र की स्थापना करना और प्राकृतिक गैस के साथ इसके उपयोग को बढ़ावा देना है। इस पहल के तहत, तेल और गैस विपणन कंपनियां (ओजीएमसी) संभावित उद्यमियों से सीबीजी खरीदने के लिए रुचि की अभिव्यक्ति (ईओआई) आमंत्रित करती हैं।

यह पहल गोबरधन योजना, स्वच्छ भारत मिशन/आत्मनिर्भर भारत/नेट जीरो उत्सर्जन के लक्ष्य के अनुरूप है। बायोगैस/सीबीजी क्षेत्र के विकास के लिए सरकार के संपूर्ण दृष्टिकोण को अपनाया जा रहा है। विभिन्न मंत्रालयों और विभागों द्वारा प्रदान की जाने वाली कुछ सुविधाएँ इस प्रकार हैं: नवीन और नवीकरणीय ऊर्जा मंत्रालय (एमएनआरई) की राष्ट्रीय जैव ऊर्जा कार्यक्रम की अम्ब्रेला योजना के अंतर्गत सभी प्रकार के सीबीजी/बायोगैस संयंत्रों के लिए केंद्रीय वित्तीय सहायता; स्वच्छ भारत मिशन नगरी 2.0 योजना के अंतर्गत आवासन और नगरी कार्य मंत्रालय द्वारा ठोस अपशिष्ट प्रबंधन के लिए राज्यों और संघ राज्य क्षेत्रों को एमएसडब्ल्यू आधारित सीबीजी संयंत्रों के लिए अतिरिक्त

केंद्रीय सहायता; उर्वरक विभाग द्वारा जैविक उर्वरक को बढ़ावा देने की नीति के अंतर्गत सीबीजी परियोजनाओं से उत्पादित फर्मेंटेड जैविक खाद पर 1,500 रुपये प्रति मीट्रिक टन की दर से बाजार के विकास हेतु सहायता; कृषि और किसान कल्याण विभाग द्वारा कृषि मशीनीकरण और फसल अवशेष प्रबंधन उप मिशन योजना के अंतर्गत बायोमास एकत्रीकरण मशीनरी हेतु प्रोत्साहन; आरबीआई द्वारा प्राथमिक क्षेत्र ऋण के तहत सीबीजी परियोजनाओं का वर्गीकरण; सीपीसीबी द्वारा मामला–दर–मामला आधार पर 'श्वेत श्रेणी' के तहत सीबीजी परियोजनाओं का वर्गीकरण; मिश्रित सीएनजी में निहित संपीड़ित बायो गैस पर भुगतान की गई जीएसटी राशि पर उत्पाद शुल्क में छूट।

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने सीजीडी नेटवर्क में सीएनजी के साथ सीबीजी के समन्वय के लिए नगर गैस डिस्ट्रीब्यूशन (सीजीडी) नेटवर्क के संपीड़ित प्राकृतिक गैस (परिवहन) और पाइप्ड प्राकृतिक गैस (घरेलू) खंडों की आपूर्ति के लिए घरेलू गैस के सह–मिश्रण हेतु दिशानिर्देश जारी किए हैं।

इसके अलावा, सरकार ने वित्त वर्ष 2023–24 से वित्त वर्ष 2026–27 तक 04 वर्ष की अवधि के लिए बायोमास संग्रह को समर्थन देने हेतु बायोमास एकत्रीकरण मशीनरी की खरीद के लिए सीबीजी उत्पादकों को वित्तीय सहायता प्रदान करने की योजना को मंजूरी दी है। इस योजना के दिशानिर्देश 02.02.2024 को जारी किए गए हैं।

देश में सीबीजी के उत्पादन और खपत को बढ़ावा देने के लिए, राष्ट्रीय जैव ईंधन समन्वय समिति (एनबीसीसी) ने 24.11.2023 को सीजीडी क्षेत्र के सीएनजी (परिवहन) और पीएनजी (घरेलू) खंडों में सीबीजी के चरणबद्ध अनिवार्य मिश्रण को शुरू करने की मंजूरी दे दी है। सीबीजी सम्मिश्रण दायित्व (सीबीओ) वित्त वर्ष 2024–25 तक स्वैच्छिक रहेगा और अनिवार्य सम्मिश्रण दायित्व वित्त वर्ष 2025–26 से शुरू होगा। वित्त वर्ष 2025–26, 2026–27 और 2027–28 के लिए सीबीओ को कुल सीएनजी / पीएनजी खपत का क्रमशः 1%, 3% और 4% रखा जाएगा। 2028–29 के बाद सीबीओ 5% होगा।

सरकार ने 15.03.2024 को नगरी गैस डिस्ट्रीब्यूशन (सीजीडी) नेटवर्क में सीबीजी को शामिल करने के लिए पाइपलाइन इंफ्रास्ट्रक्चर (डीपीआई) के विकास हेतु एक योजना को मंजूरी दी है। 1 मार्च 2024 तक, लगभग 360 मीट्रिक टन प्रतिदिन की कुल उत्पादन क्षमता वाले 58 सीबीजी / बायोगैस संयंत्र संस्थापित हो चुके हैं। 160 से अधिक रिटेल आउटलेट्स पर सीबीजी की बिक्री शुरू हो चुकी है। औद्योगिक ग्राहकों को भी सीबीजी की आपूर्ति की जा रही है। सीबीजी–सीजीडी सिंक्रोनाइजेशन योजना के तहत, गेल ने 77 त्रिपक्षीय समझौतों पर हस्ताक्षर किए हैं और सीजीडी नेटवर्क के 25 भौगोलिक क्षेत्रों में सीबीजी की बिक्री शुरू हो चुकी है।

1.20. राष्ट्रीय जैव ईंधन नीति–2018

राष्ट्रीय जैव ईंधन नीति 2018 के तहत एथेनॉल आपूर्ति वर्ष (ईएसवाई) 2025–26 तक पेट्रोल में एथेनॉल के 20% मिश्रण और 2030 तक डीजल में 5% बायोडीजल के सम्मिश्रण की सांकेतिक लक्ष्य की परिकल्पना की गई है। इस लक्ष्य को निम्नानुसार प्राप्त किया जाना है:

क. संवर्धनशील घरेलू उत्पादन के माध्यम से चालू एथेनॉल / बायोडीजल आपूर्ति को सुदृढ़ करना।

ख. सेकंड जेनेरेशन (2जी) की बायो रिफाइनरियों की स्थापना।

ग. जैव ईंधन के लिए नए फीडस्टॉक का विकास कार्य।

घ. जैव ईंधनों में रूपांतरण के लिए नई प्रौद्योगिकियों का विकास।

ङ. जैव ईंधनों के लिए उपयुक्त वातावरण तैयार करना और मुख्य ईंधन के साथ इसका एकीकरण करना।

1.21. गैर पारंपरिक ऊर्जा

1.21.1. ईबीपी कार्यक्रम: सरकार एथेनॉल संमिश्रित पेट्रोल (ईबीपी) कार्यक्रम क्रियान्वित कर रही है, जिसके तहत तेल विपणन कंपनियां (ओएमसी) एथेनॉल की उपलब्धता के अनुसार अलग–अलग प्रतिशत में एथेनॉल को पेट्रोल में संमिश्रित करके बेचती हैं। वैकल्पिक और पर्यावरण अनुकूल ईंधन के उपयोग को बढ़ावा देने के लिए इस कार्यक्रम को पूरे भारत में विस्तारित किया गया है। इस हस्तक्षेप का उद्देश्य ऊर्जा आवश्यकताओं के लिए आयात पर निर्भरता को कम करना और कृषि क्षेत्र को बढ़ावा देना है।

एथेनॉल के अधिक स्वदेशी उत्पादन के लिए सरकार ने कई हस्तक्षेप किए हैं, जिनमें प्रशासित मूल्य तंत्र को फिर से शुरू करना, एथेनॉल उत्पादन के लिए वैकल्पिक मार्ग तलाशना, उद्योग (विकास और विनियमन) अधिनियम, 1951 में संशोधन करना शामिल है, जिसमें केंद्र सरकार द्वारा विकृत एथेनॉल पर विशेष नियंत्रण का विधान निर्धारित करना, ईबीपी कार्यक्रम के लिए एथेनॉल पर माल और सेवा कर (जीएसटी) को 18% से घटाकर 5% करना, राष्ट्रीय जैव ईंधन नीति–2018 की अधिसूचना, एथेनॉल उत्पादन क्षमता को बढ़ाने और संवर्धन के लिए चीनी मिलों को वित्तीय सहायता देने की योजना बनाना, कई फीड–स्टॉक जैसे कि बी हैवी मोलासेस, गन्ने का रस, चीनी, चीनी सिरप, क्षतिग्रस्त खाद्यान्न एथेनॉल उत्पादन के लिए भारतीय खाद्य निगम (एफसीआई) के पास उपलब्ध मक्का और अधिशेष चावल का उपयोग करना, एथेनॉल उत्पादन के लिए उपयोग किए जाने वाले फीड स्टॉक के आधार

पर विभेदक एथेनॉल मूल्य, उन्नत और लागकारी एथेनॉल मूल्य निर्धारण, दीर्घकालिक एथेनॉल खरीद नीति, एथेनॉल की कमी वाले राज्यों में एथेनॉल डिस्टिलेशन क्षमता स्थापित करने की रूपरेखा बनाना आदि कुछ उदाहरण हैं।

उपर्युक्त के कारण सार्वजनिक क्षेत्र की तेल विपणन कंपनियों द्वारा एथेनॉल की खरीदी में मदद मिली है जो एथेनॉल आपूर्ति वर्ष (ईएसवाई) 2013–14 (दिसंबर 2013 से नवंबर, 2014) के दौरान 38 करोड़ लीटर से बढ़कर ईएसवाई 2022–23 (दिसंबर, 2022 से अक्टूबर, 2023) के दौरान 508.48 करोड़ लीटर हो गया है। 'भारत में एथेनॉल संमिश्रण के रोडमैप 2020–25' के अनुरूप, तेल विपणन कंपनियों ने एथेनॉल आपूर्ति वर्ष (ईएसवाई) 2021–22 और 2022–23 के दौरान पेट्रोल में औसतन 10% और 12% एथेनॉल संमिश्रण का लक्ष्य हासिल कर लिया है। ईएसवाई के अनुसार खरीद / संमिश्रण निष्पादन नीचे तालिका में दिया गया है:

ईएसवाई	एथेनॉल प्रपण/संमिश्रण की गुणवत्ता करोड़ लीटर में	संमिश्रण प्रतिशत (%)
2013-14	38.0	1.53
2014-15	67.4	2.33
2015-16	111.4	3.51
2016-17	66.5	2.07
2017-18	150.5	4.22
2018-19	188.6	5.00
2019-20	173.0	5.00
2020-21	302.3	8.10
2021-22	433.6	10.02
2022-23	508.48	12.06

'भारत में एथेनॉल संमिश्रण के रोडमैप 2020–25' के अनुसार, ई.एस.वाई. 2025–26 के दौरान पेट्रोल में 20% संमिश्रण करने के लिए लगभग 1,016 करोड़ लीटर एथेनॉल की आवश्यकता होती है। देश में एथेनॉल डिस्टिलेशन क्षमता स्थापित करने वाली नोडल एजेंसी, खाद्य और सार्वजनिक वितरण विभाग (डीएफपीडी) ने ईबीपी आवश्यकता और अन्य उपयोगों को पूरा करने के लिए प्रति वर्ष 1,700 करोड़ लीटर क्षमता की आवश्यकता का अनुमान लगाया है। एथेनॉल उत्पादन क्षमता में वृद्धि और संवर्धन के लिए ब्याज अनुदान योजना को अधिसूचित किया गया है और पर्यावरण मंजूरी (ईसी) प्रदान करने की प्रक्रिया को भी सुचारू कर दिया गया है। डिस्टिलेशन क्षमता जो 2018–19 में 685 करोड़ लीटर प्रति वर्ष थी वह 15.03.2024 तक बढ़कर 1,444 करोड़ लीटर प्रति वर्ष हो गई है। ई.एस.वाई. 2022–23 के लिए आपूर्तिकर्ताओं को भुगतान की जाने वाली विभिन्न फीडस्टॉक से उत्पादित एथेनॉल की एक्स–मिल कीमतें निम्न हैं:

फीड स्टॉक	एथेनॉल दरें (ईएसवाई 2023-24
गन्ने का जूस$	65.61[1]
बी हेवी मोलासेस$	60.63[2]
सी हेवी मोलासेस$	56.28*
क्षतिग्रस्त खाद्यान्न %	64.00
अधिशेष खाद्यान्न %	58.50
मक्का %	71.86[3]

$ पिछली ईएसवाई की मूल दरें

प्रोत्साहन 5.79 रुपये / लीटर

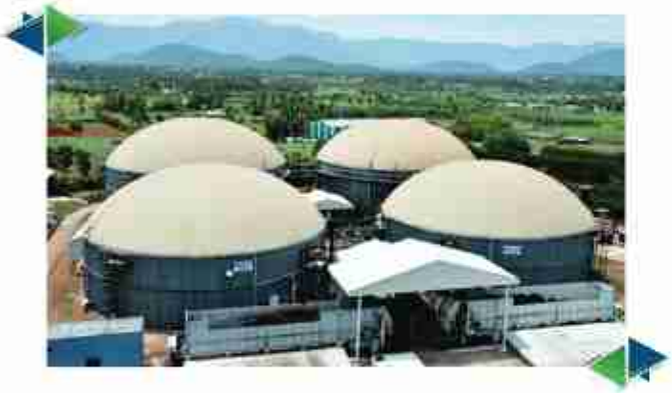
*प्रोत्साहन 6.87 रुपये / लीटर

^ सरकार द्वारा अनुमोदित मूल्य

%ओएमसी द्वारा निर्धारित मूल्य

ऐथेनॉल आपूर्तिकर्ताओं को जीएसटी और परिवहन का भुगतान किया जा रहा है

1.21.2. 2जी एथेनॉल कार्यक्रम: एथेनॉल आपूर्ति बढ़ाने के लिए, सरकार ने दिसंबर, 2014 में चावल / गेहूं के भूसे, मकई के भुट्टे, कपास के डंठल आदि जैसे सेल्यूलोसिक और लिग्नोसेल्यूलोसिक सामग्रियों और पेट्रोकेमिकल रूट से एथेनॉल की खरीदी को मंजूरी दी थी। 2जी बायो–रिफाइनरियों की स्थापना को प्रोत्साहित करने के लिए, सरकार ने एकीकृत बायो–एथेनॉल परियोजनाओं को वित्तीय सहायता प्रदान करने के लिए "प्रधानमंत्री जी–वन (जैव ईंधन–वातावरण अनुकूल फसल अवशेष निवारण) योजना" शुरू की है। इस योजना के तहत, आठ वाणिज्यिक सेकंड जेनेरेशन (2जी) बायो–एथेनॉल परियोजनाओं और चार प्रदर्शन 2जी एथेनॉल परियोजनाओं के लिए सार्वजनिक और निजी क्षेत्र की कंपनियों को ₹ 1,200 करोड़ से अधिक की वित्तीय सहायता को मंजूरी दी गई है। पानीपत में आईओसीएल का 2जी एथेनॉल संयंत्र 10.08.2022 (विश्व जैव ईंधन दिवस) को राष्ट्र को समर्पित किया गया था।



1.21.3. बायोडीजल कार्यक्रम: वित्तीय वर्ष 2023–24 के दौरान, तेल विपणन कंपनियों ने डीजल के साथ संमिश्रण करने के लिए 43.99 करोड़ लीटर बायोडीजल खरीदा है।

1.21.4. बायो–जेट (एटीएफ): सरकार ने अंतर्राष्ट्रीय उड़ानों के लिए शुरुआत में क्रमशः 2027, 2028 और 2030 के प्रभाव से एविएशन टरबाइन फ्यूल (एटीएफ) में एसएएफ के 1%, 2% और 5% संमिश्रण का सांकेतिक लक्ष्य निर्धारित किया है। स्वदेशी रूप से उत्पादित एसएएफ संमिश्रण विमानन टरबाइन ईंधन का उपयोग करके भारत की पहली वाणिज्यिक उड़ान पुणे से दिल्ली के बीच 19 मई 2023 को सफलतापूर्वक उड़ाई गई थी। आईओसीएल द्वारा पानीपत (337.2 केएलपीडी) और मैंगलोर रिफाइनरी पेट्रोकेमिकल लिमिटेड (एमआरपीएल) द्वारा मैंगलोर (20.2 केएलपीडी) में बायो एटीएफ संयंत्र स्थापित किए जा रहे हैं।

1.21.5. विश्व जैव ईंधन दिवस: पारंपरिक जीवाश्म ईंधन के विकल्प के रूप में गैर–जीवाश्म ईंधन के महत्व के बारे में जागरूकता पैदा करने और जैव ईंधन के क्षेत्र में सरकार द्वारा किए गए विभिन्न प्रयासों को उजागर करने के लिए हर साल 10 अगस्त को विश्व जैव ईंधन दिवस मनाया जाता है। इस वर्ष का विषय "जैव ईंधन–स्थायी भविष्य के लिए ईंधन" था। विश्व जैव ईंधन दिवस के अवसर पर, तेल और गैस उद्योग की ओर से इंडियन ऑयल ने विश्व जैव ईंधन दिवस के अवसर पर जैव ईंधन पर एक वेबिनार का आयोजन किया। वेबिनार की शुरुआत में पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के सचिव श्री पंकज जैन ने इसका उद्घाटन किया। अपने भाषण में पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के सचिव ने संधारणीयता और जिम्मेदार पर्यावरणीय प्रथाओं के लिए उद्योग की अटूट प्रतिबद्धता को रेखांकित किया।

1.21.6. राष्ट्रीय जैव ईंधन समन्वय समिति (एनबीसीसी): एनबीसीसी की 5वीं बैठक 24.11.2023 को पेट्रोलियम एवं प्राकृतिक गैस मंत्री की अध्यक्षता में आयोजित की गई और इस दौरान निम्नलिखित निर्णय लिए गए:

क. अंतर्राष्ट्रीय उड़ानों के लिए शुरुआत में क्रमशः 2027, 2028 और 2030 तक एटीएफ में एसएएफ के संमिश्रण के लिए 1%, 2% और 5% का सांकेतिक संमिश्रण लक्ष्य।

ख. संपीड़ित बायोगैस संमिश्रण दायित्व (सीबीओ) वित्त वर्ष 2024–25 तक स्वैच्छिक रहेगा और वित्त वर्ष 2025–26 से मिश्रण का दायित्व अनिवार्य हो जाएगा। सीबीओ को वित्त वर्ष 2025–26, 2026–27 और 2027–28 के लिए कुल सीएनजी / पीएनजी खपत का क्रमशः 1%, 3% और 4% रखा जाएगा। वित्त वर्ष 2028–29 से सीबीओ 5% होगा। एक केंद्रीय रिपोजिटरी निकाय (सीआरबी) परिचालन दिशानिर्देशों के आधार पर संमिश्रण अधिदेश की निगरानी और कार्यान्वयन करेगी;

ग. राष्ट्रीय जैव ईंधन नीति के खंड 6.3(ii) के अनुसार 2जी एथेनॉल के निर्यात की अनुमति दी जाएगी; और

घ. उत्पादों के बेस्ट बिफोर डेट (बीबीडी) के बाद बची हुई चीनी / चीनी सिरप / स्वीटनर (पेय पदार्थ, जूस आदि) को एथेनॉल उत्पादन के लिए फीडस्टॉक के रूप में उपयोग करने की अनुमति दी जाएगी और इन फीडस्टॉक्स से एथेनॉल बनाने का मूल्य निर्धारण ओएमसी द्वारा तय किया जा सकता है।

1.22. पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय का परिव्यय:

सरकार पूरे देश में पेट्रोलियम और गैस क्षेत्र को बढ़ावा देने के लिए प्रतिबद्ध है। पूंजीगत व्यय अवसंरचना परियोजनाओं के निर्माण और आर्थिक विकास को सहयोग देने और निवेश को बढ़ावा देने के माध्यम से रोजगार के अवसर पैदा करते हैं। वित्त वर्ष 2023–24 में पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के तहत

सीपीएसई के लिए कुल बजटीय आंतरिक और अतिरिक्त बजटीय संसाधन (आईईबीआर) ₹ 1,06,401 करोड़ था, जिसमें से अप्रैल–मार्च, 2023–24 के दौरान ₹ 1,36,821 करोड़ का वास्तविक व्यय हुआ है, जो बजटीय आईईबीआर का 128.6% है। वित्त वर्ष 2024–25 के लिए लक्षित बजटीय आईईबीआर ₹ 1,18,499 करोड़ है।



1.23. स्वच्छ ईंधन की उपलब्धता (एलपीजी+ पीएनजी)

एलपीजी और पीएनजी दोनों मिलकर घरेलू जरूरतों के लिए स्वच्छ ईंधन प्रदान करते हैं। भारत के कार्बन पदचिह्न को कम करने के पहल के रूप में, सरकार वर्ष 2030 तक भारत के प्राथमिक ऊर्जा संमिश्रण में प्राकृतिक गैस की हिस्सेदारी को 6.3% से बढ़ाकर 15% करके गैस आधारित अर्थव्यवस्था की परिकल्पना कर रही है। प्राकृतिक गैस पर बल दिए जाने से 31 मार्च 2024 तक पीएनजी कनेक्शन वाले घरों की संख्या 1.29 करोड़ तक पहुँच गई है। जैसे–जैसे नगरों में नगर गैस सेवा मिलने लगेगी, पीएनजी कनेक्शन की कुल संख्या बढ़ती जाएगी। एलपीजी जैसे तुलनीय जीवाश्म ईंधन की तुलना में पाइप्ड नेचुरल गैस अधिक सुरक्षित, सस्ती और सुविधाजनक है। चौबीसों घंटे निर्बाध उपलब्धता और चोरी न होने की संभवना इसके ऐसे अतिरिक्त लाभ हैं, जिन्होंने ग्राहकों को पीएनजी पर स्विच करने के लिए आकर्षित किया है। भारत में घरों में मुख्य रूप से खाना पकाने के लिए प्राकृतिक गैस का उपयोग किया जाता है।

एलपीजी खाना पकाने के लिए विश्व स्तर पर मान्यता प्राप्त स्वच्छ ईंधन है और यह एसडीजी–7 लक्ष्यों को प्राप्त करने में महत्वपूर्ण भूमिका निभाएगा। एलपीजी सीधे तौर पर एसडीजी 3,5,8,9,11,13 में सहयोग देता है और अप्रत्यक्ष रूप से शेष 10 एसडीजी में योगदान देता है। वर्ष 2014 से, भारत सरकार एलपीजी को खाना पकाने के स्वच्छ ईंधन के रूप में उपयोग करने को बढ़ावा देने के लिए मिशन मोड में कार्य कर रहा है ताकि बायोमास, लकड़ी और केरोसिन आदि जैसे पारंपरिक ईंधन के उपयोग को प्रतिस्थापित/कम किया जा सके। खाना पकाने के पारंपरिक ईंधन की तुलना में इसके अंतर्निहित लाभों के कारण नगरी और ग्रामीण दोनों क्षेत्रों में एलपीजी की खपत बढ़ रही है। 01.04.2014 तक 14.51 करोड़ सक्रिय घरेलू एलपीजी उपभोक्ता थे, जो 31 मार्च 2024 तक बढ़कर 32.42 करोड़ हो गए हैं।



1.24. डिजिटल भुगतान को बढ़ावा

खुदरा दुकानों में डिजिटल भुगतान की अवसंरचना तेजी से बढ़ रही हुआ है। 31.03.2024 तक देश भर में 81,338 (आईओसीएल–37,473, बीपीसीएल–21,841, एचपीसीएल–22,024) रिटेल आउटलेट हैं और इन सभी आरओ में 4,91,379 पीओएस टर्मिनल और 1,03,224 ई–वॉलेट सुविधा वाले डिजिटल अवसंरचना मौजूद हैं। इसके अलावा, सभी 81,338 रिटेल आउटलेट में भीम यूपीआई कार्य कर रहे हैं। सभी एलपीजी वितरक के पास भीम यूपीआई हैं।

1.25. इलेक्ट्रिक वाहन चार्जिंग स्टेशन

देश में इलेक्ट्रिक वाहन चार्जिंग अवसंरचना को बढ़ाने के लिए, तेल विपणन कंपनियां तकनीकी वाणिज्यिक व्यवहार्यता और पीईएसओ मानदंडों के अनुपालन के आधार पर चरणबद्ध तरीके से देश के विभिन्न हिस्सों में अपने रिटेल आउटलेट (आरओ) पर इलेक्ट्रिक वाहन चार्जिंग स्टेशन (ईवीसीएस) लगा रही हैं। 31.03.2024 तक, तेल विपणन कंपनियों ने अपने आरओ पर 15,800 ईवी चार्जिंग स्टेशन और 162 बैटरी स्वैपिंग स्टेशन स्थापित किए हैं।

1.26. बाजार प्राधिकरण

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने दिनांक 8.11.2019 के संकल्प के माध्यम से परिवहन ईंधन यानी एमएस और एचएसडी के विपणन के प्राधिकरण के दिशानिर्देश को संशोधित किया है। 31.03.2024 तक, 8 संस्थाएं, उक्त संकल्प के तहत परिवहन ईंधन के विपणन के लिए अधिकृत हैं।

1.27. स्टार्टअप इंडिया

तेल और गैस क्षेत्र की स्टार्टअप इंडिया पहल के तहत, वित्तपोषण करने और मेंटरिंग के लिए व्यक्तिगत पीएसयू द्वारा खुले विज्ञापनों के माध्यम से प्रस्ताव/आवेदन

आमंत्रित किए जाते हैं। प्रस्ताव के विषयों में सामाजिक रूप से प्रासंगिक विषयों के अलावा तेल पीएसयू के अपस्ट्रीम/मिडस्ट्रीम/डाउनस्ट्रीम संचालन में इंटरनेट ऑफ थिंग्स (आईओटी) को शामिल कर उनका लाभ उठाना, कारोबार प्रक्रियाओं का डिजिटलीकरण, हरित ईंधन, वैकल्पिक ऊर्जा, हाइड्रोकार्बन उद्योग के लिए उन्नत प्रौद्योगिकियां शामिल हैं। स्टार्ट-अप आवेदन प्राप्त करने के दौर से पहले, तेल पीएसयू स्टार्ट-अप के लिए अपनी प्रतिभा दिखाने और अभिनव विचार प्रदान करने के लिए समय-समय पर हैकथॉन/आइडिएशन चुनौतियों का आयोजन भी करते हैं।

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के तहत कार्यरत सार्वजनिक उपक्रमों ने कुल ₹ 495 करोड़ के स्टार्टअप कोष को जुटाया है। वर्तमान में, कुल 270 स्टार्टअप को तेल और गैस पीएसयू द्वारा लगभग ₹ 262 करोड़ का वित्त दिया गया है। तेल और गैस पीएसयू द्वारा समर्थित कुछ स्टार्टअप पहले ही परिपक्व हो चुके हैं।

1.28. कौशल विकास

कौशल भारत पहल के तहत, सोसायटी पंजीकरण अधिनियम, 1860 के तहत 26.04.2016 को हाइड्रोकार्बन क्षेत्र कौशल परिषद (एचएसएससी) की स्थापना की गई थी। पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय तथा कौशल विकास एवं उद्यमिता मंत्रालय के बीच कौशल विकास के क्षेत्र में सहयोग बढ़ाने के लिए 28 नवंबर, 2016 को एक समझौता ज्ञापन पर हस्ताक्षर किए गए थे।

राष्ट्रीय व्यावसायिक मानक (एनओएस)/योग्यता पैक (क्यूपी) विकास के लिए उद्योग सदस्यों के परामर्श से कई उच्च प्राथमिकता वाले व्यापारों की पहचान की गई थी। अब तक, राष्ट्रीय कौशल योग्यता समिति (एनएसक्यूसी) द्वारा 44 क्यूपी को मंजूरी दी गई है।

हाइड्रोकार्बन क्षेत्र के लिए छह नगरों अर्थात भुवनेश्वर, विजाग, कोच्चि, अहमदाबाद, गुवाहाटी और रायबरेली में कौशल विकास संस्थान (एसडीआई) स्थापित किए गए हैं। मार्च, 2024 तक इन एसडीआई में 34,773 से अधिक प्रशिक्षुओं को प्रशिक्षित किया जा चुका है।

20 अगस्त, 2021 को कौशल विकास संस्थान (एसडीआई), भुवनेश्वर का स्थायी परिसर, राष्ट्र को समर्पित किया गया था जिसकी परिकल्पना उद्योग के लिए प्रतिभा पूल तैयार करने के लिए अत्याधुनिक अवसंरचना और प्रौद्योगिकी का उपयोग करके विश्व स्तरीय उद्योग आधारित कौशल प्रशिक्षण प्रदान करने के लिए की गई है।

1.29. पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में प्रधानमंत्री गति शक्ति

माननीय प्रधानमंत्री द्वारा प्रधानमंत्री गति शक्ति राष्ट्रीय मास्टर प्लान (एनएमपी) का शुभारंभ 13 अक्टूबर 2021 को किया गया था। यह प्रौद्योगिकी और नवाचार का उपयोग करके विभिन्न आर्थिक क्षेत्रों में मल्टीमॉडल कनेक्टिविटी की एकीकृत योजना का परिवर्तनकारी दृष्टिकोण है। पीएम गतिशक्ति अगली पीढ़ी के लिए अवसंरचना के विकास, ईज ऑफ डूइंग और ईज ऑफ लिविंग के विकास की सुविधा प्रदान कर रही है। इस कार्यक्रम के दो प्रमुख तत्वों में (i) एक जीआईएस प्लेटफॉर्म जो राष्ट्रीय मास्टर प्लान (एनएमपी) के अनुरूप है और (ii) एनएमपी में मल्टीमॉडल इंफ्रास्ट्रक्चर कनेक्टिविटी की योजना के कार्यान्वयन के लिए एक संस्थागत ढांचा शामिल हैं।

पीएमजीएस विभिन्न तरीकों से निर्बाध परिवहन और कनेक्टिविटी को संभव बनाता है, जिसमें पाइपलाइन भी शामिल है, जिससे पेट्रोलियम उत्पादों और प्राकृतिक गैस के लिए अंतिम मील कनेक्टिविटी की चुनौतियों का समाधान होता है। एनएमपी की जानकारी का लाभ उठाते हुए, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय (एमओपीएंडएनजी) कार्यनीतिक रूप से अवसंरचनाओं के विस्तार और नए विकासों को प्राथमिकता देता है, जिससे निर्धारित समय-सीमा के भीतर अंतिम मील कनेक्टिविटी सुनिश्चित होती है।

पीएम गति शक्ति की परिकल्पना

पीएम गति शक्ति में भारतमाला, सागरमाला, अंतर्देशीय जलमार्ग, शुष्क/भूमि बंदरगाह, उड़ान आदि जैसे विभिन्न मंत्रालयों और राज्य सरकारों के अवसंरचनात्मक योजनाओं को शामिल किया जाएगा। कनेक्टिविटी में सुधार लाने और भारतीय कारोबारों को अधिक प्रतिस्पर्धी बनाने के लिए टेक्सटर क्लस्टर, फार्मास्यूटिकल्स क्लस्टर, रक्षा गलियारे, इलेक्ट्रॉनिक पार्क, औद्योगिक गलियारे, मछली पकड़ने के क्लस्टर, कृषि क्षेत्र जैसे आर्थिक क्षेत्रों को शामिल किया जाएगा। यह बीआईएसएजी-एन द्वारा विकसित इसरो (भारतीय अंतरिक्ष अनुसंधान संगठन) इमेजरी के साथ स्थानिक नियोजन उपकरणों सहित प्रौद्योगिकी का व्यापक रूप से लाभ उठाएगा।

(भास्कराचार्य राष्ट्रीय अंतरिक्ष अनुप्रयोग और भूसूचना विज्ञान संस्थान)



पीएमजीएस संस्थागत तंत्र की तरह ही, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में मंत्रालय और संबद्ध सार्वजनिक उपक्रमों के भीतर पीएमजीएस के प्रभावी कार्यान्वयन को सुनिश्चित करने के लिए कार्यकारी ढांचा बनाया गया है –

क. **गतिशक्ति प्रकोष्ठ:** यह प्रकोष्ठ पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में गतिशक्ति के कार्यान्वयन की देखरेख के लिए उप महानिदेशक (ईएंडएस) की अध्यक्षता में गठित किया गया है।

ख. **गतिशक्ति कोर टीम:** प्रत्येक सीपीएसई से जीएम और उससे ऊपर के स्तर के अधिकारी संबंधित इकाई में गतिशक्ति की निगरानी और कार्यान्वयन के लिए नामित किए गए हैं।

ग. **तकनीकी सहायता टीम:** तकनीकी विशेषज्ञों से मिलकर बनी है। पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में गतिशक्ति पहल के विकास और कार्यान्वयन में गतिशक्ति प्रकोष्ठ और नोडल अधिकारियों की सहायता के लिए गठित किया गया है।

प्रारंभिक रूपरेखा तैयार करने के बाद, इस प्लेटफॉर्म की पूरी क्षमता का दोहन करने के लिए पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने विभिन्न उपकरण विकसित किए हैं और परियोजनाओं की योजना बनाने के लिए भी इसका इस्तेमाल किया है, जिनमें से कुछ इस प्रकार हैं:

- **ऊर्जा सुरक्षा समन्वय पोर्टल का विकास**

  विशेष आर्थिक क्षेत्र (ईईजेड) के उपयोग को अनुकूलतम बनाने और अन्वेषण और उत्पादन (ईएंडपी) ऑपरेटरों की सुरक्षा सुनिश्चित करने के लिए, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने जीआईएस आधारित ऊर्जा सुरक्षा समन्वय पोर्टल विकसित किया है। पीएमजीएस–एनएमपी पोर्टल पर मैप किए गए डाटा का लाभ उठाकर, यूएसएस पोर्टल नो–गो क्षेत्रों को कम करता है, प्रोटोकॉल का पालन करने वाली सभी एजेंसियों द्वारा समवर्ती उपयोग के लिए ईईजेड का 99% उपलब्ध कराता है। निर्बाध अंतर–मंत्रालयी समन्वय के माध्यम से यूएसएस पोर्टल ईईजेड में उनका सह–अस्तित्वपूर्ण परिवहन के लिए दीर्घकालिक विकल्पों को संभव बनाता है और हमारी ब्लू अर्थव्यवस्था और ऊर्जा सुरक्षा को बढ़ावा देता है। इस पोर्टल की मदद से, ईईजेड में लगभग 10 लाख वर्ग किलोमीटर के अपतटीय क्षेत्रों से ईएंडपी संचालन के लिए प्रतिबंध को कम किया गया है।

- **इलेक्ट्रॉनिक–व्यापक मार्ग सर्वेक्षण (ई–डीआरएस) उपकरण**

  किसी भी पाइपलाइन परियोजना की आयोजना और निष्पादन के लिए विस्तृत मार्ग सर्वेक्षण अति आवश्यक है। हालाँकि, यह अधिक समय लेने वाली और जटिल प्रक्रिया है जिसमें भूभाग की पहचान करना, मिट्टी की संरचना देखना, कई एजेंसियों के साथ समन्वय करना आदि कार्य शामिल हैं।

  पारंपरागत अधिक समय लेने वाले पाइपलाइन मार्ग सर्वेक्षण प्रक्रिया को कारगर बनाने के लिए, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने ई–डीआरएस उपकरण विकसित किया है।

  पीएम गति शक्ति एनएमपी पोर्टल के मौजूदा अद्यतित डाटा का लाभ उठाते हुए, यह उपकरण व्यापक मार्ग सर्वेक्षण रिपोर्ट में लगने वाले आवश्यक समय को काफी कम कर देता है, सतह की विशेषताओं, कैडस्ट्रल मानचित्रों, क्रॉसिंग विवरण, आरओयू अधिग्रहण और राजस्व विवरण, फसल और मिट्टी के प्रकार और मार्ग के साथ जनसंख्या घनत्व पर रियल समय का डाटा प्रदान करता है। उपकरण की दक्षता के कारण पाइपलाइन निर्माण में पर्याप्त वित्तीय बचत होती है।

  लगभग 50 रिपोर्ट बनाने में इस रियल समय के डाटा और इसके सृजन से पाइपलाइन निर्माण में प्रति किलोमीटर ₹ 25,000 रुपये तक की महत्वपूर्ण वित्तीय बचत हो सकती है।

  आईओसीएल की नई मुंद्रा–पानीपत पाइपलाइन, गुरदासपुर–जम्मू पाइपलाइन और नव घोषित सिलीगुड़ी–झापा उत्पाद पाइपलाइन (एसजेपीएल) की सर्वेक्षण रिपोर्टों के सत्यापन करने के लिए ई–डीआरएस उपकरण का उपयोग किया गया था। एसजेपीएल की आयोजना के दौरान, एनएमपी–डीआरएस उपकरण का उपयोग करके बड़े वन क्षेत्र से बचा जा सका था। जिसका उपयोग आईओसीएल की नई मुंद्रा–पानीपत पाइपलाइन, गुरदासपुर–जम्मू पाइपलाइन और नव घोषित सिलीगुड़ी–झापा उत्पाद पाइपलाइन (एसजेपीएल) की सर्वेक्षण रिपोर्टों के सत्यापन के लिए किया गया था। एसजेपीएल की आयोजना के दौरान, एनएमपी का उपयोग करके बड़े वन क्षेत्र से बचा गया था।

  - विशेष सीबीएम बोली राउंड–2022 के तहत पेश किए गए 16 कोल बेड मीथेन (सीबीएम) ब्लॉकों का व्यापक डेस्कटॉप विश्लेषण
  - इंडो–नेपाल पाइपलाइन के भारतीय खंड अर्थात् सिलीगुड़ी झापा उत्पाद पाइपलाइन का रूट ऑप्टिमाइजेशन

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने पीएम गतिशक्ति पहल पर कार्य करते हुए महत्वपूर्ण प्रगति हासिल की है। पीएम गतिशक्ति का एमओपीएनजी पोर्टल पहले प्रयोग के रूप में विकसित किया गया है, जिसका बाद में मुख्य एनएमपी प्लेटफॉर्म के साथ एकीकरण है। एमओपीएनजी पीएम गतिशक्ति पोर्टल में, एमओपीएनजी गतिशक्ति सेल और कोर टीम के परामर्श से कुल 9 परतें और 23 उप–परतें निर्धारित की गई हैं। मानक डेटा बेस संरचना यानी परतों, उप–परतों, ऐट्रीब्यूट और मेटाडेटा को परिभाषित किया गया है। एनएमपी पर डेटा की गुणवत्ता बनाए रखने के लिए, एक त्रि–स्तरीय सत्यापन तंत्र (निर्माता, परीक्षक और अनुमोदनकर्ता) मौजूद है। मानक संचालन प्रक्रिया (एसओपी) को गुणवत्ता सुधार कार्यक्रम (क्यूआईपी) के

लिए अंतिम रूप दिया गया है और हितधारकों के साथ साझा किया गया है। पीएमजीएस एनएमपी पोर्टल संबंधी उपयोगकर्ता मैनुअल तैयार किया गया है और एनएमपी डैशबोर्ड पर अपलोड किया गया है। पीएनजी क्षेत्र से संबंधित 1 लाख से अधिक परिसंपत्तियों और 1 लाख किलोमीटर पाइपलाइनों को एनएमपी पर सावधानीपूर्वक मैप किया गया है जो नौ परतों और 23 उप–परतों के अनुरूप है।

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने पीएम गतिशक्ति में हितधारकों को शामिल करने के लिए सक्रिय कदम उठाए हैं, जिससे प्रकोष्ठ के सदस्य डीपीआईआईटी द्वारा आयोजित क्षेत्रीय कार्यशालाओं में भाग ले रहे हैं। लगातार विचार–मंथन सत्र आयोजित किए जा रहे हैं। बीआईएसएजी–एन में नोडल अधिकारियों और तकनीकी सहायता टीम के लिए कई संवेदीकरण कार्यशालाओं का आयोजन किया गया है, जिसके पूरक के रूप में इन–हाउस प्रशिक्षण सत्र भी आयोजित किए गए हैं। संयुक्त प्रयासों के परिणामस्वरूप अब तक 300 से अधिक अधिकारियों को प्रशिक्षण दिया गया है, यह संख्या लगातार बढ़ रहा है। सभी सीपीएसई को कार्यकारी कैडर के लिए अपने वार्षिक प्रशिक्षण कैलेंडर में पीएमजीएस को शामिल करने की सलाह दी गई है।

पीएम गतिशक्ति के तहत क्षेत्र विकास दृष्टिकोण के अनुरूप, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने तमिलनाडु के तटीय जिले नागपट्टिनम की पहचान की है, जहां लगभग 40,000 करोड़ रुपये के कैपेक्स के साथ कावेरी बेसिन रिफाइनरी और 9 एमएमटीपीए क्षमता वाले पेट्रोकेमिकल लिमिटेड (सीबीआरपीएल) रिफाइनरी और संबंधित पाइपलाइन परियोजनाओं पर कार्य चल रहा है। नागापट्टिनम में औद्योगिकीकरण की उच्च क्षमता है, जिसमें जिले को पेट्रोलियम, रसायन और पेट्रोकेमिकल्स निवेश क्षेत्र (पीसीपीआईआर) के रूप में विकसित करने की क्षमता है। बंदरगाह विकास, रेलवे साइडिंग, भारी उपकरणों के परिवहन के लिए मौजूदा राष्ट्रीय और राज्य राजमार्गों का चौड़ीकरण, स्कूल, आंगनवाड़ी केंद्र–पीएचसी, सीएचसी, एमएसएमई केंद्र, कौशल विकास केंद्र, आईटीआई, अस्पताल, पर्यटन और आतिथ्य आदि जैसी विभिन्न अवसंरचनात्मक परियोजनाओं की पहचान की गई है।

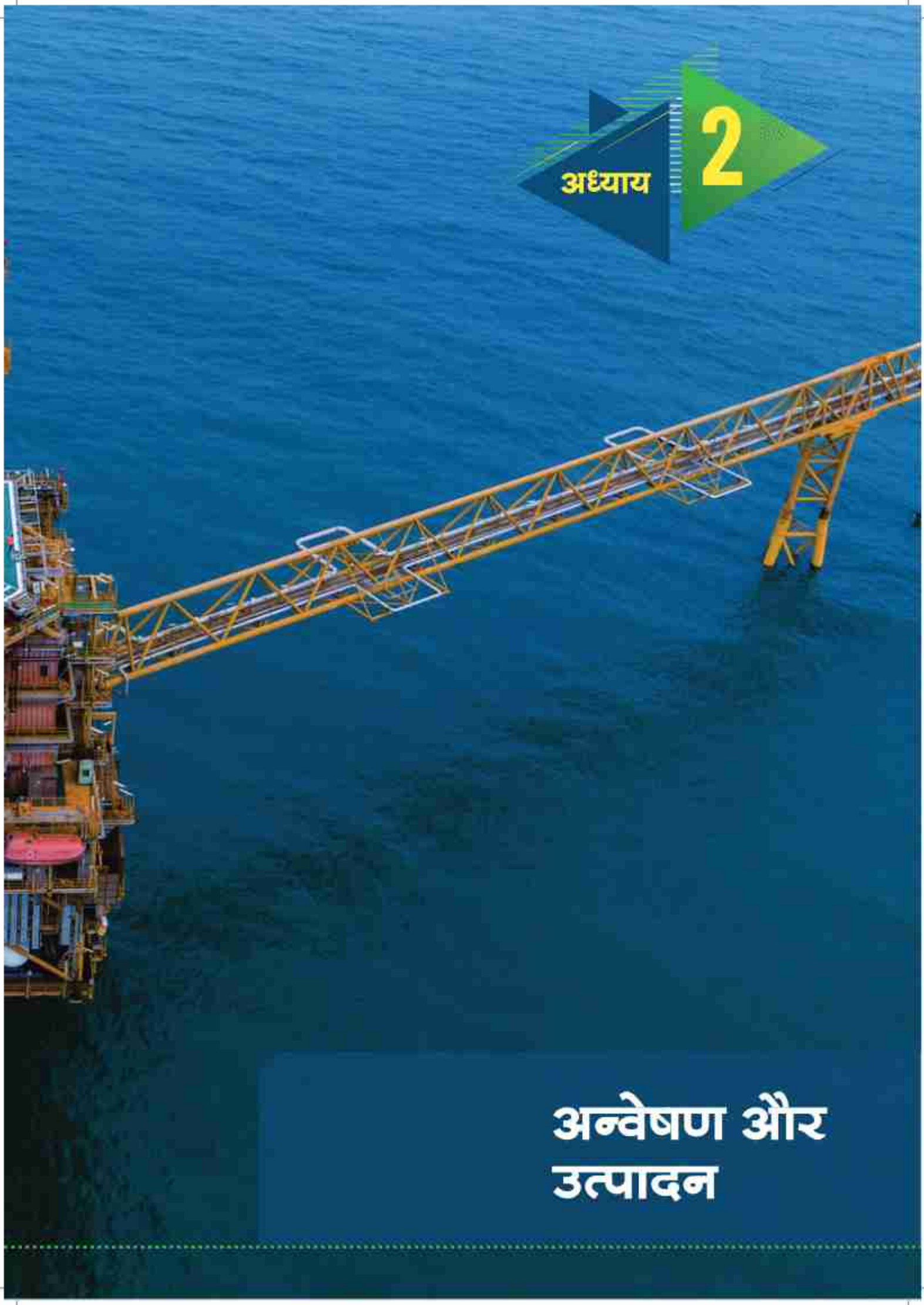
1.30. एमओपीएनजी मॉनिटरिंग डैशबोर्ड, 2019

एमओपीएनजी का मॉनिटरिंग डैशबोर्ड जिसे एमओपीएनजी परियोजना पोर्टल के रूप में जाना जाता है, 2019 में नामांकन और पीएससी/आरएससी/ सीबीएम व्यवस्था के अन्वेषण और उत्पादन प्रदर्शन से संबंधित विभिन्न केपीआई की ऑनलाइन निगरानी और विश्लेषण के लिए लॉन्च किया गया था। इसके अलावा, तेल और गैस उत्पादन, कैपेक्स रिपोर्ट, स्वच्छता कार्रवाई रिपोर्ट आदि से संबंधित तेल और गैस क्षेत्र में उत्पादन प्रदर्शन रिपोर्ट स्वचालित रूप से तैयार करने के लिए 2023 की पहली तिमाही में एमओपीएंडएनजी परियोजना पोर्टल को एपीआई के माध्यम से एमओपीएंडएनजी के सभी तेल और गैस सीपीएसई/संगठनों की निगरानी प्रणालियों के साथ एकीकृत किया गया था। एमओपीएंडएनजी परियोजना पोर्टल से एनआईपी पोर्टल पर स्वचालित डेटा हस्तांतरण की सुविधा के लिए एमओपीएंडएनजी मॉनिटरिंग डैशबोर्ड यानी एमओपीएंडएनजी परियोजना पोर्टल को भी 2023 की अंतिम तिमाही में एनआईपी पोर्टल के साथ एपीआई के माध्यम से एकीकृत किया गया था।






PLOP



अध्याय 2

अन्वेषण और उत्पादन

2 अन्वेषण और उत्पादन

2.1. प्रसंग/पृष्ठभूमि

2.1.1. हाइड्रोकार्बन महानिदेशालय (डीजीएच) की स्थापना भारत सरकार के संकल्प द्वारा 1993 में पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के प्रशासनिक नियंत्रण के तहत की गई थी। डीजीएच की स्थापना का उद्देश्य पेट्रोलियम गतिविधि के पर्यावरण, सुरक्षा, तकनीकी और आर्थिक पहलुओं के संबंध में भारतीय तेल और प्राकृतिक गैस संसाधनों के संतुलित प्रबंधन को बढ़ावा देना था। इसके अलावा, डीजीएच को खोजे गए क्षेत्रों/अन्वेषण ब्लॉकों के लिए उत्पादन साझाकरण संविदा (पीएससी), ज्ञात लघु क्षेत्र नीति, हाइड्रोकार्बन अन्वेषण और उत्पादन नीति (हेल्प) सहित नीतियों के कार्यान्वयन के माध्यम से निवेश को बढ़ावा देने और अन्वेषण और उत्पादन गतिविधियों की निगरानी से संबंधित कुछ दायित्वों के साथ सुदृढ़ किया गया है।

2.2. भारत में तलछटी बेसिन

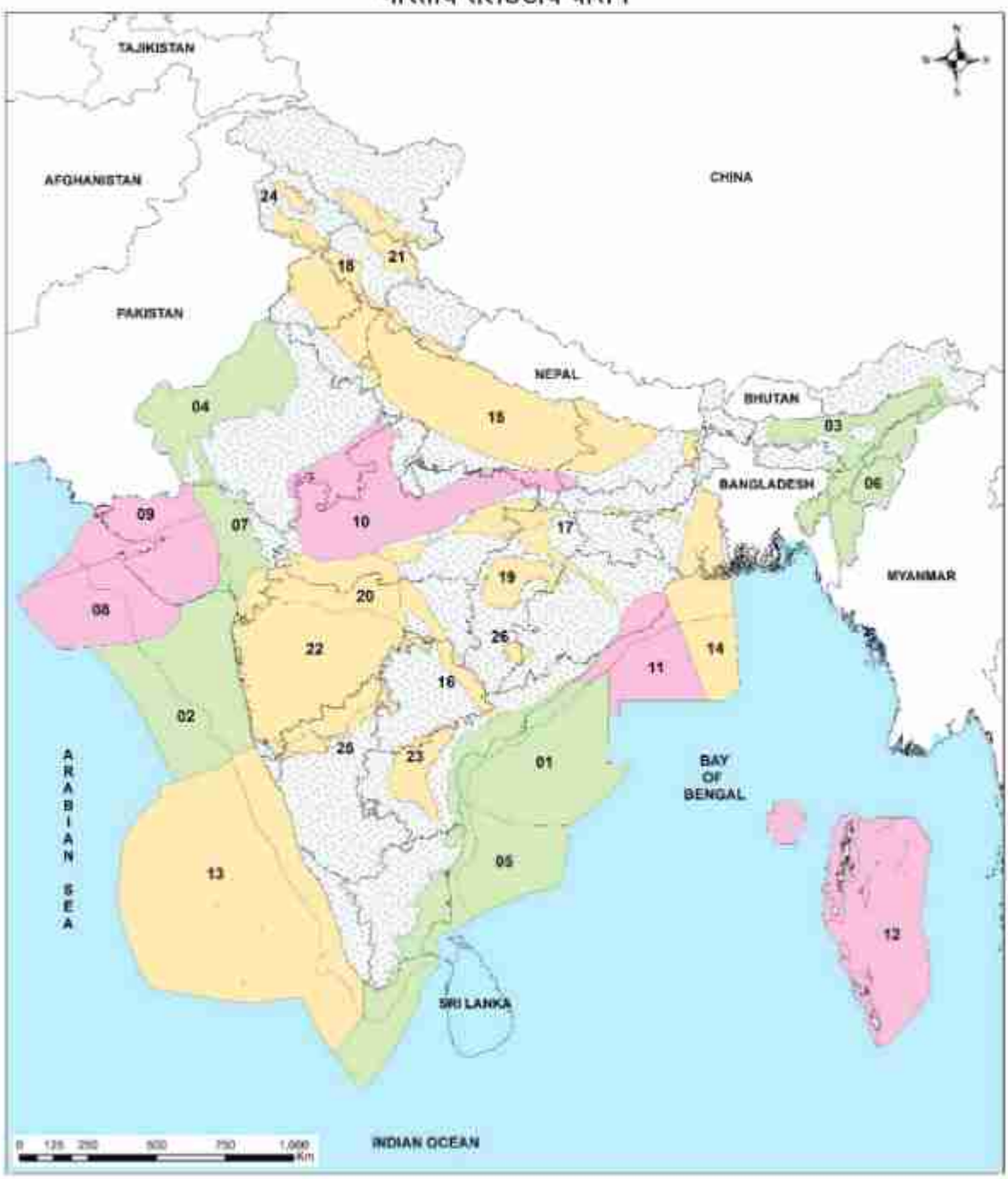
2.2.1. भारत में 26 तलछटी बेसिन हैं, जिनका क्षेत्रफल 3.36 मिलियन वर्ग किलोमीटर है। भारत के स्थलीय तलछटी बेसिनों का क्षेत्रफल (ऐक्रिएज) लगभग 1.63 मिलियन वर्ग किलोमीटर है, अपतटीय तलछटी बेसिनों का 400 मीटर आइसोबाथ तक हवाई विस्तार लगभग 0.41 मिलियन वर्ग किलोमीटर है तथा 400 मीटर आइसोबाथ से परे गहरे पानी में तलछटी क्षेत्र लगभग 1.32 मिलियन वर्ग किलोमीटर का होने का अनुमान है।

2.2.2. भारतीय तलछटी घाटियों को वर्तमान में ज्ञात उनकी संभावना की डिग्री के आधार पर मोटे तौर पर तीन श्रेणियों में विभाजित किया गया है, जो इस प्रकार हैं:

तालिका 2.1: भारतीय तलछटीय बेसिन की श्रेणियां

बेसिन के प्रकार	क्षेत्र (वर्ग कि.मी.)	हाइड्रोकार्बन संभाव्यता	बेसिन/क्षेत्र
श्रेणी–I (7 बेसिन)	9,98,325	स्थापित वाणिज्यिक उत्पादन	कैम्बे, असम शेल्फ, मुंबई अपतट, कृष्णा गोदावरी, कावेरी, असम अराकान फोल्ड बेल्ट और राजस्थान
श्रेणी–II (5 बेसिन)	7,80,974	हाइड्रोकार्बन का ज्ञात संचय परंतु अब तक वाणिज्यिक उत्पादन नहीं	कच्छ, महानदी–एनईसी, अंडमान–निकोबार, विंध्य, सौराष्ट्र
श्रेणी–III (14 बेसिन)	15,86,150	अब तक हाइड्रोकार्बन के एकत्रित होने का कोई ज्ञात नहीं हुआ है। सादृश्य द्वारा संभावित	हिमालयी फोरलैंड, गंगा–पंजाब, केरल–कोंकण, बंगाल–पूर्णिया, करेवा, स्पीति–जांस्कर, सतपुड़ा–दक्षिण रीवा–दामोदर, नर्मदा, दक्कन सिनेक्लिज, भीमा–कलडगी, कडप्पा, प्राणहिता–गोदावरी, बस्तार, छत्तीसगढ़
कुल	33,65,449		

भारतीय तलछटीय बेसिन



श्रेणी-I
(स्थापित वाणिज्यिक उत्पादन)

श्रेणी-II
(विकसित प्रोस्पेक्टिविटी)

श्रेणी-III
(अपर्याप्त बेसिन)

प्री-कैम्ब्रियन बेसमेंट
टेक्टोनिक सेडीमेंटस

श्रेणी-I
1 कृष्णा गोदावरी (केजी)
2 मुंबई अपतटीय
3 असम शेल्फ
4 राजस्थान बेसिन
5 कावेरी
6 असम अकान फोल्ड बेल्ट
7 कच्छ

श्रेणी-II
8 सौराष्ट्र
9 कच्छ
10 पिन्ना
11 महानदी
12 अंडमान

श्रेणी-III
13 केरल कर्नाटक
14 बंगाल-पूर्णिया
15 गंगा-पंजाब
16 मणहिला गोदावरी (पीजी)
17 सतपुड़ा-दक्षिण रीवा-दामोदर
18 हिमालयी फोरलैंड
19 छत्तीसगढ़
20 नर्मदा
21 स्पीति जांस्कर
22 डेकन ट्रालसेंस
23 कुडापाह
24 केरेवा
25 शीम-कलाधगी
26 बस्तर

2.2.3. देश में कच्चे तेल और प्राकृतिक गैस का उत्पादन मुख्य रूप से श्रेणी–I तलछटीय घाटियों तक ही सीमित है। इसके अलावा, पाँच श्रेणी–II घाटियों में पेट्रोलियम संसाधनों की महत्वपूर्ण मात्रा स्थापित की गई है, तथापि इन घाटियों से उत्पादन अभी शुरू नहीं हुआ है। विभिन्न श्रेणियों के तहत 3.36 मिलियन वर्ग किलोमीटर के कुल भारतीय तलछटीय क्षेत्र का वितरण निम्नानुसार है:



2.3. कच्चे तेल के अनुमानित संसाधन और प्राकृतिक गैस पारंपरिक हाइड्रोकार्बन संसाधन

2.3.1. देश के 26 तलछटीय बेसिनों में अनुमानित पारंपरिक हाइड्रोकार्बन संसाधन 41.87 बिलियन टन (तेल और तेल के समतुल्य गैस) हैं, जो कि 28.08 बिलियन टन के पहले के अनुमानों की तुलना में लगभग 49% अधिक है। इसका बेसिन–वार विवरण इस प्रकार है:

तालिका 2.2: भारत में अनुमानित हाइड्रोकार्बन संसाधन

बेसिन श्रेणी	सं.	बेसिन का नाम	अनुमानित संसाधन (एमएमटीओई) अनुमान (2017)	कुल क्षेत्र, वर्ग किमी	सक्रिय क्षेत्र (पीईएल/ पीएमएल), वर्ग किमी
श्रेणी I (उत्पादित और दोहन किए जा रहे भंडार वाले बेसिन)	1	असम अराकान फोल्ड बेल्ट	1,632.80	80,825	16160.5
	2	असम शेल्फ	6,001.20	56,000	30057.67
	3	कैम्बे	2,585.60	53,500	0340.592
	4	कावेरी	1,964.40	2,40,000	20904.42
	5	कृष्णा गोदावरी	9,554.50	2,30,000	19354.813
	6	मुंबई ऑफशोर	9,646.00	2,12,000	57542.66
	7	राजस्थान	4,126.00	1,26,000	24221.2
श्रेणी-I कुल			**35,510.50**	**9,98,325**	**1,88,582**
श्रेणी II (आकस्मिक संसाधनों वाले बेसिन जिन्हें विकसित और मुद्रीकृत किया जाना है)	8	अंडमान	371.4	2,25,918	23262
	9	कच्छ	898.4	58,554	13779
	10	महानदी	650.6	99,500	28609.73
	11	सौराष्ट्र	1,325.20	1,94,114	10882.6
	12	विंध्य	632.5	2,02,888	13722
श्रेणी-II कुल			**3,878.10**	**7,80,974**	**90,255**
श्रेणी III (केवल संभावित संसाधनों वाले बेसिन जिन्हें खोजा और खोजा जाना है)	13	बस्तर	1.3	5,360	
	14	बंगाल	828.3	1,21,914	17428
	15	भीमा–कालादगी	3.2	14,100	
	16	छत्तीसगढ़	25	32,000	
	17	कडप्पा	5.1	40,100	3306
	18	डेक्कन	11	2,37,500	
	19	गंगा	128.4	3,04,000	2428
	20	हिमालयी वनभूमि	44.4	30,110	666
	21	करेवा	4	6,671	
	22	केरला कोनाकन	1,244.60	5,80,000	11350
	23	नर्मदा	18	95,215	2999
	24	प्राणहिता गोदावरी	95.4	30,000	
	25	सतपुड़ा–सरीवा–दामोदर	63	57,180	906
	26	स्पीति–जांस्कर	11.1	32,000	
श्रेणी-III कुल			**2,482.80**	**15,86,150**	**39,083**
कुल (एमएमटीओई)			**41,871.40**	**33,65,449**	**3,17,920**

2.3.2. दिनांक 01.04.2024 की स्थिति के अनुसार देश के भंडार (2पी) और संसाधन (2सी): देश में प्रचालित ई और पी व्यवस्थाएँ, अर्थात् नामांकन, उत्पादन साझाकरण संविदा (पीएससी), ओपन एकरेज लाइसेंसिंग नीति (ओएएलपी), खोजे गए लघु क्षेत्र (डीएसएफ), और पारंपरिक और अपरंपरागत हाइड्रोकार्बन भंडार के लिए कोल बेड मीथेन (सीबीएम)। दिनांक 01.04.2024 की स्थिति के अनुसार, ऑपरेटरों ने देश स्तर पर लगभग 671 एमएमटी कच्चे तेल और 1,130 बीसीएम प्राकृतिक गैस की पुनर्प्राप्ति (2पी+2सु) भंडारण और संसाधनों की रिपोर्ट की है। देश भर में भंडारण और आकस्मिक संसाधनों की स्थिति तालिका 2.3 में दी गई है।

देश स्तर पर रिपोर्ट किए गए आकस्मिक संसाधन (2सी) काफी अधिक हैं और उन्हें एक निर्धारित समय सीमा के भीतर नई या पुनर्विकास परियोजनाओं द्वारा प्राथमिकता दी जानी चाहिए।

तालिका 2.3: हाइड्रोकार्बन भंडारण की स्थिति, 01.04.2024 की स्थिति के अनुसार

क्षेत्र	2पी सम्पदान		2पी इंक्रूअल		वर्ष 2023-20242 के दौरान खोजी		भंडार (2पी)		शेष वसूली योग्य भंडार (2सी)	
	तेल+पारं. (एमएमटी)	गैस (बीसीएम)	तेल+पारं. (एमएमटी)	गैस (बीसीएम)	तेल+पारं. (एमएमटी)	गैस (बीसीएम)	तेल+पारं. (एमएमटी)	गैस (बीसीएम)	तेल+पारं. (एमएमटी)	गैस (बीसीएम)
नामांकन (ओएनजीसी और तेल)	6209.4	2761.8	1697.6	1421.0	9.3	10.7	361.9	374.8	110.2	289.4
पीएससी	956.1	770.8	229.9	346.9	3.8	19.7	67.1	187.3	121.1	106.7
डीएसएफ	63.8	91.6	5.4	24.5	1.2	6.3	5.3	24.1	5.0	19.1
ओएएलपी	6.2	34.1	0.00	0.00	0.0	0.0	0.00	0.00	0.9	20.1
सीबीएम	0.00	342.7	0.00	63.7	0.00	-1.2	0.00	57.2	0.00	15.4
कुल योग	**7,235.4**	**4,001.1**	**1,933.0**	**1,856.1**	**14.2**	**35.6**	**434.3**	**643.4**	**237.1**	**450.8**

2.3.3. अपरंपरागत हाइड्रोकार्बन संसाधन (सीबीएम): देश के 11 राज्यों में अनुमानित सीबीएम संसाधन 2,600 बिलियन क्यूबिक मीटर (बीसीएम) या 91.8 ट्रिलियन क्यूबिक फीट (टीसीएफ) है। सीबीएम संसाधनों का राज्य–वार विवरण इस प्रकार है:



ओएनजीसी ऑईसी शेड

तालिका 2.4: भारत में कोल बेड मिथेन संसाधनों का राज्य–वार विवरण

सं.	राज्य	अनुमानित सीबीएम संसाधन (बीसीएम में)	अनुमानित सीबीएम संसाधन (टीसीएफ में)	जीआईआईपी (टूसीएफ में)
1	झारखंड	722.08	25.5	1.92
2	राजस्थान	359.62	12.7	0
3	गुजरात	351.13	12.4	0
4	ओडिशा	243.52	8.6	0
5	छत्तीसगढ़	240.69	8.5	0
6	मध्यप्रदेश	218.04	7.7	3.65
7	पश्चिम बंगाल	218.04	7.7	4.85
8	तमिलनाडु	104.77	3.7	0
9	तेलंगाना और आंध्र प्रदेश	99.11	3.5	0
10	महाराष्ट्र	33.98	1.2	0
11	पूर्वोत्तर	8.50	0.3	0
कुल सीबीएम संसाधन		**2,599.48**	**91.8**	**10.42**

* कंवर्जन फैक्टर: 1 क्यूबिक मीटर = 35.3147 क्यूबिक फीट

2.3.4. शेल गैस/तेल संसाधन

1. शेल गैस / तेल एक प्रकार का प्राकृतिक गैस / तेल है जो स्रोत चट्टान (आमतौर पर, शेल) के छिद्र स्थान और दरारों के भीतर फंसा रहता है जिसे निकाला नहीं गया है और वह वहां से हटा नहीं है। उनकी मौजूदगी की प्रकृति और निष्कर्षण की विधि के कारण उन्हें अपरंपरागत संसाधन के रूप में वर्गीकृत किया जाता है।

2. यह अनुमान लगाया गया है कि शेल तेल और गैस के दृष्टिकोण से भारत में कई तलछटीय घाटियाँ (गंगा के मैदानी इलाके, गुजरात, राजस्थान, आंध्र प्रदेश और अन्य तटीय क्षेत्र), जिनमें हाइड्रोकार्बन युक्त घाटियाँ– कैम्बे, असम–अराकान और दामोदर शामिल हैं, जिनमें शेल गैस और तेल के होने की संभावना है। वर्ष 2011 से, यूनाइटेड स्टेट्स जियोलॉजिकल सर्वे (यूएसजीएस), सेंट्रल माइन प्लानिंग एंड डिजाइन (सीएमपीडीआई) और ओएनजीसी जैसी विभिन्न एजेंसियों ने देश में शेल गैस भंडारण के अनुमान के संबंध में अध्ययन किए हैं। भारत में शेल गैस और तेल संसाधन की संभावनाओं को समझने और उसका दोहन करने के लिए, भारत सरकार ने 14 अक्टूबर 2013 को राष्ट्रीय तेल कंपनियों (एनओसीएस), ओएनजीसी और ऑयल के लिए शेल गैस और तेल अन्वेषण नीति की घोषणा की। शेल गैस नीति–2013 के तहत, ओएनजीसी ने 4 बेसिन में 50 ब्लॉकों की पहचान की है, जबकि ऑयल ने 2 बेसिनों में 6 ब्लॉकों की पहचान की है। उनके नामांकन क्षेत्रों में कुल 34 शेल कुओं की खुदाई की गई (30 ओएनजीसी द्वारा और 4 ऑयल द्वारा), तथापि, शेल गैस / तेल की संभावनाओं को सिद्ध नहीं किया जा सका है।

2.3.5. हाइड्रोकार्बन संसाधनों का पुनर्मूल्यांकन

देश में हाइड्रोकार्बन संसाधन क्षमता के अद्यतन आकलन के लिए, देश के सभी 26 तलछटीय बेसिनों में हाइड्रोकार्बन संसाधनों का पुनर्मूल्यांकन पिछले आकलन के लगभग दो दशक बाद 2017 में पूरा किया गया था। इसके परिणामस्वरूप 41.87 बिलियन टन (तेल और गैस के समतुल्य तेल) के पारंपरिक हाइड्रोकार्बन संसाधनों का पूर्वानुमान लगाया गया, जो कि 28.08 बिलियन टन के पहले के अनुमान की तुलना में लगभग 49% अधिक है।

2.4. कच्चा तेल और प्राकृतिक गैस उत्पादन

2.4.1. वित्त वर्ष 2023–24 में **कच्चे तेल का उत्पादन** लगभग 29.34 एमएमटी हुआ है। लगभग 77% कच्चा तेल ओएनजीसी और ऑयल द्वारा नामांकन व्यवस्था (जेवी शेयर को छोड़कर) से है और शेष 23% कच्चे तेल का उत्पादन पीएससी व्यवस्था से निजी / जेवी कंपनियों द्वारा किया गया है।

2.4.2. वित्त वर्ष 2023–24 में अपतटीय कच्चे तेल का उत्पादन लगभग 51% हुआ है। शेष ऑनलैंड कच्चे तेल का उत्पादन मुख्य रूप से आंध्र प्रदेश, अरुणाचल प्रदेश, असम, गुजरात, राजस्थान, तमिलनाडु, पश्चिम बंगाल आदि से हुआ। वित्त वर्ष 2023–24 और पिछले 6 वर्षों में कच्चे तेल के उत्पादन का विवरण इस प्रकार है:

तालिका 2.5: कच्चे तेल के उत्पादन का राज्य–वार रुझान (एमएमटी)

स्थान का प्रकार	राज्य/स्थान	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
ऑफशोर	पूर्वी ऑफशोर	0.83	0.65	0.56	0.74	0.63	0.55	1.46
	गुजरात ऑफशोर	0.40	0.74	0.59	0.41	0.34	0.38	0.33
	पश्चिमी ऑफशोर	16.92	15.48	14.85	14.24	13.60	13.55	13.24
कुल ऑफशोर		**18.14**	**16.87**	**16.00**	**15.39**	**14.57**	**14.48**	**15.03**
पीएसयू का हिस्सा		**16.24**	**14.97**	**14.54**	**14.24**	**13.62**	**13.54**	**13.21**
निजी/जेवी का हिस्सा		**1.91**	**1.90**	**1.47**	**1.15**	**0.95**	**0.94**	**1.82**
ऑनलैंड	आंध्र प्रदेश	0.30	0.30	0.24	0.19	0.20	0.24	0.25
	अरुणाचल प्रदेश	0.05	0.04	0.06	0.05	0.05	0.05	0.05
	असम	4.34	4.31	4.09	3.90	3.99	4.16	4.36
	गुजरात	4.59	4.63	4.71	4.65	4.63	4.85	4.95
	राजस्थान	7.89	7.67	6.65	5.89	5.89	5.07	4.42
	तमिलनाडु	0.35	0.40	0.42	0.41	0.37	0.32	0.29
	त्रिपुरा	0.003	0.003	0.003	0.003	0.003	0.003	0.002
	पश्चिम बंगाल	0.000	0.000	0.000	0.00010	0.00010	0.000008	0
कुल ऑनलैंड		**17.520**	**17.340**	**16.170**	**15.100**	**15.133**	**14.699**	**14.329**
पीएसयू का हिस्सा		**9.36**	**9.37**	**9.20**	**8.87**	**8.82**	**9.11**	**9.35**
निजी/जेवी का हिस्सा		**8.15**	**7.97**	**6.97**	**6.23**	**6.30**	**5.59**	**4.98**
कुल योग		**35.66**	**34.20**	**32.17**	**30.49**	**29.69**	**29.18**	**29.36**
पीएसयू का हिस्सा		**25.60**	**24.34**	**23.73**	**23.11**	**22.44**	**22.65**	**22.56**
निजी/जेवी का हिस्सा		**10.06**	**9.87**	**8.44**	**7.39**	**7.25**	**6.53**	**6.80**

2.4.3. वर्ष 2023–24 में **प्राकृतिक गैस का उत्पादन** लगभग 36.438 बीसीएम हुआ है। लगभग 61.5% प्राकृतिक गैस उत्पादन नामांकन व्यवस्था (जेवी शेयर को छोड़कर) से ओएनजीसी और ओआईएल द्वारा किया गया है और शेष 38.5% प्राकृतिक गैस उत्पादन पीएससी व्यवस्था से निजी / जेवी कंपनियों द्वारा किया गया है।

2.4.4. वित्त वर्ष 2023–24 में अपतटीय प्राकृतिक गैस उत्पादन का हिस्सा लगभग 63% है। सीबीएम सहित शेष प्राकृतिक गैस उत्पादन 10 राज्यों अर्थात आंध्र प्रदेश, अरुणाचल प्रदेश, असम, गुजरात, राजस्थान, तमिलनाडु, त्रिपुरा, झारखंड, मध्य प्रदेश और पश्चिम बंगाल से हुआ है। वर्ष 2023–24 और पिछले 6 वर्षों में प्राकृतिक गैस उत्पादन का विवरण निम्नानुसार है:

तालिका 2.6: प्राकृतिक गैस के उत्पादन का राज्य–वार रुझान (एमएमएससीएम)

स्थान का प्रकार	राज्य/स्थान	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
ऑफशोर	पूर्वी ऑफशोर	2816.7	2458.9	1823.1	1621.5	7024.8	7999.99	10823.6
	गुजरात ऑफशोर	97.7	122.2	128.7	147.6	163	231.93	214.375
	पश्चिमी ऑफशोर	19096.2	19535.9	18683.6	16659.9	15681.1	15176.6	14833.12
कुल ऑफशोर		**22,010.6**	**22,117.1**	**20,635.4**	**18,429.1**	**22,868.9**	**23,408.6**	**25,871.09**
पीएसयू का हिस्सा		**17,791.2**	**19,041.8**	**18,576**	**17,086.4**	**15,942.9**	**15,325.02**	**14,978.61**
निजी/जेवी का हिस्सा		**4,219.5**	**3,075.3**	**2,059.4**	**1,342.6**	**6,926**	**8,083.60**	**10,892.48**
ऑनलैंड	आंध्र प्रदेश	955.9	1076.5	906.1	827.5	808.6	709.694	721.9115
	अरुणाचल प्रदेश	29.5	27.8	45.6	55.4	57.7	53.314	39.634
	असम	3219	3289.1	3141.2	2995.4	3371.5	3557.47	3489.19
	गुजरात	1606.7	1402.2	1347.7	1138.4	1017.3	923.242	926.01
	राजस्थान	1436.4	1483.2	1882.5	2039.7	2618.8	2340.15	2198.923
	तमिलनाडु	1207.2	1207.9	1096.7	910.9	1066.5	1109.45	1015.771
	त्रिपुरा	1440.4	1554.3	1472.8	1633.8	1530.8	1674.94	1524.863
ऑनलैंड सीबीएम	झारखंड	4	3.6	4.6	1.7	4	10.095	5.371
	मध्यप्रदेश	199.8	356.7	344.9	333.7	290.1	263.93	234.16
	पश्चिमी बंगाल	531.1	350.2	305.9	307	389.2	399.421	410.947
कुल ऑनलैंड		**10,629.9**	**10,751.5**	**10,547.9**	**10,243.4**	**11,154.6**	**11,041.7**	**10,566.78**
पीएसयू का हिस्सा		**8,511**	**8,350**	**7,837.5**	**7,265.3**	**7,578.3**	**7,685.2**	**7,427.5**
निजी/जेवी का हिस्सा		**2,118.9**	**2,401.5**	**2,710.4**	**2,978.1**	**3,576.3**	**3,356.5**	**3,139.28**
कुल योग		**32,640.5**	**32,868.6**	**31,183.3**	**28,672.4**	**34,023.5**	**34,450.3**	**36,437.87**
पीएसयू का हिस्सा		**26,302.2**	**27,391.8**	**26,413.6**	**24,351.7**	**23,521.2**	**23,010.2**	**22,406.12**
निजी/जेवी का हिस्सा		**6,338.3**	**5,476.8**	**4,769.8**	**4,320.7**	**10,502.3**	**11,440.1**	**14,031.75**

2.4.5. देश में वित्त वर्ष 2023–24 में 650 एमएमएससीएम सीबीएम उत्पादन हुआ। भारत में सीबीएम का वाणिज्यिक उत्पादन जुलाई, 2007 से पश्चिम बंगाल के रानीगंज (दक्षिण) ब्लॉक में शुरू हो गया था। मार्च, 2024 में रानीगंज (दक्षिण) ब्लॉक में सीबीएम उत्पादन लगभग 0.25 एमएमएससीएमडी है। अन्य तीन ब्लॉक, एस्सार द्वारा प्रचालित रानीगंज (पूर्व) ब्लॉक 0.91 एमएमएससीएमडी की दर से उत्पादन कर रहा है और ओएनजीसी द्वारा प्रचालित झरिया और बोकारो 0.008 एमएमएससीएमडी की दर से उत्पादन कर रहा है। आरआईएल द्वारा प्रचालित सोहागपुर (पश्चिम) का सीबीएम उत्पादन लगभग 0.66 एमएमएससीएमडी है और सोहागपुर (पूर्व) का लगभग 0.003 एमएमएससीएमडी है। अतः मार्च, 2024 में देश के 6 ब्लॉकों से सीबीएम उत्पादन लगभग 1.83 एमएमएससीएमडी हुआ है, जिसमें 1 ब्लॉक से परीक्षण गैस और 5 ब्लॉकों से वाणिज्यिक उत्पादन शामिल है।

2.5. भारतीय तलछटीय क्षेत्र

वर्तमान में ऑनलैंड क्षेत्र 1.63 मिलियन वर्ग किमी (48.5%) और अपतटीय क्षेत्र 1.73 मिलियन वर्ग किमी है। अब तक, 72.8% बेसिन क्षेत्रों का मूल्यांकन किया जा चुका है। लगभग 1.6% तलछटीय बेसिन क्षेत्र को रक्षा मंत्रालय/पर्यावरण और वन मंत्रालय द्वारा "नो गो

एरिया" घोषित किया गया है, जिसका मूल्यांकन नहीं किया गया है। इसका अर्थ यह है कि लगभग आधे भारतीय तलछटीय बेसिन में हाइड्रोकार्बन की अज्ञात क्षमता है।

2.6. अन्वेषण और उत्पादन के प्रयोजनार्थ आवंटित ब्लॉक

2.6.1. भारत सरकार ने 310 उत्पादन साझा संविदों (पीएससी) पर हस्ताक्षर किए हैं, जिनमें 29 खोजे गए क्षेत्र, पूर्व–एनईएलपी अन्वेषण ब्लॉकों के अंतर्गत 28 अन्वेषण ब्लॉक और एनईएलपी व्यवस्था के अंतर्गत 254 ब्लॉक शामिल है। इसके अलावा, तीन डीएसएफ बोली राउंड (खोजे गए लघु क्षेत्र) के अंतर्गत 85 संविदा क्षेत्रों को शामिल करते हुए 85 आरएससी पर हस्ताक्षर किए गए हैं। एचईएलपी के अंतर्गत, ओएएलपी में, बोली राउंड I से टप्प तक 144 आरएससी पर हस्ताक्षर किए गए हैं। वर्तमान में, विभिन्न बोली राउंड (खोजे गए क्षेत्र, पूर्व–एनईएलपी, एनईएलपी, एचईएलपी और डीएसएफ) के अंतर्गत अब तक हस्ताक्षरित 310 पीएससी और 229 आरएससी में से, 62 पीएससी और 188 आरएससी वर्तमान में प्रचालन में हैं।

2.6.2. विभिन्न व्यवस्थाएं हैं जिसके अनुसार कंपनियों (पीएसयू और निजी) को ब्लॉक/एकरेज सौंपे/दिए गए हैं। विभिन्न ई एंड पी व्यवस्थाओं का संक्षिप्त विवरण नीचे दिया गया है

क) **नामांकन आधार:** राष्ट्रीय तेल कंपनियों नामत: तेल एवं प्राकृतिक गैस निगम लिमिटेड (ओएनजीसी) और ऑयल इंडिया लिमिटेड (ओआईएल) को एनईएलपी के कार्यान्वयन से पूर्व नामांकन आधार पर अन्वेषण और उत्पादन के लिए एकरेज प्रदान किया जाता है।

ख) **पूर्व–एनईएलपी खोजे गए क्षेत्र:** सरकार ने अगस्त 1992 में लघु/मध्यम आकार के खोजे गए क्षेत्रों (प्रमाणित भंडारण ओएनजीसी और ओआईएल द्वारा खोजे गए थे) के संविदा क्षेत्रों को निजी क्षेत्रों को पेश किया। भारत सरकार ने पूर्व–एनईएलपी खोजे गए (लघु और मध्यम आकार के क्षेत्र) व्यवस्था के तहत 29 खोजे गए क्षेत्रों के लिए 28 संविदों पर हस्ताक्षर किए हैं।

ग) **पूर्व–एनईएलपी अन्वेषण ब्लॉक:** 1990 और एनईएलपी के कार्यान्वयन से पहले 28 अन्वेषण ब्लॉकों को निजी कंपनियों को दिया गया था, जहां हाइड्रोकार्बन खोजों के बाद ओएनजीसी और ओआईएल को ब्लॉक में भागीदारी का अधिकार था।

घ) **नई अन्वेषण लाइसेंसिंग नीति (एनईएलपी)-1999 से:** एनईएलपी के तहत, भारतीय निजी और विदेशी कंपनियों को अंतरराष्ट्रीय प्रतिस्पर्धी बोली प्रक्रिया के माध्यम से अन्वेषण ब्लॉक दिए जाते हैं, जहां राष्ट्रीय तेल कंपनियां यथा ओएनजीसी और ओआईएल ने भी समान स्तर पर प्रतिस्पर्धा करते हैं।

ङ) **खोजे गए लघु क्षेत्र (डीएसएफ) नीति:** खोजे गए लघु क्षेत्र नीति के तहत, सरकार ने राजस्व साझाकरण मॉडल के आधार पर 85 संविदा क्षेत्रों को डीएसएफ–I, डीएसएफ–II और डीएसएफ–III बोली राउंड के माध्यम से सौंपा है।

च) **हाइड्रोकार्बन अन्वेषण और लाइसेंसिंग नीति:** हाइड्रोकार्बन अन्वेषण और लाइसेंसिंग नीति (एचईएलपी) के तहत, सरकार ने मार्च 2024 तक आठ बोली राउंड में राजस्व साझाकरण के आधार पर 144 अन्वेषण ब्लॉकों को सौंपा है।

2.7. पेट्रोलियम अन्वेषण लाइसेंस (पीईएल) और पेट्रोलियम खनन लीज़ (पीएमएल)

2.7.1. नामांकन व्यवस्था के तहत, ओएनजीसी 5 पीईएल और 329 पीएमएल ब्लॉकों में परिचालन कर रही है, जो लगभग 49,084.8 वर्ग किमी क्षेत्र तक फैला है। इसके अलावा, ऑयल, नामांकन व्यवस्था के तहत 1 पीईएल और 25 पीएमएल क्षेत्रों का संचालन कर रही है, जो 4,852.14 वर्ग किमी क्षेत्र तक फैला है। ओएनजीसी और ओआईएल द्वारा प्रचालित पीईएल/पीएमएल का बेसिन–वार विवरण निम्नानुसार है:

तालिका 2.7. नामांकन व्यवस्था (ओएनजीसी) के अंतर्गत **31.03.2024** की स्थिति के अनुसार बेसिन–वार पीईएल और पीएमएल

बेसिन	नामांकन			
	पीईएल		पीएमएल	
	एकरेज	क्षेत्र (वर्ग किमी)	एकरेज	क्षेत्र (वर्ग किमी)
असम–एराकन (कछार+मिजोरम)	0	0	8	818
असम–अराकन (त्रिपुरा)	0	0	18	3045
असम शेल्फ+नागालैंड	3	1583	39	1477
बंगाल	0	0	0	0
खंभात	0	0	160	5677
कच्छ ऑनलैंड	0	0	0	0
सौराष्ट्र			0	0
कावेरी (ऑन)	0	0	26	3956
गंगा घाटी	0	0	0	0
पूर्णिया	0	0	0	0
हिमालयी वनभूमि	0		0	0
कृष्णा–गोदावरी (ऑन)	0	0	37	4289
पलार	0	0	0	0
झारखंड			0	0
जैसलमेर	0	0	4	838
बीकानेर–नागौर			0	0
विंध्य	0	0	0	0
सतपुड़ा–दक्षिण रेव–दामोदर			0	0
नर्मदा			0	0
कुल ऑनलैंड	**3**	**1,583**	**292**	**20,099**
मुंबई ऑफशोर (एसडब्ल्यू)	0	0	27	25794
मुंबई ऑफशोर (डीडब्ल्यू)	1	985	0	0
मुंबई ऑफशोर (एसडब्ल्यू+डीडब्ल्यू)	1	985	27	25794
केरल–कोंकण (एसडब्ल्यू)	0	0	0	0
केरल–कोंकण (डीडब्ल्यू)	0	0	0	0
केरल–कोंकण (एसडब्ल्यू+डीडब्ल्यू)	**0**	**0**	**0**	**0**
कच्छ (एसडब्ल्यू)	0	0	0	0
कच्छ (डीडब्ल्यू)	1	420	0	0
कच्छ (एसडब्ल्यू+डीडब्ल्यू)	**1**	**420**	**0**	**0**
सौराष्ट्र (एसडब्ल्यू)	0	0	2	422
सौराष्ट्र (डीडब्ल्यू)	0	0	0	0
सौराष्ट्र (एसडब्ल्यू+डीडब्ल्यू)	**0**	**0**	**2**	**422**

कैम्बे की खाड़ी (एसडब्ल्यू)	0	0	0	0
कैम्बे की खाड़ी (डीडब्ल्यू)	0	0	0	0
कैम्बे की खाड़ी (एसडब्ल्यू+डीडब्ल्यू)	**0**	**0**	**0**	**0**
कुल पश्चिमी –अपतटीय (एसडब्ल्यू)	**0**	**0**	**29**	**26,216**
कुल पश्चिमी –अपतटीय (डीडब्ल्यू)	**2**	**1,405**	**0**	**0**
कुल पश्चिमी–अपतटीय (एसडब्ल्यू+डीडब्ल्यू)	**2**	**1,405**	**29**	**26,216**
कृष्णा–गोदावरी (एसडब्ल्यू)	0	0	5	357
कृष्णा–गोदावरी (डीडब्ल्यू)	0	0	2	224
कृष्णा–गोदावरी (एसडब्ल्यू+डीडब्ल्यू)	**0**	**0**	**7**	**581**
कावेरी (एसडब्ल्यू)	0	0	1	11
कावेरी (डीडब्ल्यू)	0	0	0	0
कावेरी (एसडब्ल्यू+डीडब्ल्यू)	**0**	**0**	**1**	**11**
बंगाल अपतटीय (एसडब्ल्यू)			0	0
बंगाल अपतटीय (डीडब्ल्यू)			0	0
बंगाल अपतटीय (एसडब्ल्यू+डीडब्ल्यू)	**0**	**0**	**0**	**0**
महानदी (एसडब्ल्यू)	0	0	0	0
महानदी (डीडब्ल्यू)	0	0	0	0
महानदी (एसडब्ल्यू+डीडब्ल्यू)	**0**	**0**	**0**	**0**
अंडमान (एसडब्ल्यू)	0	0	0	0
अंडमान (डीडब्ल्यू)	0	0	0	0
अंडमान (एसडब्ल्यू+डीडब्ल्यू)	**0**	**0**	**0**	**0**
कुल पूर्वी तट (एसडब्ल्यू)	**0**	**0**	**6**	**368**
कुल पूर्वी तट (डीडब्ल्यू)	**0**	**0**	**2**	**224**
कुल पूर्वी तट (एसडब्ल्यू+डीडब्ल्यू)	**0**	**0**	**8**	**592**
कुल पूर्वी तट (एसडब्ल्यू)	**0**	**0**	**35**	**26,583**
कुल तट (डीडब्ल्यू)	**2**	**1,405**	**2**	**224**
कुल तट (डीडब्ल्यू)	**2**	**1,405**	**37**	**26,807**
कुल तट	**5**	**2,988**	**329**	**46,907**

तालिका 2.8: नामांकन व्यवस्था (ऑयल) के अंतर्गत 31.03.2024 की स्थिति के अनुसार बेसिन–वार पीईएल और पीएमएल

कंपनी/ ऑपरेटर	बेसिन		पीईएल		पीएमएल		कुल	
			सं.	क्षेत्र (किमी^{2})	सं.	क्षेत्र (किमी^{2})	सं.	क्षेत्र (किमी^{2})
ऑयल–नामांकन	राजस्थान	ऑनलैंड	-	-	2	446.71	2	446.71
	असम–अराकन	ऑनलैंड	1	23.3	23	4382.13	24	4405.43
कुल ऑयल			**1**	**23.3**	**25**	**4,828.84**	**26**	**4,852.14**

2.7.2. पीएसटी व्यवस्था के तहत निजी/संयुक्त उद्यम कंपनियां 29,664 वर्ग किलोमीटर क्षेत्र में फैले 24 पीईएल और 65 पीएमएल ब्लॉकों का संचालन कर रही हैं। निजी/संयुक्त उद्यम कंपनियों द्वारा प्रचलित पीईएल/पीएमएल का बेसिन–वार विवरण निम्नानुसार है:

तालिका 2.9: दिनांक **31.03.2024** की स्थिति के अनुसार पीएससी व्यवस्था के तहत निजी/संयुक्त उद्यम कंपनियों का बेसिन-वार पीईएल और पीएमएल

बेसिन	कुल पीईएल	कुल पीएमएल	मौजूदा कुल पीईएल क्षेत्र	मौजूदा कुल पीएमएल क्षेत्र
असम–अराकन फोल्ड बेल्ट	1	0	3213	0
असम–अराकान शेल्फ	6	4	5713.55	263.43
बंगाल–पूर्णिया	1	0	2364	0
खंभात	4	47	258.19	1287.766
कावेरी	0	2	266.8	156
कृष्णा गोदावरी	2	12	2075.87	2388.03
महानदी	1	0	831.73	0
मुंबई	2	0	1215.66	0
राजस्थान	0	4	0	3287.17
सौराष्ट्र	1	0	552	0
विंध्य	1	0	462	0
कुल योग	**19**	**69**	**16,952.8**	**7,382.396**

तालिका 2.10: दिनांक **31.03.2024** तक डीएसएफ के तहत निजी/संयुक्त उद्यम कंपनियों का बेसिन-वार पीएमएल

बेसिन	कुल पीएमएल	कुल पीएमएल क्षेत्र, वर्ग किमी
असम–अराकान फोल्ड बेल्ट	3*	638
असम शेल्फ	9**	189
बंगाल–पूर्णिया	1	541
खंभात	10	1193
कृष्णा गोदावरी	11	1703
कच्छ	2	2092
मुंबई	16	6285
राजस्थान	3	167
कुल	**55**	**12,808**

* डीएसएफ–III संविदा क्षेत्र एए/ओएनडीएसएफ/पथरिया/2021 और एए/ओएनडीएसएफ/तुकबाई/2021 के लिए 2 पीएमएल प्रदान किए गए हैं, लेकिन यह पीएमएल डीड पर हस्ताक्षर होने के बाद प्रभावी होगा।

** डीएसएफ–III संविदा क्षेत्र एए/ओएनडीएसएफ/टीआईपीएचयूके/2021 के लिए 1 पीएमएल प्रदान किया गया है, लेकिन यह पीएमएल डीड पर हस्ताक्षर होने के बाद प्रभावी होगा।

2.7.3. दिनांक 31.03.2024 तक पेट्रोलियम अन्वेषण लाइसेंस (पीईएल) सौंपे जाने की स्थिति

आठ ओएएलपी बोली राउंड में सौंपे गए 144 ब्लॉकों में कुल 177 पीईएल प्रदान किए जाने थे। दिनांक 31.03.2024 तक 2,25,978 वर्ग किलोमीटर क्षेत्र के लिए कुल 156 पीईएल सौंपे गए हैं। पीईएल की स्थिति का सार निम्नानुसार है:

तालिका 2.11: दिनांक **31.03.2024** तक ओएएलपी के तहत पीईएल की बोली राउंड–वार स्थिति

ओएएलपी बोली राउंड	कुल पीईएल	सौंपे गए पीईएल	लम्बित पीईएल	मना किए गए पीईएल	आवेदन न किए गए पीईएल	सौंपे गए पीईएल का क्षेत्र, वर्ग किमी
ओएएलपी I	76	66	2	8**		55518
ओएएलपी II	18	17	1	0		28,394
ओएएलपी III	21	15	2	4**		22,731
ओएएलपी IV	7	7	0	0		18,510
ओएएलपी V	13	13	0	0		19,789
ओएएलपी VI	24	22	2	0		32,347
ओएएलपी VII	8	8	0	0		15,766
ओएएलपी VIII	10	8	1	0	1***	32,976
कुल	**177**	**156**	**8**	**12**	**1**	**2,26,031**

* सौंपे गए कुछ ब्लॉक एक से अधिक राज्य के अधिकार क्षेत्र में आते हैं इसलिए पीईएल की संख्या सौंपे गए ब्लॉकों से अधिक है।

** तमिलनाडु, पुदुचेरी और आंध्रप्रदेश में पीईएल के गैर–अनुदान के कारण ठेकेदार द्वारा ब्लॉक/भाग के हिस्से को वापस कर दिया गया।

तालिका 2.12: दिनांक **31.03.2024** तक ओएएलपी के तहत पीईएल की बेसिन–वार स्थिति

ओएएलपी बोली दौर	कुल पीईएल	अनुदत्त पीईएल	लम्बित पीईएल	मना किए गए पीईएल	आवेदन नही किए गए पीईएल	अनुदत्त पीईएल का क्षेत्र वर्ग किमी
अंडमान–निकोबार	6	6	0	0		23,262
असम अराकान फोल्ड बेल्ट	17	16	1	0		4,041
असम शेल्फ	31	29	2	0		20,832
बंगाल–पूर्णिया	6	5	1	0		14,523
कैम्बे	26	24	2	0		11,925
कावेरी	15	6	2	7**		16,515
कडप्पा	1	1	0	0		3,306
गंगा–पंजाब	4	4	0	0		2,428
हिमालयी फोरलैंड	1	1	0	0		666
केरल कोंकण	3	3	0	0		11,350
कृष्णा गोदावरी	10	4	0	5*	1***	8,318
कच्छ	9	9	0	0		11,267
महानदी	10	10	0	0		27,778
मुंबई अपतटीय	9	9	0	0		23,263
नर्मदा	2	2	0	0		2,999
राजस्थान	16	16	0	0		19,482
सतपुड़ा–दक्षिण रीवा–दामोदर	1	1	0	0		906
सौराष्ट्र	5	5	0	0		9,909
विंध्य	5	5	0	0		13,260
कुल	**177**	**156**	**8**	**12**	**1**	**2,26,031**

कुछ बेसिन कई अधिकार क्षेत्र में आते हैं जैसे कि ऑनशोर/ऑफशोर या कई राज्य के अधीन

* 5 पीईएल तमिलनाडु/पुदुचेरी द्वारा अस्वीकार किए जाने के कारण ऑपरेटर द्वारा क्षेत्र/ब्लॉक को वापस कर दिए गए।

** तमिलनाडु, आंध्र प्रदेश और पुदुचेरी राज्यों को मिलाकर 7 पीईएल की गैर–अनुदान के कारण ऑपरेटर ने ब्लॉक को वापस कर दिया।

*** ऑपरेटर ने अब तक आरएसएस के अनुसार पीईएल के लिए आवेदन नहीं किया है।

2.8. नामांकन व्यवस्था के तहत ओएनजीसी और ऑयल द्वारा अन्वेषण का प्रयास

ओएनजीसी और ऑयल ने स्थापना के बाद से 31.03.2024 तक 9,17,494 लाइन किलोमीटर (एलकेएम) 2डी भूकंपीय सर्वेक्षण और 1,48,242 वर्ग किलोमीटर 3डी भूकंपीय सर्वेक्षण किया है और 6871 अन्वेषण कुओं की खुदाई की है। नामांकन व्यवस्था में ओएनजीसी और ऑयल द्वारा किए गए 2डी, 3डी भूकंपीय और अन्वेषण कुओं के संदर्भ में अन्वेषण प्रयासों का विवरण निम्नानुसार है.

तालिका 2.13: नामांकन व्यवस्था के तहत ओएनजीसी और ऑयल द्वारा अन्वेषण इनपुट

क्रम संख्या	कंपनी	31.03.2024 तक संचयी अन्वेषण			2023-24		
		2डी भूकंपीय (एलकेएम)	3डी भूकंपीय (वर्ग किमी)	अन्वेषण कुआ (संख्या)	2डी भूकंपीय (एलकेएम)	3डी भूकंपीय (वर्ग किमी)	अन्वेषण कुआ (संख्या)
1	ओएनजीसी	8,83,141	1,36,009	6,437	274	2392	80
2	ऑयल इंडिया लिमिटेड	34,353	12,233	434	378.72	240.57	17
	कुल	**9,17,494**	**1,48,242**	**6,871**	**652.72**	**2,632.57**	**97**

2.9. पीएससी के तहत निजी/संयुक्त उद्यम कंपनियों द्वारा अन्वेषण प्रयास

2.9.1. दिनांक 31.03.2024 तक पीएससी और आरएससी व्यवस्थाओं के अंतर्गत 2डी भूकंपीय, 3डी भूकंपीय और अन्वेषण कुओं के संदर्भ में निजी / संयुक्त उद्यम कंपनियों द्वारा किए गए बेसिन-वार अन्वेषण प्रयास निम्नानुसार हैं:

तालिका 2.14: दिनांक 31.03.2024 तक पीएससी व्यवस्था में अन्वेषणात्मक इनपुट

बेसिन का नाम	2डी भूकंपीय एलकेएम	3डी भूकंपीय एलकेएम	अन्वेषण कुएं (सं.)
अंडमान–निकोबार	27070	16562	6
असम–अराकान फोल्ड बेल्ट	1352	613	4
असम–अराकन शेल्फ	5468	2203	43
बंगाल–पूर्णिया	5247	4909	16
कैम्बे	29994	9167	321
कावेरी	64727	44561	51
डेक्कन सिन्क्लाइज़	476	0	0
गंगा	3876	263	4
गंगा–पंजाब	2542	1420	4
हिमालय–फोरलैंड	810	0	1
केरल कोंकण	52290	14035	7
कृष्णा गोदावरी	76106	70711	210
कच्छ	2985	8345	21
महानदी	59542	64659	53
मुंबई	21349	27285	51
प्राणहिता गोदावरी	195	0	1
राजस्थान	14157	16396	312
सतपुड़ा–दक्षिण रीवा–दामोदर	2050	304	2
सौराष्ट्र	16037	15428	16
विंध्य	3918	858	10
कुल योग	**3,90,191**	**2,97,718**	**1,133**

तालिका 2.15: नामांकन व्यवस्था के तहत ओएनजीसी और ऑयल द्वारा अन्वेषण इनपुट

दिनांक 31 मार्च 2024 की स्थिति के अनुसार, ब्लॉकों के संविदाकारों ने 31,467 एलकेएम 2डी भूकंपीय डेटा और 33,705 वर्ग किमी 3डी भूकंपीय डेटा हासिल कर लिया है।

बेसिन का नाम	2डी भूकंपीय एलकेएम	3डी भूकंपीय एलकेएम	अन्वेषण कुएं (सं)
अंडमान–निकोबार	8501	2131	0
असम अराकान फोल्ड बेल्ट	1051	150	3
असम शेल्फ	3001	496	2
बंगाल–पूर्णिया	904	1728	0
कैम्बे	1519	1760	15
कावेरी	0	5709	0
कडप्पा	0	221	0
गंगा–पंजाब	0	597	0
हिमालयी फोरलैंड	0	0	0
केरल कोंकण	0	1028	0
कृष्णा गोदावरी	431	1514	1
कच्छ	398	1358	0
महानदी	2305	3586	5
मुंबई ऑफशोर	940	9248	10
नर्मदा	0	0	0
राजस्थान	10701	870	11
सतपुड़ा–दक्षिण रीवा–दामोदर	0	0	0
सौराष्ट्र	476	1856	1
विंध्य	1241	1453	4
कुल	**31,467**	**33,705**	**52**

2.10. 2023-24 में हाइड्रोकार्बन खोजें

वित्त वर्ष 2023–24 के दौरान, ओएनजीसी ने अपने प्रचालित क्षेत्रों में ओएएलपी ब्लॉकों 5 खोज सहित कुल 11 हाइड्रोकार्बन खोजें की हैं। इनमें से 6 खोजें तटवर्ती, 3 उथले अपतटीय और 2 डीप वाटर अपतटीय क्षेत्रों में की गई है। इनमें से तीन ऑनलैंड खोजों अर्थात गोपावरम–21, दक्षिण महादेवपट्टनम–2 और पूर्वी लखीबारी–6 का ओएनजीसी द्वारा मौद्रीकरण किया गया है। 2023–24 में की गई हाइड्रोकार्बन खोजों का विवरण इस प्रकार है:

तालिका 2.16: ओएनजीसी द्वारा हाइड्रोकार्बन की खोजें

क्र. सं.	खोज का नाम	कुएं का नाम	बेसिन	खोज का प्रकार	खोज की तिथि	खोज का प्रकार
			ऑनलैंड			
1	गोपावरम–21	जीएमडीएल	केजी ऑनलैंड	पूल	14/06/2023	तेल
2	दक्षिण महादेवपट्टनम–2	एसएमए–एडी	केजी ऑनलैंड	पूल	03/10/2023	गैस और कंडेन्सेट
3	चितबारी	चितबारी–1 (जीओ–20ए) (जीओएआई_सब)	एसम फोल्ड बेल्ट	पूल	02/01/2024	गैस
4	तुलामूरा	तुलामूरा–3 (टीएमएबी)	एसम फोल्ड बेल्ट	पूल	23/01/2024	गैस
5	पश्चिमी अमोड–1	पश्चिमी अमोड–1 (सीबीओएनएच 212ए–ए)	कैम्बे	संभाव्य	16/03/2024	तेल और गैस
6	पूर्वी लखीबारी–6	पूर्वी लखीबारी–6	असम	पूल	21/03/2024	तेल
			उथला पानी			
1	मूंगा	एमबीएस 182एचडीए–1 (एमबीएस 182एचडीए–ए)	मुंबई ऑफशोर	संभाव्य	09/05/2023	तेल और गैस
2	मोती	एमबीएस 181एचसीए–1 (एमबीएस 181एचडीए–ए)	मुंबई ऑफशोर	संभाव्य	16/05/2023	तेल और गैस
3	पुखराज	एसटी–6 (एसटी–ए)	मुंबई ऑफशोर	संभाव्य	17/06/2023	गैस
			डीप वाटर			
1	उत्कल	एमडीडब्ल्यू–27 (एमएनडीडब्ल्यू 181एच-ए-1)	महानदी ऑफशोर	संभाव्य	03/01/2024	गैस
2	कोनार्क	एमडीडब्ल्यू–25 (एमएनडीडब्ल्यू 181एच-बी-1)	महानदी ऑफशोर	संभाव्य	15/01/2024	गैस

वित्त वर्ष 2023–24 के दौरान, ऑयल ने जून 2023 में असम के तिनसुकिया एक्सटेंशन पीएमएल के दक्षिण बाघजान–10 कुएँ में एक खोज (तेल) की है। कुएँ के विस्तृत परीक्षण के माध्यम से कुएँ की व्यावसायिकता स्थापित कर ली गई है और वर्तमान में इससे उत्पादन हो रहा है।

संविदा व्यवस्था के तहत पाँच हाइड्रोकार्बन खोजों को अधिसूचित किया गया है। वर्ष 2023–24 में 31 मार्च, 2024 की स्थिति के अनुसार हाइड्रोकार्बन खोजों का विवरण इस प्रकार है:

तालिका 2.17: वर्ष 2023-24 में हाइड्रोकार्बन की खोजें

क्र. सं.	कंपनी	तेल	गैस	कुल
1	ओएनजीसी (नामांकन)	3	3	6
2	ऑयल (नामांकन)	1	0	1
3	पीएससी / आरएससी	3	2	5
	कुल	**7**	**5**	**12**

खोज का नाम	खोज का प्रकार	ब्लॉक	बेसिन
पश्चिम अमोड#1	तेल	सीबी–ओएनएचपी–2021 / 2	कैम्बे
कोनार्क	गैस	एमएन–डीडब्ल्यूएचपी–2018 / 1	महानदी–एनईसी
उत्कल	गैस	एमएन–डीडब्ल्यूएचपी–2018 / 1	महानदी–एनईसी
एमबीएस181एचसीए–1 (मोती)	तेल	एमबी–ओएसएचपी–2018 / 1	मुंबई ऑफशोर
एमबीएस182एचडीए–1	तेल	एमबी–ओएसएचपी–2018 / 2	मुंबई ऑफशोर

2.11. राष्ट्रीय आंकड़ा कोष (एनडीआर)

2.11.1. भारत सरकार ने 30 जून, 2017 को एचईएलपी के एक भाग के रूप में ओएएलपी को अधिसूचित किया है। निवेशकों द्वारा सतही और उप–सतही भूवैज्ञानिक, भूभौतिकीय और अन्य तकनीकी डेटा देखने के लिए ओएएलपी के संचालन हेतु राष्ट्रीय आंकड़ा कोष (एनडीआर) एक अपरिहार्य आवश्यकता और प्रमुख घटक है। एनडीआर का आरंभ 28 जून, 2017 को किया गया था।

2.11.2. राष्ट्रीय आंकड़ा कोष (एनडीआर) डीजीएच में स्थापित किया गया है और 28 जून, 2017 को उसका आरंभ' की गई ताकि वाणिज्यिक अन्वेषण, अनुसंधान और विकास और शैक्षणिक उद्देश्यों के लिए संपूर्ण अन्वेषण और उत्पादन (ई और पी) डाटा उपलब्ध कराया जा सके।

दिनांक 31 मार्च 2024 तक एनडीआर में डाला गया संचयी डेटा:

क) 2डी भूकंपीय डाटा : 3.6944 मिलियन एलकेएम

ख) 3डी भूकंपीय डाटा : 1.1482 मिलियन एसकेएम

ग) कुआं और लॉग डाटा : 23,616 कुएं

घ) कुएँ की रिपोर्ट : 49,704 रिपोर्टें

2.11.3. भविष्य के लिए तैयार राष्ट्रीय आंकड़ा कोष 2.0 [एनडीआर 2.0]

जून 2017 में अपने परिचालन की शुरूआत से, एनडीआर अपने सभी हितधारकों जैसे कि निवेशकों, ऑपरेटरों, सेवा प्रदाताओं, अनुसंधान एवं विकास संस्थानों, शिक्षाविदों और सरकारी निकायों की मांगों को सफलतापूर्वक पूरा कर रहा है। इसके पुराने हो रहे हार्डवेयर और सॉफ्टवेयर तथा इन वर्षों में प्राप्त और आत्मसात किए गए कच्चे और फील्ड डाटा की बढ़ती मात्रा को ध्यान में रखते हुए इसे अगली पीढ़ी के आईटी प्लेटफॉर्म पर अपग्रेड करना आवश्यक हो गया है, जो समय के साथ स्केलेबल हो और बेहतर स्टोरेज, कंप्यूट और नेटवर्क संसाधनों से युक्त हो। इसके अलावा, डेटा प्रबंधन में दक्षता लाने और अपने वैश्विक उपयोगकर्ताओं को किसी भी समय, कहीं भी डाटा उपलब्ध कराने की उन्नत कार्यक्षमताओं के साथ बेहतर सेवा देने के लिए, डीजीएच को वर्तमान क्लाइंट–सर्वर प्लेटफॉर्म को अगली पीढ़ी के क्लाउड आधारित राष्ट्रीय आंकड़ा कोष में अपग्रेड करना है। अगली पीढ़ी के राष्ट्रीय आंकड़ा कोष 2.0 (एनडीआर 2.0) का उद्देश्य डाटा एक्सेसिबिलिटी (डाउनलोडिंग), डाटा रिपोर्टिंग, सबमिशन (अपलोडिंग) में काफी सुधार करना और भंडारण (सभी ई और पी डाटा प्रकारों के लिए भूकंपीय क्षेत्र डाटा सहित) को बढ़ाना और क्लाउड–सक्षम डाटाबेस प्लेटफॉर्म बनाना है। एनडीआर 2.0 के लिए विशेषज्ञता पूर्ण सलाह और क्लाउड समाधान डिजाइन करने के लिए, डीजीएच ने इलेक्ट्रॉनिकी और सूचना प्रौद्योगिकी मंत्रालय के तहत डिजिटल इंडिया कॉरपोरेशन (डीआईसी) नामक परियोजना प्रबंधन सलाहकार को नियुक्त किया है। डीआईसी की सहायता से, डीजीएच ने प्रशासनिक स्वीकृति और कर सहित 127.38 करोड़ रुपए से अधिक के व्यय की अनुमानित अनुमोदन मांगते हुए पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय को एक विस्तृत परियोजना प्रस्ताव प्रस्तुत किया है। पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय (एमओपीएनजी) ने 20 अक्टूबर 2023 को इसके संबंध में अनुमोदन दिया था। इसके अलावा, 23 फरवरी 2024 को सरकारी ई–मार्केटप्लेस (जीईएम) पर एनडीआर 2.0 के लिए निविदाएं जारी की गई, जो उन्नयन की इस महत्वाकांक्षी यात्रा में एक महत्वपूर्ण मील का पत्थर होगा। इस परियोजना में 2024 की दूसरी तिमाही के अंत तक निविदा सौंपने की परिकल्पना की गई है।

2.12. कच्चे तेल और गैस उत्पादन को बढ़ाने के लिए सरकार द्वारा की गई नीतिगत पहल

हाइड्रोकार्बन क्षेत्र को बढ़ावा देने के एक बड़े अभियान के तहत, सरकार ने नीतिगत पहलों की एक श्रृंखला शुरू की है। हाइड्रोकार्बन क्षेत्र में किया जा रहा सुधार घरेलू तेल एवं गैस उत्पादन को बढ़ाने, निवेश बढ़ाने, बड़े पैमाने पर रोजगार पैदा करने, पारदर्शिता बढ़ाने और नियामक बोझ को कम करने के मार्गदर्शक सिद्धांतों पर आधारित हैं। कुछ उल्लेखनीय नीतिगत सुधार निम्नानुसार हैं:

2.12.1. हाइड्रोकार्बन अन्वेषण और लाइसेंसिंग नीति/ओपन एकरेज लाइसेंसिंग कार्यक्रम (मार्च 2016)

सरकार ने मार्च 2016 में, हाइड्रोकार्बन अन्वेषण लाइसेंसिंग नीति (एचईएलपी) शुरू की है। एचईएलपी लागत वसूली के स्थान पर राजस्व साझाकरण तंत्र अपनाने का एक आदर्श बदलाव है, जिसमें ठेकेदार उत्पादन की शुरुआत से सरकार के साथ राजस्व साझा करते हैं। सरकार ने 30 मार्च 2016 को एचईएलपी के एक भाग के रूप में ओपन एकरेज लाइसेंसिंग कार्यक्रम (ओएएलपी) की शुरुआत की और 1 जुलाई 2017 से इसके औपचारिक संचालन की शुरूआत से सरकार की ओर से औपचारिक बोली राउंड का इंतजार किए बिना इस समझौते के तहत अन्वेषण कंपनियों को खुद ही अन्वेषण ब्लॉक चुनने का विकल्प मिलेगा।

एचईएलपी में आकर्षक और उदार शर्तें शामिल हैं जैसे कि कम रॉयल्टी दरें, तेल पर उपकर नहीं लगाना, विपणन और मूल्य निर्धारण की स्वतंत्रता, साल भर बोली लगाना, निवेशकों को अपनी रुचि के ब्लॉक लेने की स्वतंत्रता, पारंपरिक और अपरंपरागत दोनों तरह के हाइड्रोकार्बन संसाधनों को कवर करने के लिए एक ही अनुज्ञप्ति का होना, पूरे संविदा अवधि के दौरान अन्वेषण की अनुमति और एक आसान, पारदर्शी और सुगम बोली और कार्य सौंपने की प्रक्रिया। एचईएलपी में इच्छुक बोलीदाताओं द्वारा 3 विंडो (1 अप्रैल से 31 जुलाई, 1 अगस्त से 30 नवंबर और 1 दिसंबर से 31 मार्च) में साल भर रुचि की अभिव्यक्ति (ईओआई) प्रस्तुत करने का भी प्रावधान है।

एचईएलपी की मुख्य विशेषताएं निम्नानुसार हैं–

- राष्ट्रीय डाटा कोष (एनडीआर) का उपयोग करके ब्लॉकों को बेहतर बनाने का अवसर
- पारंपरिक और अपरंपरागत दोनों हाइड्रोकार्बन के लिए एकीकृत लाइसेंस
- सरल और प्रचालन में आसान राजस्व साझाकरण मॉडल
- नियामक बोझ में कमी
- आसान प्रवेश और बाधा मुक्त निकास
- पूर्ण पारदर्शिता और समयबद्ध प्रक्रिया
- वैश्विक निजी कंपनियों के साथ–साथ राष्ट्रीय तेल कंपनियों के लिए समान अवसर
- बाजार मूल्य निर्धारण और बाजार तक आसान पहुंच
- अत्यधिक गहरे पानी और उथले पानी वाले क्षेत्रों के लिए रियायती रॉयल्टी व्यवस्था
- पूर्ण संविदा जीवन के लिए अन्वेषण अधिकार

सरकार ने अन्वेषण गतिविधियों को बढ़ाने, तलछटीय बेसिनों के अन्वेषित/अनावंटित क्षेत्रों में घरेलू और विदेशी निवेश को आकर्षित करने और अनुमोदन प्रक्रियाओं को सुव्यवस्थित और तेज करके ईज ऑफ डूइंग को बढ़ावा देने के लिए 28 फरवरी 2019 को एचईएलपी के तहत अपस्ट्रीम क्षेत्र में नीतिगत सुधारों को अधिसूचित किया है। ये सुधार ओएएलपी राउंड IV से लागू हो गए हैं। श्रेणी–विशिष्ट बोली मूल्यांकन मानदंड के लिए श्रेणी–I बेसिनों में अन्वेषण कार्य कार्यक्रम को अधिक महत्व देने के साथ (पहले 50% की तुलना में 70%), केवल अन्वेषण कार्य कार्यक्रम के आधार पर बोली लगाए गए श्रेणी–II और III प्रकार के ब्लॉक, लघु अन्वेषण अवधि, तेल और गैस उत्पादन में तेजी लाने के लिए रियायती रॉयल्टी दरें, वैकल्पिक विवाद समाधान तंत्र की शुरूआत और वैधानिक मंजूरी/अनुमोदन में तेजी लाने के लिए अधिकार प्राप्त समन्वय समिति (ईसीसी) का गठन।

क. भागीदारी का सारांश

ओएएलपी के तहत आठ बोली राउंड में, 149 ब्लॉक पेश किए गए और 2,42,057 वर्ग किलोमीटर क्षेत्र को कवर करने वाले 144 अन्वेषण ब्लॉक सफल बोलीदाताओं को सौंपे गए। सीबीएम ब्लॉकों के लिए ओएएलपी–राउंड–III के तहत पांच (5) गैर–पुरस्कारित ब्लॉकों की पेशकश की गई थी, हालांकि इन सीबीएम ब्लॉकों के लिए कोई बोलियां प्राप्त नहीं हुईं। शेष 144 ब्लॉकों के लिए 252 बोलियाँ प्राप्त हुईं जो 19 तलछटीय बेसिनों में फैले हुए हैं।

ओएएलपी राउंड में भागीदारी का सारांश इस प्रकार है:

ओएलपी बोली राउंड	पेश किए गए ब्लाक	भागीदारों की संख्या	बोली का सं.	पेश किया गया क्षेत्र (वर्ग किमी)	सौंपा गया क्षेत्र (वर्ग किमी)
ओएएलपी-I	55	9	110	59,282	59,282
ओएएलपी-II	14	8	33	29,233	29,233
ओएएलपी-III	18+5*	5	42	31,722	29,765
ओएएलपी-IV	7	2	8	18,510	18,510
ओएएलपी-V	11	3	12	19,789	19,789
ओएएलपी-VI	21	3	24	35,346	35,346
ओएएलपी-VII	8	4	10	15,766	15,766
ओएएलपी-VIII	10	6	13	34,365	34,365
कुल	**149**	**40**	**252**	**2,44,014**	**2,42,057**

* पांच सीबीएम ब्लॉकों के लिए कोई बोली नहीं की गई।

राउंड VIII तक प्रतिबद्ध निवेश लगभग 3.37 बिलियन अमरीकी डॉलर है। 51,725 एलकेएम 2डी भीकंपीय, 66,843 एसकेएम 3डी भीकंपीय और 499 अन्वेषण कुओं के कुल प्रतिबद्ध कार्य कार्यक्रम में से, 2डी भूकंपीय डेटा के लगभग 31,467 एलकेएम, 3डी भूकंपीय डेटा के 33,705 वर्ग किमी और 52 कुओं की ड्रिलिंग वित्त वर्ष 2023–24 तक पूरी हो गई है। अब तक 10 खोजें (6 तेल+4 गैस) की गई हैं।

सरकार ने 3 जनवरी–2024 को अंतर्राष्ट्रीय प्रतिस्पर्धी बोली के लिए 136,596 वर्ग किमी क्षेत्र को कवर करने वाले 28 ब्लॉकों की पेशकश करते हुए ओएएलपी बोली राउंड–IX लॉन्च किया है। कुल 9 (नौ) ऑनलैंड ब्लॉक, 8 (आठ) उथले–वाटर ब्लॉक और 11 (ग्यारह) अल्ट्रा डीप–वाटर ब्लॉक प्रस्तावित हैं।

2.12.2. खोजे गए लघु क्षेत्र नीति (डीएसएफ)

डीएसएफ नीति: पृष्ठभूमि

- आर्थिक कार्य संबंधी मंत्रिमंडल समिति (सीसीईए) द्वारा 2 सितंबर, 2015 को सीमांत क्षेत्र नीति को मंजूरी दी गई थी और राष्ट्रीय तेल कंपनियों (एनओसी) द्वारा गैर–मौद्रिकीकृत खोजों का उत्पादन शुरू करने के लिए दिनांक 14.10.2015 की अधिसूचना संख्या ओ–19018/22–95–ओएनजी–III के माध्यम से इसे अधिसूचित किया गया था। इस नीति का नाम बाद में खोजे गए लघु क्षेत्र (डीएसएफ) नीति रखा गया।

डीएसएफ दौरों की मुख्य राजकोषीय और नीतिगत विशेषताएं

- पारंपरिक और गैर–पारंपरिक हाइड्रोकार्बन के लिए एकल लाइसेंस
- संविदागत अवधि के दौरान अन्वेषण गतिविधि पर कोई प्रतिबंध नहीं लगाना
- कोई अग्रिम हस्ताक्षर बोनस नहीं देना
- अंतर्राष्ट्रीय प्रतिस्पर्धी बोली के तहत बोलियां आमंत्रित किया जाना।
- मूल्य निर्धारण और बिक्री–विपणन स्वतंत्रता
- कम रॉयल्टी, कोई उपकर नहीं लगाना, सीमा शुल्क से छूट
- योग्यता: किसी तकनीकी अनुभव की आवश्यकता नहीं है, विदेशी कंपनियों द्वारा 100% तक की भागीदारी

अब तक तीन डीएसएफ दौर आयोजित किए जा चुके हैं। मुख्य विवरण इस प्रकार है:

डीएसएफ राउंड	डीएलएफ-I	डीएलएफ-II	डीएलएफ-III	कुल योग
लॉंच की तारीख	**25.05.2016**	**09.08.2018**	**10.06.2021**	
पेश किए गए कुल ब्लॉक	46	25	32	103
पेश की गई कुल खोजें	67	59	75	201
कुल ओ+ओईजी (एमएमटी)	86	190	232	508
पेश किया गया कुल क्षेत्र (वर्ग किमी)	1551	3042	13000	17593
आरएससी पर हस्ताक्षर करने की तिथि	27.03.2017	07.03.2019	09.09.2022	
सौंपे गए कुल ब्लॉक	30	24	31	85
सौंपी गई कुल खोजें	43	58	74	175
कुल सौंपे गए ओ+ओजी (एमएमटी)	45	189	230	464
सौंपे गए कुल क्षेत्र (वर्ग किमी)	777	3004	12727	16508
प्राप्त ई–बोली	34 संविदा क्षेत्रों के लिए 134 बोलियां	24 संविदा क्षेत्रों लिए 145 बोलियां	32 संविदा क्षेत्रों के लिए 107 बोलियां	

डीएसएफ I, II और III संविदा की स्थिति इस प्रकार है:

क्र.सं.	स्थिति	डीएसएफ-I	डीएसएफ-II	डीएसएफ-III	कुल
1	सौंपा गया संविदा क्षेत्र (सीए)	30	24	31	85
2	सीए जहां पीएमएल लंबित है	4	3	6	13
3	त्याग के अधीन संविदा क्षेत्र	6	-	-	6
4	समाप्ति के अधीन/समाप्त किए गए मामले	5	5	0	10
5	आरएससी जिनपर हस्ताक्षर किए जाने है			1	1
6	**परिचालन**	**15**	**16**	**24**	**55**

2.12.3. सीबीएम ब्लॉकों के लिए बोली लगाना

- भारत सरकार ने 1997 में कोल बेड मीथेन (सीबीएम) नीति तैयार की। देश में सीबीएम अन्वेषण के लिए लगभग 26,000 वर्ग किलोमीटर की पहचान की गई। भारत के सीबीएम संसाधनों का अनुमान लगभग 2,600 बिलियन क्यूबिक मीटर (बीसीएम) है।
- पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय द्वारा चार सीबीएम बोली राउंड (2001, 2003, 2005 और 2008) कार्यान्वित किए गए, जिसके परिणामस्वरूप 16,598 वर्ग किलोमीटर को कवर करने वाले 33 सीबीएम ब्लॉक नामांकन आधार पर 2 ब्लॉक और विदेशी निवेश संवर्धन बोर्ड (एफआईपीबी) मार्ग के माध्यम से 1 ब्लॉक सहित, सौंपे गए।
- भारत सरकार ने अंतर्राष्ट्रीय प्रतिस्पर्धी बोली के माध्यम से एचईएलपी के तहत दो विशेष सीबीएम बोली दौर (2021 और 2022) शुरू किया। इन विशेष सीबीएम राउंड में 4,579 वर्ग किलोमीटर क्षेत्र के 7 ब्लॉक (एससीबीएम–21 में 4 और एससीबीएम–22 में 3) सौंपे गए।
- वर्तमान में कुल 15 सीबीएम ब्लॉक (7,009 वर्ग किलोमीटर) सक्रिय है। इनमें से 04 ब्लॉक अन्वेषण चरण में हैं, 03 विकास चरण में हैं और 05 ब्लॉक उत्पादन चरण में हैं। मार्च 2024 तक सीबीएम का संचयी उत्पादन लगभग 6.4 बीसीएम है।

2.12.4. भारत के तलछटीय बेसिनों में भूवैज्ञानिक डेटा प्राप्त करने के लिए भारत सरकार के प्रयास

i. राष्ट्रीय भूकंपीय कार्यक्रम (एनएसपी) परियोजना, (पूर्ण हो चुकी है):

राष्ट्रीय भूकंपीय कार्यक्रम (एनएसपी) का आरंभ 12 अक्टूबर 2016 को देश के गैस–मूल्यांकित भूमिगत बेसिन क्षेत्रों का मूल्यांकन करने के उद्देश्य से किया गया था। इस कार्यक्रम के अंतर्गत, सरकार ने 48,243 लाइन किलोमीटर (एलकेएम) के डाटा अधिग्रहण, प्रसंस्करण और व्याख्या (एपीआई) के लिए 2डी भूकंपीय सर्वेक्षण करने के प्रस्ताव को मंजूरी दी है।

48,243 एलकेएम के कुल लक्ष्य में से 46,960 एलकेएम (97%) 2डी भूकंपीय डेटा का अधिग्रहण, प्रसंस्करण और व्याख्या की जा सकी है। गुजरात ऊर्जा अनुसंधान और प्रबंधन संस्थान (जीईआरएमआई), गांधीनगर ने एनएसपी डाटा का एक तृतीय–पक्ष मूल्यांकन अध्ययन किया और एनडीआर को एक रिपोर्ट प्रस्तुत की।

एनएसपी परियोजना के तहत दुर्गम और प्रतिकूल भौगोलिक क्षेत्रों (जहां दुर्गम भूभाग और प्रतिकूल वातावरण के कारण भूकंपीय डेटा प्राप्त नहीं किया जा सका) को शामिल करने के लिए, 80 करोड़ रुपये की अनुमानित लागत के साथ 40,000 फ्लाइट एलकेएम के एयरबॉर्न भूभौतिक सर्वेक्षण की योजना बनाई गई है। मंत्रालय की ओर से, ऑयल इंडिया लिमिटेड (ओआईएल) ने एयरबोर्न ग्रेविटी ग्रैडोमीटर और ग्रेविटी मैग्नेटिक (एजीजी और जीएम) डाटा सर्वेक्षण किया और एजीजी और जीएम सर्वेक्षण के 42,944 फ्लाइट एलकेएम का एपीआई (अधिग्रहण, प्रसंस्करण और व्याख्या) पूरा किया।

एजीजी और जीएम लक्ष्यों और उपलब्धियों का क्षेत्र–वार/राज्य–वार ब्यौरा नीचे सारणीबद्ध है।

क्षेत्र	लक्ष्य	उपलब्धि (फ्लाइट एलकेएम में)
एएस–एपी	2064	2064.46
एएस–एपी–एनएल	8131	8131.15
एएस–एमएल–एमएन–एनएल	11240	11227.83
एमजेड–टीआर	5606	5573.59
पूर्वोत्तर भारत कुल	27,041	26,997.03
कावेरी	11888	12295.14
बस्तर	1764	1833.99
करेवा	1710	1816.93
स्पीति*	7392	-
शेष भारत का योग	**22,754**	**15,946.06**
परियोजना योग	**49,795**	**42,943.09**

*स्पीति घाटी में अत्यधिक ऊंचाई पर जोखिम का विश्लेषण करने के लिए परीक्षण फ्लाइट का आयोजन किया गया था, हालांकि, एचएसई चिंताओं के कारण, स्पीति घाटी में डाटा प्राप्त नहीं किया गया था।

ii. डीप अंडमान ऑफशोर परियोजना

अंडमान बेसिन बंगाल की खाड़ी के दक्षिण–पूर्वी भाग में स्थित एक संभाव्य पेट्रोलियम समृद्ध बेसिन है, जो दक्षिण–पूर्व एशिया के सबसे समृद्ध पेट्रोलियम प्रांतों के निकट है। अंडमान बेसिन का क्षेत्रफल 2,25,918 वर्ग किलोमीटर है और इसमें भारत के अपतटीय तलछटी बेसिनों के अप्रमाणित क्षेत्र का एक बड़ा हिस्सा शामिल है। बेसिन का 36% मूल्यांकन किया गया है, जिसमें बेसिन के पूर्वी भाग में 71,290 एलकेएम 2डी भूकंपीय और 13,710 वर्ग किलोमीटर 3डी भूकंपीय डेटा और 22 अन्वेषण कुएँ हैं।

बेसिन में प्राप्त 2डी/3डी भूकंपीय या कुएँ का डाटा बहुत कम था और डाटा कवरेज मध्यम से विरल था। अंडमान और निकोबार (एएंडएन) द्वीपों के आस–पास स्थित क्षेत्रों में तेल और गैस मिलने की काफी संभावना है, लेकिन यहां अन्वेषण गतिविधियां शुरू नहीं की जा सकी हैं क्योंकि वहां के अधिकांश क्षेत्र को "नो–गो" क्षेत्र (नो–गो क्षेत्र का 0.37 मिलियन वर्ग किमी क्षेत्र अंडमान बेसिन में आता है) के रूप में नामित हैं।

अंडमान अपतटीय क्षेत्र के व्यापक मूल्यांकन के लिए, डीजीएच ने लगभग 2,81,613 वर्ग किमी के बेसिन क्षेत्र को कवर करते हुए 22,500 एलकेएम 2डी ब्रॉडबैंड भूकंपीय डेटा अधिग्रहण, प्रसंस्करण और व्याख्या प्राप्त करने की योजना तैयार की। तदनुसार, भारत सरकार द्वारा गहरे अंडमान अपतटीय सर्वेक्षण शुरू किया गया।

इस परियोजना को मेसर्स ऑयल इंडिया लिमिटेड के माध्यम से क्रियान्वित किया गया है। गहरे अंडमान अपतटीय क्षेत्र से कुल 22,500 एलकेएम भूकंपीय डाटा प्राप्त किया गया। अक्टूबर 2022 तक अधिग्रहण और प्रसंस्करण पूरा हो गया और पूरे डेटासेट की व्याख्या मार्च 2023 में पूरी हो गई और इस डाटा को एनडीआर पोर्टल पर अपलोड किया गया है।

iii. नो–गो क्षेत्रों में कमी:

सरकार ने अप्रैल 2022 में 'नो–गो' क्षेत्रों को लगभग 99% तक कम करने में सफलता हासिल की है, जो अब तक ईएंडपी गतिविधियों के लिए उपलब्ध नहीं थे। इससे भारत के ईईजेड का लगभग 1 मिलियन वर्ग किलोमीटर क्षेत्र अन्वेषण के लिए उपलब्ध हो गया है।

iv. विशेष आर्थिक क्षेत्र (ईईजेड) सर्वेक्षण (क्रियांवित किया जा रहा है):

भारतीय तलछटी घाटियों के अपतटीय बेसिन क्षेत्रों में ईईजेड तक का लगभग 1.13 मिलियन

वर्ग किलोमीटर क्षेत्र अमूल्यांकित है। देश के विशेष आर्थिक क्षेत्र (ईईजेड) तक फैले अपतटीय बेसिन क्षेत्र का संपूर्ण आकलन करने के लिए, लगभग 80,000 एलकेएम (कार्यान्वयन एजेंसी: ओएनजीसी) क्षेत्र को कवर करते हुए 2डी ब्रॉडबैंड भूकंपीय सर्वेक्षण करने के प्रयास किया गया। इसके परिणामस्वरूप, जून 2023 में कुल लगभग 79,540 एलकेएम 2डी भूकंपीय डाटा का अधिग्रहण सफलतापूर्वक पूरा किया गया। 22.07.2023 से 2डी भूकंपीय डाटा प्रसंस्करण और व्याख्या शुरू की गई और यह जून, 2024 में पूरी हो गई।

v. मिशन अनवेशण (आगामी):

भारतीय तलछटी बेसिनों के व्यापक मूल्यांकन के लिए, प्रस्तावित मिशन अनवेशण के तहत 07 ऑनलैंड तलछटीय बेसिनों में क्लोज्ड 2डी भूकंपीय प्रोफाइल की योजना बनाई गई है। इस परियोजना का उद्देश्य बेसिन का व्यापक मुल्यांकन करना और हाइड्रोकार्बन संभाव्यता का पता लगाना है। 07 ऑन–लैंड तलछटी बेसिनों में 20,275 एलकेएम के क्लोज्ड ग्रिड 2डी भूकंपीय एपीआई (अधिग्रहण, प्रसंस्करण और व्याख्या) का प्रस्ताव तैयार किया गया है।

vi. भारत के विस्तारित महाद्वीपीय शेल्फ का मूल्यांकन (आगामी):

ईईजेड सीमा से परे पश्चिमी और पूर्वी ऑफशोर में महाद्वीपीय शेल्फ में कम अंतराल के साथ अच्छी गुणवत्ता वाले उच्च समाधान भूकंपीय डेटा से तलछट की उपस्थिति के बारे में मूल्यवान जानकारी मिल सकती है और इससे महाद्वीपीय शेल्फ क्षेत्र में हाइड्रोकार्बन की क्षमता का पता लगाने में मदद मिल सकती है। ये सभी इनपुट ब्लू अर्थव्यवस्था के संदर्भ में अपतटीय क्षेत्रों में दीर्घकालिक ऊर्जा नीति तैयार करने के लिए उपयोगी होंगे। यह कार्य ईईजेड सीमा से परे एमओईएस द्वारा पूर्वी और पश्चिमी तट में विस्तारित महाद्वीपीय शेल्फ सीमा के दावे का समर्थन करने में मदद करेगा। विस्तारित स्ट्रीमर और उच्च शक्ति वाले भूकंपीय स्रोतों सहित प्रस्तावित भूकंपीय प्रतिबिम्ब प्रोफाइल से उम्मीद है कि वह लक्ष्मी रिज के भीतर क्रस्ट की प्रकृति का निर्धारण करने के लिए सब–बेसमेंट प्रतिबिंबों का विवरण प्रदान करे।

पूर्वी और पश्चिमी अपतटीय क्षेत्र में 30,000 एलकेएम के लिए 2डी भूकंपीय एपीआई का प्रस्ताव है (मात्रा: ओएनजीसी द्वारा पश्चिमी क्षेत्र में 15,500 एलकेएम और ओआईएल द्वारा पूर्वी क्षेत्र में 14,500 एलकेएम)।

2.12.5. प्राकृतिक गैस विपणन सुधार

- सरकार ने अक्टूबर, 2014 में हेनरी हब (यूएसए), अल्बर्टा (कनाडा), एनबीपी (यूके), रूस आदि जैसे प्रमुख अंतरराष्ट्रीय केंद्रों में प्रचलित कीमतों के आधार पर नए घरेलू प्राकृतिक गैस मूल्य निर्धारण दिशानिर्देश को मंजूरी दी ताकि उत्पादक और उपभोक्ता दोनों क्षेत्रों की आवश्यकताओं के बीच संतुलन बनाया जा सके। प्राकृतिक गैस की कीमतों का हर छह महीने में संशोधन किया जाता है और एमओपीएनजी के तहत पेट्रोलियम योजना और विश्लेषण सेल (पीपीएसी) द्वारा अधिसूचित किया जाता है। ये दिशानिर्देश नामांकन क्षेत्रों और एनईएलपी, प्री–एनईएलपी ब्लॉक/क्षेत्रों से उत्पादित प्राकृतिक गैस पर लागू होते हैं, जहां उत्पादन साझाकरण संविदा (पीएससी) के तहत मूल्य निर्धारण सरकार द्वारा अनुमोदित किया जाता है।
- तदुपरांत, सरकार ने वर्ष 2015 से डीएसएफ, ओएएलपी, सीबीएम व्यवस्थाओं के तहत गैस और 28.02.2019 के बाद सभी व्यवस्थाओं के तहत पूर्वोत्तर क्षेत्र (एनईआर) और नई गैस खोजों से उत्पादित गैस के लिए विपणन और मूल्य निर्धारण की स्वतंत्रता प्रदान की है।
- उच्च दबाव–उच्च तापमान (एचपी–एचटी) भंडारों तथा गहरे पानी और अति गहरे पानी वाले क्षेत्रों जैसे कठिन क्षेत्रों से गैस उत्पादन को प्रोत्साहित करने के लिए सरकार ने 23 मार्च, 2016 को प्राकृतिक गैस के उत्पादन के लिए विपणन सहित मूल्य निर्धारण की स्वतंत्रता प्रदान की, जिसकी मूल्य सीमा पेट्रोलियम नियोजन और विश्लेषण प्रकोष्ठ (पीपीएसी) द्वारा अर्धवार्षिक आधार पर घोषित की जाएगी।
- इसके अलावा, 15.10.2020 की अधिसूचना के माध्यम से 'प्राकृतिक गैस विपणन सुधार' की घोषणा की गई ताकि इलेक्ट्रॉनिक बोली के जरिए पारदर्शी और प्रतिस्पर्धी प्रक्रिया के जरिए गैस उत्पादकों द्वारा बाजार में बेचे जाने वाले गैस का

बाजार मूल्य पता लगाने के लिए मानक प्रक्रिया निर्धारित की जा सके; सहयोगियों को गैस की बिक्री के लिए बोली प्रक्रिया में भाग लेने की अनुमति दी जा सके और कुछ क्षेत्र विकास योजनाओं (एफडीपी) को विपणन की स्वतंत्रता दी जा सके, जहां उत्पादन साझाकरण संविदा पहले से ही मूल्य निर्धारण की स्वतंत्रता प्रदान करते हैं। इसके बाद, 03.12.2020 की अधिसूचना के माध्यम से ई–बोली से घरेलू स्तर पर उत्पादित प्राकृतिक गैस के लिए बाजार मूल्य की खोज के लिए विस्तृत दिशानिर्देश जारी किए गए। ई–बोली लगाने के लिए डीजीएच द्वारा पैनल में शामिल किए गए एजेंसियों को भी अधिसूचित किया गया है।

- इसके अलावा, 19.08.2021 के कार्यालय ज्ञापन के माध्यम से मूल्य निर्धारण और विपणन की स्वतंत्रता वाले गैस उत्पादकों को पीएनजीआरबी द्वारा अधिकृत गैस एक्सचेंजों के माध्यम से छोटी मात्रा में गैस (यानी प्रति वर्ष 500 एमएमएससीएम तक) बेचने के लिए अतिरिक्त विकल्प की अनुमति दी गई है।

- गैस सुधारों को गति देने और पर्यावरण को बचाने के लिए, सरकार ने 22.11.2021 के कार्यालय ज्ञापन के माध्यम से तेल और गैस कुओं के परीक्षण के दौरान उत्पादित एड–हॉक / टेस्ट गैस के मौद्रीकरण के लिए विस्तृत दिशा–निर्देश जारी किए हैं।

- 13 जनवरी, 2023 की अधिसूचना के माध्यम से, सरकार ने विपणन और मूल्य निर्धारण की स्वतंत्रता के साथ गहरे पानी, अत्यधिक गहरे पानी और उच्च दबाव / उच्च तापमान वाले क्षेत्रों में किए गए खोजों से उत्पादित गैस की बाजार मूल्य और बिक्री तथा पुनर्विक्रय पर स्पष्टीकरण प्रदान किया।

2.12.6. तेल और गैस के लिए उन्नत रिकवरी विधियों को बढ़ावा देने और प्रोत्साहित करने की नीतिगत रूपरेखा (अक्टूबर 2018)

- सरकार ने रॉयल्टी और उपकर की आंशिक छूट और मौजूदा क्षेत्रों की उत्पादकता में सुधार और घरेलू हाइड्रोकार्बन के समग्र उत्पादन को बढ़ाने के लिए एक सक्षम पारिस्थितिकी तंत्र के रूप में राजकोषीय प्रोत्साहन के माध्यम से उन्नत रिकवरी (ईआर) / बेहतर रिकवरी (आईआर) / गैर–उन्मूलन हाइड्रोकार्बन (यूएचसी) उत्पादन विधियों / तकनीकों को बढ़ावा देने और प्रोत्साहित करने के लिए नीतिगत रूपरेखा को मंजूरी दी। नीति के अनुसार, एक उन्नत रिकवरी (ईआर) समिति का गठन किया गया है जो नीतिगत कार्यान्वयन की देखरेख करेगी।

- वर्तमान नीति के अंतर्गत, 200 से अधिक तेल और गैस क्षेत्रों की ईआर क्षमता का प्रारंभिक मूल्यांकन किया गया है। ईआर पायलट चरण की शुरुआत के लिए 19 परियोजनाओं (क्षेत्रवार, ईआर विधिवार) की ईआर स्क्रीनिंग रिपोर्ट को मंजूरी दी गई। इनमें से पांच पायलट परियोजनाओं को मंजूरी दी गई है और ईआर नीति के तहत क्षेत्र(क्षेत्रों) ऑपरेटरों को वाणिज्यिक कार्यान्वयन योजना तैयार / प्रस्तुत करना है। इनमें से दो क्षेत्रों को वाणिज्यिक परियोजनाओं के प्रोत्साहन के लिए सैद्धांतिक मंजूरी दी गई।

2.12.7. कच्चे तेल के विनियमन संबंधी नीति (जून, 2022)

- आर्थिक कार्य संबंधी मंत्रिमंडल समिति ने 'घरेलू स्तर पर उत्पादित कच्चे तेल की बिक्री को विनियमन मुक्त करने' को मंजूरी दी। इस नीतिगत निर्णय के तहत सरकार 01.10.2022 से कच्चे तेल और कंडेनसेट का आवंटन बंद कर देगी, जिससे सभी नीति व्यवस्थाओं में विपणन की स्वतंत्रता मिलेगी। उत्पादन साझाकरण संविदों (पीएससी) से सरकार, या उसके नामित व्यक्ति, या सरकारी कंपनियों को कच्चा तेल बेचने की शर्त को माफ कर दिया जाएगा और सभी अन्वेषण और उत्पादन ऑपरेटर अपने क्षेत्रों से घरेलू बाजार में कच्चा तेल बेचने के लिए स्वतंत्र होंगे। हालांकि, पहले की तरह कच्चे तेल के निर्यात की अनुमति नहीं होगी। रॉयल्टी, उपकर और संविदात्मक भुगतान आदि जैसे सरकारी राजस्व की गणना बिक्री मूल्य या सरकार द्वारा नामित एजेंसी द्वारा गणना की गई कच्चे तेल की भारतीय बास्केट की कीमत, **जो भी अधिक हो**, के आधार पर तय की जाएगी।

2.12.8. अपरंपरागत हाइड्रोकार्बन के अन्वेषण और दोहन की नीतिगत रूपरेखा (अगस्त 2018)

यह नीति मौजूदा ठेकेदारों को नीति दस्तावेज में निर्धारित शर्तों के अधीन पीएससी और सीबीएम

संविदों के तहत मौजूदा एकरेज में शेल तेल और गैस तथा सीबीएम सहित अपरंपरागत हाइड्रोकार्बन की क्षमता को अनलॉक करने के लिए प्रोत्साहित करने के लिए प्रारंभ की गई है। पहले इसकी अनुमति नहीं थी। इस नीति के कारण, पीएससी के तहत 72,027 वर्ग किमी और सीबीएम संविदों के तहत 5,269 वर्ग किमी के क्षेत्र को पारंपरिक अथवा अपारंपरिक हाइड्रोकार्बन के अन्वेषण और दोहन के लिए एक साथ खोल दिया गया है।

2.12.9. डेटा सृजन के माध्यम से संवर्धित संभाव्य बोध

- **राष्ट्रीय आंकड़ा कोष (एनडीआर) का उन्नयन:** एनडीआर देश के भू–वैज्ञानिक डेटाबेस के भंडार के रूप में कार्य करता है और संभावित बोलीदाताओं को ओएएलपी के तहत बोली लगाने के लिए ब्लॉकों का चयन करने में सुविधा प्रदान करके महत्वपूर्ण भूमिका निभाता है। ईएंडपी डाटा की लगातार बढ़ती मांगों को पूरा करने के लिए, एनडीआर को क्लाउड–सक्षम हाइपर–कन्वर्जड इंफ्रास्ट्रक्चर में अपग्रेड किया जा रहा है ताकि सार्थक उपयोग के लिए उद्योग को आसानी से डाटा प्राप्त करने की सुविधा मिल सके।

- **हाइड्रोकार्बन संसाधनों का पुनर्मूल्यांकन:** देश में मौजूद हाइड्रोकार्बन संसाधन क्षमता का अद्यतन आकलन करने के लिए, देश के सभी 26 तलछटीय बेसिनों के लिए हाइड्रोकार्बन संसाधनों का पुनर्मूल्यांकन पूर्व के आकलन के लगभग दो दशक बाद 2017 में पूरा किया गया था। इसके परिणामस्वरूप, संभाव्य पारंपरिक हाइड्रोकार्बन संसाधन की मात्रा अनुमानतः 41.87 बिलियन टन (तेल और गैस के तेल समतुल्य) हो गई है, जो कि पहले के अनुमानित 28.08 बिलियन टन की तुलना में लगभग 49% अधिक है।

- **तेल और गैस के घरेलू अन्वेषण और उत्पादन को बढ़ाने के लिए अन्वेषण और लाइसेंसिंग नीति में सुधार (28 फरवरी, 2019):** सरकार ने अन्वेषण गतिविधियों को तेज करने, विदेशी और घरेलू निवेश को आकर्षित करने और घरेलू उत्पादन को बढ़ाने के उद्देश्य से 28 फरवरी 2019 को तेल और गैस के घरेलू अन्वेषण और उत्पादन को बढ़ाने के लिए अन्वेषण और लाइसेंसिंग नीति में सुधार को अधिसूचित किया।

2.12.10. हाइड्रोकार्बन खोजों के शीघ्र मौद्रीकरण के दिशानिर्देश, जून 2020

देश की ऊर्जा सुरक्षा को सुदृढ़ करने की दिशा में एक कदम के रूप में, निर्धारित संविदात्मक समयसीमा के भीतर अर्थात मूल्यांकन, वाणिज्यिकता की घोषणा (डीओसी) और क्षेत्र विकास योजना (एफडीपी) प्रस्तुत करने जैसी अन्य गतिविधियों के पूरा होने से पहले प्रारंभिक चरण में उत्पादन साझाकरण संविदा/राजस्व साझाकरण संविदा के तहत खोज के मौद्रीकरण के लिए दिनांक 23.06.2020 को दिशानिर्देश जारी किए गए थे।

2.13. ईएंडपी में ईज ऑफ डूइंग बिजनेस (ईओडीबी) को बढ़ाने के लिए किए गए प्रमुख सुधार

- **अनुपालन बोझ को कम करना–** स्व–प्रमाणन के **आधार पर दस्तावेजों को प्रस्तुत करने के लिए प्रक्रियाओं और पद्धतियों का सरलीकरण:** ईज ऑफ डूइंग बिजनेस के तहत प्रणाली को पारदर्शी और तेज बनाने के उद्देश्य से, स्व–प्रमाणन के आधार पर दस्तावेजों को प्रस्तुत करने के लिए प्रक्रियाओं और पद्धतियों के सरलीकरण के लिए 28.02.2020 को दिशानिर्देश जारी किए गए, जिसमें पीएससी संविदा के तहत 3 श्रेणियों में 37 प्रक्रियाओं को लागू किया गया।

- **विवाद समाधान समिति (2019) के संबंध में अधिसूचना:** दिनांक 16.12.2019 की अधिसूचना के माध्यम से प्रतिष्ठित व्यक्तियों/विशेषज्ञों की बाह्य समिति गठित की गई है तथा विवाद समाधान तंत्र की रूपरेखा और संरचना को अंतिम रूप दिया गया है।

- **डीजीएच को शक्तियों का प्रत्यायोजन (2018-2020):** पीएससी के तहत परिचालन को सुव्यवस्थित करने तथा अनुमोदन के अतिरिक्त स्तरों को हटाने के लिए, संविदा प्रबंधन के लिए कुछ को छोड़कर सभी शक्तियां डीजीएच को प्रत्यायोजित की गई हैं।

- उत्पादन साझाकरण संविदा प्रबंधन प्रणाली, पेट्रोलियम अन्वेषण पट्टा/पेट्रोलियम खनन पट्टा डेटा प्रबंधन प्रणाली, उत्पादन डेटाबेस प्रबंधन प्रणाली, ई–बोली पोर्टल आदि जैसी विभिन्न अनुप्रयोग और प्रणालियां भी शुरू की गई हैं।

- **ईएंडपी रोडमैप दस्तावेज़ का डिजिटलीकरण:** संपूर्ण भारत ईएंडपी पारिस्थितिकी तंत्र के साथ सहयोग के माध्यम से संपूर्ण अपस्ट्रीम मूल्य श्रृंखला में डिजिटलीकरण के अवसरों की पहचान करने और उन्हें सुविधाजनक बनाने के इरादे से, 10 जून, 2021 को सचिव, पीएनजी द्वारा 'ईएंडपी उद्योग के लिए डिजिटलीकरण रोडमैप' जारी किया गया है।

- **प्रदर्शन निगरानी डैशबोर्ड:** विभिन्न प्रमुख ईएंडपी प्रदर्शन संकेतकों की निगरानी के लिए 2019 में एक व्यापक डिजिटल निगरानी डैशबोर्ड बनाया गया था। इसे 2021 में एमओपीएनजी पोर्टल के साथ एकीकृत किया गया है।



सीपीसीएल, चेन्नै





अध्याय 3

पाइपलाइन और प्राकृतिक गैस

3 पाइपलाइन और प्राकृतिक गैस

भारत न केवल चीन और अमरीका के बाद दुनिया में तीसरा सबसे बड़ा ऊर्जा उपभोक्ता है, बल्कि यह सबसे तेजी से बढ़ने वाले ऊर्जा उपभोक्ताओं में से एक भी है। वर्ष 2021 में, देश में प्राथमिक ऊर्जा खपत लगभग 870 मिलियन टन तेल समतुल्य (एमटीओई) था, जो वित्त वर्ष 2023–24 के दौरान बढ़कर 932 एमटीओई हो गया है और देश के प्राथमिक ऊर्जा मिश्रण में प्राकृतिक गैस की भागीदारी लगभग 6% है। आने वाले वर्षों में देश के प्राथमिक ऊर्जा मिश्रण में प्राकृतिक गैस की भागीदारी को मौजूदा स्तर से बढ़ाकर 15% करने की परिकल्पना की गई है। प्रगति करने के उद्देश्य से, घरेलू गैस उत्पादन को बढ़ाने, तरल प्राकृतिक गैस (एलएनजी) के आयात को प्रोत्साहित करने और एलएनजी आयात क्षमता को बढ़ाने, राष्ट्रीय गैस ग्रिड के कार्य को सम्पन्न करने और देश भर में नगरी गैस वितरण (सीजीडी) नेटवर्क के तीव्र रोलआउट पर बल दिया गया है।

प्राकृतिक गैस की क्षेत्रीय खपत नीचे दी गई है:

	वित्त वर्ष 2023-24		
क्षेत्र	**घरेलू**	**आरएलएनजी**	**कुल**
ऊर्जा क्षेत्र			
विद्युत	6504	2578	9082
सीजीडी	10041	3451	13491
रिफाइनरी	2147	3689	5837
पी / एल सिस्टम के लिए आईसी	1871	52	1924
कृषि (चाय बागान)	142	0	142
औद्योगिक	530	516	1046
विनिर्माण	79	332	412
अन्य / विविध	8885	2053	10938
गैर ऊर्जा क्षेत्र			
उर्वरक	3029	18017	21046
पेट्रोकेमिकल	1115	1552	2667
एलपीजी मिक्केज	977	24	1001
स्पंज आयरन / स्टील	684	493	1177
कुल	36004	32757	68761
कुल योग	**68,761**		

3.1. गैस ग्रिड

गैस पाइपलाइन अवसंरचना के माध्यम से गैस स्रोतों और गैस उपभोक्ता बाजारों का जोड़ा जाना प्राकृतिक गैस के परिवहन का आर्थिक रूप से सबसे व्यवहार्य और सुरक्षित तरीका है। गैस पाइपलाइन व्यावहारिक रूप से गैस बाजार की संरचना और उसके विकास को निर्धारित करता है। इसलिए, देश के सभी प्रांतों में प्राकृतिक गैस की पर्याप्त उपलब्धता और समान वितरण सुनिश्चित करने हेतु परस्पर जुड़े हुए राष्ट्रीय गैस ग्रिड की परिकल्पना की गई है। मार्च, 2024 तक, देश में लगभग 24,881 किलोमीटर लंबा गैस पाइपलाइन नेटवर्क परिचालन में है और लगभग 10,404 किलोमीटर के पाइपलाइन का निर्माण विभिन्न चरणों में है। गैस ग्रिड को समयबद्ध तरीके से पूरा करने का प्रयास किया जा रहा है।

देश के पूर्वी भाग में गैस पाइपलाइन नेटवर्क विकसित करने के लिए, आर्थिक कार्य संबंधी मंत्रिमंडलीय समिति (सीसीईए) ने जगदीशपुर–हल्दिया और बोकारो–धामरा पाइपलाइन परियोजना के विकास के लिए गेल को 12,940 करोड़ रुपये के अनुमानित पूंजी लागत का 40 प्रतिशत (5,176 करोड़ रुपये) आंशिक पूंजी अनुदान देने की मंजूरी दे दी है। इस परियोजना ने देश के पूर्वी भाग को राष्ट्रीय गैस ग्रिड से जोड़ दिया है और इससे उत्तर प्रदेश, बिहार, झारखंड, ओडिशा और पश्चिम बंगाल राज्यों के औद्योगिक, वाणिज्यिक, घरेलू और परिवहन क्षेत्रों को स्वच्छ और पर्यावरण अनुकूल ईंधन यानी प्राकृतिक गैस की उपलब्धता सुनिश्चित होगी। ये पाइपलाइन परियोजनाएं गोरखपुर, बरौनी और सिंदरी नामक 3 उर्वरक संयंत्रों के पुनरुद्धार में समर्थन देते है जो इन पाइपलाइन परियोजनाओं के मार्ग में आते हैं। जेएचबीडीपीएल (प्रधानमंत्री ऊर्जा गंगा परियोजना) के आरंभ के बाद उत्तर पूर्वी भाग को एनजीजी से जोड़ना अधिक व्यवहार्य हो गया है। इस पाइपलाइन को बरौनी से गुवाहाटी (सिलीगुड़ी और बोंगाईगांव के माध्यम से) तक विस्तारित किया गया है, जो उत्तर पूर्व क्षेत्र (एनईआर) को राष्ट्रीय गैस ग्रिड से जोड़ने के लिए जगदीशपुर हल्दिया और बोकारो धामरा पाइपलाइन (जेएचबीडीपीएल) का एक अभिन्न अंग है।

729 किलोमीटर का बरौनी–गुवाहाटी पाइपलाइन तीन राज्यों अर्थात् बिहार, पश्चिम बंगाल और असम से गुजरती

है। कुल 3,384 किलोमीटर पाइपलाइन यानी जगदीशपुर–हल्दिया और बोकारो–धामरा और बरौनी–गुवाहाटी को 15,520 करोड़ रुपये के कुल अनुमानित निवेश के साथ निष्पादित किया गया है। इसके अलावा, जेएचबीडीपीएल परियोजना के विस्तार के रूप में धामरा–हल्दिया पाइपलाइन खंड के 253 किलोमीटर को भी गेल को प्राधिकृत किया गया है। पाइपलाइन को जोड़ दिया गया है और 4 उर्वरक संयंत्रों अर्थात् एचयूआरएल गोरखपुर, बरौनी, सिंदरी और मैटिक्स फर्टिलाइजर को गैस की आपूर्ति की जानी शुरू हो गई है। उत्तर प्रदेश, बिहार, झारखंड और पश्चिम बंगाल राज्यों में पाइपलाइनों के मार्ग में आने वाले वाराणसी, पटना, रांची, जमशेदपुर नगर गैस वितरण और अन्य सीजीडी को भी कनेक्टिविटी प्रदान की गई है। इसके अलावा, 326 किमी का काम यांत्रिक रूप से पूरा हो चुका है और इनकी संस्थापना की जा रही है। दिसंबर 2023 की स्थिति के अनुसार, एकीकृत जेएचबीडीपीएल के लिए लगभग 2,952 किलोमीटर पाइपलाइन क्रियान्वित हो गई है।

तेल और गैस सीपीएसई यथा गेल, आईओसीएल, ओआईएल, ओएनजीसी और एनआरएल के बीच एक संयुक्त उद्यम कंपनी बनाने के लिए 03.02.2018 को एक समझौता ज्ञापन पर हस्ताक्षर किए गए थे जो सिक्किम सहित सभी पूर्वोत्तर राज्य की राजधानियों को जोड़ने वाली पाइपलाइन बिछाएगी। तदनुसार, "इंद्रधनुष गैस ग्रिड लिमिटेड" (आईजीजीएल) जो एक संयुक्त उद्यम कंपनी है 10.08.2018 को संघटित किया गया है। यह संयुक्त उद्यम कंपनी चरणबद्ध तरीके से सभी पूर्वोत्तर राज्यों अर्थात असम, सिक्किम, मिजोरम, मणिपुर, अरुणाचल प्रदेश, त्रिपुरा, नागालैंड और मेघालय में ट्रंक पाइपलाइन कनेक्टिविटी विकसित कर रही है। पीएनजीआरबी ने 17.11.2020 को पूर्वोत्तर गैस पाइपलाइन ग्रिड (एनईजीजी) के विकास के लिए आईजीजीएल को अंतिम प्राधिकार जारी किया। यह परियोजना नगरी गैस परियोजनाओं को विकसित करने में भी मदद करेगी, जिससे पूर्वोत्तर राज्यों के प्रमुख नगरों में घरों में स्वच्छ खाना पकाने के ईंधन और औद्योगिक, वाणिज्यिक और परिवहन क्षेत्रों को पर्यावरण अनुकूल ईंधन की उपलब्धता सुनिश्चित होगी। सीसीईए ने परियोजना की व्यवहार्यता में सुधार के लिए 5,559 करोड़ रुपये के पूंजी अनुदान (परियोजना लागत का 60%) को मंजूरी दी है। इसके अलावा, 1,656 किलोमीटर एनईजीजी में से लगभग 847 किलोमीटर की लोअरिंग मार्च 2024 तक पूरी हो चुकी है।

दक्षिणी क्षेत्र में, दिसंबर 2023 तक, तमिलनाडु राज्य में शेष ~462 किलोमीटर लंबी कोच्चि–कूटनद–बेंगलोर –मंगलौर (केकेबीएमपीएल) प्राकृतिक गैस पाइपलाइन के निर्माण का कार्य चल रहा है।

आईओसीएल तमिलनाडु, आंध्र प्रदेश, कर्नाटक और पुदुचेरी संघ राज्य क्षेत्र में प्रमुख ग्राहकों और नगरी गैस वितरकों को प्राकृतिक गैस की आपूर्ति के लिए 35 एमएमएससीएनडी क्षमता की 1,440 किलोमीटर (आर–एलएनजी) पाइपलाइन बिछा रही है। इस परियोजना का उद्देश्य भारत सरकार के गैस आधारित अर्थव्यवस्था बनने के दृष्टिकोण के अनुरूप दक्षिणी भारत के कुछ हिस्सों में राष्ट्रीय गैस ग्रिड स्थापित करना है। दिसंबर 2023 तक लगभग 1,080 किलोमीटर पाइपलाइन चालू हो चुके है।

इसके अलावा, संबंधित पाइपलाइन की स्परलाइन निर्माणाधीन हैं और इससे क्षेत्र में औद्योगिक विकास को उत्प्रेरित करने में मदद मिलेगी। यह पाइपलाइन वर्तमान में चेन्नई और तिरुवल्लूर जिलों और कांचीपुरम जिले के भौगोलिक क्षेत्रों को गैस की आपूर्ति कर रही है। इसके अलावा, आईओसीएल संबंधित अधिकृत सीजीडी संस्थाओं के साथ समझौतों के आधार पर इस पाइपलाइन के मार्ग में आने वाले 9 और भौगोलिक क्षेत्रों को गैस की आपूर्ति करेगी। घरेलू, वाणिज्यिक और परिवहन क्षेत्र के ग्राहकों को स्वच्छ और हरित ईंधन की आपूर्ति न सिर्फ पर्यावरण की सुरक्षा सुनिश्चित करेगा बल्कि ईज ऑफ डूइंग और जीवनयापन में सुधार भी लाएगा।

पीएनजीआरबी ने 12.07.2023 को गेल इंडिया लिमिटेड को गुरदासपुर से जम्मू तक प्राकृतिक गैस पाइपलाइन बिछाने के लिए प्राधिकृत किया है। श्रीनगर क्षेत्र की मांग को पूरा करने के लिए, पीएनजीआरबी ने गेल की गुरदासपुर जम्मू प्राकृतिक गैस पाइपलाइन से जम्मू से श्रीनगर तक 325 किलोमीटर लंबी प्राकृतिक गैस पाइपलाइन बिछाने के लिए बोलियां आमंत्रित की है। इसके अतिरिक्त, पीएनजीआरबी ने एन्नोर, तमिलनाडु से बार्शी, महाराष्ट्र तक 875 किलोमीटर लंबी प्राकृतिक गैस पाइपलाइन बिछाने के लिए भी बोलियां आमंत्रित की है। यह पाइपलाइन एन्नोर एलएनजी टर्मिनल से निकलेगी और बार्शी में ईस्टवेस्ट पाइपलाइन से जुड़ेगी, जिससे देश के प्रमुख इंटरकनेक्टिंग पाइपलाइनों तक प्राकृतिक गैस का भविष्य में परिवहन भी संभव होगा।

3.2. देश में पुनर्गैसीकरण अवसंरचना

देश ने वर्ष 2004 में दाहेज (गुजरात) में स्थित अपने पहले पुनर्गैसीकरण एलएनजी (आरएलएनजी) टर्मिनल की स्थापना के साथ साथ तरलीकृत प्राकृतिक गैस (एलएनजी) का प्रथम आयात आरंभ किया। एलएनजी का आयात ओपन जनरल लाइसेंस (ओजीएल) मद के रूप में किया जा रहा है। आयातित आरएलएनजी की आपूर्ति

सपूर्ण देशभर में आपूर्तिकर्ताओं और क्रेताओं के बीच संविदात्मक समझौते के अनुसार बाजार निर्धारित कीमतों पर की जा रही है। एक अवसंरचना परियोजना के रूप में एलएनजी टर्मिनलों की स्थापना की अनुमति है और यह 100% प्रत्यक्ष विदेशी निवेश (एफडीआई) की पात्र है।

वर्तमान स्थिति के अनुसार, देश में लगभग 47.7 एमएमटीपीए (~172 एमएमएससीएमडी) की क्षमता सहित सात (7) प्रचालित एलएनजी पुनर्गैसीकरण टर्मिनल स्थापित हैं। टर्मिनल–वार विवरण निम्नानुसार है:

स्थान	मालिक और ऑपरेटर	क्षमता (एमएमटीपीए)
दाहेज (गुजरात)	पीएलएल	17.5
हजीरा (गुजरात)	शेल	5.2
कोच्चि (केरल)	पीएलएल	5
धबोल (महाराष्ट्र)	गेल (केएलपीएल)	5.0
मुंद्रा (गुजरात)	जीएसपीसी एलएनजी लि.	5
धमरा (ओडिशा)	अडानी एलएनजी प्रा.लि.	5
एन्नोर (तमिलनाडु)	आईओसीएल	5
कुल क्षमता (एमएमटीपीए)		**47.7**

उपरोक्त के अलावा, निम्नलिखित एलएनजी टर्मिनल निर्माणाधीन हैं:

स्थान	मालिक और ऑपरेटर	क्षमता (एमएमटीपीए)
दाहेज विस्तार (गुजरात)	पीएलएल	5
गोपालपुर (ओडिशा)	पीएलएल	4
जाफराबाग (गुजरात)	स्वान एनर्जी	5
छारा (गुजरात)	एचपीएलएनजी	5
कुल क्षमता (एमएमटीपीए)		**19**

3.3. नगर गैस वितरण (सीजीडी)

सीजीडी नेटवर्क को भौगोलिक क्षेत्रों में ट्रंक गैस पाइपलाइन कनेक्टिविटी अथवा गैस स्रोतों और तकनीकी–वाणिज्यिक व्यवहार्यता की उपलब्धता के आधार पर विकसित किया जा रहा है।

सीजीडी नेटवर्क देश के घरों तक पाइप्ड नेचुरल गैस (पीएनजी) के रूप में पर्यावरण अनुकूल खाना पकाने के ईंधन की आपूर्ति सुनिश्चित करता है, साथ ही संपीडित प्राकृतिक गैस (सीएनजी) के रूप में परिवहन क्षेत्र को स्वच्छ ईंधन भी उपलब्ध कराता है। परिवहन क्षेत्र में सीएनजी के उपयोग से नगरी क्षेत्रों में वाहनों से होने वाले उत्सर्जन को कम करने में मदद मिलती है और इससे वायु की गुणवत्ता में सुधार होता है।

- मई 2014 तक, देश के विभिन्न भागों के 53 जिलों (आंशिक / पूर्ण) में फैले लगभग 33 भौगोलिक क्षेत्रों (जीए) तक सीजीडी नेटवर्क उपलब्ध थे।
- वर्ष 2014–18 (मई 2018 तक) के दौरान, 113 जिलों (आंशिक / पूर्ण) में फैले 92 भौगोलिक क्षेत्रों को सीजीडी नेटवर्क का विकास करके कवर किया गया था।
- वर्ष 2019 में 9वें और 10वें सीजीडी बोली राउंड के सफल समापन के साथ, सीजीडी नेटवर्क का कवरेज 298 जिलों (आंशिक / पूर्ण) को कवर करते हुए अतिरिक्त 136 भौगोलिक क्षेत्रों तक बढ़ा दिया गया था।
- वर्ष 2022 में, पीएनजीआरबी ने 11वें और 11ए सीजीडी बोली राउंड पूरा किया और 67 अतिरिक्त भौगोलिक क्षेत्रों को अधिकृत किया। इस राउंड के पूरा होने के साथ, सीजीडी नेटवर्क का संभावित कवरेज भारत के 88% क्षेत्र में फैली देश की लगभग 98% आबादी तक फैल गई है।
- पेट्रोलियम एवं प्राकृतिक गैस नियामक बोर्ड (पीएनजीआरबी) ने 12वें और 12ए सीजीडी बोली राउंड के तहत 103 जिलों जो अरुणाचल प्रदेश, मेघालय, मणिपुर, नागालैंड, सिक्किम और मिजोरम और 2 संघ राज्य क्षेत्र– जम्मू और कश्मीर और लद्दाख में फैले हैं, को कवर करने वाले सफल बोलीदाताओं को अंतिम रूप दिया है। तदनुसार, 04.03.2024 को 7 भौगोलिक क्षेत्रों के लिए सफल बोलीदाताओं को आशय पत्र जारी किए गए हैं। इसके अलावा, सीजीडी प्राधिकरण विनियमों के अनुसार पीएनजीआरबी द्वारा संबंधित संस्थाओं से अपेक्षित प्रदर्शन बैंक गारंटी प्राप्त होने के बाद सफल बोलीदाताओं को प्राधिकरण प्रदान किया जाएगा।
- 12 / 12ए सीजीडी बोली राउंड के पूरा होने के बाद, पीएनजीआरबी ने 2032 तक देश भर में 18,336 सीएनजी स्टेशन और लगभग 12.63 करोड़ पीएनजी कनेक्शन स्थापित करने के एमडब्ल्यूपी का लक्ष्य के साथ सीजीडी नेटवर्क के विकास के लिए 34 राज्यों / संघ राज्य क्षेत्रों के लगभग 733 जिलों में फैले देश के लगभग 100% मुख्य भूमि क्षेत्र और लगभग 100% भौगोलिक क्षेत्र को कवर करने वाले 307 भौगोलिक क्षेत्रों (जीए) को अधिकृत किया है।
- घरेलू परिवारों तक पीएनजी की आपूर्ति 25.4 लाख (मई 2014) के स्तर से बढ़कर 129.22 लाख (मार्च

2024 तक) हो गई है। कुल 6,861 सीएनजी स्टेशन (31.03.2024 की स्थिति के अनुसार) देश भर में लगभग 55 लाख सीएनजी वाहनों को स्वच्छ और किफायती परिवहन ईंधन उपलब्ध करा रहे हैं।

नगरी गैस नेटवर्क के विस्तार को बढ़ावा देने और नगरों में प्राकृतिक गैस के उपयोग को बढ़ाने के लिए, सरकार ने निम्नलिखित कदम उठाए हैं:

i. घरेलू गैस, जो आयातित गैस की तुलना में सस्ती है, को सीजीडी क्षेत्र के पीएनजी (डी) और सीएनजी (टी) खंडों की आवश्यकता को पूरा करने के लिए आवंटित किया गया है और इसे नो कट श्रेणी में रखा गया है।

ii. श्रम और रोजगार मंत्रालय (एमओएलई) द्वारा सीजीडी परियोजनाओं को सार्वजनिक उपयोगिता का दर्जा दिया गया।

iii. रक्षा मंत्रालय (एमओडी) ने अपने आवासीय क्षेत्रों/यूनिट लाइनों में पीएनजी के उपयोग के लिए दिशा–निर्देश जारी किए हैं।

iv. लोक उद्यम विभाग (डीपीई) ने सार्वजनिक क्षेत्र के उद्यमों (पीएसई) को दिशा–निर्देश जारी किए हैं कि वे अपने संबंधित आवासीय परिसरों में पीएनजी का प्रावधान रखें।

v. आवासन और नगरी कार्य मंत्रालय (एमओएचयूए) ने राज्य सरकारों को निम्नलिखित पहलुओं पर परामर्शी जारी की है:

क. स्थानीय परिस्थितियों के अनुसार समयबद्ध अनुमति के साथ–साथ सड़क बहाली/अनुमति शुल्क को मानकीकृत करना।

ख. नगर/कस्बों के नियोजन चरण में सीएनजी स्टेशनों के विकास के लिए भूमि भूखंड का निर्धारण और संशोधित मास्टर प्लान में इसे निर्दिष्ट किया जाना चाहिए।

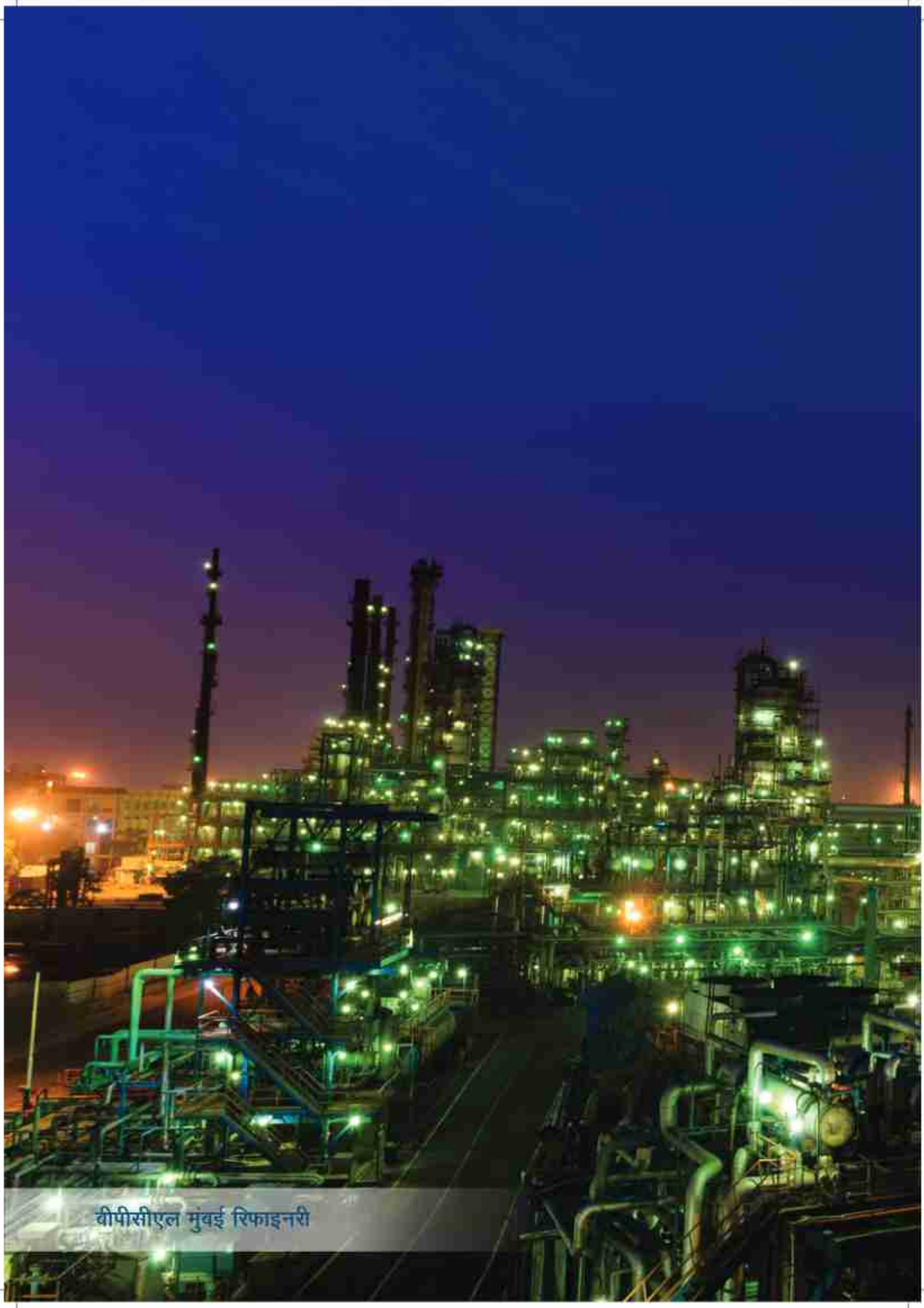
ग. वास्तुशिल्प डिजाइन चरण में आवासीय और वाणिज्यिक भवनों में गैस पाइपलाइन की अवसंरचना प्रदान करने के लिए भवन उप–नियमों में प्रासंगिक संशोधन करना।

vi. इसके अलावा, एमओएचयूए ने सीपीडब्ल्यूडी और एनबीसीसी को सभी सरकारी आवासीय परिसरों में पीएनजी का प्रावधान रखने का निर्देश दिया है।

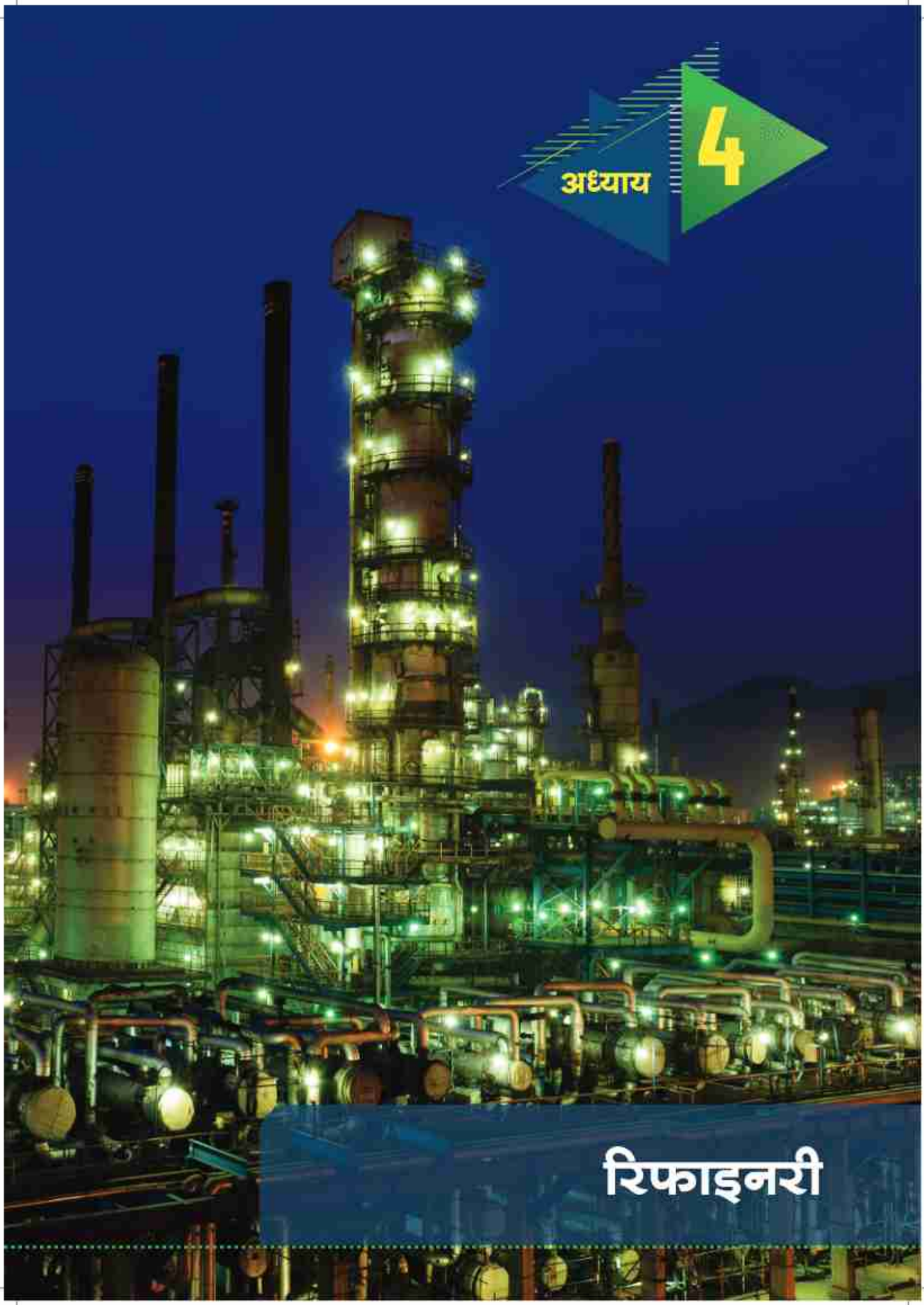
vii. डीआईपीपी ने मौजूदा ओएमसी रोस में सीएनजी डिस्पेंसिंग सुविधाएं स्थापित करने की प्रक्रिया को आसान बनाने के लिए संशोधित नियम 2018 को अधिसूचित किया है।

viii. सरकार ने ओएनजीसी/ओआईएल के नामांकन क्षेत्रों, नई अन्वेषण लाइसेंसिंग नीति (एनईएलपी) ब्लॉकों और प्री–एनईएलपी ब्लॉकों से उत्पादित गैस के लिए दिनांक 07.04.2023 के राजपत्र अधिसूचना के माध्यम से संशोधित घरेलू प्राकृतिक गैस मूल्य निर्धारण दिशानिर्देशों को मंजूरी दे दी है, जहां उत्पादन साझाकरण संविदा (पीएससी) के माध्यम से कीमतों पर सरकार की मंजूरी प्रदान की जाती है।





बीपीसीएल मुंबई रिफाइनरी


अध्याय
4
रिफाइनरी

4 रिफाइनरी

4.1. भारतीय रिफाइनिंग उद्योग ने वैश्विक स्तर पर स्वयं को एक प्रमुख खिलाड़ी के रूप में स्थापित किया है। भारत एक रिफाइनरी हब के रूप में उभर रहा है और रिफाइनिंग क्षमता मांग से अधिक है। देश की रिफाइनिंग क्षमता 1998 में 62.0 मिलियन मीट्रिक टन प्रति वर्ष (एमएमटीपीए) से बढ़कर 01.04.2024 तक 256.82 एमएमटीपीए हो गई है, जिसमें 23 रिफाइनरियाँ शामिल हैं– 19 सार्वजनिक क्षेत्र के तहत, 3 निजी क्षेत्र के तहत और 1 संयुक्त उद्यम (जेवी) में है।

रिफाइनरियों का क्षमता–वार विवरण निम्नानुसार है:

क्र.सं.	रिफाइनरी का स्थान/ स्थापना का वर्ष	कंपनी का नाम	निर्दिष्ट क्षमता (एमएमटीपीए)
1	डिगबोई–1901#	इंडियन ऑयल कॉर्पोरेशन लिमिटेड	0.650
2	गुवाहाटी–1962		1.200
3	बरौनी–1964		6.000
4	कोयली–1965		13.700
5	बोंगाईगांव–1974		2.700
6	हल्दिया–1975		8.000
7	मथुरा–1982		8.000
8	पानीपत–1998		15.000
9	पारादीप–2016		15.000
10	मनाली–1965	चेन्नई पेट्रोलियम कॉर्पोरेशन लिमिटेड	10.500
11	नागपट्टिनम–1993@		0
	कुल आईओसीएल समूह		**80.750**
12	मुंबई–1954	हिंदुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड	9.500
13	विशाखापत्तनम–1957		13.700
	कुल एचपीसीएल		**23.200**
14	मुंबई–1955	भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड	12.000
15	कोच्चि–1963		15.500
16	बीना–2011		7.800
	कुल बीपीसीएल		**35.300**
17	नुमालीगढ़–2000	नुमालीगढ़ रिफाइनरी लिमिटेड	3.000
18	मैंगलोर–1996	मैंगलोर रिफाइनरी एंड पेट्रोकेमिकल्स लिमिटेड	15.000
19	टाटिपाका, एपी–2001	तेल एवं प्राकृतिक गैस निगम लिमिटेड	0.066
	उप–कुल पीएसयू		**157.300**
20	जामनगर, आरआईएल डीटीए, 1999	रिलायंस इंडस्ट्रीज लिमिटेड	33.000
21	जामनगर आरआईएल एसईजेड, 2008	रिलायंस इंडस्ट्रीज लिमिटेड	35.200
22	वाडिनार, 2006	नायरा एनर्जी	20.000
	उप–कुल निजी क्षेत्र		**88.200**
23	भटिंडा, एचएमईएल, 2012	एचपीसीएल मित्तल एनर्जी लिमिटेड	11.300
	उप–कुल संयुक्त उद्यम		**11.300**
	कुल		**256.816**

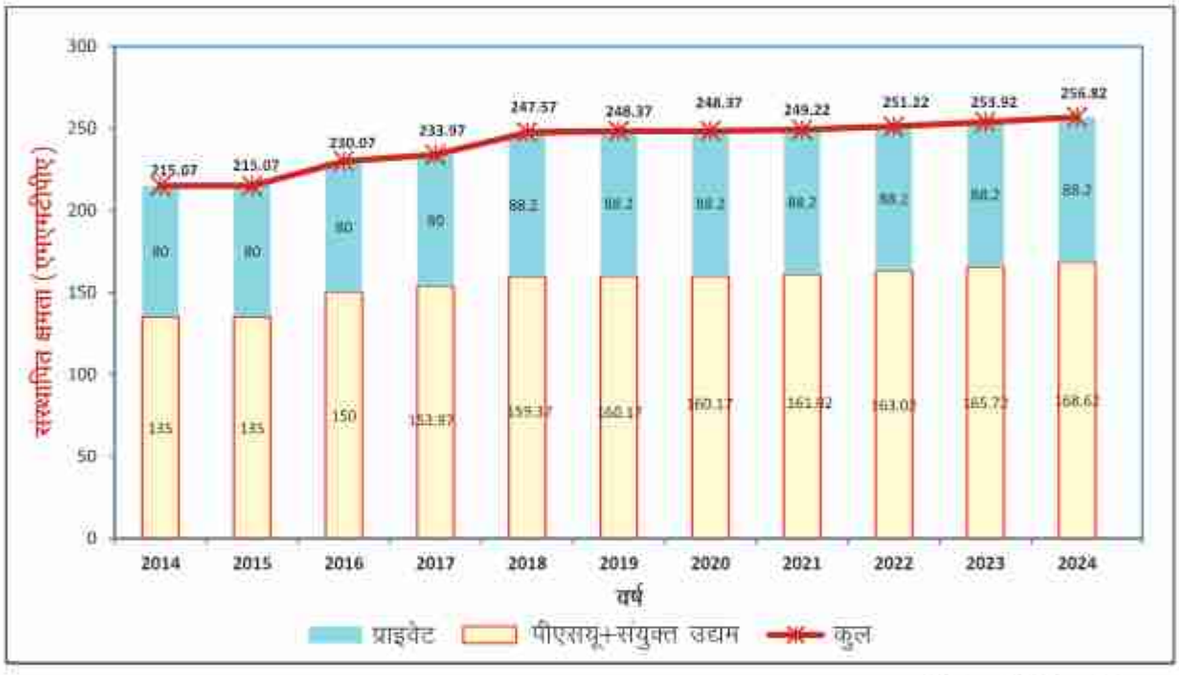
रिफाइनरी की स्थापना 1901 में डिगबोई में असम तेल कंपनी लिमिटेड द्वारा की गई थी और समयोपरांत इस रिफाइनरी का अधिग्रहण आईओसीएल द्वारा दिनांक 14.10.1981 को कर लिया गया।

@नागपट्टिनम की 1.0 एमएमटीपीए की कावेरी बेसिन रिफाइनरी (सीबीआर) का प्रचालन दिनांक 1.4.2019 से 9 एमएमटीपीए क्षमता की नई रिफाइनरी की परियोजना गतिविधियों को संपन्न करने के लिए बाधाओं के कारण स्थगित कर दिया गया है।

4.1.1 रिफाइनिंग क्षमता न केवल घरेलू खपत के लिए पर्याप्त है, बल्कि पेट्रोलियम उत्पादों के निर्यात के लिए भी अधिशेष है। 2001–02 से, भारत पेट्रोलियम उत्पादों का शुद्ध निर्यातक बन गया है। वित्त वर्ष 2023–2024 के दौरान, देश ने 47.7 बिलियन अमेरिकी डॉलर (अनंतिम) मूल्य के 62.4 मिलियन मीट्रिक टन (एमएमटी) (अनंतिम) पेट्रोलियम उत्पादों का निर्यात किया है।

4.2. वर्षों के दौरान रिफाइनिंग क्षमता वृद्धि

4.2.1. वर्षों के दौरान रिफाइनिंग क्षमता में वृद्धि का चित्रमय प्रस्तुतिकरण ग्राफ में दर्शाया गया है।



संबंधित वर्षों की 1 अप्रैल तक

4.3. ग्रीन फील्ड रिफाइनरी और मौजूदा रिफाइनरियों का विस्तार

ग्रीन फील्ड रिफाइनरी

क्र.स.	कंपनी का नाम	रिफाइनरी का स्थान	अभिलक्षित वर्ष	क्षमता, एमएमटीपीए
1	एचपीसीएल राजस्थान रिफाइनरी लिमिटेड (एचआरआरएल)	बाड़मेर, राजस्थान	2025-26	9.0

मौजूदा रिफाइनरियों का विस्तार

वर्ष 2025–26 तक योजनाबद्ध क्षमता विस्तार निम्नानुसार है:

क्र. स.	कंपनी का नाम	रिफाइनरी का स्थान	अभिलक्षित वर्ष	क्षमता में वृद्धि, एमएमटीपीए
1	भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड	बीना, मध्य प्रदेश	2027-28	3.2
2	भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड	मुंबई, महाराष्ट्र	2025-26	4.0
3	भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड	कोच्चि, केरल	2026-27	2.5
4	इंडियन ऑयल कॉर्पोरेशन लिमिटेड	डिगबोई, असम	2025-26	0.35
5	इंडियन ऑयल कॉर्पोरेशन लिमिटेड	कोयली, गुजरात	2025-26	4.3
6	इंडियन ऑयल कॉर्पोरेशन लिमिटेड	बरौनी, बिहार	2024-25	3.0
7	इंडियन ऑयल कॉर्पोरेशन लिमिटेड	पानीपत, हरियाणा	2025-26	10.0
8	हिंदुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड (एचपीसीएल)	विशाखापत्तनम, आंध्र प्रदेश	2024-25	1.3
9	नुमालीगढ़ रिफाइनरीज लिमिटेड (एनआरएल)	नुमालीगढ़, असम	2025-26	6.0

4.3. रिफाइनरी के प्रदर्शन सुधार

4.4.1. भारतीय सार्वजनिक क्षेत्र की रिफाइनरियाँ आधुनिक तकनीकों से सुसज्जित हैं और उन्होंने अंतर्राष्ट्रीय प्रवृत्ति के अनुरूप और आवश्यकता के अनुसार प्रौद्योगिकियों को निरंतर उन्नत किया है। भारतीय रिफाइनरियों द्वारा विभिन्न ऊर्जा संरक्षण उपायों के माध्यम से ऊर्जा खपत को कम करने को सर्वोच्च प्राथमिकता दी है।

उच्च प्रौद्योगिकी केन्द्र (सीएचटी) द्वारा 2010, 2012, 2014, 2016, 2018, 2020 और 2022 के निरंतर चक्रों के लिए मेसर्स सोलोमन एसोसिएट्स के माध्यम से सार्वजनिक क्षेत्र की रिफाइनरियों के प्रदर्शन बेंचमार्किंग का अध्ययन किया गया है।

आधुनिक तकनीकों को अपनाने के माध्यम से पीएसयू रिफाइनरियों द्वारा उत्तरोत्र रूप से डिस्टिलेट प्राप्ति और पेट्रोल/डीजल की गुणवत्ता में सुधार किया गया है। डिस्टिलेट प्राप्ति के मानकीकरण के लिए, सभी भारतीय रिफाइनरियों ने 2020–21 से सीएचटी द्वारा विकसित एक मानक डिस्टिलेट प्राप्ति पद्धति को अपनाया है।

पीएसयू रिफाइनरियों की औसत डिस्टिलेट प्राप्ति (कच्चे तेल पर भारिता:) वर्ष 2005–06 में 73.3% से बढ़कर वित्त वर्ष 2023–24 में 78.5% हो गई है। इसी प्रकार से, ऊर्जा संरक्षण उपायों द्वारा उद्योग की विशिष्ट ऊर्जा खपत (एमबीएन) कोकम करने में सहायता प्रदान की है जिसे एमबीटीयू/बीबीएल/एनआरजीएफ के संदर्भ में वर्ष 2005–06 से 2023–24 की अवधि के दौरान लगभग 30% तक मापा गया है। चूंकि ईंधन और घाटा रिफाइनरी की जटिलता के साथ–साथ भिन्न होते रहते हैं, जटिलता के साथ ईंधन और घाटा को अभिग्रहित करने के लिए सीएचटी द्वारा एमबीएन पद्धति विकसित की गई थी। सलाहकारों से प्राप्त सूचनाओं के आधार पर तकनीकी प्रवृत्तियों को प्रतिबिंबित करने के लिए एमबीएन पद्धति को नया रूप दिया गया था और वर्ष 2015–16 से रिपोर्टिंग को नए एमबीएन में परिवर्तित कर दिया गया है।



2020–21 से मानकीकरण के लिए सीएचटी की डिस्टिलेट पद्धति को अपनाया गया है।



*बीईई द्वारा सत्यापन के तहत वर्ष 2022–23 के एमबीएन आंकड़े

एसईसी या एमबीएन के रूप में विशिष्ट ऊर्जा खपत; एमबीएन = एमबीटीयू/बीबी/एनआरजीएफ; एमबीटीयू: रिफाइनरी में शुद्ध ऊर्जा और घाटा (हजार ब्रिटिश थर्मल यूनिट);

2015–16 से, मानकीकरण के लिए नई एमबीएन पद्धति को अपनाया गया

4.5. ऑटो ईंधन गुणवत्ता उन्नयन

देश भर में बीएस–IV गुणवत्ता युक्त ईंधन की आपूर्ति दिनांक 01.04.2017 तक चरणों में संपन्न की गई। सरकार द्वार दिनांक 01.01.2019 से देश में बीएस–IV से सीधे बीएस–VI उत्सर्जन मानदंडों पर जाने का निर्णय लिया गया। सड़क परिवहन और राजमार्ग मंत्रालय द्वारा अधिसूचना सं. जीएसआर 889(ई) दिनांक 16.09.2016 के तहत बीएस–VI ईंधन के लिए उत्सर्जन मानकों को अधिसूचित किया गया। दिल्ली में प्रदूषण के स्तर में वृद्धि को ध्यान में रखते हुए, सरकार द्वारा दिनांक 01.04.2018 से एनसीटी दिल्ली में, तत्पश्चात 1 अप्रैल, 2019 से एनसीआर के प्रमुख भागों में बीएस–VI लागू कर दिया गया। बीएस–VI गुणवत्ता युक्त ईंधन की राष्ट्रव्यापी आपूर्ति दिनांक 1 अप्रैल, 2020 से आरंभ की गई।



4.5. रिफाइनरी का संक्षिप्त विवरण

सार्वजनिक क्षेत्र की रिफाइनरियां

आईओसीएल रिफाइनरियां

4.6.1. दिगबोई रिफाइनरी (असम)–इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल)

डिगबोई रिफाइनरी को वर्ष 1901 में बर्मा ऑयल कंपनी लिमिटेड (तत्पश्चात असम ऑयल कंपनी लिमिटेड) द्वारा कमीशन किया गया था। इंडियन ऑयल कॉर्पोरेशन लिमिटेड द्वारा दिनांक 14.10.1981 से असम ऑयल कंपनी लिमिटेड की रिफाइनरी और मार्केटिंग प्रबंधन का अधिग्रहण कर लिया और एक पृथक डिवीजन बनाया गया। इस प्रभाग रिफाइनरी और मार्केटिंग दोनों कार्य निहित थे। डिगबोई रिफाइनरी दुनिया की सबसे पुरानी ऑपरेटिंग रिफाइनरी है और प्रीमियम ग्रेड पैराफिन वैक्स और माइक्रो–क्रिस्टलीय वैक्स का उत्पादन करती है। रिफाइनरी की वर्तमान क्षमता 0.65 एमएमटीपीए है। 2021–22 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 109.92% था।

4.6.2. गुवाहाटी रिफाइनरी (असम)–इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल)

गुवाहाटी रिफाइनरी को 0.75 एमएमटीपीए की डिजाइन क्षमता के साथ जनवरी, 1962 चालू किया गया था। रिफाइनरी की स्थापना रोमानिया के सहयोग से की गई थी। गुवाहाटी रिफाइनरी सार्वजनिक क्षेत्र की पहली रिफाइनरी थी। यह 2003 में भारी सिरों को एलपीजी, मोटर स्पिरिट और डीजल तेल में अपग्रेड करने के लिए आईओसीएल आर एंड डी सेंटर द्वारा विकसित एक नई तकनीक 'इंडमैक्स यूनिट' स्थापित करती पहली रिफाइनरी थी। रिफाइनरी की वर्तमान क्षमता 1.02 एमएमटीपीए है। वर्ष 2023–24में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 83.33% था।

4.6.3. बरौनी रिफाइनरी (बिहार) इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल)

बरौनी रिफाइनरी जुलाई 1964 में चालू की गई थी। रिफाइनरी की स्थापना तत्कालीन सोवियत संघ के सहयोग से की गई थी। रिफाइनरी, जिसे मूल रूप से स्वदेशी असम क्रूड के प्रसंस्करण के लिए डिज़ाइन किया गया था, का तत्पश्चात पुनरुद्धार और विस्तारित किया गया था और अब यह आयातित क्रूड के प्रसंस्करण में सक्षम है। रिफाइनरी की वर्तमान क्षमता 6.00 एमएमटीपीए है। रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग वर्ष 2023–24 में 110.33% था।

4.6.4. कोयली रिफाइनरी (गुजरात)–इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल)

कोयाली रिफाइनरी अक्टूबर, 1965 में चालू की गई थी। रिफाइनरी की स्थापना पूर्व सोवियत संघ के सहयोग से की गई थी। कोयली रिफाइनरी द्वारा कच्चे तेल के भारी सिरों को उच्च मूल्य युक्ती बेहतर गुणवत्ता वाले मिटटी तेल/एटीएफ और डीजल में परिवर्तित करने के लिए देश की प्रथम हाइड्रोक्रैकर इकाई आरंभ की गई। इसमें विश्व की सबसे बड़ी सिंगल ट्रेन लीनियर अल्काइल बेंजीन (एलएबी) संयंत्र भी स्थापित है, जिसने पेट्रोकेमिकल्स में इंडियन ऑयल के प्रवेश को चिह्नित किया है। रिफाइनरी की वर्तमान क्षमता 13.70 एमएमटीपीए है। वर्ष 2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 110.94% था।

4.6.5 बोंगाईगांव रिफाइनरी (असम)–इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल)

बोंगाईगांव रिफाइनरी एंड पेट्रोकेमिकल्स लिमिटेड (बीआरपीएल) को दिनांक 20 फरवरी 1974 को केंद्र सरकार की पूर्ण स्वामित्वाधीन कंपनी के रूप में शामिल किया गया था। मार्च 2001 में बीआरपीएल, इंडियन ऑयल कॉर्पोरेशन लिमिटेड की सहायक कंपनी बन गई। बीआरपीएल को दिनांक 25 मार्च, 2009 से धारक कंपनी इंडियन ऑयल कॉर्पोरेशन लिमिटेड के साथ मिला दिया गया था। बीआरपीएल जो मूल रूप से असम क्रूड का प्रसंस्करण कार्य कर रहा था, अब आयातित क्रूड को संसाधित करने में सक्षम हो गया है। रिफाइनरी की वर्तमान क्षमता को वर्ष 2020–21 में 2.35 से बढ़ाकर 2.70 एमएमटीपीए कर दिया गया है। वर्ष 2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 111.48% रहा था।

4.6.6. हल्दिया रिफाइनरी (पश्चिम बंगाल)–इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल)

हल्दिया रिफाइनरी इंडियन ऑयल की चौथी रिफाइनरी है और इसे जनवरी, 1975 में संस्थापित किया गया था। यह एक तटीय रिफाइनरी है और हुगली और हल्दिया नदी के संगम के पास, पश्चिम बंगाल के पूरब मेदिनीपुर जिले में कोलकाता से 136 किलोमीटर दूर स्थित है।

यह इंडियन ऑयल ग्रुप कंपनियों की दो रिफाइनरियों में से एक है जो ल्यूब ऑयल बेस स्टॉक्स (एलओबीएस) का उत्पादन करती है, इसके अलावा यह जूट बैचिंग ऑयल (जेबीओ) का एकमात्र उत्पादक भी है।

प्रारंभ में इसे 2.5 एमएमटीपीए कच्चे तेल के प्रसंस्करण की क्षमता के साथ स्थापित किया गया था, 1989–90 में रिफाइनरी की क्षमता डी–बॉटलनेकिंग के माध्यम से 2.75 एमएमटीपीए तक बढ़ा दी गई थी, और

1.0 एमएमटीपीएक्षमता के दूसरे सीडीयू की स्थापना/कमीशनिंग के साथ वर्ष 1997 में इसे 3.75 एमएमटूपीएतक बढ़ा दिया गया था। इसके बाद रिफाइनरी की क्षमता 7.5 एमएमटीपीए तक बढ़ा दी गई है। वर्ष 2020 में सीडीयू–1 के पुनरुद्धार (सीडीयू–1 का 3.4 एमएमटीपीए से 3.9 एमएमटीपीए में पुनरुद्धार) के बाद इसकी वर्तमान क्षमता 8.0 एमएमटीपीए हो गई है। वर्ष 2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 100.75% था।

4.6.7. मथुरा रिफाइनरी (उत्तर प्रदेश)–इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल)

मथुरा रिफाइनरी को जनवरी 1982 में चालू किया गया था। रिफाइनरी की प्राथमिक इकाइयों को तत्कालीन सोवियत संघ द्वारा डिजाइन किया गया था। यह विस्तृत पर्यावरण निगरानी प्रणाली और पारिस्थितिक पार्क से सुसज्जित भारत की पहली ग्रीन रिफाइनरी है। इस रिफाइनरी द्वारा एसओ2 उत्सर्जन को नियंत्रित करने के लिए प्राकृतिक गैस का भी उपयोग किया जाता है। रिफाइनरी की वर्तमान क्षमता 8.00 एमएमटीपीए है। वर्ष 2023–24 में रिफाइनरी की 114.87% क्रूड रिफाइनिंग क्षमता का उपयोग हुआ था।

4.6.8. पानीपत रिफाइनरी (हरियाणा)–इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल)

पानीपत रिफाइनरी को 1998 में चालू किया गया था । पानीपत रिफाइनरी सार्वजनिक क्षेत्र में पहली आधुनिक एकीकृत रिफाइनरी एवं पेट्रोकेमिकल कॉम्प्लेक्स है। यह देश का सबसे बड़ा शुद्ध टेरेफथेलिक एसिड (पीटीए) संयंत्र है। पानीपत नेफ्था क्रैकर यूनिट, मोनो एथिलीन ग्लाइकॉल (एमईजी) यूनिट, पॉली प्रोपलीन (पीपी) यूनिट, लीनियर लो–डेंसिटी पॉली एथिलीन (एलएलडीपीई) और हाई डेंसिटी पॉली एथिलीन (एचडीपीई) यूनिट आदि की कमीशनिंग से इंडियन ऑयल की प्लास्टिक उद्योग में प्रवेश की शुरुआत हुई थी।

रिफाइनरी की वर्तमान क्षमता 15.00 एमएमटीपीए है। वर्ष 2023–24में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 95.33% था।

4.6.9 पारादीप रिफाइनरी (ओडिशा)–इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल)

पारादीप रिफाइनरी को माननीय प्रधान मंत्री द्वारा दिनांक 07.02.2016 को राष्ट्र को समर्पित किया गया था। पारादीप रिफाइनरी इंडियन ऑयल की अब तक की सबसे प्रतिष्ठित और पूंजी–गहन परियोजना है और यह पारादीप, ओडिशा में स्थित आईओसीएल के समूह की 11वीं रिफाइनरी है। यह रिफाइनरी सहायक उद्योगों के तत्काल संभावित विकास के माध्यम से क्षेत्र में औद्योगिक विकास के लिए एक आर्थिक प्रोत्साहन के रूप में कार्य करेगी।

यह रिफाइनरी दुनिया भर के विभिन्न प्रौद्योगिकी लाइसेंसधारियों की अत्याधुनिक तकनीकों से युक्त सबसे आधुनिक रिफाइनरी है। रिफाइनरी को 10.8 के समग्र नेल्सन जटिलता कारक के साथ 15.0 एमएमटीपीए कच्चे तेल को संसाधित करने के लिए डिज़ाइन किया गया था, जो इसे एलपीजी, मोटर स्पिरिट (पेट्रोल) और बीएस–VI गुणवत्ता वाले डीजल, केरोसिन, एविएशन टर्बाइन ईंधन, प्रोपलीन, सल्फर और पेट्रोलियम कोक जैसे विभिन्न पेट्रोलियम उत्पादों का उत्पादन करने के लिए 100% उच्च सल्फर और भारी कच्चे तेल को संसाधित करने में सक्षम बनाता है। रिफाइनरी प्रीमियम गुणवत्ता वाली मोटर स्पिरिट और विभिन्न देशों को निर्यात के लिए अन्य हरित ऑटो ईंधन वेरिएंटका भी उत्पादन कर रही है।

रिफाइनरी से घरेलू बाजार और आंशिक रूप से दक्षिण–पूर्व एशियाई निर्यात बाज़ार की ऊर्जा माँगों को पूरा करने योग्य उत्पादन हो रहाहै। रिफाइनरी की वर्तमान क्षमता 15.00 एमएमटीपीए है। वर्ष 2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 101.4% था।

एचपीसीएल रिफ़ाइनरीज़

4.6.10. मुंबई रिफाइनरी (महाराष्ट्र) हिंदुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड (एचपीसीएल)

मुंबई रिफाइनरी को पहली बार वर्ष 1952 में स्टैंडर्ड वैक्यूम रिफाइनिंग कंपनी ऑफ इंडिया (स्टैन वैक) के रूप में शामिल किया गया था, जिसे वर्ष 1954 में कमीशन किया गया था। वर्ष 1962 में सटैन वैक को एस्सो इंडिया लिमिटेड नाम दिया गया था। वर्ष 1969 में, ल्यूब इंडिया लिमिटेड, ल्यूब ऑयल बेस स्टॉक (एलओबीएस) के निर्माण के लिए अस्तित्व में आई। दिनांक 15 जुलाई, 1974 को इएसएसओ और ल्यूब इंडिया लिमिटेड के उपक्रमों का राष्ट्रीयकरण किया गया और हिंदुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड (एचपीसीएल) बनाने के लिए इनका विलय कर दिया गया। एचपीसीएल–मुंबई रिफाइनरी एचपीसीएल की एकमात्र रिफाइनरी है जो ल्यूब ऑयल बेस स्टॉक का उत्पादन करती है। रिफाइनरी फूड ग्रेड हेक्सेन, रबर प्रोसेसिंग (आरपीओ) डायना प्रोसेसिंग ऑयल (स्वच्छ और पारदर्शी पैराफिन प्रकार का संसाधित तेल जिसकी गर्मी प्रतिरोधक क्षमता और जल प्रतिरोधी क्षमता उत्कृष्ट है) आदि जैसे विशेष उत्पादों का भी उत्पादन करती है। रिफाइनरी की क्षमता 1 अप्रैल, 2022 के प्रभाव से 7.5 से बढ़ाकर 9.5 एमएमटीपीए कर दिया गया है। वर्ष

2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 101.47% रहा था ।

4.6.11. विशाख रिफाइनरी (आंध्र प्रदेश)–हिंदुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड (एचपीसीएल)

एचपीसीएल की विशाख रिफाइनरी को वर्ष 1957 में कैलटेक्स ऑयल रिफाइनिंग (इंडिया) लिमिटेड द्वारा कमीशन किया गया था। रिफाइनरी को वर्ष 1976 में भारत सरकार द्वारा अधिग्रहित कर लिया गया था और परिणामस्वरूप वर्ष 1978 में इसे एचपीसीएल के साथ समामेलित कर दिया गया था। एचपीसीएल–विशाख रिफाइनरी पूर्वी तट पर स्थित प्रथम तेल रिफाइनरी थी और यह विशाखापत्तनम के प्रथम प्रमुख उद्योगों में से एक थी। वर्ष 2010 में विशाख में सिंगल प्वाइंट मूरिंग (एसपीएम) सुविधा के चालू होने के साथ ही 'वेरी लार्ज क्रूड कैरियर्स' (वीएलसीसी) जो 2 मिलियन बैरल तेल तक ले जाते हैं, अब विशाख रिफाइनरी में प्राप्त किए जा सकते हैं। इंडियन स्ट्रैटेजिक पेट्रोलियम रिजर्व लिमिटेड (आईएसपीआरएल) रिफाइनरी के समीप स्थित है। रिफाइनरी की क्षमता वर्ष 2023–24 में 11.0 से बढ़ाकर 13.7 एमएमटीपीए किया गया है। वर्ष 2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 92.62% था।

बीपीसीएल रिफाइनरी

4.6.12. मुंबई रिफाइनरी (महाराष्ट्र)–भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड (बीपीसीएल)

मुंबई में रिफाइनरी को जनवरी 1955 में बर्माशेल रिफाइनरी लिमिटेड के स्वामित्वाधिकार में चालू किया गया था। बर्मा शेल के सरकारी अधिग्रहण के पश्चात, भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड दिनांक 24 जनवरी 1976 को अस्तित्व में आया। बीपीसीएल–मुंबई रिफाइनरी द्वारा स्वदेशी कच्चे तेल के प्रसंस्करण की शुरूआत की गई और वर्तमान स्थिति के अनुसार 72 प्रकार के कच्चे तेल के प्रसंस्करण के कार्य का निर्वाह किया जा सकता है। रिफाइनरी में पर्यावरण के अनुकूल ग्रुप II/III बेस ऑयल के उत्पादन के लिए ल्यूब बेस ऑयल यूनिट भी स्थित है। रिफाइनरी की वर्तमान क्षमता 12.00 एमएमटीपीए है। वर्ष 2023–24में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 125.83% था।

4.6.13. कोच्चि रिफाइनरी (केरल)–भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड (बीपीसीएल)

कोच्चि रिफाइनरी लिमिटेड (केआरएल) की स्थापना भारत सरकार, संयुक्त राज्य अमरीका की फिलिप्स पेट्रोलियम कंपनी और कलकत्ता के डंकन ब्रदर्स के बीच दिनांक 27 अप्रैल, 1963 गठन संबंधी समझौते के अनुसरण में की गई थी। रिफाइनरी को वर्ष 2006 में भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड के साथ समामेलित कर दिया गया। यह रिफाइनरी वेरी लार्ज क्रूड कैरियर्स (वीएलसीसी) में कच्चा तेल प्राप्त करने के लिए सुसज्जित है।आज कोच्चि रिफाइनरी के उत्पाद पोर्टफोलियो में इसकी गुणवत्ता वाले ईंधन की रेंज के साथ पेट्रोकेमिकल फीडस्टॉक्स और विशेष उत्पाद शामिल हैं। कोच्चि रिफाइनरी ने मूल्य संवर्धन के लिए पेट्रोकेमिकल विनिर्माण में विविधता लाने की एक महत्वाकांक्षी योजना शुरू की है। रिफाइनरी की वर्तमान क्षमता 15.50 एमएमटीपीए है। वर्ष 2023-24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 111.61% था।

4.6.14. बीना रिफाइनरी भारत ओमान रिफाइनरी लिमिटेड (बीओआरएल) (मध्य प्रदेश)

बीना रिफाइनरी की स्थापना भारत ओमान रिफाइनरी लिमिटेड (बीओआरएल) द्वारा की गई थी, जो मई 2011 में चालू किया गया भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड (बीपीसीएल) और ओमान ऑयल कॉर्पोरेशन लिमिटेड (ओओसीएल) का एक संयुक्त उद्यम था। मार्च 2020 से, यह कंपनी भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड की सहायक कंपनी बन गई है और जुलाई 2021 में, ओक्यू एसएओसी (पूर्व में ओमान ऑयल कंपनी एसएओसी) की संपूर्ण शेयरधारिता भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड द्वारा क्रय कर ली थी।

बीना रिफाइनरी भारत के मध्य भाग में स्थित प्रथम रिफाइनरी है और यह मध्य और उत्तरी भारत में पेट्रोलियम उत्पादों की उपलब्धता को संवृद्धि करता है। इसकी अन्य सुविधाओं में सिंगल प्वाइंट मूरिंग सुविधा (एसपीएम) गुजरात के वाडीनार में क्रूड ऑयल स्टोरेज टर्मिनल (सीओटी) और वाडीनार से बीना (वीबीपीएल) तक 935 किलोमीटर लंबी देश पार पाइपलाइन शामिल है। रिफाइनरी की वर्तमान क्षमता 7.80 एमएमटीपीए है। वर्ष 2023–24में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 91.02% था।

सीपीसीएल रिफाइनरी :

4.6.15. मनाली रिफाइनरी (तमिलनाडु) पेट्रोलियम कॉर्पोरेशन लिमिटेड (सीपीसीएल)

चेन्नै पेट्रोलियम कॉर्पोरेशन लिमिटेड (सीपीसीएल), जिसे इससे पूर्व मद्रास रिफाइनरीज लिमिटेड (एमआरएल) के नाम से जाना जाता था, वर्ष 1965 में भारत सरकार (जीओआई) एएमओसीओ और नेशनल ईरानी ऑयल कंपनी (एनआईओसी) के बीच एक संयुक्त उद्यम के रूप में स्थापित की गई थी। सीपीसीएल 2001 में आईओसीएल की सहायक कंपनी बन गई। सीपीसीएल मनाली रिफाइनरी भारत में ईंधन, ल्यूब,

वैक्स और पेट्रोकेमिकल फीडस्टॉक्स उत्पादन सुविधाओं के साथ सबसे जटिल रिफाइनरियों में से एक है। अपनी रिफाइनरी की जल संबंधी आवश्यकताओं को बढ़ाने के लिए 5.8 एम जी डी समुद्री जल विलवणीकरण परियोजना उद्योग में अपने प्रकार की प्रथम परियोजना थी। रिफाइनरी की वर्तमान क्षमता 10.50 एमएमटीपीए है। वर्ष 2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 110.85% था।

4.6.16. कावेरी बेसिन रिफाइनरी (नागापट्टिनम तमिलनाडु) – चेन्नै पेट्रोलियम कॉर्पोरेशन लिमिटेड (सीपीसीएल)

1.00 एमएमटीपीए क्षमता युक्त सीपीसीएल की कावेरी बेसिन रिफाइनरी (सीबीआर) का प्रचालन कार्य दिनांक 01.04.2019 से रोक दिया गया है और 9.00 एमएमटीपीए की एक नई रिफाइनरी की योजना बनाई गई है।

एनआरएल रिफाइनरी

4.6.17. नुमालीगढ़ रिफाइनरी (असम)–नुमालीगढ़ रिफाइनरी लिमिटेड (एनआरएल)

नुमालीगढ़ रिफाइनरी, जिसे 'असम एकॉर्ड रिफाइनरी' के रूप में जाना जाता है, को अक्टूबर, 2000 में चालू किया गया था। एनआरएल का वर्तमान शेयरधारिता पैटर्न यह है: ऑयल इंडिया लिमिटेड (72.15%) और असम सरकार (23.48%) और इंजीनियर्स इंडिया लिमिटेड (4.37%)। डिस्टीलेट प्राप्ति को अधिकतम करने के लिए एनआरएल पूर्वोत्तर की सबसे बड़ी रिफाइनरी है जो आधुनिक इकाइयों, हाइड्रोक्रेकर और डिलेड कोकर से सुसज्जित है। रिफाइनरी की वर्तमान क्षमता 3.00 एमएमटीपीए है। 2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 83.66% था।

एमआरपीएल रिफाइनरी

4.6.18. मैंगलोर रिफाइनरी (कर्नाटक)–मैंगलोर रिफाइनरी एंड पेट्रोकेमिकल्स लिमिटेड (एमआरपीएल)

मैंगलोर रिफाइनरी एंड पेट्रोकेमिकल्स लिमिटेड (एमआरपीएल) को मार्च 1996 में चालू किया गया था। एमआरपीएल को मूल रूप से एक संयुक्त उद्यम रिफाइनरी के रूप में स्थापित किया गया था जो हिंदुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड (एचपीसीएल) और आदित्य बिड़ला ग्रुप ऑफ कंपनीज द्वारा संवर्धित है। मार्च, 2003 में एमआरपीएल ओएनजीसी की सहायक कंपनी बन गई। रिफाइनरी को 24 से 46 एपीआई गुरुत्वाकर्षण युक्त क्रूड को संसाधित करने के लिए उच्च लचीलेपन से युक्त एक बहुमुखी डिजाइन प्राप्त हुआ है और इसमें उच्च स्तरीय स्वचालन स्थापित है। एमआरपीएल, भारत की एकमात्र रिफाइनरी है जिसमें प्रीमियम डीजल (हाई सिटेन) का उत्पादन करने के लिए 2 हाइड्रोक्रैकर हैं। यह भारत की एकमात्र ऐसी रिफाइनरी भी है जिसमें हाई ऑक्टेन के अनलेडेड पेट्रोल का उत्पादन करने के 2 सीसीआर स्थापित हैं। रिफाइनरी की वर्तमान क्षमता 15.00 एमएमटीपीए है। रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग वर्ष 2023–24 में 110.20% था।

ओएनजीसी रिफाइनरी

4.6.19. तातीपका रिफाइनरी (आंध्र प्रदेश)–ऑयल एंड नेचुरल गैस कॉरपोरेशन लिमिटेड (ओएनजीसी)

ओएनजीसी की मिनी रिफाइनरी (चरण–1) के रूप में स्थापित इस रिफाइनरी को सितंबर, 2001 में आंध्र प्रदेश के पूर्वी गोदावरी जिले के तातीपका में चालू किया गया था। रिफाइनरी की वर्तमान क्षमता 0.066 एमएमटीपीए है। वर्ष 2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 98.5% था।

संयुक्त उद्यम रिफाइनरी:

4.6.20. गुरु गोविंद सिंह रिफाइनरी–एचपीसीएल–मित्तल एनर्जी लिमिटेड (एचएमईएल), बठिंडा (पंजाब)

एचपीसीएल और मित्तल एनर्जी लिमिटेड के बीच एक संयुक्त उद्यम हिंदुस्तान मित्तल एनर्जी लिमिटेड (एचएमईएल) के स्वामित्वाधिकार युक्तन गुरु गोविंद सिंह रिफाइनरी (जीजीएसआर) को अप्रैल, 2012 में चालू किया गया था। बठिंडा की कार्यनीतिक स्थिति को ध्यान में रखते हुए तेल और गैस क्षेत्र में यह रिफाइनरी एक सफल सार्वजनिक निजी भागीदारी का प्रमाण है, यह रिफाइनरी भारत के उत्तरी राज्यों की ईंधन आवश्यकताओं की पूर्ति करेगी।

एचएमईएल द्वारा कच्चे तेल की प्राप्ति, भंडारण और कच्चे तेल के देश पार परिवहन के लिए एक एसपीएम स्थापित करने और प्रचालित करने के प्रयोजन से एक पूर्ण स्वामित्वाधिकार युक्तर सहायक एचपीसीएल–मित्तल पाइपलाइन लिमिटेड (एचएमपीएल) को भी शामिल किया गया है। रिफाइनरी की वर्तमान क्षमता 11.30 एमएमटीपीए है। वर्ष 2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 111.5% था।

निजी क्षेत्र की रिफाइनरियां:

4.6.21. रिलायंस इंडस्ट्रीज लिमिटेड (घरेलू टैरिफ क्षेत्र) (आरआईएल डीटीए) (निजी क्षेत्र), जामनगर (गुजरात)

इस रिफाइनरी को जुलाई 1999 में चालू किया गया था। आरआईएल–डीटीए देश की प्रथम निजी क्षेत्र की रिफाइनरी थी। आरआईएल–डीटीए विश्व भर की सबसे बड़ी जमीनी स्तर की रिफाइनरी है, जिसमें पैराज़ाइलीन

के उत्पादन के लिए एक पेटोलियम संयंत्र, पॉलीप्रोपाइलीन के उत्पादन के लिए एक पॉलीमर संयंत्र है। रिफाइनरी की वर्तमान क्षमता 33.00 एमएमटीपीए है। वर्ष 2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 104.24% था।

4.6.22. रिलायंस इंडस्ट्रीज लिमिटेड–एसईजेड (आरआईएल–एसईजेड), जामनगर (गुजरात)

यह रिफाइनरी दिसंबर, 2008 में चालू की गई थी। इस निर्यात आधारित एसईजेड रिफाइनरी में 'स्वच्छ ईंधन' प्रक्रिया संयंत्र के साथ एक अद्वितीय डिजाइन और पथ–प्रदर्शक विन्यास शामिल है। इसे अर्थव्यवस्था के आधार पर ग्रेड बदलने और बाजार की गतिशीलता के आधार पर मार्जिन हासिल करने के लिए उच्च स्तर के लचीलेपन के साथ डिजाइन किया गया है। नई एसईजेड रिफाइनरी भारत में गैसोलीन और डीजल के यूरो–IV ग्रेड का उत्पादन करने वाली पहली रिफाइनरी है। रिफाइनरी की वर्तमान क्षमता 35.20 एमएमटीपीए है। वर्ष 2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 80.39% (अनंतिम) था।

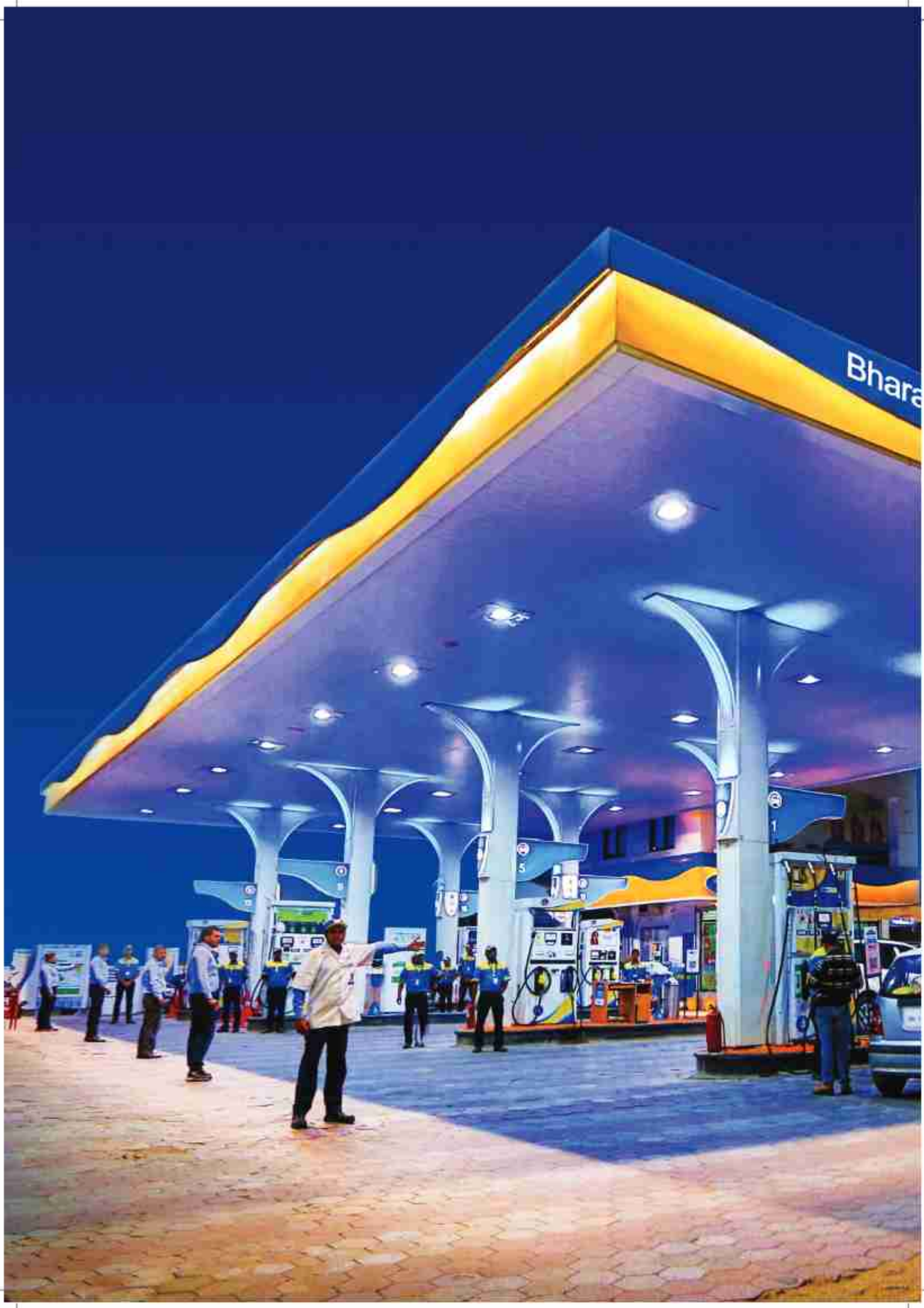
4.6.23. नयारा एनर्जी लिमिटेड, वाडिनार रिफाइनरी, वाडिनार (गुजरात)

यह रिफाइनरी नवंबर, 2006 में चालू की गई थी। वाडिनार रिफाइनरी देश में एकल–स्थान वाली दूसरी सबसे बड़ी रिफाइनरी है। रिफाइनरी की वर्तमान क्षमता 20.00 एमएमटीपीए है। वर्ष 2023–24 में रिफाइनरी की क्रूड रिफाइनिंग क्षमता का उपयोग 101.50% था।

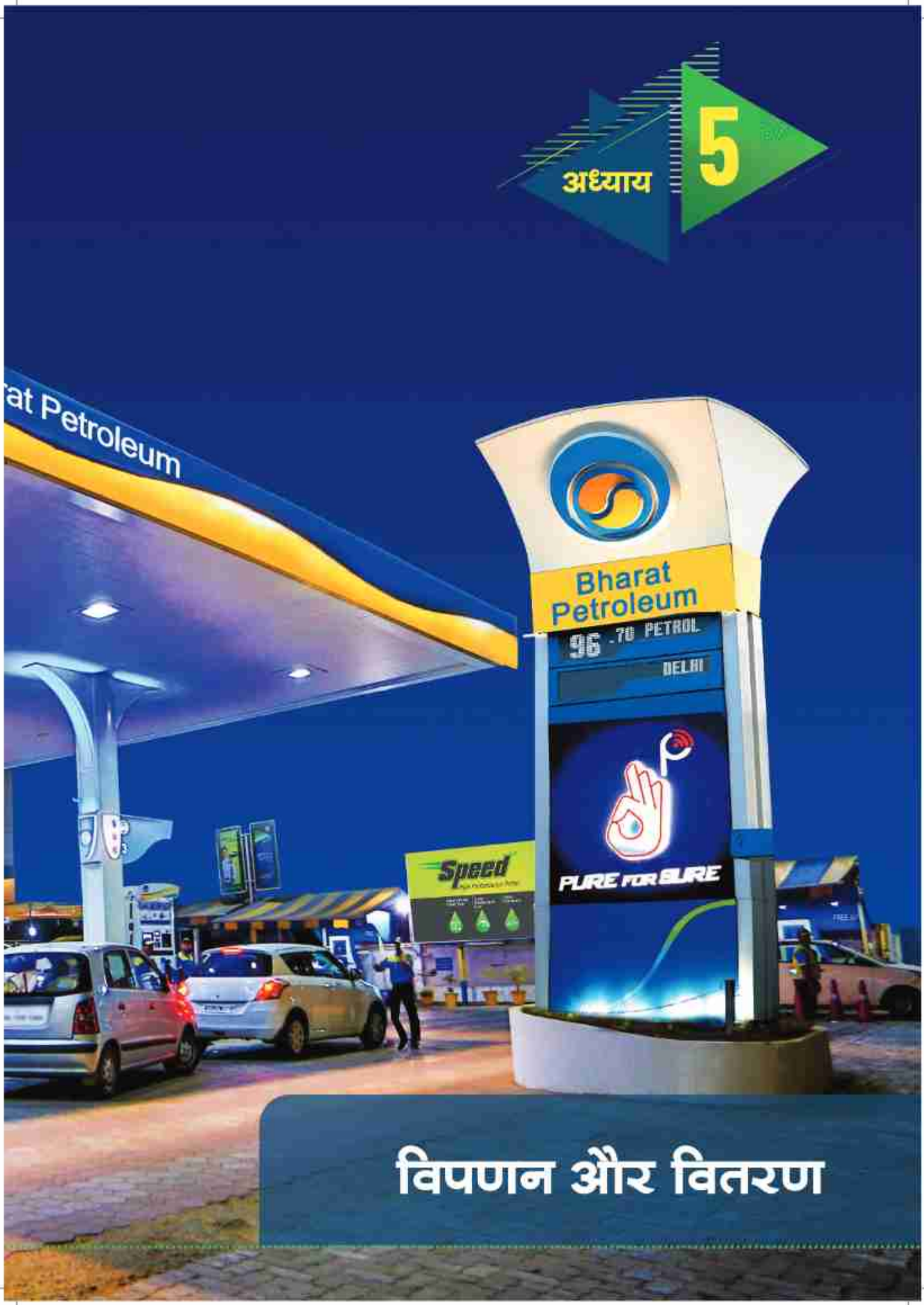


आईओसीएल पानीपत रिफाइनरी का दृश्य


MAP OF REFINERIES IN INDIA
Refining Capacity - 256.8 MMTPA
N
BHATINDA (11.3)
PANIPAT (15.0)
MATHURA (8.0)
RAJASTHAN REFINERY BARMER (HRRL) (9.0)
KOYALI (13.7)
BINA (7.8)
NAYARA (20.0)
RIL (35.2)
RIL (33.0)
JAMNAGAR
MUMBAI (12.0)
MUMBAI (9.5)
Arabian Sea
MANGALORE (15.0)
KOCHI (15.5)
Lakshadweep
CHENNAI (10.5)
CAUVERY BASIN REFINERY (CBRPL), NAGAPATTINAM (9.0)
TATIPAKA (0.07)
VIZAG (13.7)
PARADIP (15.0)
BARAUNI (6.0)
HALDIA (8.0)
BONGAIGAON (2.7)
DIGBOI (0.65)
GUWAHATI (1.2)
NUMALIGARH (3.0)
Bay of Bengal
Andaman & Nicobar Islands
INDIAN OCEAN
(Capacity in MMTPA)
New Refineries (Upcoming)
Map not to Scale


Bhara

अध्याय 5



विपणन और वितरण

5 विपणन और वितरण

5.1. एलपीजी का खुदरा विपणन अवसंरचना

भारत में एलपीजी की खुदरा बिक्री सार्वजनिक क्षेत्र की तेल विपणन कंपनियों (ओएमसी) यथा इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल), हिंदुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड (एचपीसीएल), भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड (बीपीसीएल) और निजी कंपनियों जैसे कि रिलायंस इंडस्ट्रीज, एस्सर, शेल आदि द्वारा किया जाता है। दिनांक 31.03.2024 की स्थिति के अनुसार, देश में सार्वजनिक क्षेत्र की तेल विपणन कंपनियों द्वारा प्रचालित 22,843 टीएमटीपीए की रेटेड बॉटलिंग क्षमता वाले 210 एलपीजी बॉटलिंग संयंत्र हैं और 25,481 एलपीजी वितरक हैं। दिनांक 31.03.2024 तक देश में कुल सक्रिय एलपीजी उपभोक्ता 32.42 करोड़ हैं। वित्त वर्ष 2023–24 के दौरान सार्वजनिक क्षेत्र की ओएमसी द्वारा कुल 96 नए एलपीजी वितरक और 5 नए बॉटलिंग संयंत्र स्थापित किए गए हैं। इसके अलावा, वित्त वर्ष 2023–24 के दौरान ओएमसी द्वारा कुल 112.7 लाख नए एलपीजी कनेक्शन दिए गए हैं, जिनमें पीएम उज्ज्वला योजना के तहत प्रदान किया गया 74.18 लाख कनेक्शन शामिल हैं।

5.2. प्रमुख पहलें

5.2.1. पहल (डीबीटीएल योजना)



भारत सरकार ने 15.11.2014 को देश के 54 जिलों में एलपीजी उपभोक्ताओं के लिए प्रत्यक्ष लाभ अंतरण (डीबीटीएल) योजना शुरू की है, जिसका नाम है 'पहल' (प्रत्यक्ष हस्तान्तरित लाभ) है। बाद में इस योजना को पूरे देश के लिए विस्तारित किया गया है और दिनांक 31.03.2024 तक कुल 30.04 करोड़ एलपीजी उपभोक्ता इस योजना में शामिल हो चुके है।

इस योजना का उद्देश्य राजसहायता को युक्तिसंगत बनाना और राजसहायता लीकेज को कम करना है। जो एलपीजी उपभोक्ता पहल योजना में शामिल हैं, उन्हें बिना राजसहायता वाले मूल्य पर एलपीजी रिफिल मिलते हैं और उनकी एलपीजी राजसहायता (उनकी पात्रता के अनुसार) सीधे उनके बैंक खातों में प्राप्त होती है। पहल के कार्यान्वयन के साथ, राजसहायता प्रबंधन में पारदर्शिता की नई व्यवस्था लागू हो गई है जिससे देश में एलपीजी उपभोक्ताओं को सशक्त हो रहे हैं। इसके अलावा, पहल ने 'जाली' खातों, एकाधिक खातों और निष्क्रिय खातों की पहचान करने में मदद की है। इसके परिणामस्वरूप राजसहायता वाले एलपीजी को वाणिज्यिक उद्देश्यों के लिए उपयोग किए जाने करने पर रोक लगी है।

गिव इट अप: राजसहायता प्रबंधन के एक हिस्से के रूप में, भारत के माननीय प्रधान मंत्री ने 'गिव इट अप' अभियान शुरू करके सभी अमीर एलपीजी उपभोक्ताओं से स्वेच्छा से अपनी एलपीजी राजसहायता छोड़ने की अपील की। 'गिव इट अप' अभियान को सामाजिक रूप से प्रतिबद्ध व्यक्तियों द्वारा भारी सकारात्मक प्रतिक्रिया मिली है और इसके परिणामस्वरूप दिनांक 31.03.2024 तक 1.15 करोड़ से अधिक उपभोक्ताओं ने स्वेच्छा से अपनी एलपीजी राजसहायता छोड़ दी है। सरकार के 'गिव इट अप' अभियान को दुनिया भर से व्यापक प्रशंसा मिली है और यह मनोविज्ञान और व्यवहार अर्थशास्त्र के क्षेत्र से प्रेरित सार्वजनिक नीति में इस्तेमाल किए जाने वाले नज टूल का एक अग्रणी और शुरुआती उदाहरण है।

5.2.2. प्रधानमंत्री उज्ज्वला योजना (पीएमयूवाई)

मई 2016 में, पेट्रोलियम और प्राकृतिक गैस मंत्रालय (एमओपीएंडएनजी) ने 'प्रधानमंत्री उज्ज्वला योजना' (पीएमयूवाई) को एक प्रमुख योजना के रूप में पेश किया, जिसका उद्देश्य ग्रामीण और वंचित परिवारों को एलपीजी जैसे खाना पकाने के स्वच्छ ईंधन उपलब्ध कराना था, जो अन्यथा जलाऊ लकड़ी, कोयला, गोबर के उपले आदि जैसे खाना पकाने के पारंपरिक ईंधन का उपयोग कर रहे थे। खाना पकाने के पारंपरिक ईंधन के उपयोग से ग्रामीण महिलाओं के स्वास्थ्य के साथ–साथ पर्यावरण पर भी हानिकारक प्रभाव पड़ता है।

भारत के माननीय प्रधानमंत्री ने दिनांक 01.05.2016 को औपचारिक रूप से इस योजना का आरंभ किया।

प्रारंभ में, पीएमयूवाई का लक्ष्य वित्त वर्ष 2016–17 से शुरू करके 3 वर्षों की अवधि में 5 करोड़ कनेक्शन प्रदान करना था। बाद में, सरकार द्वारा प्रधानमंत्री उज्ज्वला योजना (पीएमयूवाई) का लक्ष्य 5 करोड़ से बढ़ाकर 8 करोड़ कर दिया गया। लक्ष्य में वृद्धि के साथ–साथ सरकार ने पीएमयूवाई के लाभ को देश के ऐसे गरीब परिवारों तक भी पहुंचाया, जो एसईसीसीसूची या 7 पहचानी गई श्रेणियों में न होने के कारण छूट गए थे ताकि सभी गरीब परिवारों को इसमें शामिल किया जा सके। लाभार्थियों की इस विस्तारित सूची में आवेदक द्वारा 14–बिंदु स्व–घोषणा के अनुसार अ.जा, अ.ज.जा, प्रधानमंत्री आवास योजना, सबसे पिछड़ा वर्ग, अंत्योदय अन्न योजना, चाय और एक्स–चाय बागान जनजातियों, वनवासी, द्वीप और नदी द्वीप के लोग और गरीब परिवार शामिल थे।

इस योजना के तहत सरकार बीपीएल परिवार की वयस्क महिला सदस्य को कोई राशि के जमा किए बिना एलपीजी कनेक्शन प्रदान करती है। सरकार सिलेंडर और प्रेशर रेगुलेटर, डीजीसीसी कार्ड, सुरक्षा नली और प्रत्येक नए कनेक्शन के लिए प्रशासनिक / स्थापना शुल्क के रूप में ₹ 1,600 की सुरक्षा जमा राशि का खर्च वहन करती है।

पीएमयूवाई योजना के तहत 8 करोड़ एलपीजी कनेक्शन प्रदान करने के लक्ष्य को 31 मार्च 2020 की लक्षित तिथि से 7 महीने पहले 7 सितंबर, 2019 को हासिल कर लिया गया था।

उज्ज्वला 2.0



माननीय वित्त मंत्री ने दिनांक 01.02.2021 के अपने बजट भाषण के दौरान घोषणा की थी कि उज्ज्वला योजना, जिससे 8 करोड़ परिवारों को लाभ मिला है, को 1 करोड़ और लाभार्थियों तक बढ़ाया जाएगा।

तदनुसार, 10 अगस्त, 2021 को उत्तर प्रदेश के महोबा जिले में माननीय प्रधानमंत्री की गरिमामयी उपस्थिति में अखिल भारतीय आधार पर उज्ज्वला 2.0 का आरंभ किया गया, ताकि पीएमयूवाई के तहत एक करोड़ अतिरिक्त एलपीजी कनेक्शन प्रदान किए जा सकें।

जमा मुक्त एलपीजी कनेक्शन के साथ, उज्ज्वला 2.0 में सभी लाभार्थियों को पहली रिफिल और हॉटप्लेट निःशुल्क प्रदान की जाती है। प्रवासी परिवारों को नया कनेक्शन प्रदान करने के लिए विशेष प्रावधान किया गया है। प्रवासी आवेदक के लिए 'पारिवारिक घोषणा' और 'पते का प्रमाण' दोनों के लिए स्व–घोषणा पर्याप्त होगी।

आवेदकों के लिए पहली बार सीएससी केंद्र, हेल्पडेस्क और ओएमसी वितरक आदि जैसे मौजूदा विकल्पों के साथ–साथ ऑनलाइन आवेदन का विकल्प भी प्रदान किया गया है। आवेदक योजना की वेबसाइट www.pmuy.gov.in का उपयोग करके उज्ज्वला कनेक्शन के लिए ऑनलाइन आवेदन कर सकते हैं।

उज्ज्वला 2.0 के तहत जनवरी 2022 तक 1 करोड़ का लक्ष्य हासिल कर लिया गया है। इसके अलावा, वंचित परिवारों को कवर करने के लिए, योजना के तहत लक्ष्य को अतिरिक्त 60 लाख कनेक्शन तक बढ़ाकर 1.6 करोड़ कर दिया गया था और यह लक्ष्य 22 दिसंबर 2022 के दौरान हासिल कर लिया गया। दिनांक 01.01.2023 तक, उज्ज्वला 2.0 के तहत कुल 1.6 करोड़ एलपीजी कनेक्शन जारी किए गए हैं।

सरकार ने सितंबर 2023 में 3 वित्तीय वर्षों (2023–24 से 2025–26) में 75 लाख अतिरिक्त एलपीजी कनेक्शन जारी करने के लिए उज्ज्वला योजना के विस्तार को मंजूरी दी जिनमें से 74 लाख से अधिक कनेक्शन जारी किए जा चुके हैं। दिनांक 31.03.2024 तक, देश में कुल 10.33 करोड़ पीएमयूवाई कनेक्शन हैं।

पीएमयूवाई लाभार्थियों की एलपीजी खपत में सुधार

पीएमयूवाई लाभार्थियों की एलपीजी खपत वित्त वर्ष 2016–17 में 542 टीएमटी से बढ़कर वित्त वर्ष 2023–24 में 5,591 टीएमटी हो गई है।



पीएमयूवाई लाभार्थियों का प्रति व्यक्ति खपत वित्त वर्ष 2023–24 में 3.95 थी, जबकि वित्त वर्ष 2019–20 में यह 3.0 थी।

पीएमयूवाई परिवारों को लक्षित राजसहायता

पीएमयूवाई उपभोक्ताओं के लिए एलपीजी को और अधिक किफायती बनाने और उनके द्वारा एलपीजी के निरंतर उपयोग को सुनिश्चित करने के लिए, सरकार ने मई 2022 में पीएमयूवाई उपभोक्ताओं को प्रति वर्ष 12 रिफिल तक (और आनुपातिक रूप से 5 किलोग्राम कनेक्शन के लिए प्रो–रेटेड) के लिए 14.2 किलोग्राम सिलेंडर पर ₹200/– की लक्षित राजसहायता शुरू की। अक्टूबर 2023 में इस राजसहायता को बढ़ाकर ₹100 किया गया जिससे कुल राजसहायता ₹300 कर दी गई। राजसहायता सीधे पात्र लाभार्थियों के पंजीकृत बैंक खातों में जमा की जाती है।

5.2.3. नए एलपीजी कनेक्शन

एलपीजी घरेलू कनेक्शन मांग पर आसानी से उपलब्ध है और ये संभावित ग्राहकों को तब जारी किए जाते हैं जब वे संबंधित वितरक से संपर्क करते हैं और केवाईसी औपचारिकताएं पूरी कर लेते हैं। तेल विपणन कंपनियों के एलपीजी वितरक तुरंत पंजीकरण करते हैं और नए एलपीजी कनेक्शन के अनुरोध पर कार्रवाई करते हैं। देश में सामान्य एलपीजी कनेक्शन की कोई प्रतीक्षा सूची नहीं है।

वित्तीय वर्ष	जारी किए गए नए एलपीजी कनेक्शन (संख्या करोड़ में)
2021-22	1.58
2022-23	1.01
2023-24	1.12

घरेलू एलपीजी ग्राहकों के लिए पोर्टेबिलिटी का विकल्प

क. **रिफिल पोर्टेबिलिटी:** पोर्टल और मोबाइल ऐप के माध्यम से रिफिल बुक करते समय उपभोक्ताओं को अपने मूल वितरक के अलावा किसी अन्य वितरक को चुनने का विकल्प दिया जाता है। पिन कोड/बाजार में सेवा देने वाले सभी वितरकों की सूची ग्राहक को उनकी स्टार रेटिंग के साथ दिखाई जाती है। वर्ष 2023–24 में कुल 15.8 लाख रिफिल पोर्टेबिलिटी अनुरोध संसाधित किए गए।

ख. **उपभोक्ताओं के लिए एलपीजी कनेक्शन पोर्टेबिलिटी:** पहली बार संबंधित ओएमसी के वेब पोर्टल और मोबाइल ऐप के माध्यम से एलपीजी ग्राहकों को उसी क्षेत्र में सेवा देने वाले दूसरे वितरक को एलपीजी कनेक्शन के ऑनलाइन हस्तांतरण की सुविधा प्रदान की गई है। वर्ष 2023–24 में, सार्वजनिक क्षेत्र की तेल विपणन कंपनियों ने एलपीजी उपभोक्ताओं के 6.4 लाख कनेक्शन पोर्टेबिलिटी अनुरोधों पर कार्रवाई की।

5.2.4. नए वितरकों की स्थापना

वर्तमान में, सभी प्रकार के वितरकों के लिए चयन प्रक्रिया एलपीजी वितरकों के चयन के एकीकृत दिशानिर्देशों के तहत की जाती है। वित्त वर्ष 2021–22 में, 214 नए एलपीजी वितरक संस्थापना किए गए। वित्त वर्ष 2022–23 में, कुल 116 नए एलपीजी वितरक संस्थापित किए गए और वित्त वर्ष 2023–24 में, देश भर में कुल 96 नए एलपीजी वितरकों की स्थापना की गई। दिनांक 31.03.2024 की स्थिति के अनुसार कुल 25,481 वितरक मौजूद हैं।

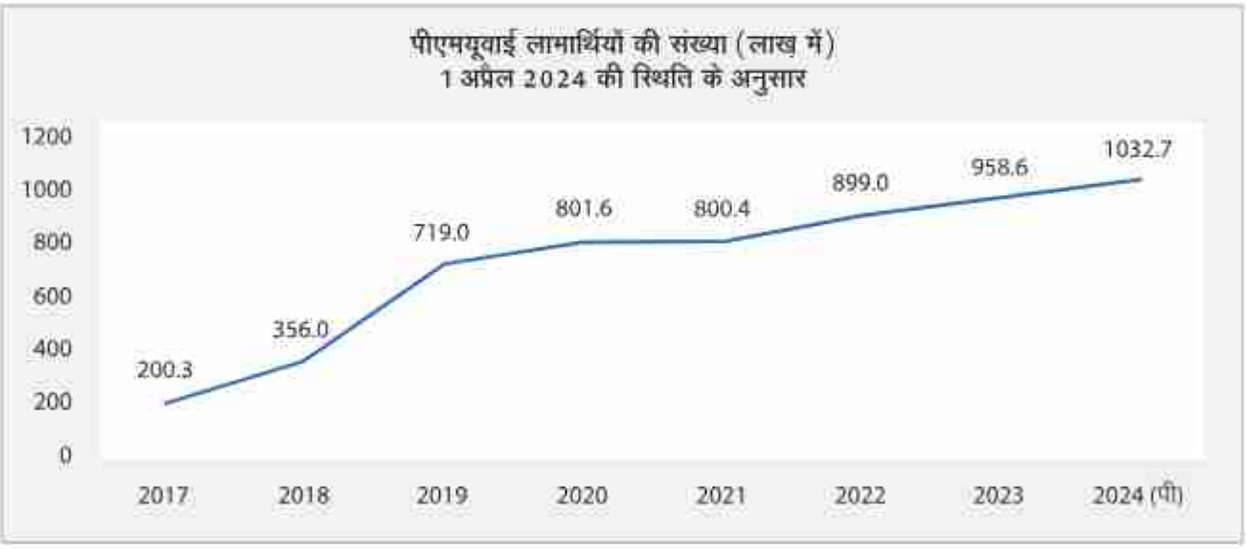
दिनांक 31.03.2024 तक के वितरकों का राज्य–वार विवरण इस प्रकार है:

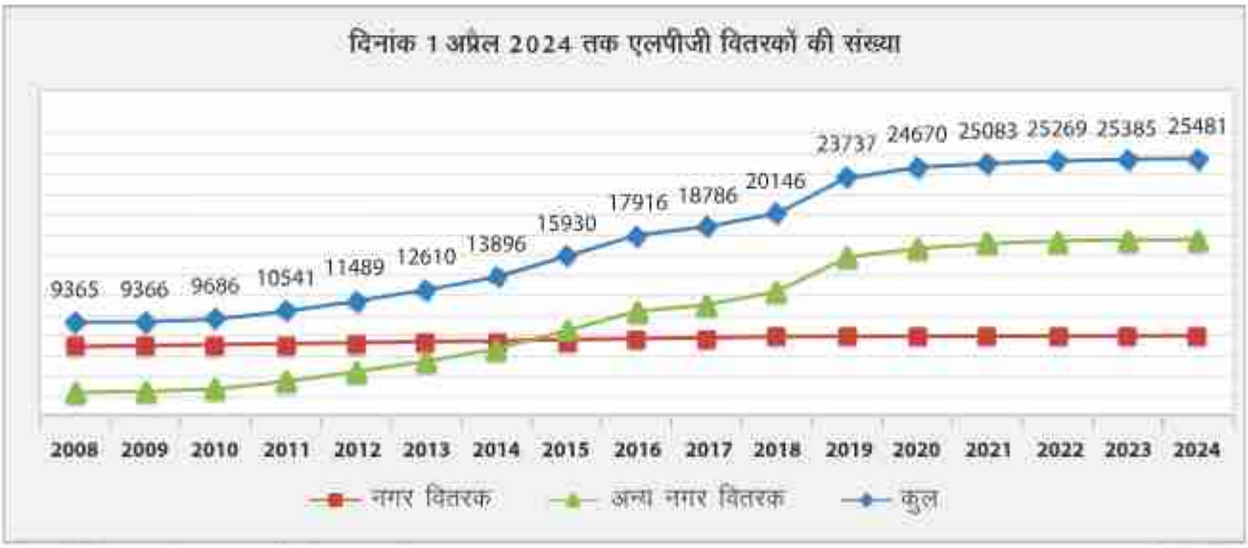
राज्य/संघ राज्य क्षेत्र	नगर वितरक	अर्धनगर वितरक	ग्रामीण वितरक	दुर्गम क्षेत्रीय वितरक	कुल
चंडीगढ़	26	0	0	0	26
दिल्ली	317	0	0	0	317
हरियाणा	282	103	232	9	626
हिमाचल प्रदेश	69	13	91	36	209
जम्मू और कश्मीर	125	47	76	49	297
पंजाब	334	256	249	21	860
राजस्थान	434	163	654	133	1384
उत्तर प्रदेश	1008	706	2306	122	4142
उत्तरांचल	114	105	59	40	318
उत्तरी उप योग	**2,709**	**1,393**	**3,667**	**410**	**8,179**

राज्य/संघ राज्य क्षेत्र	नगर वितरक	अर्धनगर वितरक	ग्रामीण वितरक	दुर्गम क्षेत्रीय वितरक	कुल
अंडमान और निकोबार	0	4	5	1	10
अरुणाचल प्रदेश	6	6	33	40	85
असम	128	101	307	61	597
बिहार	240	252	1502	39	2033
झारखंड	163	51	353	20	587
मणिपुर	15	13	36	38	102
मेघालय	21	9	19	16	65
मिजोरम	11	6	26	16	59
नागालैंड	15	11	17	40	83
ओडिशा	173	100	579	113	965
सिक्किम	9	1	9	10	29
त्रिपुरा	18	8	46	11	83
पश्चिम बंगाल	405	164	948	74	1591
पूर्वी उप योग	**1,204**	**726**	**3,880**	**479**	**6,289**
छत्तीसगढ़	105	75	172	182	534
दादरा एवं नगर हवेली	3	1	1	0	5
दमन और दीव	2	0	0	0	2
गोवा	44	4	5	2	55
गुजरात	422	120	486	13	1041
मध्य प्रदेश	472	210	484	385	1551
महाराष्ट्र	1008	192	846	191	2237
पश्चिमी उप योग	**2,056**	**602**	**1,994**	**773**	**5,425**
आंध्र प्रदेश	323	286	427	108	1144
कर्नाटक	534	139	547	51	1271
केरल	225	132	319	22	698
लक्षद्वीप	1	0	0	0	1
पुडुचेरी	15	11	3	0	29
तमिलनाडु	566	362	609	106	1643
तेलंगाना	288	103	332	79	802
दक्षिणी उप योग	**1,952**	**1,033**	**2,237**	**366**	**5,588**
अखिल भारतीय	**7,921**	**3,754**	**11,778**	**2,028**	**25,481**

स्रोत: सार्वजनिक क्षेत्र के ओएमसी की ओर से आईओसीएल







स्रोत: पेट्रोलियम योजना एवं विश्लेषण प्रकोष्ठ

1.28: **डिजिटल भुगतान को बढ़ावा देना :** खुदरा आउटलेटों पर डिजिटल भुगतान अवसंरचना का उल्लेखनीय विस्तार हुआ है। **दिनांक 31.03.2024** तक, देश भर में कुल 81,338 (**आईओसीएल-37,473, बीपीसीएल-21,841, एचपीसीएल–22,024**) खुदरा दुकानों में से, **81,338** आरओ में डिजिटल अवसंरचना प्रदान की गयी है, जिसमें **4,91,379** पीओएस टर्मिनल और **1,03,224** ई–वॉलेट सुविधाएं हैं और **81,338** खुदरा दुकानों को भीम यूपीआई से समर्थित किया गया है। सभी एलपीजी वितरक भीम यूपीआई से समर्थित हैं।

1.29: **इलेक्ट्रिक वाहन चार्जिंग स्टेशन:** देश में इलेक्ट्रिक वाहन चार्जिंग अवसंरचनाओं को बढ़ाने के लिए, तेल विपणन कंपनियाँ तकनीकी वाणिज्यिक व्यवहार्यता और पीईएसओ मानदंडों के अनुपालन के आधार पर चरणबद्ध तरीके से देश के विभिन्न हिस्सों में अपने खुदरा दुकानों (आरओ) पर इलेक्ट्रिक वाहन चार्जिंग स्टेशन (ईवीसीएस) लगा रही हैं। दिनांक **31.03.2024** तक, तेल विपणन कंपनियों ने अपने आरओ पर **15,800** ईवी चार्जिंग स्टेशन और 162 बैटरी स्वैपिंग स्टेशन लगाए हैं।

1.30: **बाजार प्राधिकरण:** पेट्रोलियम और प्राकृतिक गैस मंत्रालय ने दिनांक 08.11.2019 के संकल्प के माध्यम से परिवहन ईंधन यानी एमएस और एचएसडी के विपणन के लिए प्राधिकरण के दिशा–निर्देशों को संशोधित किया है। दिनांक **31.03.2024** तक, **8** संस्थाएँ उक्त संकल्प के तहत परिवहन ईंधन के विपणन के लिए अधिकृत हैं।

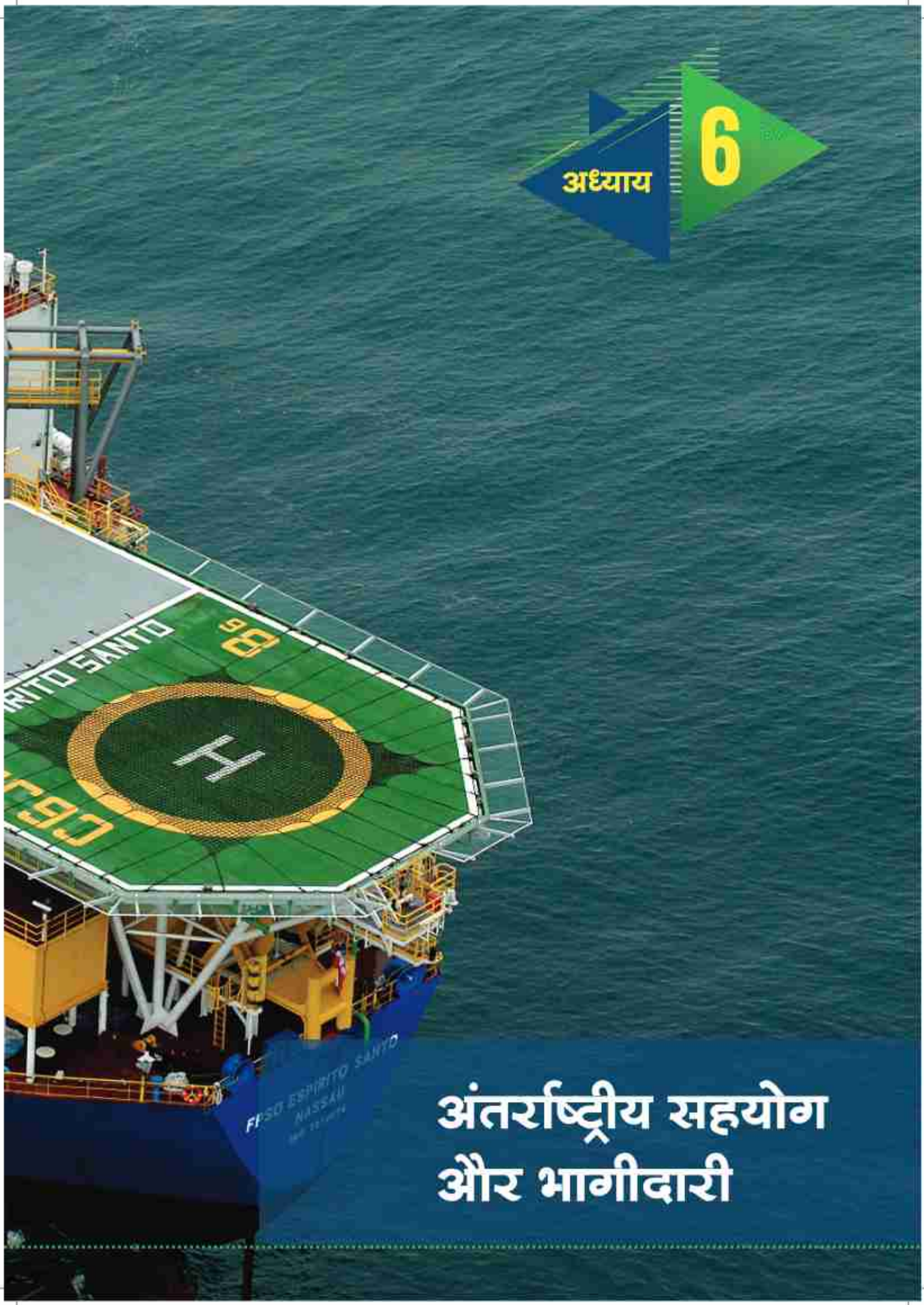









SO ESPIRITO SANTO



अध्याय 6

अंतर्राष्ट्रीय सहयोग और भागीदारी

6 अंतर्राष्ट्रीय सहयोग और भागीदारी

भारत दुनिया के अग्रणी ऊर्जा उपभोक्ताओं में से एक है और इसे पारंपरिक और स्वच्छ ऊर्जा संसाधनों दोनों की मांग के चालक के रूप में उभरती हुई ऊर्जा महाशक्ति माना जाता है। विश्व के ऊर्जा संबंधी नवीनतम आंकड़ों के अनुसार, भारत वर्तमान में दुनिया का तीसरा सबसे बड़ा ऊर्जा उपभोक्ता, तीसरा सबसे बड़ा तेल उपभोक्ता, तीसरा सबसे बड़ा एलपीजी उपभोक्ता, चौथा सबसे बड़ा एलएनजी आयातक और चौथा सबसे बड़ा रिफाइनर है।

इस संदर्भ में,यह नोट करनासमुचित है कि भारत की प्रति व्यक्ति ऊर्जा खपत विश्व औसत का लगभग 1/3 है। भारत जैसा जैसे "आत्मनिर्भर भारत" के उद्देश्य से आर्थिक सुधार और तेजी से नगरीकरण और औद्योगीकरण के उच्च पथ पर अग्रसर हो रहा है, भारत की ऊर्जा की मांग में उत्तरोत्तर वृद्धि होना आवश्यंभावी है। भारत के विकास के संबंध में यह दृष्टिकोण शीर्ष आर्थिक संस्थानों और एजेंसियों द्वारा स्पष्ट रूप से साझा किया गया है।

अंतर्राष्ट्रीय ऊर्जा एजेंसी (आईईए) के विश्व ऊर्जा आउटलुक 2022 के अनुसार, भारत की ऊर्जा खपत 2040 तक दोगुनी हो जाएगी। वैश्विक ऊर्जा मांग के विकास की 1% दर की तुलना में भारत की ऊर्जा मांग वर्ष 2040 तक लगभग 3% प्रति वर्ष बढ़ने की उम्मीद है। आउटलुक में यह भी अनुमान लगाया गया है कि वैश्विक ऊर्जा मांग में भारत की हिस्सेदारी दोगुनी होकर 11% हो जाएगी–यह वर्तमान में किसी भी देश की इस अवधि में 6% से बढ़ने की सबसे बड़ी वृद्धि है और भारत वर्ष 2030 तक कुल ऊर्जा खपत के मामले में यूरोपीय संघ से आगे निकल जाएगा। ओपेक ने भी अपने विश्व तेल आउटलुक (डब्ल्यूओओ) 2023 में भी इसी दृष्टिकोण का समर्थन किया है और पूर्वानुमान लगाया है कि आउटलुक के अनुसार भारत में सबसे अधिक ऊर्जा मांग वृद्धि होगी, जिसमें परिवहन, पेट्रोकेमिकल्स और आवासीय क्षेत्रों द्वारा प्रचालित तेल की मांग 2021 में 5.1 एमबी/डी से बढ़कर 2045 में 11.6 एमबी/डी होने का अनुमान है। आर्थिक विकास, बढ़ती आबादी और मध्यम वर्ग के विस्तार के कारण भारत की ऊर्जा मांग 2045तक दोगुनी होकर प्रतिदिन 38.5 मिलियन बैरल तेल के बराबर हो जाएगी। डब्ल्यूओओ 2023 में यह भी कहा गया है कि भारत में अक्षय ऊर्जा की औसत वृद्धि दर 11.5% प्रति वर्ष हो जाएगी, जो विश्व में की सबसे तेज वृद्धि होगी।

यह क्षमता आयात पर उल्लेखनीय निर्भरता के बावजूद है। वित्त वर्ष 2022–23 में आयातित कच्चे तेल और प्राकृतिक गैस पर हमारी निर्भरता क्रमशः लगभग 87% और 44% है। इस बढ़ती मांग और आयात पर अत्यधिक निर्भरता को ध्यान में रखते हुए भारत सरकार कच्चे तेल के केंद्रित स्रोतों के कारण उत्पन्न होने वाले भू–राजनीतिक जोखिमों के शमन के लिए दीर्घकालिक समाधानों की दिशा में काम कर रही है। इस कार्यनीति को ऊर्जा सुरक्षा के लिए भारत की चार–बिंदु आधारित कार्यनीति में देखा जा सकता है अर्थात् ऊर्जा आपूर्ति का विविधीकरण, अन्वेषण और उत्पादन पदचिह्न बढ़ाना, वैकल्पिक ऊर्जा स्रोतों का उपयोग करना और गैस–आधारित अर्थव्यवस्था, हरित हाइड्रोजन और ईवी के माध्यम से ऊर्जा परिवर्तन को पूरा करना।

6.1. कच्चे तेल और एलएनजी आयात में विविधता

भारत की ऊर्जा सुरक्षा पर हमेशा भू–राजनीतिक जोखिमों का खतरा रहा है। इस स्थिति से निपटने के लिए सुरक्षात्मक उपाय के रूप में भारत सरकार ने घरेलू उत्पादन बढ़ाने के साथ–साथ अपने कच्चे तेल और एलएनजी आयात पोर्टफोलियो में विविधता लाने को प्राथमिकता दी है।

पिछले पांच वर्षों में, भारत के कच्चे तेल के बास्केट में कच्चे तेल के नए आपूर्तिकर्ता नामत: यूएसए, रूस, कनाडा, अंगोला, गुयाना और मैक्सिको शामिल किया गया हैं। इसी प्रकार से, कतर से ऑस्ट्रेलिया, यूएसए और रूस तक एलएनजी आयात में भी विविधता लाई गई है। तदनुसार, भारत ने 2006–2007 में 27 देशों से कच्चे तेल के स्रोतों को बढ़ाकर 2022–23 में 39 देशों तक कर विविधता लाई है।

स्पॉट खरीदी को कम करने और आपूर्ति को सुरक्षित करने के लिए, ओएमसी ने पेट्रोब्रास (ब्राजील) और इकोपेट्रोल (कोलंबिया) के साथ कच्चे तेल की स्थायी व्यवस्था की है। यह पहली बार था जब भारतीय कंपनियों ने ब्राजील की कंपनी (पेट्रोब्रास) के साथ टर्म अरेंजमेंट पर हस्ताक्षर किए थे। इसके अलावा, इको पेट्रोल (कोलंबिया) की स्थायी व्यवस्था के साथ पुरानी व्यवस्था को फिर से स्थापित किया है, जिसे वित्त वर्ष 2015–16 के बाद नवीनीकृत नहीं किया गया था।

इस दिशा में अन्य उल्लेखनीय प्रयासों में संयुक्त राज्य अमेरिका का एक महत्वपूर्ण ऊर्जा भागीदार के रूप में उभरना शामिल है। वर्ष 2017–18 और 2022–23 के बीच, 5 वर्षों की छोटी अवधि में, यूएसए भारत का 5वां

सबसे बड़ा कच्चा तेल और दूसरा सबसे बड़ा एलएनजी आपूर्तिकर्ता बन गया है, जिसका मूल्य वर्ष 2017–18 के मूल्यों की तुलना में कच्चे तेल और एलएनजी के आयात में क्रमशः 1,570% और 1,050% अधिक है।

6.2. वैश्विक जैव ईंधन गठबंधन

वैश्विक जैव ईंधन गठबंधन (जीबीए) सरकारों, अंतर्राष्ट्रीय संगठनों और उद्योगों का एक बहु–हितधारक गठबंधन है, जो जी20 अध्यक्ष के रूप में भारत द्वारा शुरू की गई एक पहल है, जो जैव ईंधन के विकास और उपयोग को आगे बढ़ाने के लिए जैव ईंधन के सबसे बड़े उपभोक्ताओं और उत्पादकों को एक साथ लाता है। यूएसए, ब्राजील और भारत जो जीबीएसदस्य हैंउत्पादन में लगभग 85% और एथेनॉल की खपत में लगभग 81% योगदान करते हैं।

इस पहल का उद्देश्य ऊर्जा में परिवर्तन के इस काल में जैव ईंधन को कुंजी के रूप में स्थापित करना और नौकरियों और आर्थिक विकास में योगदान देना है। इस गठबंधन का उद्देश्य मूल्य श्रृंखला में क्षमता निर्माण अभ्यासों की सुविधा, राष्ट्रीय कार्यक्रमों के लिए तकनीकी सहायता और नीतिगत सबक साझा करने, प्रौद्योगिकी उन्नति को बढ़ावा देने और हितधारकों की एक विस्तृत श्रृंखला की भागीदारी द्वारा किफायती परिवहन के लिए दीर्घकालिक विकल्प जैव ईंधन के उपयोग को बढ़ाने के माध्यम से जैव ईंधन के वैश्विक उपयोग में तेजी लाना है।

यह जीबीए जैव ईंधन अपनाने और व्यापार को प्रोत्साहित करने के लिए अंतरराष्ट्रीय स्तर के मान्यता प्राप्त मानकों, संहिताओं, स्थिरता सिद्धांतों और विनियमों के विकास, स्वीकरण और कार्यान्वयन की सुविधा प्रदान करेगा। यह पहल भारत के लिए कई मोर्चों पर फायदेमंद होगी और वैश्विक स्तर पर भारत की स्थिति को मजबूत करने में मदद करेगी। यह भारत के मौजूदा जैव ईंधन कार्यक्रमों जैसे कि पीएम–जीवन योजना, किफायती परिवहन के लिए दीर्घकालिक विकल्प और गोबरधन योजना को बल देगा, जिससे किसानों की आय में वृद्धि, रोजगार सृजन और भारतीय पारिस्थितिकी तंत्र के समग्र विकास में योगदान मिलेगा। इसके अलावा, गठबंधन भारतीय उद्योगों को प्रौद्योगिकी और उपकरणों के निर्यात के रूप में अतिरिक्त अवसर प्रदान करेगा।

माननीय पेट्रोलियम और प्राकृतिक गैस तथा आवासन और नगर कार्य मंत्री ने 22 जुलाई 2023 को गोवा में आयोजित वैश्विक जैव ईंधन गठबंधन पर विशेष मंत्रिस्तरीय परामर्श और सिफारिशों में भाग लिया।

माननीय मंत्री ने जोर देकर कहा, "वैश्विक जैव ईंधन गठबंधन की सच्ची सफलता तब होगी जब यह परियोजना सरकार की परियोजना न रहकर लोगों की परियोजना बन जाएगी।" ब्राजील, इटली, केन्या और यूएई सहित कई देशों ने नीति, प्रौद्योगिकी और कार्यान्वयन में सर्वोत्तम प्रथाओं को साझा करने के महत्व पर प्रकाश डाला। इस फोरम ने माना कि फीडस्टॉक प्रबंधन, मानक विकास और तकनीकी नवाचारों जैसी चुनौतियों पर काबू पाने के लिए एक सहयोगी दृष्टिकोण की आवश्यकता है और वैश्विक गठबंधन के निर्माण की दिशा में आगे बढ़ने के लिए भारतीय की अध्यक्षता में की गई पहल का स्वागत किया।



इसके बाद, 9 सितंबर 2023 को नई दिल्ली में जी20 शिखर सम्मेलन के दौरान माननीय प्रधान मंत्री श्री नरेंद्र मोदी द्वारा यूएसए, ब्राजील, इटली, अर्जेंटीना, सिंगापुर, बांग्लादेश, मॉरीशस और यूएई के नेताओं के साथ ग्लोबल जैव ईंधन एलायंस (जीबीए) का शुभारंभ किया गया। दिनांक 31 मार्च 2024 तक, 24 देश और 12 अंतर्राष्ट्रीय संगठन इस गठबंधन में शामिल होने के लिए सहमत हो गए।



विश्व आर्थिक मंच, 2024 के तर्ज पर, माननीय मंत्री ने 18 जनवरी 2024 को ब्राजील के खान एवं ऊर्जा मंत्री,

महामहिम एलेक्जेंडर सिल्वेरा, ब्राजील के ऊर्जा मंत्री, आईईए के कार्यकारी निदेशक श्री फतिह बिरोल और डब्ल्यूईएफ के श्री रॉबर्टो बोका के साथ वैश्विक जैव ईंधन गठबंधन पर एक वैश्विक गोलमेज सम्मेलन की मेजबानी की। गोलमेज सम्मेलन में हितधारकों और उद्योग के प्रमुखों को एक साथ लाया गया ताकि एसएएफ, स्वच्छ खाना पकाने ईंधन विकल्प और जैव ईंधन के वैकल्पिक स्रोत को अपनाने की दिशा में मार्ग प्रशस्त किया जा सके।



पहली अस्थायी कार्यकारी समिति (टीईसी) की बैठक 26 अक्टूबर 2023 को वर्चुअल रूप से आयोजित की गई और दूसरी टीईसी बैठक 16 जनवरी 2024 को आयोजित की गई। जीबीएके अंतरिम महानिदेशक, श्री पंकज जैन, सचिव एमओपीएनजी ने बैठकों की अध्यक्षता की। उन्होंने इस बात पर प्रकाश डाला कि जीबीए को वैश्विक ऊर्जा उद्योग के नेताओं से उत्साहजनक समर्थन और व्यापक मीडिया कवरेज मिला है, जिसने वैश्विक ऊर्जा परिदृश्य में जैव ईंधन के महत्व को रेखांकित किया है। टीईसीने जीबीएचार्टर, जीबीएलोगो प्रविष्टियों, मुख्यालय समझौतों और जीबीएकी कार्य योजना पर विचार–विमर्श किया। टीईसीने अंतर्राष्ट्रीय मंचों पर जीबीएकी भागीदारी में भी भाग लिया और आपसी सहयोग के अन्य महत्वपूर्ण मुद्दों पर चर्चा की।

इसके अलावा, पहली उप–समिति की बैठक 10 जनवरी 2024 को ब्राज़ील, इटली, केन्या और यूएसए के प्रतिनिधियों के साथ वर्चुअल माध्यम से आयोजित की गई थी। वर्तमान में, ग्लोबल बायोफ्यूल एलायंस जीबीए चार्टर और आगे के रचनात्मक मार्ग पर विचार–विमर्श कर रहा है।



6.3. प्रमुख साझेदार देशों के साथ वृहद द्विपक्षीय ऊर्जा भागीदारी

6.3.1. संयुक्त राज्य अमेरिका (यूएसए) के साथ सहयोग

- भारत और यूएसए तेल और गैस क्षेत्र के पूरे स्पेक्ट्रम में भागीदारी करते हैं। भारत यूएसए से कच्चा तेल, एलएनजी और एलपीजी आयात करता है। भारतीय पीएसयू के पास एलएनजी के आयात के लिए दीर्घकालिक संविदा मौजूद हैं। इसके अलावा, भारतीय पीएसयू कंपनियों ने यूएसए में तेल और गैस क्षेत्र में निवेश किया है। भारत और यूएसए के बीच द्विपक्षीय हाइड्रोकार्बन व्यापार 2022–23 में 19.4 बिलियन अमरीकी डॉलर तक पहुँच गया है, जो 2017–18 की तुलना में 306% की वृद्धि दर्शाता है। इस अवधि के दौरान, कच्चे तेल और एलएनजी आयात का मूल्य भी क्रमशः 1,570% और 1,050% तक काफी हद तक बढ़ गया है।
- सितंबर 2021 में, दोनों पक्षों ने उभरते ईंधन और प्रौद्योगिकियों पर पांचवें स्तंभ को जोड़ने के साथ भारत–अमेरिका संशोधित कार्यनीतिक स्वच्छ ऊर्जा साझेदारी (एससीईपी) की घोषणा की, जो स्वच्छ ऊर्जा ईंधन को बढ़ावा देने के लिए एक संयुक्त संकल्प का संकेत देता है।
- माननीय मंत्री ने 18 जुलाई 2023 को नई दिल्ली में अमेरिकी ऊर्जा सचिव महामहिम जेनिफर ग्रानहोम के

साथ भारत–अमेरिका कार्यनीतिक स्वच्छ ऊर्जा साझेदारी (एससीईपी) की मंत्रिस्तरीय बैठक की सह–अध्यक्षता की। अमेरिका और भारत सरकार की एजेंसियों ने सहयोग के पाँच तकनीकी स्तंभों–1) बिजली और ऊर्जा दक्षता, 2) नवीकरणीय ऊर्जा, 3) जिम्मेदार तेल और गैस, 4) किफायती परिवहन के लिए दीर्घकालिक विकल्प विकास, और 5) उभरते ईंधन और प्रौद्योगिकियों पर कई उपलब्धियाँ प्रदर्शित कीं। बैठक के दौरान, दोनों पक्षों ने जैव ईंधन, ग्रीन हाइड्रोजन, नवीकरणीय ऊर्जा, ऊर्जा भंडारण और स्मार्ट ग्रिड में महत्वाकांक्षी स्वच्छ ऊर्जा सहयोग की समीक्षा की।



- माननीय मंत्री ने 24 जनवरी 2024 को नई दिल्ली में टेक्सास, यूएसए के गवर्नर महामहिम श्री ग्रेग एबॉट से भी मुलाकात की, जिसमें दोनों पक्षों ने यूएसए और भारत के बीच "हाइड्रोकार्बन ब्रिज" को मजबूत करने के तरीकों पर चर्चा की।

- इसके अलावा, माननीय मंत्री ने 29 जनवरी 2024 को अमेरिकी विदेश विभाग के ऊर्जा संसाधन मामलों के सहायक सचिव श्री ज्योफ्रे पायट के साथ आमने–सामने चर्चा की। दोनों पक्षों ने ऊर्जा क्षेत्र में वैश्विक विकास पर चर्चा की, मौजूदा ऊर्जा सहयोग की समीक्षा की और ऊर्जा मूल्य श्रृंखला में सहयोग को और मजबूत करने के तरीकों पर चर्चा की। दोनों पक्षों ने ऊर्जा क्षेत्र में वैश्विक विकास पर चर्चा की, मौजूदा ऊर्जा सहयोग की समीक्षा की और ऊर्जा मूल्य श्रृंखला में सहयोग को और मजबूत करने के तरीकों पर चर्चा की।



6.3.2. सऊदी अरब के साथ सहयोग

- भारत सऊदी अरब के साथ हाइड्रोकार्बन क्षेत्र में दीर्घकालिक सहयोग कायम रखे हुए है। सऊदी अरब भारत के सबसे बड़े व्यापार भागीदारों में से एक है और भारत के लिए ऊर्जा का एक प्रमुख स्रोत है। सऊदी अरब वित्त वर्ष 2022–23 में हमारे कच्चे तेल का तीसरा सबसे बड़ा स्रोत और हमारे एलपीजी आयात का तीसरा सबसे बड़ा स्रोत था।

- भारत और सऊदी अरब भारत के कार्यनीतिक पेट्रोलियम रिजर्व कार्यक्रम के दूसरे चरण में सऊदी अरामको की भागीदारी और हाइड्रोकार्बन क्षेत्र में अन्य निवेश अवसरों की भी खोज कर रहे हैं।

6.3.3. यूएई के साथ सहयोग

- भारत और यूएई करीबी व्यापारिक और निवेश भागीदार हैं। दोनों देश मिलकर कच्चे तेल, एलएनजी, एलपीजी और पेट्रोलियम उत्पादों के व्यापार के साथ–साथ अन्वेषण और उत्पादन गतिविधियां कर रहे हैं। हाइड्रोकार्बन क्षेत्र पर ध्यान देने के साथ यूएई और भारत के संबंधों को कार्यनीतिक साझेदारी तक बढ़ा दिया गया है।

- वित्त वर्ष 2022–23 में, यूएई कच्चे तेल का चौथा सबसे बड़ा स्रोत, एलपीजी का दूसरा सबसे बड़ा स्रोत, एलएनजी का दूसरा सबसे बड़ा स्रोत और तैयार पेट्रोलियम उत्पादों के लिए दूसरा सबसे बड़ा निर्यात गंतव्य था।

- माननीय मंत्री ने 22 जुलाई 2023 को गोवा में जलवायु परिवर्तन के संबंध में यूएई के विशेष दूत और उद्योग और उन्नत प्रौद्योगिकी मंत्री, सीओपी28 के अध्यक्ष महामहिम डॉ. सुल्तान अल जाबेर से मुलाकात की। दोनों पक्षों ने संपूर्ण ऊर्जा मूल्य श्रृंखला में भारत और यूएई के बीच सहयोग को और गहरा करने और विस्तारित करने के तरीकों पर चर्चा की। दोनों नेताओं की एडीआईपीईसी–2023 के दौरान भी मुलाकात हुई और यूएई के साथ भारत के संबंधों के महत्व को रेखांकित किया।

- एडीआईपीईसी 2023 और आईईडब्ल्यू 2024 के दौरान माननीय मंत्री ने यूएई के ऊर्जा और अवसंरचना मंत्री महामहिम सुहैल मोहम्मद अल मजरूई के साथ द्विपक्षीय बैठक भी की। दोनों पक्षों ने भारत–यूएई के मजबूत सहयोग को और मजबूत करने के तरीकों पर चर्चा की।

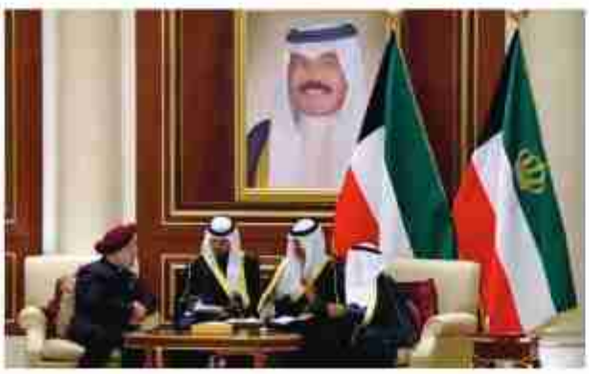


6.3.4. कुवैत के साथ सहयोग

- वित्त वर्ष 2022–23 में कुवैत भारत का कच्चे तेल का छठा सबसे बड़ा आपूर्तिकर्ता और एलपीजी का चौथा सबसे बड़ा आपूर्तिकर्ता था।

- हाइड्रोकार्बन पर 6वां भारत–कुवैत संयुक्त कार्य समूह जुलाई 2023 में आयोजित किया गया था, जिसमें दोनों पक्षों ने हाइड्रोकार्बन क्षेत्र में मौजूदा द्विपक्षीय सहयोग की समीक्षा की और सहभागिता के नए क्षेत्रों के बारे में चर्चा की।

- दूरदर्शी नेता महामहिम शेख नवाफ अल–अहमद अल–जबर अल–सबा के दुखद निधन पर, माननीय मंत्री ने भारत सरकार और जनता की ओर से शोक व्यक्त करने और भारत के राष्ट्रपति और प्रधान मंत्री की ओर से नए अमीर महामहिम शेख मेशल अल–अहमद अल–जबर अल–सबा को व्यक्तिगत संवेदना पत्र देने के लिए विशेष दूत के रूप में कुवैत का दौरा किया।



6.3.5. ओमान के साथ सहयोग

- ओमान खाड़ी क्षेत्र में भारत का एक कार्यनीतिक साझेदार है और दोनों देश शीर्ष व्यापारिक साझेदारों में शामिल हैं।

- भारत ओमान से कच्चे तेल, पेट्रोलियम उत्पादों और एलएनजी का आयात करता है जबकि ओमान को पर्याप्त मात्रा में पेट्रोलियम उत्पाद निर्यात करता है। वित्त वर्ष 2022–23 के दौरान, ओमान भारत के लिए एलएनजी का चौथा सबसे बड़ा स्रोत, एलपीजी का आठवां सबसे बड़ा स्रोत और कच्चे तेल का दसवां सबसे बड़ा स्रोत था, जबकि भारत ओमान के कच्चे तेल के निर्यात के लिए दूसरा सबसे बड़ा बाजार है।

- भारत के ऊर्जा बास्केट में विविधता लाने के लिए, दोनों पक्ष लंबी अवधि तक के लिए कच्चे तेल के स्रोत संबंधी संविदों और संपूर्ण हाइड्रोकार्बन मूल्य श्रृंखला में अन्य अवसरों में प्रवेश करने के अवसरों की खोज कर रहे हैं।



- इसके अलावा, भारतीय कार्यनीतिक भंडारण शाखा, आईएसपीआरएल और ओमान टैंकिंग टर्मिनल कंपनी एलएलसी (ओटीटीसीओ) ने जून 2023 में एक समझौता ज्ञापन पर हस्ताक्षर किया, जिसमें ओमान में ओटीटीसीओ द्वारा विकसित की जा रही कच्चे तेल भंडारण सुविधा में आईएसपीआरएल की भागीदारी की संभावना शामिल की गई।

6.3.6. इराक के साथ सहयोग

- इराक पिछले कई वर्षों से भारत के लिए कच्चे तेल के शीर्ष आपूर्तिकर्ताओं में से एक रहा है। वित्त वर्ष 2022–23 में, इराक ने भारत को लगभग 51 एमएमटी कच्चे तेल की आपूर्ति की, जो भारत के कुल तेल आयात का लगभग 21.5% है।

- माननीय मंत्री ने 20 जून 2023 को नई दिल्ली में आयोजित 18वीं भारत–इराक संयुक्त आयोग बैठक (जेसीएम) में इराक गणराज्य के ऊर्जा मामलों के उप प्रधान मंत्री और तेल मंत्री महामहिम हयान अब्दुल





गनी अब्दुल जहरा अल सवाद की मेज़बानी की। इस बैठक के दौरान, दोनों पक्षों ने दोनों देशों के बीच मौजूद प्राकृतिक और पारंपरिक तालमेल पर प्रकाश डाला और खरीदार–विक्रेता संबंध से ऊर्जा साझेदारी की ओर बढ़ने पर सहमति व्यक्त की।

6.3.7. रूस के साथ सहयोग

- रूस भारत का एक दीर्घकालिक और समय–परीक्षित साझेदार रहा है। अंतर्राष्ट्रीय स्तर पर कच्चे तेल की कीमतों में अत्यधिक अस्थिरता को दौरान भारतीय सार्वजनिक उपक्रमों ने रूस से आयात बढ़ा दिया है। परिणामस्वरूप, वित्त वर्ष 2022–23 में रूस से हमारा संचयी आयात शून्य स्तर से बढ़कर 34 बिलियन अमरीकी डॉलर हो गया।
- 16 बिलियन अमरीकी डॉलर से अधिक के निवेश के साथ, रूस भारतीय तेल और गैस कंपनियों के लिए निवेश का सबसे बड़ा गंतव्य है। भारतीय सार्वजनिक उपक्रमों की रूस के 5 ब्लॉकों में भागीदारी करने में रुचि है।

6.3.8. ब्राज़ील के साथ सहयोग

- वित्त वर्ष 2022–23 में ब्राजील भारत के लिए कच्चे तेल का 12वां सबसे बड़ा आपूर्तिकर्ता था और भारत से पेट्रोलियम उत्पादों के निर्यात के लिए 7वां सबसे बड़ा बाज़ार था।
- भारत और ब्राजील किफायती परिवहन के लिए दीर्घकालिक विकल्प जैव ऊर्जा और जैव ईंधन के अंतर्राष्ट्रीय उत्पादन और उपयोग को बढ़ाने के लिए भी सहयोग कर रहे हैं, जो वैश्विक स्तर पर कम–कार्बन भविष्य की ओर परिवर्तन करने हेतु एक महत्वपूर्ण क्षेत्र है।इसी संदर्भ में, जुलाई 2023 में यूनिका के सदस्यों के साथ ब्राजील के एक संसदीय प्रतिनिधिमंडल ने नई दिल्ली का दौरा किया। दोनों पक्षों ने दोनों देशों के बीच मुख्य रूप से तेल और गैस में चल रहे व्यापार और द्विपक्षीय संबंधों पर चर्चा की। दोनों पक्षों ने किफायती परिवहन के लिए दीर्घकालिक विकल्प जैव ऊर्जा और जैव ईंधन के अंतर्राष्ट्रीय उत्पादन और उपयोग को बढ़ाने के लिए दोनों देशों के बीच सहयोग की अपार संभावनाओं को स्वीकार किया।



- महामहिम एलेक्जेंडर सिल्वेरा डी ओलिवेरा, खान और ऊर्जा राज्य मंत्री, ब्राजील; पेट्रोलियम और प्राकृतिक गैस सचिव ने विशेष निमंत्रण पर, 20 जुलाई 2023 को भारत में किफायती परिवहन के लिए दीर्घकालिक विकल्प गतिशीलता: एथेनॉल वार्ता, विशेष संस्करण ऊर्जा सप्ताह में भाग लिया। संगोष्ठी का आयोजन ब्राजील से यूनिका, एपीएलए और भारत की ओर से आईएसएमए और एसआईएएम द्वारा किया गया था।

6.3.9. 'पड़ोसी' देशों हेतु प्रयास

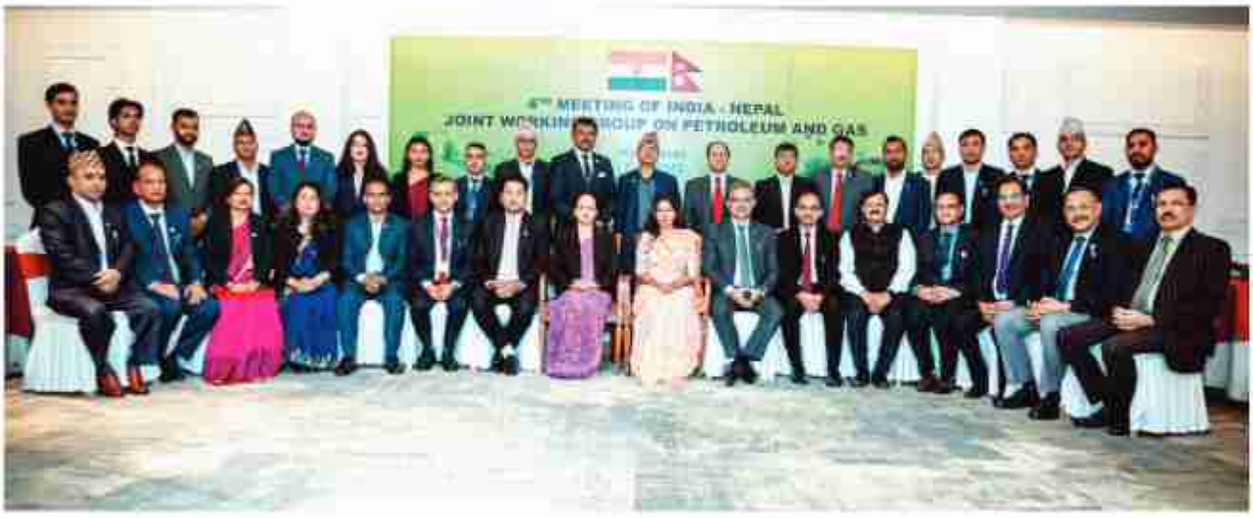
- 'पड़ोस पहले' भारत की विदेश नीति के प्रमुख तत्वों में से एक है। भारत का मानना है कि अपने पड़ोसियों के साथ ऊर्जा संपर्क/गलियारों सहित बेहतर संपर्क सभी के लिए समान और संतुलित तरीके से अधिक समृद्धि लाएगा।

6.3.9.1. बांग्लादेश के साथ सहयोग

- बांग्लादेश हमारा निकटतम पड़ोसी देश हमारा महत्त्वपूर्ण ऊर्जा भागीदार है। वित्त वर्ष 2022–23 के लिए, दोनों पक्षों के बीच द्विपक्षीय हाइड्रोकार्बन व्यापार 830 मिलियन अमरीकी डॉलर था। भारतीय सार्वजनिक क्षेत्र को उपक्रमों ने बांग्लादेश के अपस्ट्रीम क्षेत्र में भी निवेश किया है।
- माननीय प्रधान मंत्री श्री नरेंद्र मोदी और बांग्लादेश की माननीय प्रधान मंत्री सुश्री शेख हसीना द्वारा 18 मार्च 2023 को भारत–बांग्लादेश मैत्री पाइपलाइन (आईबीएफपी) को संयुक्त रूप से संस्थापित किया गया था। यह भारत–नेपाल पाइपलाइन के बाद दक्षिण एशिया में दूसरी क्रॉस–कंट्री पाइपलाइन है।

6.3.9.2. नेपाल के साथ सहयोग

- भारत 1974 से नेपाल के पेट्रोलियम उत्पादों की 100% जरूरतों को पूरा करता रहा है।
- भारत और नेपाल ने अप्रैल 2023 में पेट्रोलियम और गैस संबंधी भारत–नेपाल संयुक्त कार्य समूह (जेडब्ल्यूजी) की चौथी बैठक की। जेडब्ल्यूजी के निष्कर्ष स्वरूप नेपाल में पेट्रोलियम अवसंरचना के विकास के लिए 31 मई 2023 को एक जी2जी समझौता ज्ञापन पर हस्ताक्षर किए गए, जिसमें अमलेखगंज से चितवन तक मोतिहारी–अमलेखगंज पाइपलाइन (एमएपीएल) का विस्तार, चितवन में एक ग्रीनफील्ड टर्मिनल का निर्माण, सिलीगुड़ी–झापा



पाइपलाइन का निर्माण और झापा में ग्रीनफील्ड टर्मिनल का निर्माण शामिल है। इस समझौता ज्ञापन से पेट्रोलियम अवसंरचना मजबूत होगी, कम लागत लगेगा और नेपाल के नागरिकों और अर्थव्यवस्था को आपूर्ति सुरक्षा में समर्थन मिलेगा।

6.3.9.3. श्रीलंका के साथ सहयोग

- भारत और श्रीलंका के बीच एक जीवंत ऊर्जा साझेदारी है। भारत पारंपरिक रूप से श्रीलंका के सबसे बड़े व्यापार भागीदारों में से एक रहा है और श्रीलंका सार्क में भारत के सबसे बड़े व्यापार भागीदारों में से एक बना हुआ है।
- श्रीलंका में ऊर्जा संकट के दौरान भारत ने श्रीलंका को दी गई कुल 4 बिलियन अमेरिकी डॉलर की ऋण सहायता के बदले पेट्रोलियम उत्पादों की आपूर्ति करके सहायता प्रदान की।
- भारतीय कंपनियां त्रिंकोमाली क्षेत्र को ऊर्जा केंद्र के रूप में विकसित करने की संभावना तलाश रही हैं, जो इस क्षेत्र के लिए श्रीलंका की सरकार की योजना के अनुरूप है।

- भारत और श्रीलंका कोलंबो के केरावलपिटिया में आरएलएनजी आधारित बिजली संयंत्र के लिए श्रीलंका को एलएनजी की आपूर्ति, भारत में सीबीआर, नागापट्टिनम से कोलंबो और त्रिंकोमाली तक एक बहु–उत्पाद पाइपलाइन और श्रीलंका के ईएंडपी क्षेत्र में अवसरों पर भी कार्य कर रहे हैं।



6.3.10. जर्मनी

- माननीय मंत्री ने वैकल्पिक और संधारणीय ईंधन के संबंध में द्विपक्षीय सहयोग को बढ़ावा देने के लिए 7–9 नवंबर 2023 तक जर्मनी और वियना में एक उद्योग प्रतिनिधिमंडल का नेतृत्व किया। इस यात्रा के दौरान माननीय मंत्री ने जर्मनी के उप कुलपति और आर्थिक मामले एवं जलवायु कार्रवाई संघीय मंत्री रॉबर्ट हेबेक के साथ द्विपक्षीय बैठक हुई जिसमें दोनों पक्षों ने वैकल्पिक ईंधन के क्षेत्र में सहयोग करने पर चर्चा की।





- माननीय मंत्री ने जर्मन बायोगैस एसोसिएशन के सीईओ डॉ. क्लॉडियस दा कोस्टा गोमेज और बायोगैस तथा जैव ईंधन के अन्य उद्योग जगत के नेताओं के साथ एक गोलमेज चर्चा में भाग लिया। दोनों पक्षों ने ऊर्जा के स्वच्छ स्रोतों और किसानों के लिए आय का एक अतिरिक्त स्रोत बनाने के लिए भारत की खोज पर चर्चा की।

6.3.11. मोजाम्बिक

- 8.5 बिलियन अमेरिकी डॉलर के निवेश के साथ, मोजाम्बिक भारत के लिए दूसरा सबसे बड़ा अपस्ट्रीम निवेश गंतव्य और अफ्रीका में सबसे बड़ा गंतव्य है। यह वैश्विक स्तर पर भारतीय सार्वजनिक क्षेत्र के उपक्रमों द्वारा किए गए सभी निवेशों में से किसी एक परिसंपत्ति में सबसे बड़ा निवेश भी है। भारत के प्राथमिक ऊर्जा बास्केट में प्राकृतिक गैस के बढ़ते महत्व से इसे अन्य स्रोतों की तुलना में कार्यनीतिक बढ़त मिलती है और मोजाम्बिक एलएनजी प्रतिस्पर्धी दरों पर एलएनजी आपूर्ति के लिए एक पसंदीदा स्रोत हो सकता है।

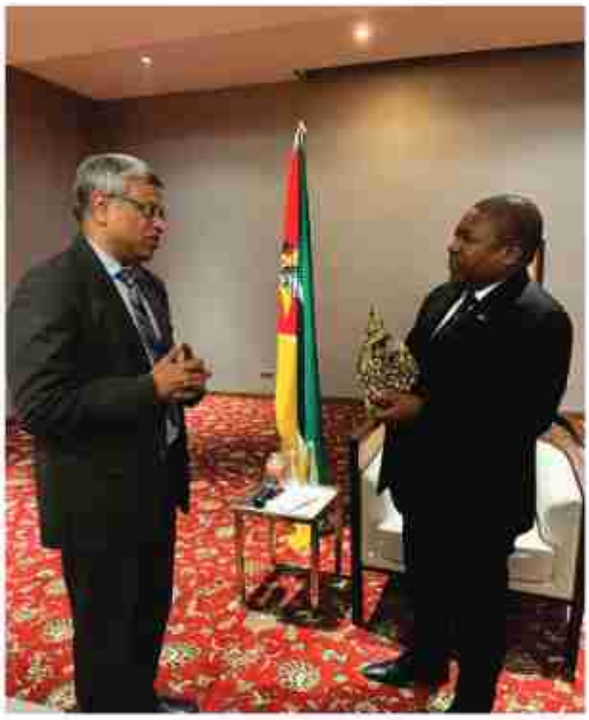


- माननीय मंत्री ने अक्टूबर 2023 में मोजाम्बिक में एक उच्च स्तरीय मंत्रिस्तरीय और औद्योगिक प्रतिनिधिमंडल का नेतृत्व किया। माननीय मंत्री ने मोजाम्बिक गणराज्य के राष्ट्रपति महामहिम फिलिप जैसिंटो न्यूसी से मुलाकात की और मोजाम्बिक और भारत दोनों के लिए विन-विन स्थिति में परियोजना के शीघ्र पुनरुद्धार के लिए समर्थन का अनुरोध किया।
- अपनी यात्रा के दौरान, माननीय मंत्री ने मोजाम्बिक के खनिज संसाधन और ऊर्जा मंत्री महामहिम कार्लोस जकारियास, मोजाम्बिक के अर्थव्यवस्था और वित्त मंत्री महामहिम अर्नेस्टो मैक्स एलियास टोनेला के साथ द्विपक्षीय बैठक भी की। दोनों पक्षों ने परियोजना को जल्द से जल्द फिर से शुरू करने पर चर्चा की और इस तरह दोनों देशों के लिए परियोजना के कार्यनीतिक महत्व को रेखांकित किया।
- इसके अलावा, मोजाम्बिक की परिसंपत्तियों को प्रमुख महत्व देते हुए, माननीय मंत्री ने सुरक्षा स्थिति की समीक्षा करने के लिए राजधानी मापुटो से 2,500 किलोमीटर दूर स्थित काबो डेलागाडो में एरिया-1 परियोजना स्थल का भी दौरा किया। माननीय मंत्री ने



टोटल एनर्जीज के सीईओ के साथ एक समीक्षा बैठक भी की। टोटल एनर्जीज ने स्थिति के बारे में जानकारी दी और स्थानीय स्थिति में सुधार के साथ परियोजना को "पुनः आरंभ करने के लिए तैयार" करने के लिए किए जा रहे प्रयासों के बारे में बताया।

- 10वें वाइब्रेंट गुजरात ग्लोबल समिट 2024 के मौके पर मोजाम्बिक के साथ समग्र सहयोग के संबंध में, सचिव, पेट्रोलियम और प्राकृतिक गैस ने 9 जनवरी 2024 को मोजाम्बिक गणराज्य के राष्ट्रपति महामहिम फिलिप जैसिंटो न्यूसी से मुलाकात की, जिसमें दोनों पक्षों ने एरिया–1 एलएनजी परियोजना को पुनर्जीवित करने की योजनाओं पर चर्चा की।





6.4. अंतर्राष्ट्रीय संगठनों के साथ सहयोग

6.4.1. पेट्रोलियम निर्यातक देशों के संगठन (ओपेक) के साथ जुड़ाव

- ओपेक के साथ नियमित सहयोग तेल और गैस संसाधनों के जिम्मेदार मूल्य निर्धारण की वकालत करने के लिए भारत की ऊर्जा कूटनीति का एक महत्वपूर्ण तत्व है क्योंकि तेल की कीमतों को आकार देने में ओपेक प्रमुख भूमिका निभाता है।
- भारत ने ओपेक देशों से लगभग 60% कच्चा तेल, 63% एलपीजी, 19% एलएनजी और 40% पेट्रोलियम उत्पाद आयात किए हैं, जिनका मूल्य लगभग 120 बिलियन अमरीकी डॉलर है। तदनुसार, भारत लगातार बड़े तेल उत्पादकों को खरीदारों और विक्रेताओं के समग्र हित में अधिक जिम्मेदार मूल्य निर्धारण प्रणाली की ओर ले जाने के लिए ओपेक की नेतृत्वकारी भूमिका पर बल दे रहा है।
- ओपेक ने अपने नवीनतम जारी विश्व तेल आउटलुक 2023 में उल्लेख किया है कि 6.1% प्रति वर्ष की औसत दीर्घकालिक वृद्धि के साथ भारत सबसे तेजी से बढ़ने वाले प्रमुख विकासशील देश और गैर–ओईसीडी वृद्धिशील तेल की मांग में सबसे बड़ा योगदानकर्ता बना हुआ है। रिपोर्ट में यह भी बताया गया है कि भारत 2045 तक मौजूदा 5.1 एमबी/डी तेल की मांग में 6.5 एमबी/डी मांग और जोड़ देगा। इसी कालखंड में भारत में नवीकरणीय ऊर्जा का सबसे तेजी से विकास होगा जिनका औसत विकास दर 11.5% प्रति वर्ष होगा।
- ऑस्ट्रिया के वियना में 9 नवंबर 2023 को ओपेक सचिवालय में भारत–ओपेक ऊर्जा वार्ता की छठी उच्च स्तरीय बैठक हुई। माननीय मंत्री ने ओपेक के महासचिव महामहिम हैथम अल घैस के साथ बैठक की सह–अध्यक्षता की। भारत–ओपेक ऊर्जा वार्ता जून 2015 में शुरू हुई थी। गत वर्षों में, भारत–ओपेक ऊर्जा वार्ता ने तेल और गैस उद्योग के कई विषयों



और चुनौतियों पर चर्चा करने के लिए एक अनूठा मंच प्रदान किया है, जिसमें विशेष रूप से तकनीकी स्तर पर बाजार स्थिरता को बढ़ाने पर ध्यान केंद्रित किया गया है। बैठक में तेल और ऊर्जा बाजारों से संबंधित प्रमुख मुद्दों पर ध्यान केंद्रित किया गया, जिसमें उपलब्धता, सामर्थ्य और स्थिरता सुनिश्चित करने पर विशेष बल दिया गया, जो ऊर्जा बाजारों की स्थिरता और आर्थिक विकास और ऊर्जा मांग दोनों के चालक के रूप में भारत की भूमिका सुनिश्चित करने के लिए आवश्यक है।

6.4.2. अंतर्राष्ट्रीय ऊर्जा एजेंसी (आईईए) के साथ सहयोग

- भारत–आईईए सहयोग मार्च 2017 से तेज हो गया है जब भारत आईईए का सहयोगी देश बन गया। तब से, भारत और आईईए विभिन्न विषयों पर सहयोग कर रहे हैं जिसमें अक्षय ऊर्जा के विस्तार, ऊर्जा दक्षता, गैस सुरक्षा, तेल भंडार और आपातकालीन तैयारी, निवेश, नवाचार, डिजिटलीकरण आदि पर डेटा विश्लेषण और अंतर्राष्ट्रीय सर्वोत्तम प्रथाओं को साझा करना शामिल है।
- भारत अब आईईए का पूर्णकालिक सदस्य बनना चाहता है। इस संबंध में, माननीय मंत्री ने आईईए के कार्यकारी निदेशक डॉ. फतिह बिरोल के साथ नियमित बैठकें की हैं।

6.4.3. अंतर्राष्ट्रीय ऊर्जा मंच (आईईएफ) के साथ सहयोग

- भारत और आईईएफ के बीच लंबे समय से सहयोग चल रहा है। भारत वर्ष 2002 में इसकी स्थापना के बाद से इसके कार्यकारी बोर्ड का स्थायी सदस्य है। पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के संयुक्त सचिव (आईसी) आईईएफ के कार्यकारी बोर्ड सदस्य हैं।
- आईईएफ ऊर्जा उपभोक्ताओं और उत्पादकों के बीच संवाद के माध्यम से अंतर्राष्ट्रीय सहयोग को मजबूत करने में अग्रणी भूमिका निभा रहा है।
- 7 फरवरी 2023 को, भारत ने आईईएफ के साथ मिलकर भारत ऊर्जा सप्ताह 2023 के अवसर पर 9वें एशियाई मंत्रिस्तरीय ऊर्जा गोलमेज सम्मेलन (एएमईआर9) की मेजबानी की।

6.5. पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय द्वारा आयोजित/भागीदारी वाले अंतर्राष्ट्रीय कार्यक्रम

6.5.1. भारत ऊर्जा सप्ताह 2023

भारत ऊर्जा सप्ताह (आईईडब्ल्यू), 2023 का पहला संस्करण 6 से 8 फरवरी, 2023 तक बेंगलुरु में आयोजित किया गया था। माननीय प्रधान मंत्री श्री नरेंद्र मोदी ने आईईडब्ल्यू 2023 के उद्घाटन सत्र का उद्घाटन किया। इस कार्यक्रम में 100 से अधिक देशों के अंतर्राष्ट्रीय संगठनों के प्रमुखों, 500 अंतर्राष्ट्रीय वक्ताओं, 30,000 से अधिक ऊर्जा पेशेवरों, 8,000 से अधिक प्रतिनिधियों और 700 प्रदर्शकों सहित 35 से अधिक विदेश मंत्रियों ने भाग लिया।

आईईडब्ल्यू, 2023 मेघरेलू और अंतर्राष्ट्रीय सभी हितधारकों को एक साझा मंच प्रदान किया है ताकि विकास, सहयोग और परिवर्तन को सुविधाजनक बनाया जा सके।



आईईडब्ल्यू विभिन्न वार्षिक आयोजनों जैसे कि सीईआरए सप्ताह, अबू धाबी अंतर्राष्ट्रीय पेट्रोलियम प्रदर्शनी और सम्मेलन (एडीआईपीईसी), विश्व पेट्रोलियम कांग्रेस और गैसटेक के सदृश्यऊर्जा क्षेत्र में सबसे प्रत्याशित प्रमुख आयोजन के रूप में उभरा है।

आईईडब्ल्यू ने ऊर्जा आयोजन के रूप में एक अलग स्थान बनाया है जो ऊर्जा सुरक्षा, ग्राहक केंद्रितता, न्यायपूर्ण ऊर्जा परिवर्तन, ऊर्जा का वहनीयता को रेखांकित करता है, भारत को मांग केंद्र के रूप में उजागर करता है और नवाचार और सहयोग को बढ़ावा देता है। भारत ऊर्जा सप्ताह में ऊर्जा का व्याख्या अधिक समावेशी, व्यावहारिक और न्यायपूर्ण तरीके से की जा रहा है, जिससे विश्व आकर्षित हो रहा है और सीईओ और उद्योग के नेताओं की भागीदारी बढ़ रही है।

कार्यनीतिक सम्मेलन वैश्विक ऊर्जा बाजारों को प्रभावित करने वाली कार्यनीतियों और रुझानों पर अंतर्दृष्टि साझा करने में सफल रहा, जबकि कार्यकारी सत्र में नेट जीरो एजेंडे को आगे बढ़ाने में सर्वोत्तम प्रथाओं को साझा करने के लिए व्यावसायिक संचालन के अग्रणी नेताओं को एकजुट किया गया और तकनीकी सम्मेलन से इंजीनियरों और परियोजना प्रबंधकों को नवीनतम उद्योग की विशेषज्ञता का परिचय मिला। आईईडब्ल्यू 2023 के दौरान, ऊर्जा क्षेत्र में भारत की यात्रा को इमर्सिव डिजिटल प्रदर्शनियों और मंत्रिस्तरीय संवादों के माध्यम से प्रदर्शित किया गया।

आईईडब्ल्यू 2023 ने कई सुदृढ़ीकरण और रहस्योद्घाटन किए, जिनमें निम्न शामिल हैं

- वैश्विक वियोजन द्वारा प्रेरित– वैश्विक ऊर्जा समीकरण उभरते बाजारों और उन्नत अर्थव्यवस्थाओं के लिए मौलिक रूप से अलग–अलग है। आयात निर्भरता वाले उभरते बाजारों के लिए ऊर्जा समीकरण एक चतुर्भुज है, जिसमें 'सुरक्षा' अन्य बिंदुओं– 'पहुँच', 'वहनीयता' और 'स्थिरता' के लिए एक महत्वपूर्ण और अग्रदूत तत्व बन जाती है।
- बढ़ते बाजार उतार–चढ़ाव और ऊर्जा संबंधों के औचक पुनर्गठन ने ऊर्जा सुरक्षा बाजार स्थिरता, व्यवस्थित और न्यायसंगत बदलावों पर उत्पादक–उपभोक्ता संवाद को अंतरराष्ट्रीय एजेंडे के शीर्ष पर वापस ला दिया है।
- ऊर्जा परिवर्तन वैश्विक ऊर्जा पोर्टफोलियो में प्रबंधित परिवर्तन की एक लहर की तरह होगा। इस परिवर्तन के लिए वैश्विक समन्वय और कौशल, प्रौद्योगिकी और वैश्विक वित्तपोषण की उपलब्धता आवश्यकता है।
- ऊर्जा सुरक्षा और कम कार्बन तथा उच्च ऊर्जा घनत्व ट्रेड–ऑफ खुले, पारदर्शी और अविकृत बाजारों पर निर्भर करते हैं। बेहतर कनेक्टिविटी और समान प्रतिस्पर्धा अधिक लागत–कुशल परिवर्तन और समावेशी विकास लाएगी।

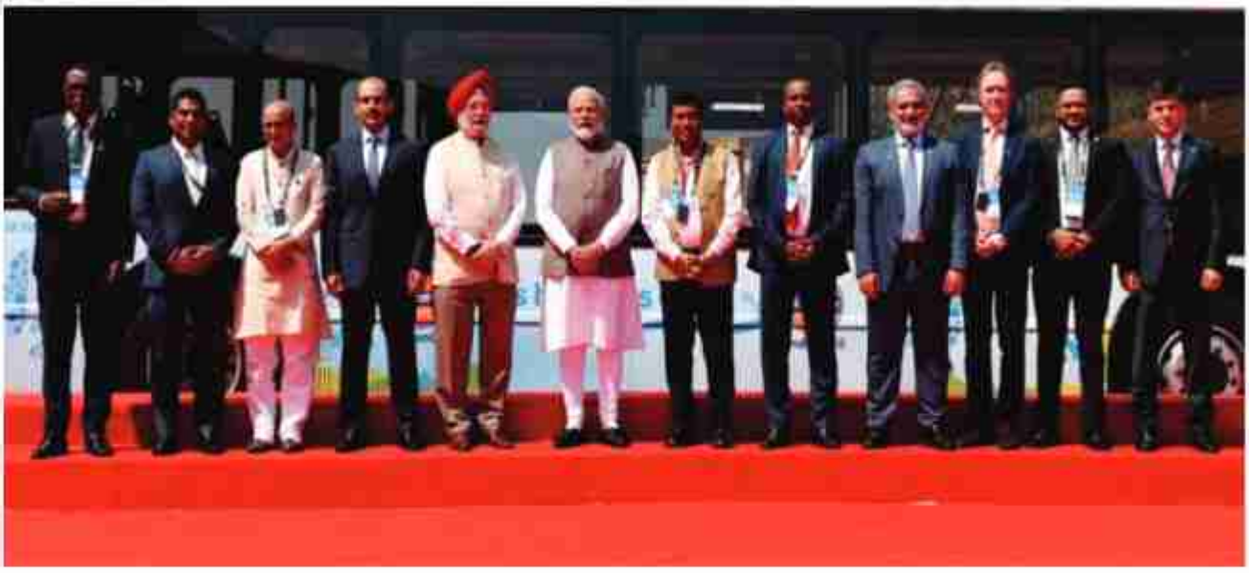
आईईडब्ल्यूके दौरान हस्ताक्षरित कुछ प्रमुख समझौता ज्ञापन / समझौते इस प्रकार हैं:

- पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के हाइड्रोकार्बन महानिदेशालय और ह्यूस्टन विश्वविद्यालय, टेक्सास, यूएसए के बीच किया गया यह समझौता ज्ञापन ह्यूस्टन विश्वविद्यालय के साथ डेटा सेंटर स्थापित करने के लिए भारत और संयुक्त राज्य अमेरिका के बीच कार्यनीतिक साझेदारी को मजबूत करने की दिशा में लिया गया एक कदम आगे है।
- वैश्विक ऊर्जा सुरक्षा को बढ़ाने के लिए ऊर्जा क्षेत्र में डाटा और अनुसंधान के क्षेत्र में सहयोग को मजबूत करने के लिए पेट्रोलियम नियोजन और विश्लेषण सेल (पीपीएसी) और अंतर्राष्ट्रीय ऊर्जा एजेंसी (आईईए) के बीच स्टेटमेंट ऑफ इंटेंट (एसओआई)।

6.5.2. भारत ऊर्जा सप्ताह 2024

भारत ऊर्जा सप्ताह (आईईडब्ल्यू) का दूसरा संस्करण 6–9 फरवरी 2024 से ओएनजीसी के पेट्रोलियम सुरक्षा, स्वास्थ्य और पर्यावरण प्रबंधन संस्थान (आईपीएसएचईएम) में आयोजित किया गया। माननीय प्रधान मंत्री श्री नरेंद्र मोदी ने आईईडब्ल्यू 2024 के दूसरे संस्करण का उद्घाटन किया, जहां उन्होंने वैश्विक ऊर्जा नेताओं की सभा को संबोधित करते हुए ऊर्जा क्षेत्र में भारत द्वारा अभूतपूर्व निवेश करने की प्रतिबद्धता पर बल दिया। माननीय प्रधान मंत्री ने रेखांकित किया कि इस क्षेत्र पर बड़े पैमाने पर सरकारी खर्च करने से भारत में निवेश के नए रास्ते खुलेंगे।

इस कार्यक्रम में 13 से अधिक विदेश मंत्री और उप मंत्री प्रतिनिधियों की सक्रिय भागीदारी के साथ–साथ 360 से अधिक वक्ताओं के विविध पैनल की प्रभावशाली सभा ने हिस्सा लिया। इस कार्यक्रम में 40,000 से अधिक आगंतुकों आए, जिन्होंने 25 से अधिक देशों का प्रतिनिधित्व करने वाले 900 से अधिक प्रदर्शकों की पेशकश देखी। आईईडब्ल्यू 2024 की वैश्विक अपील इसके स्वागत में स्पष्ट परिलक्षित थी, क्योंकि इस कार्यक्रम ने महत्वपूर्ण रुचि आकर्षित की, जिसके परिणामस्वरूप 18 तकनीकी श्रेणियों में 193



प्रस्तुतकर्ताओं से लगभग 2,000 तकनीकी सार प्रस्तुत किए गए।

आईईडब्ल्यू के दूसरे संस्करण द्वारा की गई प्रगति की पर्याप्त वृद्धि इसके उद्घाटन संस्करण की तुलना में स्पष्ट है। विशेष रूप से, प्रदर्शनी क्षेत्र में उल्लेखनीय 25% की वृद्धि हुई है जहां आईईडब्ल्यू 2024, 18.5 हजार वर्ग मीटर में फैला था वही आईईडब्ल्यू 2023, 15 हजार वर्ग मीटर तक ही था। यह महत्वपूर्ण विस्तार दर्शाता है।

आईईडब्ल्यू 2024 ने मेक इन इंडिया और स्टार्टअप पैवेलियन के माध्यम से 300 से अधिक स्टार्टअप और एमएसएमई के लिए एक मंच प्रदान करके भारत को ऊर्जा नवप्रवर्तक के रूप में प्रोत्साहन दिया है। आईईडब्ल्यू के माध्यम से कई स्वदेशी समाधानों को वैश्विक मंच मिला और उनसे दुनिया की समस्याओं का हल हुआ इससे मेक इन इंडिया की भावना उजागर होती है। आईईडब्ल्यू 2024 के दौरान आयोजित स्टार्टअप इवेंट चैलेंज – अविन्या को विभिन्न क्षेत्रों के स्पेक्ट्रम को कवर करने वाले 116 अभिनव अनुप्रयोगों के साथ जबरदस्त प्रतिक्रिया मिली। इस कार्यक्रम में नवाचार कौशल को बढ़ावा देने हेतु वीसी, इनक्यूबेटर, एक्सेलरेटर, उद्योग जगत के नेता और स्टार्टअप सहित विभिन्न क्षेत्रों के दिग्गज शामिल हुए।

भारत में ऊर्जा क्षेत्र में निवेश करने के लिए दुनिया को आमंत्रित करने के प्रगतिशील दृष्टिकोण का समर्थन करते हुए, आईईडब्ल्यू 2024 ने सहयोग के संभावित अवसरों को उजागर करने के लिए एक मंच के रूप में कार्य किया, जिनमें से कई हासिल किए गए:

- भारत ने कतर एनर्जी के साथ 78 बिलियन अमरीकी डॉलर का ऐतिहासिक एलएनजी सौदा हासिल किया, जिससे इसके आयात समझौते का 2048 तक विस्तार हुआ, जिससे देश को 6 बिलियन अमरीकी डॉलर की बचत होने की उम्मीद है।
- टोटल एनर्जी की अग्रणी एयूएसईए (पर्यावरण अनुप्रयोगों के लिए एयरबोर्न अल्ट्रालाइट स्पेक्ट्रोमीटर) तकनीक का उपयोग करके मीथेन उत्सर्जन का पता लगाने और माप अभियान चलाने के लिए ओएनजीसीने टोटल एनर्जी के साथ एक सहयोग समझौते पर हस्ताक्षर किए।
- तेल उत्पादन के दौरान उत्पन्न अपशिष्ट जल का उपचार करने वाली बायोइलेक्ट्रिकल प्रक्रिया का उपयोग करके हरित हाइड्रोजन के उत्पादन हेतु ओएनजीसी ने ऑसरा बायोरिन्यूएबल्स के साथ एक समझौते पर हस्ताक्षर किए।

आईईडब्ल्यू 2024 में महत्वपूर्ण रिपोर्टों का लोकार्पण भी हुआ, जिनमें नीति आयोग और नीदरलैंड्स द्वारा "मध्यम और भारी वाणिज्यिक वाहनों में परिवहन ईंधन के रूप में एलएनजी", पीपीएसीजर्नल, और अंतर्राष्ट्रीय ऊर्जा एजेंसी (आईईए) द्वारा "भारत तेल बाजार परिदृश्य" शामिल है, जो ऊर्जा परिदृश्य को नया रूप देने के लिए आवश्यक अंतर्दृष्टि प्रदान करते हैं। आईईए ने पूर्वानुमान लगाया है कि भारत अब से लेकर 2030 तक

वैश्विक तेल मांग वृद्धि का सबसे बड़ा स्रोत बनकर उभरेगा।

आईईडब्ल्यू 2024 के दौरान अभिनव समाधान प्रदर्शित किए गए, जिनमें (i) आईओसीएल और भारत की पहलीहरित हाइड्रोजन ईंधन कोशिकाओं द्वारा प्रचालित बसें, (ii) बीपीसीएल–बीएआरसी और भारत की पहली घरेलू रूप से विकसित इलेक्ट्रोलाइज़र, एचपीसीएल का ईंधन फ्लेक्स इंजन, (iii) प्रयुक्त कुकिंग ऑयल (यूसीओ) का उपयोग करने वाला बायोडीजल संयंत्र, (iv) गेल का शिप–टू–शिप एलएनजी ट्रांसफर, फ्लोटिंग सीएनजी स्टेशन और लंबी दूरी की एलएनजी बसें, (v) खाना पकाने के लिए स्वच्छ ईंधन का प्रयोग करने वाला एथेनॉल स्टोव शामिल हैं।

आईईडब्ल्यू द्वारा दर्ज की गई जबरदस्त प्रतिक्रिया, और विकासतथा ऊर्जा परिवर्तन संबंधी कार्यनीतिक दिशा और व्यावहारिकता जो आईईडब्ल्यू वैश्विक ऊर्जा जगत में प्रदर्शित कर रहा है, यह इस बात का प्रमाण है कि भारत वैश्विक ऊर्जा परिवर्तन परिदृश्य में अग्रणी है और आईईडब्ल्यू वैश्विक ऊर्जा आयोजनों में अपनी जगह बना रहा है।

6.5.3. भारत के माननीय प्रधान मंत्री की वैश्विक तेल और गैस के सीईओ और विशेषज्ञों के साथ बातचीत

भारत के माननीय प्रधान मंत्री श्री नरेंद्र मोदी ने भारत ऊर्जा सप्ताह 2024 के दौरान वैश्विक तेल और गैस के सीईओ और विशेषज्ञों के साथ 8वें वार्षिक गोलमेज सम्मेलन की अध्यक्षता की। इस चर्चा में ऊर्जा क्षेत्र के 26 प्रमुख नेताओं ने भाग लिया।

इस चर्चा में घरेलू तेल और गैस उत्पादन को बढ़ाने के महत्व, निवेश और सहयोग के महत्व, ऊर्जा दक्षता को बढ़ावा देना, संधारणीय ईंधन को शामिल करना, डिजिटलीकरण और एआई, भारत की वैश्विक ऊर्जा मांग केंद्र के रूप में स्थिति, 'मेक इन इंडिया' और 'स्किलिंग इन इंडिया' जैसी पहलों सहित कई विषयों पर चर्चा की गई।

तेल और गैस विशेषज्ञों ने ऊर्जा की सुलभता, वहनीयता और सुरक्षा बढ़ाने में सरकार की हालिया उपलब्धियों की सराहना की। उन्होंने अमृत के पांच तत्वों– "पंचामृत" और सहायक नीतियों द्वारा समर्थित दूरदर्शी लक्ष्यों का हवाला देते हुए भारत के स्वच्छ ऊर्जा में परिवर्तन का नेतृत्व करने के लिए प्रधानमंत्री के नेतृत्व की सराहना की। इसके अतिरिक्त, उन्होंने भारत द्वारा स्वच्छ ऊर्जा



प्रौद्योगिकियों को तेजी से अपनाने और वैश्विक ऊर्जा आपूर्ति श्रृंखलाओं को प्रभावित करने की इसकी क्षमता पर प्रकाश डाला।

प्रारंभिक टिप्पणियों में, माननीय पेट्रोलियम एवं प्राकृतिक गैस मंत्री ने निरंतर संवाद करने और सामंजस्यपूर्ण कार्यनीतियों, विविध दृष्टिकोणों की समझ और भारत के दृष्टिकोण तथा योजनाओं के साथ तालमेल बिठानेके महत्व पर जोर दिया।

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के सचिव ने "तेल और गैस क्षेत्र का परिचय" पर एक प्रस्तुति दी। प्रस्तुति में इस बात पर प्रकाश डाला गया कि भारत वैश्विक ऊर्जा मांग को आगे बढ़ाएगा और पहलों, उपलब्धियों तथा निवेश के अवसरों पर ध्यान केंद्रित करेगा।

माननीय प्रधान मंत्री ने तेल और गैस के क्षेत्र में किए गए सुधारों पर प्रकाश डाला, जिसमें घरेलू तेल और गैस उत्पादन को बढ़ाना, गैस आधारित अर्थव्यवस्था की ओर बढ़ना और स्वच्छ ऊर्जा को अपनाना शामिल है और वैश्विक तेल और गैस कंपनियों को भारत के विकास गाथा का हिस्सा बनने के लिए आमंत्रित किया।

6.5.4. विश्व पेट्रोलियम कांग्रेस

श्री पंकज जैन, एमओपीएनजी, ने 24वें विश्व पेट्रोलियम कांग्रेस (डब्ल्यूपीसी) में भाग लेने के लिए 17 से 21 सितंबर 2023 तक कैलगरी, कनाडा में एक उच्च स्तरीय उद्योग प्रतिनिधिमंडल का नेतृत्व किया। एमओपीएनजी के सचिव ने डब्ल्यूपीसी में भारतीय पैवेलियन का उद्घाटन किया, जिसमें भारत की ऊर्जा की विकास यात्रा की कहानी पर प्रकाश डाला गया।

इस यात्रा के दौरान, एमओपीएनजी के सचिव ने मंत्रिस्तरीय गोलमेज सम्मेलन में एक वक्ता के रूप में भाग लिया: आपके देश के लिए ऊर्जा परिवर्तन का क्या



अर्थ है? जिसमें श्री पावेल–कैसियन नितुलेस्कु, राज्य सचिव–ऊर्जा मंत्रालय, रोमानिया और श्री हेनेकेन लोकपुबिरी, मंत्री–पेट्रोलियम संसाधन मंत्रालय, नाइजीरिया उनके सह–पैनलिस्ट थे। ऊर्जा सुरक्षा, वहनीयता और विश्वसनीयता की आवश्यकता पर बल दिया गया। इसके अलावा, पेट्रोलियम एवं प्राकृतिक गैस सचिव ने इस सत्र में भारत के लिए आर्थिक समृद्धि और विकास को बनाए रखने के लिए पर्याप्त ऊर्जा आपूर्ति की महत्वपूर्ण आवश्यकता पर बल दिया।

यात्रा के दौरान, पेट्रोलियम एवं प्राकृतिक गैस सचिव ने कैव कान, कंप्यूटर मॉडलिंग ग्रुप (सीएमजी) लिमिटेड, फैरोस एनर्जी पीएलसी, पीटीआरसी, सेमी जियो, ब्लैकफिश इंडस्ट्रीज, कैलगरी विश्वविद्यालय जैसे अपस्ट्रीम और डाउनस्ट्रीम अंतर्राष्ट्रीय तेल एवं गैस सेवा प्रदाताओं के विभिन्न अधिकारियों और विशेषज्ञों के साथ आमने–सामने बैठकें कीं। पेट्रोलियम एवं प्राकृतिक गैस सचिव ने भूकंपीय प्रसंस्करण और व्याख्या के लिए प्रौद्योगिकी पर ध्यान केंद्रित करते हुए, सिस्मिक रिजरवॉयर कैरेक्टराइजेशन कंपनी, सैमीजियो के साथ एक गोलमेज चर्चा भी की।

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के सचिव ने 20 सितंबर, 2023 को कनाडा में आईओसीएल की



पीएनडब्ल्यू परिसंपत्तियों का भी दौरा किया। इस क्षेत्र दौरे में कोवेस क्षेत्र में एक ड्रिल–साइट (गुंडी क्रीक वेस्ट पैड डी–डी82–जे/94–बी–9) का दौरा शामिल था, जिसके बाद परियोजना के सबसे बड़े गैस संयंत्र (बी–89–जे) का दौरा किया गया, जिसकी कुल प्रसंस्करण क्षमता 400 एमएमएससीएफडी है, जिसमें दो ट्रेनें शामिल हैं।

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के सचिव ने अल्बर्टा विश्वविद्यालय में एक भारतीय प्रतिनिधिमंडल का भी नेतृत्व किया। प्रतिनिधिमंडल ने अल्बर्टा विश्वविद्यालय में गोलमेज चर्चा में भाग लिया।

6.5.5. एडीआईपीईसी–अबू धाबी 2023

माननीय मंत्री ने 2–4 अक्टूबर 2023 तक यूएई का दौरा किया, जहाँ उन्होंने अबू धाबी अंतर्राष्ट्रीय पेट्रोलियम प्रदर्शनी और सम्मेलन (एडीआईपीईसी 2023) में भाग लिया – जो ऊर्जा उद्योग के लिए दुनिया का सबसे प्रभावशाली सम्मेलन है। एडीआईपीईसी 2023 में, माननीय मंत्री ने भारतीय पैवेलियन का भी उद्घाटन किया।



यात्रा के दौरान, माननीय मंत्री ने 'ऊर्जा वार्ता: भारतीय ऊर्जा उद्योग: विविधीकरण से आर्थिक विकास तक' पर स्पॉटलाइट सत्र में अपनी टिप्पणी दी। उन्होंने चर्चा की कि भारत में विकास–ऊर्जा सहसंबंध कैसे स्पष्ट है क्योंकि यह अब दुनिया का तीसरा सबसे बड़ा ऊर्जा उपभोक्ता है। भारत की ऊर्जा मांग भविष्य में आर्थिक विकास के लिए ईंधन प्रदान करती रहेगी क्योंकि इसमें उत्तरोत्तर वृद्धि अवश्यंभावी है: भारत दुनिया का तीसरा सबसे बड़ा तेल उपभोक्ता, तीसरा सबसे बड़ा एलपीजी उपभोक्ता, चौथा सबसे बड़ा एलएनजी आयातक, चौथा सबसे बड़ा रिफाइनर और चौथा सबसे बड़ा ऑटोमोबाइल बाजार है।

इस यात्रा के दौरान, माननीय मंत्री ने यूएई के अपने समकक्षों, महामहिम सुहैल मोहम्मद अल मजरूई, ऊर्जा और बुनियादी ढांचा मंत्री, यूएई; और महामहिम डॉ. सुल्तान अहमद अल जाबेर, सीओपी 28 अध्यक्ष–पदनाम, यूएई के विशेष दूत, उद्योग और उन्नत प्रौद्योगिकी मंत्री; एडीएनओसी के एमडी और समूह सीईओ के साथ द्विपक्षीय चर्चा में भाग लिया। दोनों पक्षों ने भारत–यूएई संबंधों को गहरा बनाने और इस तरह भारत–यूएई कार्यनीतिक साझेदारी के समग्र ढांचे के भीतर ऊर्जा सहयोग को मजबूत करने के तरीकों पर चर्चा की। माननीय मंत्री ने भारतीय पीपुल्स फोरम, यूएई की टीम से भी मुलाकात की।

माननीय मंत्री ने संघीय गणराज्य नाइजीरिया के पेट्रोलियम संसाधन (तेल) राज्य मंत्री माननीय ओबॉन्गेमम एकपेरिकपे एकपो और सीनेटर हेनेकेन लोकपोबिरी के साथ द्विपक्षीय बैठक की। माननीय मंत्री ने मिस्र के पेट्रोलियम और खनिज संसाधन मंत्री महामहिम तारेक एल मोल्ला की भी मेजबानी की।





माननीय मंत्री ने टोटल एनर्जीज के चेयरमैन और सीईओ श्री पैट्रिक पोयाने के साथ बैठक की, जिसमें दोनों पक्षों ने मोजाम्बिक परियोजना में तेजी लाने के तरीकों पर चर्चा की। इसके अलावा, यात्रा के दौरान, माननीय मंत्री ने वैश्विक तेल और गैस कंपनियों के सीईओ के साथ बैठकें कीं। माननीय मंत्री ने बीपी के अंतरिम सीईओ श्री मरे औचिनक्लोस, श्लम्बरगर के सीईओ श्री ओलिवियर ले प्यूच, बेकर ह्यूजेस के चेयरमैन और सीईओ श्री लोरेंजो सिमोनेली और ऑक्सिडेंटल पेट्रोलियम, की अध्यक्ष और सीईओसुश्री विकी होलब के साथ बैठकें कीं। माननीय मंत्री ने भारत के ईएंडपी क्षेत्र में अपार अवसरों पर जोर दिया, जिसके लिए भारत ने अन्वेषण के लिए दस लाख वर्ग किलोमीटर 'नो गो' क्षेत्र खोले हैं और राष्ट्रीय आंकड़ा कोष बनाई है, जिसे भारत में ईएंडपी में रुचि रखने वाली कंपनियों के लाभ के लिए साझा किया जा सकता है।



पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के सचिवने मंत्रिस्तरीय सत्र 'नई विश्व व्यवस्था में ऊर्जा और भूराजनीति को नेविगेट करना' में भाग लिया, जहां उन्होंने ऊर्जा सुरक्षा, वहनीयता और विश्वसनीयता की आवश्यकता पर जोर दिया। उन्होंने भारत के लिए आर्थिक समृद्धि और विकास को बनाए रखने के लिए पर्याप्त ऊर्जा आपूर्ति की महती आवश्यकता पर बल दिया।



6.5.6. द्वितीय वॉयस ऑफ ग्लोबल साउथ शिखर सम्मेलन

माननीय मंत्री ने द्वितीय वॉयस ऑफ ग्लोबल साउथ शिखर सम्मेलन में 17 नवंबर 2023 को आयोजित ऊर्जा मंत्रियों के सत्र की अध्यक्षता की जो 'किफायती परिवहन के लिए दीर्घकालिक विकल्प विकास के लिए किफायती और समावेशी ऊर्जा परिवर्तन' पर केंद्रित था। द्वितीय वॉयस ऑफ ग्लोबल साउथ शिखर सम्मेलन जिसका विषय 'वैश्विक दक्षिण: सब का विकास, सब का विश्वास' था, वैश्विक दक्षिण राष्ट्रों के सम्मुख आने वाली अनूठी चुनौतियों का समाधान करने हेतु प्रतिबद्ध है। यह समावेशिता, विकास और विश्वास की दिशा में किया जा रहा एक संयुक्त प्रयास है।

भारत की अपनी ऊर्जा नीति का व्यापक विविधीकरण करना राष्ट्रीय हितों का समर्थन करते हुए और भारत की ऊर्जा मांग को पूरा करते हुए जलवायु परिवर्तन को कम करने की इसकी प्रतिबद्धता को रेखांकित करता है। 15 देशों के मंत्री और उप मंत्री स्वच्छ, हरित और संधारणीय भविष्य की ओर मार्ग प्रशस्त करने के लिए एकत्रित हुए जिससे सहयोग का महत्व प्रतिपादित होता है।





6.5.7. विश्व आर्थिक मंच

माननीय मंत्री ने 15–19 जनवरी 2024 तक दावोस में विश्व आर्थिक मंच (डब्ल्यूईएफ) 2024 में भाग लेने के लिए एक उद्योग प्रतिनिधिमंडल का नेतृत्व किया। डब्ल्यूईएफ वैश्विक, क्षेत्रीय और उद्योग एजेंडा को आकार देने के लिए समाज के अग्रणी राजनीतिक, व्यापारिक, सांस्कृतिक और अन्य नेताओं को एकजुट करता है।

डब्ल्यूईएफ 2024 में माननीय मंत्री ने लगभग 7 सत्रों में भाग लिया:

क. भारत के ऊर्जा परिवर्तन में तेजी लाने के लिए किफायती परिवहन के लिए दीर्घकालिक विकल्प आर्थिक विकास पर सीआईआई–ईवाई ब्रेकफास्ट सत्र

ख. प्रतिद्वंद्विता के बीच ऊर्जा पर डब्ल्यूईएफ सत्र

ग. सीआईआई सत्र: भारत में हरित हाइड्रोजन के अवसर

घ. डब्ल्यूईएफ सत्र–गोलमेज: ऊर्जा परिवर्तन नेता

ङ. डब्ल्यूईएफ सत्र: क्या भारत इस अवसर का लाभ उठा सकता है?

च. डब्ल्यूईएफ सत्र: भारत पर देश कार्यनीति संवाद

छ. डब्ल्यूईएफ सत्र–गोलमेज आईजीडब्ल्यूईएल (विश्व आर्थिक नेताओं की अनौपचारिक सभा): ऊर्जा सत्र

माननीय मंत्री ने वैश्विक ऊर्जा उद्योग के नेताओं के साथ सक्रीय बातचीत की। माननीय मंत्री ने इस बात पर प्रकाश डाला कि दुनिया अब वैश्विक मंच पर भारत के ऊर्जा क्षेत्र के उद्भव और जबरदस्त क्षमता, हरित ऊर्जा परिवर्तन की इसकी प्रक्रिया, नेट जीरो लक्ष्य और ऊर्जा पर्याप्तता की ओर इसकी यात्रा को समझ रही है। भारत अब दुनिया का एक विकास इंजन है और भारत में हो रहे नवाचार वैश्विक दक्षिण के देशों की चुनौतियों के लिए समाधान प्रदान कर रहे हैं।

माननीय मंत्री ने बहरीन आर्थिक विकास बोर्ड के प्रबंधन बोर्ड के वरिष्ठ सलाहकार श्री इयान लिंडसे; बीएपीसीओ एनर्जीज के सीईओ श्री मार्क थॉमस के साथ द्विपक्षीय बैठक की, जिसमें दोनों पक्षों ने मध्य पूर्व में उभरती स्थितियों पर चर्चा की। दोनों पक्षों ने इस बात पर चर्चा की कि किस तरह भारत, जो 254 एमएमटीपीए की वर्तमान क्षमता के साथ विश्व में चौथा सबसे बड़ा रिफाइनर है और बहरीन जो सित्रा रिफाइनरी को अपग्रेड और विस्तारित करने के लिए तैयार है, रिफाइनरी सह पेट्रोकेमिकल क्षेत्र के साथ–साथ 2जी/3जी जैव ईंधन रिफाइनरियों में आपसी द्विपक्षीय





हाइड्रोकार्बन व्यापार और निवेश को बढ़ाने के लिए महत्वपूर्ण अवसर प्रस्तुत करता है।

माननीय मंत्री ने भाग लेने वाले प्रमुख तेल और गैस कंपनियों के साथ–साथ प्रमुख जैव ईंधन कंपनियों के प्रमुख मंत्रियों और सीईओ के साथ कई द्विपक्षीय बैठकें भी कीं।

6.6. विदेशी परिसंपत्ति का अधिग्रहण

- पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय देश की ऊर्जा सुरक्षा को मजबूत करने के लिए विदेशों के गुणवत्तापूर्ण तेल और गैस परिसंपत्तियों को हासिल करने के अवसरों को आक्रामक रूप से लाभ उठाने के लिए भारतीय तेल और गैस पीएसयू को सुविधा प्रदान कर रहा है।
- पिछले 6 वर्षों के दौरान, भारतीय कंपनियों ने यूएई (लोअर जकुम और ऑनशोर ब्लॉक–1), ओमान (मुखाज्ना) और रूस (वैंकोरनेफ्ट और तस्सयुर्याख) में परिसंपत्तियां हासिल की हैं।
- 1 अप्रैल 2024 तक, भारतीय सार्वजनिक क्षेत्र के उपक्रमों ने विभिन्न ईएंडपी विदेशी परिसंपत्तियों पर ~38 बिलियन अमेरिकी डॉलर का निवेश किया है। वित्त वर्ष 2023–24 के दौरान, इन परिसंपत्तियों से भारतीय सार्वजनिक क्षेत्र के उपक्रमों के लिए इक्विटी तेल और गैस का हिस्सा लगभग 19.9 एमएमटीओई था, जो भारत के घरेलू उत्पादन के 30.24% के बराबर है। परिसंपत्तियों की सूची परिशिष्ट-XI में दी गई है।







अध्याय 7

उत्तर पूर्वी क्षेत्र का विकास

7 उत्तर पूर्वी क्षेत्र का विकास

7.1. पृष्ठभूमि

7.1.1. उत्तर–पूर्व क्षेत्र में तेल और गैस की खोज मुख्य रूप से स्वतंत्रता के बाद के दौरान हुई। इनमें असम ऑयल कंपनी (एओसी) द्वारा नहरकटिया और मोरन क्षेत्रों तथा ओएनजीसी द्वारा क्रमशः 1953, 1956 और 1960 में रुद्रसागर तेल क्षेत्रों की खोज शामिल है। बाद में, 100 से अधिक तेल और गैस क्षेत्रों की खोज की गई जिनमें जोराजन, कुमचाई, हापजान, शालमारी, डिकोम, काथालोनी, तेंगाखाट, मोगपारा, छाबुआ, बागजान, बरेकुरी, तिचना, गोजालिया, रोखिया, खोबल, होरटोकी जैसे क्षेत्र शामिल हैं जिन्हें ओआईएल और ओएनजीसी द्वारा पूर्वोत्तर के असम, अरुणाचल प्रदेश, नागालैंड, त्रिपुरा और मिजोरम राज्यों में खोज की गई है।

7.1.2. इस क्षेत्र को प्री–एनईएलपी, एनईएलपी, डीएसएफ और ओएएलपी पूर्व बोलियों के माध्यम से निजी/संयुक्त उद्यम और विदेशी कंपनियों के अन्वेषण के लिए खोला गया था। ओआईएल और ओएनजीसी ने पर्याप्त मात्रा में उत्पादन योग्य हाइड्रोकार्बन साबित किए हैं और उत्पादन और जटिल जलाशयों के प्रबंधन की तकनीकी जानकारी है और उत्तर–पूर्व में अपनी उत्पादक परिसंपत्तियों से प्रति वर्ष तेल और गैस के बराबर तेल (ओ+ओईजी) में योगदान (2021–22 में लगभग 8.99 एमएमटीओई) है।

7.1.3. पूर्वोत्तर क्षेत्र में देश के कुल अनुमानित हाइड्रोकार्बन संसाधनों का लगभग 18% (7634 एमएमटी) है। अन्वेषण एवं उत्पादन कंपनियों द्वारा अब तक लगभग 2246.6 एमएमटी तत्स्थान हाइड्रोकार्बन भंडार मिले हैं जिसका अर्थ है कि लगभग 73% हाइड्रोकार्बन संसाधन अभी 'खोजे जाने' की श्रेणी के अंतर्गत है।

7.1.4. दो राष्ट्रीय तेल कंपनियां, नामतः ओएनजीसी और ओआईएल 60 वर्षों से अधिक समय से तेल और गैस के अन्वेषण और दोहन के लिए पूर्वोत्तर क्षेत्र में कार्यरत हैं और इस बेसिन के विशाल भू–वैज्ञानिक डाटाबेस और भूवैज्ञानिक समझ का सृजन किया है।

7.2. नामांकन व्यवस्था के तहत पूर्वोत्तर में अन्वेषण गतिविधियां

7.2.1. फरवरी, 1959 में अपनी स्थापना के बाद से ओआईएल असम राज्य में सक्रिय रूप से अन्वेषण और विकास गतिविधियों को आगे बढ़ा रहा है।

7.2.2. 1969–79 के दौरान, असम और अरुणाचल प्रदेश में व्यापक भूभौतिकीय सर्वेक्षण और विकास प्रयास किए गए थे, जिसके परिणामस्वरूप 1972 में जोराजन क्षेत्र की खोज हुई और 1973 में तेंगक हाट (नहरकटिया के पश्चिम) के इओसीन में गैस संसाधनों की खोज की गई। 31.12.2022 तक, ओआईएल ने उत्तर–पूर्व में 2डी भूकंपीय डेटा का 16,280.59 जीएलकेएम से अधिक और 3डी भूकंपीय डेटा का लगभग 10,846.15 वर्ग किलोमीटर अधिग्रहण किया है और तेल खोज के लिए 71 खुदाई की एवं 1424 कुंओं को विकसित किया गया है। 31 मार्च 2024 तक, ओआईएल के पास नामांकन व्यवस्था के तहत पूर्वोत्तर में 1 अन्वेषण ब्लॉक है। ओआईएल के पूर्वोत्तर क्षेत्र में 2 एनईएलपी अन्वेषण ब्लाक भी हैं। इसके अलावा,



बीपीसीएल दुलियाजान प्लांट

खुला रकबा लाइसेंस नीति (ओएएलपी) के तहत, ओआईएल को असम, अरुणाचल प्रदेश, नागालैंड और त्रिपुरा में एक ऑपरेटर के रूप में 17 ब्लॉक (ओएएलपी राउंड I में 7 ब्लॉक, ओएएलपी राउंड III में 3 ब्लॉक और ओएएलपी राउंड V, VI – VII में 2 ब्लॉक और VIII में 1 ब्लॉक) प्रदान किए गए थे। ओआईएल को डीएसएफ राउंड–II के अंतर्गत दक्षिण त्रिपुरा में 1 ब्लाक प्रदान किया गया है।

7.2.3. ओएनजीसी ने 1956 में असम में अपना अन्वेषण कार्य शुरू किया। ओएनजीसी का प्रथम अन्वेषी कुआँ 1960 में दिसांगमुख संरचना पर ड्रिल किया गया था, हालांकि, पहली वाणिज्यिक तेल खोज उसी वर्ष रुद्रसागर संरचना पर हुई थी। पूर्वोत्तर क्षेत्र में, 31.03.2024 तक, ओएनजीसी ने असम राज्य में 826 अन्वेषणात्मक कुआं, त्रिपुरा में 235 कुआं, मेघालय में 3, मिजोरम में 4 और नागालैंड राज्य में 26 कुआं की खुदाई की है।

7.2.4. इस अन्वेषण दर्शन के साथ पानीडीहिंग, दिसांगमुख, लकवा, लखमनी, सोनारी, गेलेकी, देमुलगांव, अमगुरी और चरली सहित बड़ी संख्या में तेल और गैस क्षेत्रों की खोज की गई थी।

7.2.5. वर्तमान में, ओएनजीसी के पास नामांकन व्यवस्था के तहत नागालैंड राज्य में 3 पीईएल ब्लॉक है। इसके पास पूर्वोत्तर में 65 पीएमएल ब्लॉक (असम में 46, त्रिपुरा में 18, नागालैंड में 1) भी हैं, जिसमें दीर्घकालिक और अल्पकालिक पीएमएल दोनों शामिल हैं। वित्त वर्ष 2023–24 के दौरान, ओएनजीसी ने 299.99 एलकेएम 2डी भूकंपीय डेटा (असम शेल्फ में 65.2 एलकेएम और असम अराकान फोल्ड बेल्ट में 234.79 एलकेएम), 216.93 एसकेएम 3डी भूकंपीय डेटा (असम शेल्फ में 59.22 और असम अराकान फोल्ड बेल्ट में 157.71) का अधिग्रहण किया और 22 अन्वेषणात्मक कुओं (असम शेल्फ में 9 और असम अराकान फोल्ड बेल्ट में 13) की खुदाई की। इसके अतिरिक्त, पूर्वोत्तर क्षेत्र में और अधिक रकबा अर्जित करने के लिए जी एंड जी के अन्वेषणात्मक प्रयास प्रगति पर हैं।

7.3. पीएससी व्यवस्था के तहत पूर्वोत्तर में अन्वेषण गतिविधियां

पीएससी व्यवस्था के तहत, एनईएलपी–पूर्व बोली दौरों के तहत वर्ष 1998 में असम राज्य में पहली बार अन्वेषण ब्लाक प्रदान किए गए थे। तदनंतर, एनईएलपी के विभिन्न दौरों के तहत ब्लाक प्रदान किए गए थे। कुल 33 ब्लाक प्रदान किए गए हैं (खोजे गए फील्ड राउंड के तहत 02 ब्लाक, 5 अन्वेषण ब्लाक और 26 एनईएलपी ब्लाक)। ये प्रदान किए गए ब्लॉक (असम–21, मणिपुर–2, मिजोरम–3, नागालैंड–3 और त्रिपुरा–3 और अरुणाचल प्रदेश–1) 43,439 वर्ग किमी के क्षेत्र में फैले हैं। इनमें से 11 ब्लाक प्रचालनरत हैं, प्रचालकों द्वारा 1 ब्लाक का परित्याग किए जाने का प्रस्ताव किया गया था तथा 21 ब्लाक का परित्याग कर दिया गया है।

7.4. उत्तर–पूर्व में कच्चे तेल और प्राकृतिक गैस का उत्पादन

7.4.1. पूर्वोत्तर राज्यों द्वारा कच्चे तेल के उत्पादन में योगदान कुल उत्पादन का लगभग 15: है। वित्त वर्ष 2023–24 में, उत्तर–पूर्व में कच्चे तेल का उत्पादन लगभग 4.43 मिलियन मीट्रिक टन (एमएमटी) है। पिछले 5 वर्षों में कच्चे तेल के उत्पादन का राज्य–वार और कंपनी–वार रुझान नीचे दिया गया है:

कंपनी	आस्ति	2019-20	2020-21	2021-22	2022-23	2023-24
ओआईएल नामांकन	अरूणाचल प्रदेश	0.02	0.02	0.02	0.02	0.03
	असम	3.08	2.90	2.96	3.11	3.29
ओआईएल कुल		**3.10**	**2.92**	**2.98**	**3.13**	**3.32**
ओएनजीसी नामांकन	असम	0.99	0.96	0.99	1.007	1.044
	त्रिपुरा	0.002	0.003	0.003	0.003	0.002
ओएनजीसी कुल		**0.99**	**0.96**	**0.99**	**1.01**	**1.05**
संविदात्मक व्यवस्था	अरूणाचल प्रदेश	0.03	0.03	0.03	0.02	0.03
	असम	0.03	0.03	0.04	0.04	0.03
पीएससी कुल		**0.06**	**0.06**	**0.07**	**0.06**	**0.06**
कुल योग		**4.15**	**3.94**	**4.04**	**4.20**	**4.43**

7.4.2. उपरोक्त सारणी से, यह देखा जा सकता है कि वित्त वर्ष 2023–24 में उत्तर–पूर्व में कच्चे तेल के उत्पादन में ओआईएल की हिस्सेदारी ~75% है, इसके बाद ~24% की हिस्सेदारी के साथ ओएनजीसी है। कच्चे तेल के उत्पादन में निजी / संयुक्त उद्यम कंपनियों का हिस्सा लगभग ~1% है।

7.4.3. वित्त वर्ष 2023–24 में पूर्वोत्तर राज्यों द्वारा प्राकृतिक गैस उत्पादन में योगदान कुल उत्पादन का लगभग 14% है। 2023–24 में उत्तर–पूर्व में प्राकृतिक गैस का उत्पादन प्राकृतिक गैस लगभग 5.06 बिलियन मीट्रिक स्टैंडर्ड क्यूबिक मीटर (बीसीएम) है। पिछले 5 वर्षों में प्राकृतिक गैस उत्पादन की राज्य–वार और कंपनी–वार प्रवृत्ति नीचे दी गई है:

कंपनी	आस्ति	2019-20	2020-21	2021-22	2022-23	2023-24
ओआईएल नामांकन	अरूणाचल प्रदेश	0.04	0.05	0.05	0.04	0.04
	असम	2.38	2.24	2.62	2.81	2.89
ओआईएल कुल		**2.42**	**2.29**	**2.67**	**2.85**	**2.93**
ओएनजीसी नामांकन	असम	0.46	0.39	0.37	0.36	0.33
	त्रिपुरा	1.47	1.63	1.53	1.67	1.52
ओएनजीसी कुल		**1.93**	**2.02**	**1.90**	**2.03**	**1.86**
पीएससी	अरूणाचल प्रदेश	0.01	0.00	0.00	0.01	0.00
	असम	0.30	0.37	0.38	0.39	0.27
पीएससी कुल		**0.31**	**0.37**	**0.38**	**0.40**	**0.27**
कुल योग		**4.66**	**4.68**	**4.95**	**5.28**	**5.06**

7.4.4. उपरोक्त तालिका से, यह देखा जा सकता है कि वित्त वर्ष 2023–24 में उत्तर–पूर्व में प्राकृतिक गैस उत्पादन में ओआईएल की ~58% की हिस्सेदारी है, इसके बाद ~37% की हिस्सेदारी के साथ ओएनजीसी है। प्राकृतिक गैस उत्पादन में निजी / संयुक्त उद्यम कंपनियों का हिस्सा लगभग ~5% है।

7.4.5. असम ने देश में उत्तर–पूर्वी राज्यों में से कुल तेल उत्पादन का ~99% और पिछले वित्त वर्ष के दौरान देश के कुल तेल उत्पादन का 15% योगदान दिया। अरुणाचल प्रदेश ने देश के उत्तर–पूर्वी राज्यों में से कुल तेल उत्पादन में ~1.4% का योगदान दिया, जबकि त्रिपुरा ने देश के उत्तर–पूर्वी राज्यों में से कुल तेल उत्पादन में ~0.05% का योगदान दिया।

सारणी 7.1 : पूर्वोत्तर में पिछले पांच वर्षों में कच्चे तेल उत्पादन (एमएमटी में)

राज्य/क्षेत्र	स्रोत	2019-20	2020-21	2021-22	2022-23	2023-24
असम	ओआईएल	3.075	2.905	2.957	3.114	3.286
	ओएनजीसी	0.985	0.961	0.991	1.007	1.044
	निजी / संयुक्त उद्यम	0.030	0.033	0.040	0.042	0.028
	कुल	**4.090**	**3.899**	**3.988**	**4.164**	**4.359**
अरुणाचल प्रदेश	ओआईएल	0.023	0.024	0.021	0.024	0.032
	निजी / संयुक्त उद्यम	0.032	0.030	0.027	0.023	0.027
	कुल	**0.055**	**0.054**	**0.048**	**0.047**	**0.059**
त्रिपुरा	ओएनजीसी	0.002	0.003	0.003	0.003	0.002
उत्तर पूर्व	**कुल योग**	**4.147**	**3.956**	**4.039**	**4.214**	**4.420**

7.4.6. असम ने देश में उत्तर–पूर्वी राज्यों से कुल गैस उत्पादन का ~69% और पिछले वित्त वर्ष के दौरान देश के कुल गैस उत्पादन का 9.6% योगदान दिया। अरुणाचल प्रदेश ने उत्तर–पूर्वी राज्यों से कुल गैस उत्पादन का ~0.8% योगदान दिया जबकि त्रिपुरा ने उत्तर–पूर्वी राज्यों से कुल गैस उत्पादन का ~30% योगदान दिया।

सारणी 7.2 : पूर्वोत्तर क्षेत्र में गत पांच वर्षों में प्राकृतिक गैस उत्पादन (एमएमएससीएम)

राज्य/क्षेत्र	स्रोत	2019-20	2020-21	2021-22	2022-23	2023-24
असम	ओआईएल	2379	2241	2620	2812	2885
	ओएनजीसी	460	387	373	355	335
	निजी / संयुक्त उद्यम	302	367	378	390	270
	कुल	**3,141**	**2,995**	**3,371**	**3,557**	**34,89**
अरुणाचल प्रदेश	ओआईएल	38.22	50.41	52.79	48.30	34.69
	निजी / संयुक्त उद्यम	7.37	4.95	4.92	5.02	4.94
	कुल	**45.59**	**55.36**	**57.71**	**53.31**	**39.63**
त्रिपुरा	ओएनजीसी	1473	1634	1531	1675	1525
उत्तर पूर्व	**कुल योग**	**4,660**	**4,684**	**4,960**	**5,286**	**5,054**

7.5. तैयार लघु क्षेत्र नीति

उत्तर पूर्व क्षेत्र में डीएसएफ के अंतर्गत ब्लॉकों का ब्योरा निम्नवत् है:

स्थिति	बेसिन	डीएसएफ बोली दौर	राज्य/ स्थान	संविदा क्षेत्र	ऑपरेटर
पीएमएल दिया गया	असम–आराकान फोल्ड बेल्ट	डीएसएफ-II	त्रिपुरा	एए / ओएनडीएसएफ / तुलामारा / 2018	ऑयल इंडिया लिमिटेड
	असम शेल्फ	डीएसएफ-I	असम	एए / ओएनडीएसएफ / बार्सिला / 2016	रामायण इस्पात प्राइवेट लिमिटेड और महेंद्र इंफ्राटेक प्राइवेट लिमिटेड
				एए / ओएनडीएसएफ / बराईदेव / 2016	ऑयलमैक्स एनर्जी प्राइवेट लिमिटेड
				एए / ओएनडीएसएफ / डिपलिंग / 2016	रामायण इस्पात प्राइवेट लिमिटेड और महेंद्र इंफ्राटेक प्राइवेट लिमिटेड
				एए / ओएनडीएसएफ / दुअरमारा / 2016	एंटेलोपस एनर्जी प्राइवेट लिमिटेड
				एए / ओएनडीएसएफ / लक्ष्मीजान / 2016	मेघा इंजीनियरिंग एंड इन्फ्रास्ट्रक्चर्स लिमिटेड
		डीएसएफ-II	असम	एए / ओएनडीएसएफ / दिसाइजन / 2018	इन्वेनियर एनर्जी प्राइवेट लिमिटेड
				एए / ओएनडीएसएफ / हजारीगांव / 2018	वेदांत लिमिटेड
				एए / ओएनडीएसएफ / उमतारा / 2018	इंडियन ऑयल कॉर्पोरेशन लिमिटेड
		डीएसएफ-II	असम	एए / ओएनडीएसएफ / टिफुक / 2021	ऑयलमैक्स एनर्जी प्राइवेट लिमिटेड
	असम–आराकान फोल्ड बेल्ट	डीएसएफ-II	असम	एए / ओएनडीएसएफ / पठानिया / 2021	वेदांत लिमिटेड
				एए / ओएनडीएसएफ / टुकबाई / 2021	वेदांत लिमिटेड
पीएमएल नहीं दिया गया	असम शेल्फ	डीएसएफ-I	अरुणाचल प्रदेश	एए / ओएनडीएसएफ / कोहेरेम / 2016	एचओईसी लिमिटेड, प्राइज पेट्रोलियम

त्याग दिया गया	असम शेल्फ	डीएसएफ-I	असम	एए/ओएनडीएसएफ/जेरागपथर/2016	इंडियन ऑयल कॉर्पोरेशन लिमिटेड
समाप्त कर दिया गया	असम–आराकान फोल्ड बेल्ट	डीएसएफ-I	असम	एए/ओएनडीएसएफ/हिलारा/2016	प्राइज पेट्रोलियम कंपनी लिमिटेड
				एए/ओएनडीएसएफ/पठाना/2016	विजयश्री भास्कर इंडस्ट्रीज प्रा. लि.
	असम शेल्फ	डीएसएफ-II	असम	एए/ओएनडीएसएफ/माधकाली/2018	अर्श कॉर्पोरेट सर्विसेज प्राइवेट लिमिटेड (दुर्गता)
				एए/ओएनडीएसएफ/टिफुक/2018	शांति जीडी इस्पात एंड पावर प्रा. लि.

7.6. पूर्वोत्तर क्षेत्र में वैकल्पिक हाइड्रोकार्बन स्रोत

7.6.1. शेल गैस: ओएनजीसी द्वारा प्रचालित 3 शेल गैस ब्लॉक और ओआईएल द्वारा प्रचालित 4 ब्लाक असम राज्य में हैं। अब तक ओएनजीसी ने 2 कूपों (नामती एमएल ब्लॉक में जीकेबीओ और लकवा में एलबीजी) की खुदाई की है। ओआईएल ने राजस्थान में जैसलमेर पीएमएल, असम के डिब्रूगढ़, दमदुमा और छाबुआ पीएमएल से पारंपरिक चार कोर हासिल किए हैं। मूल्यांकन के परिणाम इन स्थानों पर खराब संभावना दर्शाते हैं क्योंकि शैलों को प्रारंभिक तेल उत्पादन की ओर ले जाता है।

अरुणाचल प्रदेश में, ओआईएल ने शेल गैस/तेल संभाव्यता की अभिपुष्टि के लिए क्रमशः अपर टिकाक पार्टबेट और दिसांग शैलों के लक्ष्य शेल की तुलना में पारंपरिक कोर की व्यापक मात्रा प्राप्त करने के लिए पारंपरिक कोर अर्थात् जयरामपुर विस्तार, पीईएल और देवमाली पीईएल प्राप्त करने के लिए दो स्थानों की पहचान की है।

7.7. उत्तर–पूर्व विजन 2030

7.7.1. उत्तर–पूर्व विजन दस्तावेज पूर्वोत्तर क्षेत्र के लोगों के लाभ के लिए साझा आकांक्षा विकसित करने की संकेन्द्रित और परामर्शी प्रक्रिया है।

7.7.2. इस योजना का उद्देश्य क्षेत्र की हाइड्रोकार्बन क्षमता का लाभ उठाना, स्वच्छ ईंधन तक पहुंच बढ़ाना, पेट्रोलियम उत्पादों की उपलब्धता में सुधार करना, आर्थिक विकास को सुविधाजनक बनाना और आम लोगों को इस क्षेत्र में आर्थिक गतिविधियों से जोड़ना है। इसके दायरे में आने वाले राज्यों में अरुणाचल प्रदेश, असम, मणिपुर, मेघालय, मिजोरम, नागालैंड, सिक्किम और त्रिपुरा शामिल हैं। मंत्रालय ने विजन दस्तावेज का मसौदा तैयार करते समय राज्य सरकारों के साथ कई परामर्श भी किए।

7.7.3. इस विजन का उद्देश्य 2030 तक तेल और गैस उत्पादन को दोगुना करना, स्वच्छ ईंधन सुलभ बनाना, परियोजनाओं को तेजी से कार्यान्वित करना, रोजगार के अवसर पैदा करना और पड़ोसी देशों के साथ सहयोग को बढ़ावा देना है।

विजन 2030 के अंतर्गत परिकल्पित प्रमुख लक्ष्यों में से एक लक्ष्य को पूरा करने के लिए सरकार ने पूर्वोत्तर क्षेत्र में प्रचालनात्मक ब्लाकों के लिए अन्वेषण अवधि में 2 वर्ष और मूल्यांकन अवधि में 1 वर्ष के विस्तार की विशेष छूट की अनुमति दी है। सरकार ने पूर्वोत्तर क्षेत्र में भविष्य में उत्पादित प्राकृतिक गैस के लिए विपणन और मूल्य निर्धारण स्वतंत्रता भी प्रदान की है।



7.7.4. पूर्वोत्तर विजन 2030 के तहत, ओएनजीसी ने पूर्वोत्तर क्षेत्र में असम शेल्फ और फोल्ड बेल्ट क्षेत्रों में भूकंपीय डाटा अधिग्रहण और अन्वेषणात्मक कुंओं की खुदाई के लिए एक अन्वेषण योजना की परिकल्पना की है। हाल ही में विभिन्न बेसिनों की अन्वेषणात्मक प्राथमिकताओं पर विचार करते हुए वर्ष 2022–23 से वर्ष 2024–25 तक की अवधि के लिये एक त्रिवर्षीय कार्य योजना तैयार की गई है। इस योजना के अंतर्गत, आनुपातिक अवधि के दौरान पूर्वोत्तर क्षेत्र में व्यय किए जाने के लिए प्रस्तावित अन्वेषणात्मक आदानों को नीचे सारणीबद्ध किया गया है:

विविरण		2022-23	2023-24	2024-25	Total
असम और असम आराकन	2डी (एलकेएम)	254	377	200	831
	3डी (एसकेएम)	320	455	470	1245
	अन्वेषी कुंआ	21	23	24	68

7.7.5. पूर्वोत्तर विजन 2030 के अंतर्गत वर्ष 2024–25 से 2026–27 तक पूर्वोत्तर क्षेत्र में असम शेल्फ और असम अराकान फोल्ड बेसिन क्षेत्रों में भूकंपीय डाटा अधिग्रहण और अन्वेषणात्मक कूपों की खुदाई के लिए ओआईएल अन्वेषण योजना नीचे सारणी में दी गई है।

ओआईएल ने पूर्वोत्तर क्षेत्र में योजनाबद्ध भूकंपीय सर्वेक्षण और अन्वेषणात्मक खुदाई कार्यकलापों को नीचे सारणीबद्ध किया है:

उत्तर–पूर्व क्षेत्र	कार्यकलाप	2024-25	2025-26	2026-27
असम और असम अराकान	2डी सर्वेक्षण (एलकेएम)	269	150	100
	3डी सर्वेक्षण (वर्ग किमी)	234	250	300
	अन्वेषी खुदाई (सं.)	25	29	30

7.7.6. 2023–24 में, ओएनजीसी ने 299.99 एलकेएम 2डी भूकंपीय डेटा, 216.93 एसकेएम 3डी भूकंपीय डेटा का अधिग्रहण पूरा कर लिया है और असम शेल्फ में 9 कुओं और असम अराकान फोल्ड बेल्ट क्षेत्र में 13 कुओं को ड्रिल किया है।

7.8. हाइड्रोकार्बन अन्वेषण और लाइसेंसिंग नीति (एचईएलपी) के तहत पूर्वोत्तर क्षेत्र में नए अन्वेषण ब्लॉक

तेल अन्वेषण एवं उत्पादन कंपनियां पूर्वोत्तर क्षेत्र में गहरी रूचि दर्शा रही है। 31 मार्च 2024 तक उत्तर–पूर्वी क्षेत्र में प्रदान किए गए अन्वेषण ब्लॉकों का विवरण और स्थिति इस प्रकार है:

क्र. सं.	ओएएलपी दौर	ब्लॉक नाम	कांट्रेक्टर/ आपरेटर	बेसिन नाम सांवेदा क्षेत्र (वर्ग किमी)	मूल	टिप्पणी
1	ओएएलपी-I	एए–ओएनएचपी–2017/1	वेदांता लि.	असम शेल्फ	714.71	नागालैंड का पीईएल क्षेत्र लंबित है
2	ओएएलपी-I	एए–ओएनएचपी–2017/10	ऑयल इंडिया लि.	असम शेल्फ	543.28	
3	ओएएलपी-I	एए–ओएनएचपी –2017/11	वेदांता लि.	असम शेल्फ	784.55	
4	ओएएलपी-I	एए–ओएनएचपी –2017/12	ऑयल इंडिया लि.	असम शेल्फ	489.06	
5	ओएएलपी-I	एए–ओएनएचपी –2017/13	ऑयल इंडिया लि.	असम शेल्फ	840.69	
6	ओएएलपी-I	एए–ओएनएचपी –2017/14	वेदांता लि.	असम अराकान फोल्ड बेल्ट	1719.17	
7	ओएएलपी-I	एए–ओएनएचपी –2017/15	वेदांता लि.	असम शेल्फ	1367.38	
8	ओएएलपी-I	एए–ओएनएचपी –2017/16	ऑयल इंडिया लि.	असम शेल्फ	361.49	
9	ओएएलपी-I	एए–ओएनएचपी –2017/17	ऑयल इंडिया लि.	असम शेल्फ	309.07	
10	ओएएलपी-I	एए–ओएनएचपी–2017/18	ऑयल इंडिया लि.	असम शेल्फ	1711.1	
11	ओएएलपी-I	एए–ओएनएचपी –2017/19	एचओईसी	असम अराकान फोल्ड बेल्ट	79.21	
12	ओएएलपी-I	एए–ओएनएचपी –2017/2	वेदांता लि.	असम अराकान फोल्ड बेल्ट	73.19	

क्र. सं.	ओएएलपी दौर	ब्लॉक नाम	कांट्रेक्टर/ आपरेटर	बेसिन नाम सविदा क्षेत्र (वर्ग किमी)	मूल	टिप्पणी
13	ओएएलपी-I	एए–ओएनएचपी–2017/20	ऑयल इंडिया लि.	असम अराकान फोल्ड बेल्ट	125.08	
14	ओएएलपी-I	एए–ओएनएचपी–2017/3	वेदांता लि.	असम अराकान फोल्ड बेल्ट	267.94	
15	ओएएलपी-I	एए–ओएनएचपी–2017/4	वेदांता लि.	असम शेल्फ	839.33	नागालैंड का पीईएल क्षेत्र लंबित है
6	ओएएलपी-I	एए–ओएनएचपी–2017/5	वेदांता लि.	असम शेल्फ	758.23	
17	ओएएलपी-I	एए–ओएनएचपी–2017/6	वेदांता लि.	असम अराकान फोल्ड बेल्ट	278.79	
18	ओएएलपी-I	एए–ओएनएचपी –2017/8	वेदांता लि.	असम शेल्फ	610.54	
19	ओएएलपी-I	एए–ओएनएचपी –2017/9	वेदांता लि.	असम शेल्फ	18.32	
20	ओएएलपी-III	एए–ओएनएचपी –2018/1	वेदांता लि.	असम शेल्फ	248.87	
21	ओएएलपी-III	एए–ओएनएचपी–2018/2	ऑयल इंडिया लि.	असम अराकान फोल्ड बेल्ट	2526.74	
22	ओएएलपी-III	एए–ओएनएचपी–2018/3	ऑयल इंडिया लि.	असम शेल्फ	1234.42	
23	ओएएलपी-III	एए–ओएनएचपी –2018/4	ओएनजीसी लि.	असम अराकान फोल्ड बेल्ट	44.01	
24	ओएएलपी-III	एए–ओएनएचपी –2018/5	ऑयल इंडिया लि.	असम अराकान फोल्ड बेल्ट	207.74	
25	ओएएलपी-V	एए–ओएनएचपी –2019/1	ऑयल इंडिया लि.	असम शेल्फ	1278.27	
26	ओएएलपी-V	एए–ओएनएचपी –2019/2	ऑयल इंडिया लि.	असम शेल्फ	2405.12	छोड़ दिया गया
27	ओएएलपी-VI	एए–ओएनएचपी –2020/1	ऑयल इंडिया लि.	असम अराकान फोल्ड बेल्ट	557.33	
28	ओएएलपी-VI	एए–ओएनएचपी –2020/2	ओएनजीसी लि.	असम अराकान फोल्ड बेल्ट	50.41	
29	ओएएलपी-VI	एए–ओएनएचपी –2020/3	ऑयल इंडिया लि.	असम अराकान फोल्ड बेल्ट	219.37	
30	ओएएलपी-VI	एए–ओएनएचपी –2021/1	ओएनजीसी लि.	असम अराकान फोल्ड बेल्ट	37.68	
31	ओएएलपी-VI	एएस–ओएनएचपी –2021/1	ओएनजीसी लि.	असम शेल्फ	24.64	
32	ओएएलपी-VII	एए–ओएनएचपी –2021/2	ओएनजीसी लि.	असम अराकान फोल्ड बेल्ट	382.05	
33	ओएएलपी-VII	एएस–ओएनएचपी –2021/2	ऑयल इंडिया लि.	असम शेल्फ	2445.3	
34	ओएएलपी-VII	एएस–ओएनएचपी –2021/3	ऑयल इंडिया लि.	असम शेल्फ	1840.87	
35	ओएएलपी-VIII	एएस–ओएनएचपी–2022/1	ऑयल इंडिया लि.	असम शेल्फ	2057.63	पीईएल डीड कार्यान्वित नहीं किया गया

7.9. राष्ट्रीय भूकंपीय कार्यक्रम

राष्ट्रीय भूकंपीय कार्यक्रम (एनएसपी) 12 अक्टूबर 2016 को जमीनी तलछटी घाटियों के संपूर्ण अनपेक्षित क्षेत्रों के 2 डी भूकंपीय सर्वेक्षण आयोजित करने के लिए सरकार की पहल के हिस्से के रूप में शुरू किया गया था। इसका उद्देश्य भारत में मूल्यांकित न किए गए तलछटीय बेसिनों का मूल्यांकन करना था और इसमें जमीनी क्षेत्रों के मूल्यांकन के लिए 48,243 लाइन किलोमीटर (एलकेएम) 2डी भूकंपीय आंकड़ों की परिकल्पना की गई थी। एनएसपी वर्ष, 2022 में पूरा हुआ। दुर्गम भू–भाग और प्रतिकूल वातावरण के कारण जिन क्षेत्रों में भूकंपीय सर्वेक्षण नहीं किए जा सके हैं, उनका मूल्यांकन इस समय एयरबोर्न भूनौतिकीय सर्वेक्षण करके किया जा रहा है। एनएसपी के अंतर्गत क्षेत्रवार अधिग्रहीत आंकड़े निम्नानुसार हैं

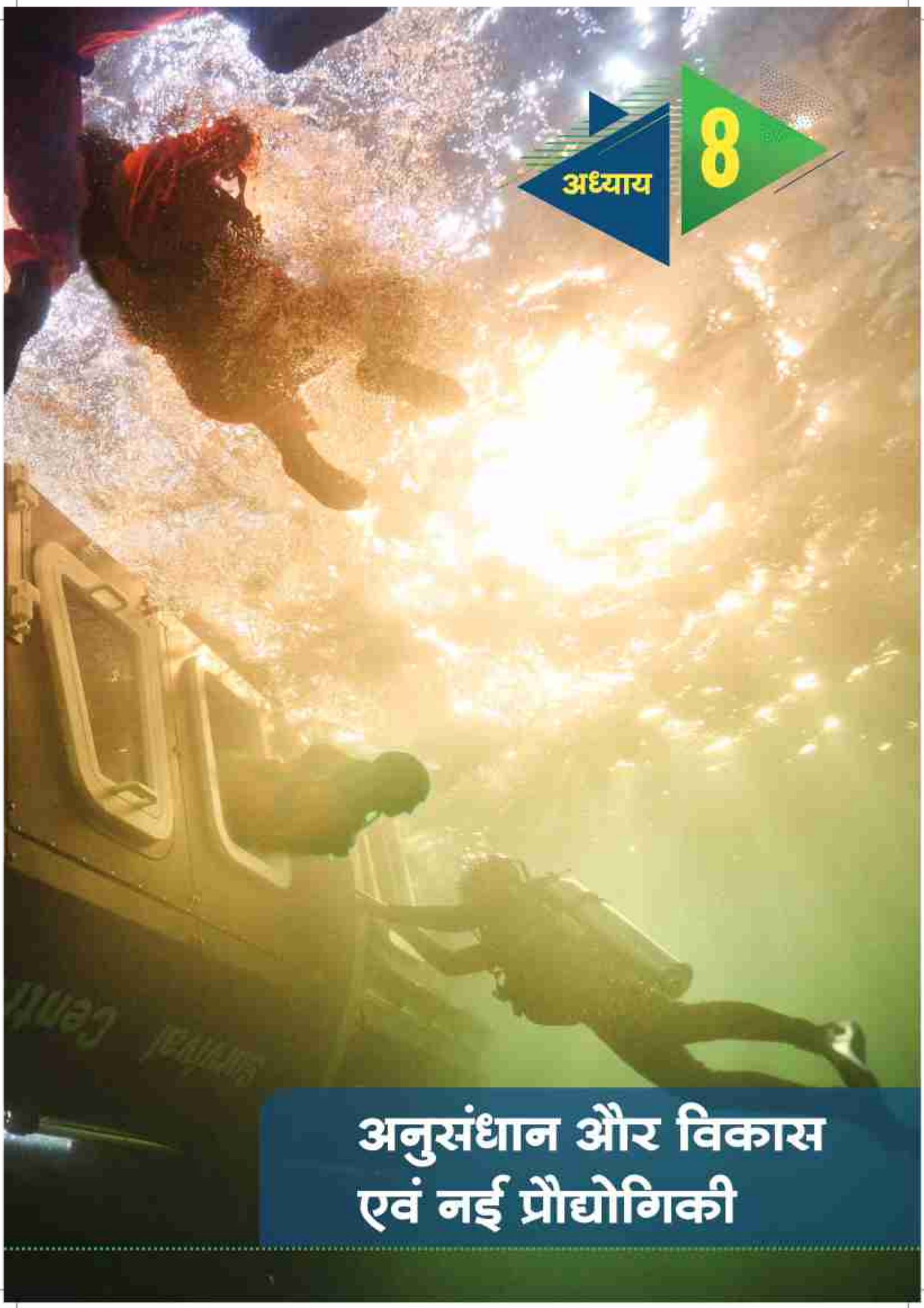
उत्तर–पूर्व में राज्य/स्थान–वार एनएसपी व्योरा	
राज्य/स्थान	2डी भूकंपीय (एलकेएम)
अरूणाचल प्रदेश	185.58
असम	3899.34
मणिपुर	4.74
मेघालय	12.66
मिजोरम	980
नागालैंड	0
कुल	**5,082.32**

7.10. एयरबोर्न ग्रेविटी ग्रिडियोमिट्री और ग्रेविटी मैग्नेटिक सर्वे (एजीजी और जीएम)

उत्तर पूर्व भारत, कावेरी, बस्तर और स्पीति और करेवा क्षेत्रों में 40,000 एलकेएम के एपीआई के लिए ओआईएल द्वारा एजीजी और जीएम सर्वेक्षण के लिए अनुबंध दिया गया था। सर्वेक्षण 27.05.2023 को शुरू किया गया था और 31.03.2024 तक पूर्वोत्तर भारत में क्षेत्रवार डेटा अधिग्रहण, प्रसंस्करण और व्याख्या नीचे दी गई है:

उत्तर पूर्व			
राज्य	ब्लॉक नाम	लगभग क्षेत्र (वर्ग किमी)	पंक्ति स्थान: 2x2 किमी.–एलकेएम
अरूणाचल प्रदेश	एएस_एपी एवं एएस_मैन_नागा	4,000	2,112
असम	एएस_एपी एवं एएस_मैन_नागा	10,100	5,489
नागालैंड	एएस_मैन_नागा	13,500	7,336
मणिपुर	एएस_मैन_नागा	10,030	5,451
मेघालय	एएस_मैन_नागा	1,700	924
मिजोरम	एएस मिज_त्रि	8,478	4,726
त्रिपुरा	एएस मिज_त्रि	1,722	960
		कुल	**26,997**





अध्याय 8

अनुसंधान और विकास एवं नई प्रौद्योगिकी

8 अनुसंधान और विकास एवं नई प्रौद्योगिकी

8.1. तेल एवं प्राकृतिक गैस कॉरपोरेशन (ओएनजीसी)

ओ एन जी सी में, अनुसंधान और विकास (आरएंडडी) और नवाचार लंबी अवधि में इसके निरंतर विकास के लिए महत्वपूर्ण उत्प्रेरक के रूप में कार्य करते हैं। संगठन नवाचार को पोषित करने के लिए अनुसंधान और विकास (आरएंडडी) प्रयासों में निवेश पर काफी जोर देता है। ओएनजीसी अपने अनुसंधान एवं विकास संस्थानों के माध्यम से ऊर्जा मूल्य श्रृंखला में अनुप्रयुक्त अनुसंधान कर रही है।

ओ एन जी सी ने अन्वेषण, वेधन, जलाशय प्रबंधन, उत्पादन प्रौद्योगिकी, महासागरीय इंजीनियरी तथा स्वास्थ्य, सुरक्षा और पर्यावरण (एचएसई) प्रबंधन के मुख्य क्षेत्रों में विशिष्ट कार्यकलाप करने के लिए पृथक अनुसंधान एवं विकास संस्थानों की स्थापना की है। वर्ष 2023–24 में, ओ एन जी सी ने अपने विभिन्न संस्थानों में पारंपरिक और गैर–पारंपरिक हाइड्रोकार्बन के लिए कई आरएंडडी अध्ययन किए।

8.1.1. उद्योग–शैक्षणिक भागीदारी

ओ एन जी सी ने हाइड्रोकार्बन और ऊर्जा के वैकल्पिक स्रोतों की खोज और दोहन बढ़ाने के लिए स्वदेशी प्रौद्योगिकियों के विकास के लिए सामूहिक अनुसंधान एवं विकास कार्यक्रम की दिशा में काम करने के लिए नई दिल्ली में 19 जनवरी, 2015 को पैन आईआईटी के साथ एक समझौता ज्ञापन (एमओसी) पर हस्ताक्षर किए हैं। पैन आईआईटी सात प्रमुख भारतीय प्रौद्योगिकी संस्थानों अर्थात् आईआईटी-खड़गपुर, आईआईटी-कानपुर, आईआईटी-मद्रास, आईआईटी-मुंबई, आईआईटी-दिल्ली, आईआईटी-गुवाहाटी और आईआईटी रूड़की का एक संघ है। यह किफायती परिवहन के लिए दीर्घकालिक विकल्प अनुसंधान, विकास और क्षमता निर्माण के लिए एक दीर्घकालिक पहल है। इस कार्यक्रम के तहत, ओ एन जी सी संस्थानों/अनुसंधान एवं विकास केंद्रों ने ओ एन जी सी और आईआईटी खड़गपुर (सात आईआईटी की ओर से) के बीच हस्ताक्षरित सहयोग ज्ञापन के तहत 4 चरणों में 40 अनुसंधान एवं विकास परियोजनाएं शुरू की हैं। हाइड्रोकार्बन की खोज और दोहन को बढ़ाने के लिए स्वदेशी प्रौद्योगिकियों को विकसित करने के लिए अनुसंधान एवं विकास कार्यक्रम का एक निश्चित उद्देश्य है। 31.03.2024 तक, 39 परियोजनाएं पूरी हो चुकी हैं और 01 परियोजना प्रगति पर है।

- पेट्रोलियम उद्योग की बढ़ती आवश्यकताओं को पूरा करने के लिए विकासात्मक प्रयासों में तेजी लाने हेतु आईडीटी और आईआईटी खड़गपुर की क्षमताओं को सहक्रियात्मक करने की दृष्टि से भावी दृष्टिकोण के साथ विशेष रूप से अग्रणी क्षेत्रों में कुओं की खुदाई के क्षेत्रों में अनुसंधान के लिए आईआईटी, खड़गपुर के साथ सहयोगात्मक परियोजना। "तापीय रूप से स्थिर योजक और 230 डिग्री सेल्सियस तक उच्च प्रदर्शन जल–आधारित ड्रिलिंग तरल पदार्थ का विकास" नामक एक सहयोगी अनुसंधान एवं विकास परियोजना में शामिल हुआ जिसके तहत 13 पीपीजी मेगावाट के साथ द्रव हानि नियंत्रण योजक और 350 डिग्री फारेनहाइट तक स्थिर का उपयोग करके सोडियम फॉर्मेट आधारित डीएफ फॉर्मूलेशन सफलतापूर्वक किए गए हैं।
- **ओएनजीसी ने गैस मीठा करने की प्रक्रिया के लिए आईआईटी बॉम्बे के साथ सहयोग किया:** 28 अप्रैल 2023 को उरण संयंत्र ने भारतीय प्रौद्योगिकी संस्थान, बॉम्बे (आईआईटीबी) के साथ इंटर फेज मास ट्रांसफर प्रक्रियाओं से जुड़ी एक गहन कार्यनीति के माध्यम से प्राकृतिक गैस को मीठा करने के लिए एक आरएंडडी परियोजना शुरू करने के लिए एक समझौते पर हस्ताक्षर किए।
- **ओएनजीसी ने कार्बन कैप्चर, उपयोग और भंडारण (सीसीयूएस):** अनुसंधान और विकास को बढ़ावा देने के लिए आईआईटी–बी, मुंबई के साथ अनुबंध किया। दी इंस्टीट्यूट ऑफ रिजर्वायर स्टडीज (आईआरएस) ओ एन जी सी ने आईआईटी– बी, मुम्बई में हाल ही में नेशनल सेंटर ऑफ एक्सीलेंस इन कार्बन कैप्चर एंड यूटिलाइजेशन (एनसीओई सीसीयू) के साथ तीन साल के व्यापक अनुबंध पर हस्ताक्षर किए। यह सहयोग नेट–जीरो ओ एन जी सी–2038 विजन के अनुरूप सीसीयूएस के उद्देश्य को आगे बढ़ाने में एक महत्वपूर्ण कदम है।



आईआरएस, ओ एन जी सी, अहमदाबाद ने कार्बन कैप्चर, उपयोग और भंडारण (सीसीयूएस) अनुसंधान और विकास को बढ़ावा देने के लिए आईआईटी–बी, मुंबई के साथ तीन साल के अनुबंध पर हस्ताक्षर किए

- **उत्पादन, इंजीनियरिंग और महासागरीय प्रौद्योगिकी संस्थान (आईपीईओटी)** ने कोलंबिया, दक्षिण अमेरिका में वेलास्केज़ क्षेत्र में हाइड्रोकार्बन उत्पादन कुओं में संक्षारण विफलता के कारण और संक्षारण रोकथाम' के क्षेत्र में तकनीकी परामर्श सेवाएं प्रदान करने के लिए मैसर्स मानसरोवर एनर्जी कोलंबिया लिमिटेड (एमईसीएल) के साथ एक वाणिज्यिक परामर्श परियोजना पर हस्ताक्षर किए।



आईपीईओटी, ओ एन जी सी ने मैसर्स मानसरोवर एनर्जी कोलंबिया लिमिटेड के साथ वाणिज्यिक परामर्श परियोजना पर हस्ताक्षर किए

- पेट्रोलियम उद्योग के लिए प्रत्यक्ष हित और प्रासंगिकता की अनुसंधान परियोजनाओं की पहचान करने और उनका कार्यान्वयन करने तथा तेल और गैस कूपों व अन्य पारस्परिक रूप से सहमति वाले अनुसंधान क्षेत्रों में ड्रिलिंग, ड्रिलिंग तरल पदार्थ, सीमेंटिंग, पूर्ण द्रव चुनौतियों के **समाधान विकसित करने के लिए राजीव गांधी पेट्रोलियम प्रौद्योगिकी संस्थान (आरजीआईपीटी)** के साथ सहयोगात्मक परियोजना। इस समझौते के तहत, मैकेनिकल गुणों, माइक्रोस्ट्रक्चर शोधन और शेल के रूप में बढ़ाने के लिए एकल-चरण सिलिका नैनो तरल पदार्थ' नामक एक सहयोगी अनुसंधान एवं विकास परियोजना सीमेंट स्लरीज के लिए स्टेबलाइजर का कार्य प्रगति पर है।
- **पांच (05) वर्षों की अवधि के लिए भूविज्ञान के क्षेत्रों** में सहयोगात्मक कार्य संबंध के लिए **केशव देव मालवीय पेट्रोलियम अन्वेषण संस्थान (केडीएमआईपीई), ओएनजीसी और सीएसआईआर नेशनल इंस्टीट्यूट ऑफ ओशनोग्राफी (एनआईओ), डोना पाउला, गोवा के बीच 05.01.2022 को एनआईओ के साथ समझौता ज्ञापन पर हस्ताक्षर** किए गए। केडीएमआईपीई और सीएसआईआर एनआईओ दोनों द्वारा जमीनी और अपतटीय बेसिनों को शामिल करते हुए उत्तर-पश्चिमी महाद्वीपीय मार्जिन पर जोर देते हुए भारतीय प्लेट का प्लेट विवर्तनिक विकास और हाइड्रोकार्बन प्रगति पर इसके निहितार्थ नामक एक सहयोगी परियोजना की परिकल्पना की गई है। केडीएमआईपीई और सीएसआईआर-एनआईओ के बीच परियोजना समझौते पर 23.02.2024 को हस्ताक्षर किए गए हैं। सहयोगात्मक परियोजना शुरू की जा रही है।
- **ओएनजीसी, आईआईटी बॉम्बे, बीपीआरएल और ओआईएल के बीच जैसलमेर बेसिन के क्रेटेशियस सक्सेशन की उच्च विभेदन अनुक्रम स्ट्रैटिग्राफिक व्याख्या और जलाशय लक्षण वर्णन के लिए इसके निहितार्थ** के लिए एक सहयोगी परियोजना को सीओई-ओजीई, आईआईटी बॉम्बे में निष्पादित करने की योजना बनाई गई थी। इस परियोजना के लिए शुरूआती बैठक 17.11.2023 को आयोजित की गई थी।
- फरीदाबाद में आईओसीएल अनुसंधान एवं विकास केंद्र के साथ **एक सहयोगी परियोजना 'गैस हाइड्रेट्स गठन और पृथक्करण का अध्ययन और गतिज** अवरोधक के रूप में कार्यात्मक नैनो-सामग्रियों की भूमिका को समझना' शुरू की गई है।
- **सीएसआईआर के साथ अनुसंधान एवं विकास सहयोग: (एनईआईएसटी)** अपनी अनुसंधान पहलों को एक कदम आगे बढ़ाते हुए और उद्योग शिक्षा जगत सहयोग की एक विस्तृत श्रृंखला पर एक कार्यनीतिक गठबंधन का पता लगाने के लिए ओएनजीसी, वर्षों से, अपने हित क्षेत्रों में उच्च गुणवत्ता वाले बुनियादी और अनुप्रयुक्त अनुसंधान को आगे बढ़ाने के लिए शिक्षाविदों / उद्योग के साथ सहयोग कर रहा है। इंस्टीट्यूट ऑफ बायोटेक्नोलॉजी एंड जियोटेक्टोनिक स्टडीज (आईएनबीआईजीएस), असम और असम अराकान बेसिन, जोरहाट ने सीएसआईआर-एनईआईएसटी के साथ एक परियोजना समझौता भी किया है ताकि स्थायी पर्यावरण के उद्देश्य से इलेक्ट्रो-स्पून नैनो-फाइबर झिल्ली का उपयोग करके ओएनजीसी संचालन से संबंधित अपशिष्ट जल उपचार के मुद्दों का समाधान किया जा सके।

- **पूर्वोत्तर पर्वतीय विश्वविद्यालय (एनईएचयू), शिलांग के साथ आरएंडडी सहयोग:** पिछले कुछ दशकों में मैग्नेटोटेल्यूरिक (एमटी) तकनीक विभिन्न भूवैज्ञानिक सेटिंग्स जैसे तलछटी बेसिनों, प्रीकैम्ब्रियन शील्ड, ऑरोजेनिक बेल्ट आदि में पृथ्वी के आंतरिक भाग की गहरी विद्युत प्रतिरोधकता की जाँच और मानचित्रण के लिये एक प्रभावी भूभौतिकीय अन्वेषण उपकरण के रूप में उभरी है। इस तरह के अध्ययन क्रस्टल विकासवादी प्रक्रियाओं को समझने में उपयोगी साबित हुए हैं। इंस्टीट्यूट ऑफ बायोटेक्नोलॉजी एंड जियोटेक्टोनिक स्टडीज (आईएनबीआईजीएस), असम और असम अराकान बेसिन, जोरहाट और एनईएचयू, शिलांग के बीच बनासकांडी क्षेत्र की गहरी भू-विद्युत संरचना को समरूप बनाने और बेसिन विन्यास और तलछट मोटाई का पता लगाने के लिए एक समझौता किया गया था। इस संबंध में, 157 एलकेएम एमटी डेटा एकत्र किया गया था जो आगे अन्वेषण गतिविधियों में मदद कर रहा है।

ओएनजीसी ऊर्जा केंद्र (ओईसी):

ओईसी अग्रणी शैक्षणिक अनुसंधान एवं विकास संस्थानों के सहयोग से 15 सहयोगी अनुसंधान एवं विकास परियोजनाओं पर निम्नानुसार काम कर रहा है:

टेक्नोलॉजी/कार्यक्रम	संस्थान
हाइड्रोजन	• रासायनिक प्रौद्योगिकी संस्थान (आईसीटी), मुंबई • भारतीय प्रौद्योगिकी संस्थान (आईआईटी), दिल्ली • वैज्ञानिक और औद्योगिक अनुसंधान परिषद (सीएसआईआर)–केंद्रीय लवण और समुद्री रसायन अनुसंधान संस्थान (सीएसएमसीआरआई), भावनगर • सीएसआईआर–सेंट्रल ग्लास एंड सिरेमिक रिसर्च इंस्टीट्यूट (सीजीसीआरआई), कोलकाता • सीएसआईआर–नेशनल इंस्टीट्यूट फॉर इंटरडिसिप्लिनरी साइंस एंड टेक्नोलॉजी (एनआईआईएसटी), तिरुवनंतपुरम • बिरला इंस्टीट्यूट ऑफ टेक्नोलॉजी एंड साइंस (बिट्स) पिलानी, गोवा • भारतीय प्रौद्योगिकी संस्थान (आईआईटी), मद्रास
भूतापीय	• आइसलैंड जियोसर्वे (आईएसओआर), आइसलैंड
ऊर्जा हेतु जैव प्रौद्योगिकी	• अगरकर अनुसंधान संस्थान (एआरआई), पुणे • द एनर्जी एंड रिसोर्सेज इंस्टीट्यूट (टेरी), नई दिल्ली • पीएसजी इंस्टीट्यूट ऑफ एडवांस्ड स्टडीज (पीएसजीआईएएस), कोयंबटूर • केशव देव मालवीय इंस्टीट्यूट ऑफ पेट्रोलियम एक्सप्लोरेशन (केडीएमआईपीई), देहरादून
सी ओ 2 वैलोराइजेशन	• रासायनिक प्रौद्योगिकी संस्थान (आईसीटी), मुंबई • सीएसआईआर–नेशनल इंस्टीट्यूट फॉर इंटरडिसिप्लिनरी साइंस एंड टेक्नोलॉजी (एनआईआईएसटी), तिरुवनंतपुरम
यूरेनियम	• परमाणु ऊर्जा विभाग (डीएई) • परमाणु खनिज निदेशालय (एएमडी), हैदराबाद • भाभा परमाणु अनुसंधान केंद्र (बीएआरसी), मुंबई • वेरिएबल एनर्जी साइक्लोट्रॉन सेंटर (वीईसीसी), कोलकाता, पश्चिम बंगाल • यूरेनियम कॉर्पोरेशन ऑफ इंडिया लिमिटेड (यूसीआईएल), जादूगुडा • सीएसआईआर–नेशनल जियोफिजिकल रिसर्च इंस्टिट्यूट (एनजीआरआई), हैदराबाद • इंस्टीट्यूट ऑफ रिजर्वायर स्टडीज (आईआरएस), अहमदाबाद • क्षेत्रीय भूविज्ञान प्रयोगशालाएं (आरजीएल), वडोदरा • पेट्रोलियम सुरक्षा, स्वास्थ्य और पर्यावरण प्रबंधन संस्थान (आईपीएसएचईएम), गोवा • केशव देव मालवीय इंस्टीट्यूट ऑफ पेट्रोलियम एक्सप्लोरेशन (केडीएमआईपीई), देहरादून
हीलियम	• सीएसआईआर–भारतीय पेट्रोलियम संस्थान (आईआईपी), देहरादून
सौर तापीय	• भाभा परमाणु अनुसंधान केंद्र (बीएआरसी), मुंबई • भारतीय प्रौद्योगिकी संस्थान (आईआईटी), बॉम्बे
उत्पादित जल शोधन	• सीएसआईआर–केंद्रीय नमक और समुद्री रसायन अनुसंधान संस्थान (सीएसएमसीआरआई), भावनगर • भाभा परमाणु अनुसंधान केंद्र (बीएआरसी), मुंबई

8.1.2. आईओआर/ईओआर कार्यकलापों के क्षेत्र में ओएनजीसी द्वारा आरएंडडी पहल

ओएनजीसी क्षेत्रों के कार्यनिष्पादन विश्लेषण के लिए किफायती परिवहन के लिए दीर्घकालिक विकल्प आधार पर प्रयास करती है तथा क्षेत्र निष्पादन और रिकवरी में सुधार के लिए उपयुक्त सुधारात्मक उपाय किए जाते हैं। वास्तव में, रिकवरी घटक को 40% तक सुधारना ओएनजीसी के कार्यनीतिक लक्ष्यों में से एक है। ओएनजीसी द्वारा प्रचालित क्षेत्रों की निष्कर्षण दक्षता अथवा निकासी घटक अंतर्राष्ट्रीय मानकों के साथ तुलनीय है, हालांकि इसमें सुधार के लिए और प्रयास किए जा रहे हैं। रिकवरी फैक्टर को बढ़ाने के लिए मुख्य अनुसंधान और विकास उपाय निम्नानुसार हैं:

- **मुंबई हाई साउथ फील्ड में कम लवणता वाले जल बाढ़ (एलएसडब्ल्यूएफ) पायलट:** इस परियोजना को बोर्ड द्वारा एमएचएसआरडी चरण–IV के अंतर्गत अनुमोदित किया गया है। इसके अलावा, एलएसडब्ल्यूएफ स्क्रीनिंग रिपोर्ट को जून–2019 में डीजीएच द्वारा अनुमोदित किया गया था। प्रायोगिक परियोजना कार्यान्वित की जा रही है। अंतरूक्षेपण मई, 2022 में शुरू हुआ। इसमें वर्ष 2035 तक वृद्धिशील वसूली में 0.8% की सुधार करने की परिकल्पना की गई है।
- **झालोरा फील्ड के के–IV पे में एएसपी परियोजना का व्यावसायीकरण:** एएसपी परियोजना के कार्यान्वयन पर मार्च 2022 से विचार किया गया है। इस परियोजना में 12524 करोड़ रुपए के पूंजीगत व्यय की परिकल्पना की गई है। परियोजना के कार्यान्वयन से 2036–37 तक 0774 एमएमटी की वृद्धिशील तेल की परिकल्पना की जाएगी।
- **कासोमरीगांव क्षेत्र में गैस समर्थित गुरुत्व जल निकासी:** इस योजना में 33% की रिकवरी और 75 करोड़ रुपए के पूंजीगत व्यय के साथ 031 एमएमटी की वृद्धिशील तेल की परिकल्पना की गई है। एफआर स्वीकृत और परियोजना कार्यान्वयनाधीन है जिसे 2024–25 की प्रथम तिमाही तक पूरा होने की संभावना है।
- **खोराघाट क्षेत्र में गुरुत्व समर्थित अमिश्रणीय गैस अंतरूक्षेपण (ईओआर):** इस योजना में 23% की रिकवरी और 157 करोड़ रुपए के पूंजीगत व्यय के साथ 0.15 एमएमटी के वृद्धिशील तेल की परिकल्पना की गई है। परियोजना अनुमोदित की गई है और परियोजना कार्यान्वयनाधीन है जिसके 2024–25 की प्रथम तिमाही तक पूरा होने की संभावना है।
- **संथाल में डाउन डिप एयर इंजेक्शन:** 6 एयर इंजेक्टर और 3 नए उत्पादकों के साथ 2 पैटर्न अनुमोदित किए गए हैं और कार्यान्वयन के अधीन हैं। परिकल्पित वृद्धिशील तेल 0.222 एमएमटी है।
- **बेचराजी क्षेत्र में पूर्ण क्षेत्र पश्चलिमर बाढ़:** क्षेत्र कार्यान्वयन समय को कम करने के लिए पायलट परिणामों से पहले पूर्ण क्षेत्र पॉलिमर बाढ़ अध्ययन किया गया। वृद्धिशील लाभ एफआर एनवी के 4,960 एम3 के मुकाबले 13 महीनों में 5,057 एम3 है। स्कीम का पूर्ण फील्ड अनुप्रयोग अनुमोदित कर दिया गया है और कार्यान्वयनाधीन है। इस योजना में 2045–46 तक ~1.8 एमएमटी के वृद्धिशील तेल के साथ 63 नए विकास स्थानों (तेल उत्पादक–35 और पॉलिमर इंजेक्टररू 28) की ड्रिलिंग की परिकल्पना की गई है। पॉलिमर इंजेक्शन अक्टूबर 2023 में शुरू हुआ।
- **संथाल फील्ड:** मौजूदा आईएससी स्कीम को इष्टतम बनाने और पैटर्न एयर इंजेक्शन द्वारा 940 मी एमएसएल कंटूर से नीचे डाउन डिप ऑयल को लक्षित करने के लिए सिमुलेशन अध्ययन किया गया। इनपुट 15 एफआर से अतिरिक्त एयर इंजेक्टर (एयर इंजेक्शन 7 से 13 एलसीएमडी तक बढ़ाने के लिए) माना गया। इसमें 2.6 के वृद्धिशील तेल लाभ एमएमटी (बीएयू पर ~5%) और 2035 तक 43% रिकवरी की परिकल्पना की गई है। डाउन डिप एयर इंजेक्शन अनुमोदित है और कार्यान्वयनाधीन है।
- **साणंद में एएसपी पायलट:** वृद्धिशील तेल 6,450 एम3 की परिकल्पना की गई। यह परियोजना मई 2022 में शुरू हुई थी।
- **नवागाम में उच्च दबाव एयर इंजेक्शन पायलट:** हल्के तेल में पहली बार एयर इंजेक्शन का परीक्षण किया जाएगा। परिकल्पित वृद्धिशील तेल 37,000 एम³।
- **गांधार क्षेत्र में कार्बन कैप्चर, उपयोग और भंडारण (सीसीयूएस) के रूप में कार्बन डाईआक्साइड ईओआर:** यह भारत में सीसीयूएस के लिये पहला कार्बन डाईआक्साइड ईओआर होगा। गांधार क्षेत्र में सीसीयूएस के रूप में कार्बन डाईआक्साइड ईओआर का व्यवहार्यता अध्ययन किया गया था। अध्ययन में 2025–26 से कार्बन डाईआक्साइड इंजेक्शन और 2026–27 से उत्पादन की परिकल्पना की गई है। इस परियोजना में 20 वर्षों के लिए 75 नए कूपों की ड्रिलिंग और 1500 टीपीडी की दर से कार्बन डाईआक्साइड इंजेक्शन की परिकल्पना की गई है। वृद्धिशील उत्पादन 2045–46 तक ~4.2 एमएमटीओ + ओईजी (तेल

~3.2 एमएमटी + गैस ~1 बीसीएम) होने की परिकल्पना की गई है। परियोजना काल के दौरान लगभग 6.5 एमएमटी कार्बन डाईआक्साइड को अनुक्रमित किए जाने की उम्मीद है।

- **लानवा क्षेत्र में चक्रीय स्टीम स्टीमुलेशन (सीएसएस) पायलट:** इस योजना में 8 वर्षों की अवधि में 0.312 एमएमटी के वृद्धिशील तेल की परिकल्पना की गई है। प्रथम कुएं एलएनडब्लू#216 में स्टीम इंजेक्शन फरवरी 2024 में शुरू हुआ।

8.1.3. ओएनजीसी द्वारा पंजीकृत आरएंडडी पेटेंट

ओएनजीसी ने देश की समग्र प्रगति में योगदान देने के लक्ष्य के साथ अपनी व्यापक अनुसंधान एवं विकास पहलों के माध्यम से रचनात्मकता और नवाचार को लगातार बढ़ावा दिया है। ओएनजीसी के भीतर बौद्धिक संपदा (आईपी) का सृजन मुख्य रूप से इसके विविध संस्थानों और कार्य केंद्रों में आयोजित अनुसंधान एवं विकास गतिविधियों से उत्पन्न होता है, जिनमें से प्रत्येक अन्वेषण और उत्पादन मूल्य श्रृंखला के विभिन्न पहलुओं में विशेषज्ञता रखता है। 1 जनवरी, 2023 से 31 मार्च, 2024 की अवधि के दौरान ओएनजीसी ने 35 पेटेंट प्राप्त किए हैं, 14 पेटेंट दायर किए हैं। इसके अलावा, इसने 08 कॉपीराइट पंजीकृत किए हैं और 06 कॉपीराइट आवेदन किए हैं।

विवरण नीचे दिया गया है।

क. ओएनजीसी द्वारा प्राप्त पेटेंट:

- एक सैल्क–क्लीनिंग कोटिंग सोल्युशन और कॉनफोकल कुअल–स्प्रे कोटिंग प्रक्रिया
- कच्चे तेल की थर्मल परिपक्वता के मात्रात्मक अनुमान के लिए एक प्रणाली और विधि
- नियत अपतटीय प्लेटफॉर्म के पुनर्मूल्यांकन के लिए विधि
- तलछटी चट्टानों के डायग्नेसिस के दौरान भौतिक–रासायनिक स्थितियों और घटनाओं के मूल्यांकन की विधि
- कार्बन डाईआक्साइड मीथेनेशन अभिक्रिया के लिए उत्प्रेरक जिसमें उच्च गतिविधि और दीर्घकालिक स्थिरता और उसकी प्रक्रिया होती है।
- अत्यधिक उच्च दाब और उच्च तापमान अनुप्रयोगों में उपयोग के लिए समापन तरल पदार्थ के लिए संरचना
- एक उन्नत तेल कूप सीमेंट तैयार करने की प्रक्रिया
- बजरी पैकिंग और सीलिंग के लिए शीर्ष संयोजन पर
- परतदार शेल रेत कुंडों में जल संतृप्ति और निवल मूल्य का आकलन करने की प्रक्रिया
- इनर स्ट्रिंग आवरण सीमेंटेशन सिस्टम और तेल या गैस कुओं के लिए सीमेंटेशन प्रक्रिया
- प्रबलित प्लास्टिक बाड़ लगाने वाली प्रणाली
- माइक्रोग्रैविटी द्वारा पेट्रोलियम प्रांतों की पहचान के लिए एक प्रणाली और विधि
- परमाणु चुंबकीय अनुनाद लॉग से मुक्त द्रव कट ऑफ मूल्य के आकलन के लिए प्रक्रिया
- सकर रॉड पंप के लिए उत्पादन वृद्धि उपकरण
- अपरंपरागत जलाशयों की शेल गैस क्षमता का आकलन करने के लिए एक विधि
- गैर–सीमेंट क्षति नियंत्रण संरचना तैयार करने की प्रक्रिया
- मध्यवर्ती प्रतिबाधा की जलाशय परत को चित्रित करने के लिए प्रणाली और विधि
- कुशल और आरोग्य सेल्फ–क्लीनिंग कोटिंग तैयार करने की एक विधि
- तरल को एक बांध की दीवार को ओवरटॉपिंग से रोकने के लिए उपकरण और विधि
- भूमिगत कोयला बेड मीथेन कुओं से मीथेन उत्पादन
- समाप्त जलाशयों में खोए हुए परिसंचरण को नियंत्रित करने के लिए संरचना
- उप–सतह संरचनाओं के गणना सीमेंटेशन प्रतिपादक द्वारा वास्तविक हाइड्रोकार्बन संतृप्ति के आकलन की प्रक्रिया
- तेल और गैस कुओं में क्षय को रोकने के लिए अच्छी तरह से पूरा तरल पदार्थ और प्रक्रिया
- 2डी एनएमआर स्पेक्ट्रोस्कोपी का उपयोग करके शेल जलाशयों के द्रव घटकों के लक्षण वर्णन करने के लिए विधि
- कच्चे तेल की थर्मल परिपक्वता के इष्टतम मात्रात्मक अनुमान के लिए एक प्रणाली
- इष्टतम ताप उपयोग के लिए बेहतर अप्रत्यक्ष बाथ हीटर

- एक मलबे निस्पंदन संयोजन
- लिग्नाइट से बायो मीथेन उत्पादन के लिए एक नए एनारोबिक संघ का विकास
- कुशल और आरोह्य सेल्फ–क्लीनिंग कोटिंग तैयार करने की विधि
- बजरी पैकिंग के लिए शीर्ष प्रणाली के लिए 5½ "और 7" आवरण आकार के लिए सार्वभौमिक एक्स–ओवर टूल (सर्विस उपकरण) का डिजाइन बनाना और विकसित करना
- चिकनाई सूत्रीकरण और तत्संबंधी उपयोग
- कार्बन डाईआक्साइड मीथेनेशन प्रतिक्रिया का उपयोग जिसमें उच्च गतिविधि और उत्प्रेरक की दीर्घकालिक स्थिरता और उसके लिए विधि होती है
- अम्ल और ऑक्सीकारक प्रतिरोधी धनायन परिवर्तनीय झिल्ली और इसकी तैयारी की विधि
- उच्च दबाव/उच्च तापमान तेल और गैस कूप के लिए वैकल्पिक बजरी पैक/क्रैक पैक पैकर का डिजाइन और विकास
- लिग्नाइट के ह्यूमिक एसिड के बायोकोनवर्जन के लिए एक प्रक्रिया

ख. ओएनजीसी द्वारा दायर पेटेंट:

- लिग्नोसेल्यूलोसिक बायोमास के एसिड हाइड्रोलिसिस के लिए भिन्नात्मक हाइड्रोलिसिस रिएक्टर प्रणाली
- लिग्नोसेल्यूलोसिक बायोमास से किण्वित शर्करा के उत्पादन के लिए नव भिन्नात्मक एसिड हाइड्रोलिसिस प्रक्रिया विधि
- बेंजोकार्बाजोल और बेंजोख्बी, नेपथोथियोफेनेस के एक साथ अलगाव और पहचान की एक विधि
- एक बेहतर जैल गठन और एक बेहतर जैल गठन तैयार करने की प्रक्रिया
- इष्टतम ताप उपयोग हेतु संवर्धित अप्रत्यक्ष बाथ हीटर
- स्वचालित गलती का पता लगाने और पकड़ने की विधि
- मोम युक्त कच्चे तेल के इमल्शनों के कम तापमान के विपायन के लिए विपायित संघटक।
- मोम युक्त कच्चे तेल के लिए बहाव बिंदु शमक संघटक
- कच्चे तेल की थर्मल परिपक्वता के मात्रात्मक अनुमान की एक प्रणाली और विधि
- सल्फेट कम करने वाले बैक्टीरिया के नियंत्रण के लिए बायोसाइड
- गैर–सीमेंटियस ह्रास नियंत्रण संरचना तैयार करने की प्रक्रिया (यूएसए में दायर)
- गैर–सीमेंटियस ह्रास नियंत्रण संरचना तैयार करने की प्रक्रिया (मलेशिया में दायर)
- बहिस्त्राव जल आधारित ड्रिलिंग तरल पदार्थ तैयार करने की प्रक्रिया
- सिलोक्सेन आधारित नैनो–हाइब्रिड पोर पॉइंट डिप्रेसेंट

ग. ओएनजीसी द्वारा पंजीकृत कॉपीराइट:

- तेल क्षेत्र के लिए डेटा विश्लेषण के लिए तेल क्षेत्र विश्लेषक (ओएफए) सॉफ्टवेयर–यह एक ही स्थान पर सभी अच्छी तरह से संबंधित डेटा को फीड करने के लिए एक एकल मंच प्रदान करता है जिसे संगठन/उत्पादक आस्ति में साझा किया जा सकता है। उत्पादन वितरण निर्धारित करने की क्षमता– तेल, तरल और गैस दर की अधिकतम, न्यूनतम और प्रतिशत भिन्नता सॉफ्टवेयर की मुख्य विशेषताओं में से एक है, जो किसी विशेष कुएं के प्रदर्शन की जांच करने के लिए उपयोगी हो सकती है।
- गैस वेल डिलीक्विफिकेशन के लिए पीईबीयूएल सॉफ्टवेयर
- डीएआईएल सॉफ्टवेयर– आंतरायिक गैस लिफ्ट (डीएआईएल) का गतिशील अनुप्रयोग पहले सिद्धांत पर आधारित यांत्रिक सॉफ्टवेयर है जो इसके प्रदर्शन की भविष्यवाणी, विश्लेषण और अनुकूलन के लिए आंतरायिक गैस लिफ्ट प्रक्रिया के गतिशील सिमुलेशन को पूरा करता है। भौतिकी आधारित मॉडल के रूप में, यह एक आंतरायिक गैस लिफ्ट चक्र में क्षणिक भौतिक प्रक्रियाओं का यथार्थवादी कार्य करता है।
- हाइड्रेटमाइड
- ए–रॉड (सकर रॉड पंप (एसआरपी) पूरा करने के लिए सॉफ्टवेयर)
- डिसकंटीन्यूटी ट्रैकर (पायथन आधारित आर्टिफिशियल इंटेलिजेंस/मशीन लर्निंग सॉफ्टवेयर)
- वेल पाथ ऑप्टिमाइजेशन सॉफ्टवेयर (डब्ल्यूपीओएस)
- सिस्लेस्टिक्स (पायथन आधारित आर्टिफिशियल इंटेलिजेंस/मशीन लर्निंग सॉफ्टवेयर)

घ. ओ एन जी सी द्वारा दायर कॉपीराइट:

- ए–रॉड (सकर रॉड पंप (एसआरपी) पूरा करने के लिए सॉफ्टवेयर)
- डिसकंटीन्यूटी ट्रैकर (पायथन आधारित आर्टिफिशियल इंटेलिजेंस/मशीन लर्निंग सॉफ्टवेयर)
- वेल पाथ ऑप्टिमाइज़ेशन सॉफ्टवेयर (डब्ल्यूपीओएस)
- 'हाइड्रेटमाइंड' इन–हाउस विकसित एमएल एल्गोरिदम–आधारित सॉफ्टवेयर जो जीएंडजी डेटा का उपयोग करके गैस हाइड्रेट जोन की पहचान करने में मदद करता है
- सिस्लेस्टिक्स (पायथन आधारित आर्टिफिशियल इंटेलिजेंस/मशीन लर्निंग सॉफ्टवेयर)
- वेललिटिक्स (पायथन आधारित आर्टिफिशियल इंटेलिजेंस/मशीन लर्निंग सॉफ्टवेयर)

8.1.4. ओ एन जी सी में शामिल नई प्रौद्योगिकी

ओ एन जी सी उद्योग बेंचमार्कों के साथ संरेखित करने के लिए अत्याधुनिक प्रौद्योगिकियों को अपनाने और एकीकृत करने के लिए लगातार प्रयास कर रही है। इस अवधि के दौरान मूल्यांकित/शामिल की गई प्रौद्योगिकियों की मुख्य विशेषताएं नीचे दी गई हैं।

- **अत्याधुनिक कार्बन कैप्चर यूटिलाइजेशन और स्टोरेज (सीसीयूएस) प्रयोगशाला:** केशव देव मालवीय इंस्टीट्यूट ऑफ पेट्रोलियम एक्सप्लोरेशन (केडीएमआईपीई), देहरादून ने केडीएमआईपीई में सीसीयूएस प्रयोगशाला स्थापित करके नेट जीरो के लक्ष्य को प्राप्त करने की दिशा में एक कदम उठाया है। इस प्रयोगशाला का उद्देश्य कार्बन उत्सर्जन में कमी और नवीकरणीय ऊर्जा के उपयोग को बढ़ाने की दिशा में कंपनी के लक्ष्यों को प्राप्त करना है।



निदेशक (अन्वेषण), ओ एन जी सी ने ऑएनजीसी, केडीएमआईपीई, देहरादून में अत्याधुनिक कार्बन कैप्चर यूटिलाइजेशन एंड स्लोरेज (सीसीयूएस) प्रयोगशाला का उद्घाटन किया

- **रियोमीटर:** दबाव सेल (400 बार) के साथ अत्याधुनिक उपकरण नए रियोमीटर का उपयोग 200 डिग्री सेल्सियस तक के तापमान पर पानी आधारित जेल फार्मूलेशन और अन्य द्रव नमूनों की चिपचिपाहट माप करने के लिए किया जाएगा और विशेष दबाव (वायुमंडलीय से 400 बार) पर जो पानी/हल्के घटकों के स्टीमीकरण के कारण दबाव सेल के बिना रियोमीटर में संभव नहीं था।

- **लेजर विवर्तन कण आकार विश्लेषक:** यह उपकरण गैस हाइड्रेट वाले रेतीले खदान के निक्षेपणीय वातावरण और पायलट उत्पादन परीक्षण में इष्टतम रेत नियंत्रण प्रणाली को डिजाइन का वर्णन करने में सहायक है जो जलाशय से वेल बोर में रेत के जाने के प्रभावी नियंत्रण का कारण बन सकता है। यह उपकरण विषमता और कुर्टोसिस जैसे महत्वपूर्ण तलछट के गुणों का वर्णन करने में भी बहुत सहायक है, जो ओएनजीसी के पारंपरिक तेल और गैस क्षेत्रों के जलाशय के लक्षण वर्णन की अवधारणा करते समय बहुत महत्वपूर्ण भूमिका निभाता है। विभिन्न बेसिनों और परिसंपत्तियों से प्राप्त नमूनों की व्याख्या के साथ अनाज के आकार (µm), कुर्टोसिस, तिरछापन, एसटीडीएवी (µm), डी10, डी50 और डी90 (µm) जैसे विभिन्न प्रमुख अवसादी अध्ययन किए गए थे।

- **रसायन रहित टाइनी बबल प्रौद्योगिकी आधारित ईटीपी (300 केएलडी)–कैम्बे:** उत्पादित जल के शोधन के लिए किसी रसायन की आवश्यकता के बिना वैधानिक मानदंडों को पूरा करने के लिए उत्पादित बहिस्त्राव जल के उपचार के लिए अगली पीढ़ी की प्रौद्योगिकी जो इस उद्देश्य के लिए उपकरणों के एक सेट और डिजाइन प्रक्रियाओं के साथ होती है। इस डिजाइन में कुछ मुख्य घटक जैसे झुकी हुई प्लेट इंसेप्टर (टीपीआई), टाइनी बबल सर्जक (टीबीजी), सिलिका कार्बाइड सिरेमिक मेम्ब्रेन सेपरेशन सिस्टम (एसआईसीसीएमएस) शामिल हैं, जिसमें अन्य घटकों के साथ बहिस्त्राव निपटान के वैधानिक दिशानिर्देशों को पूरा करने के लिए इनलेट बहिस्त्राव जल का शोधन किया जा सकता है।

- **ओएनजीसी ने पश्चिमी अपतटीय कार्बोनेट जलाशयों के उद्दीपन के लिए अगली पीढ़ी एसिडाइजिंग फॉर्मूलेशन (एसपीआरएएस) विकसित किया:** कार्बोनेट जलाशयों में मैट्रिक्स उद्दीपन में हाइड्रोक्लोरिक एसिड (एचसीएल) उपयोग करते हुए चुनौतियों को दूर करने के लिए आईपीईओटी ने एक नया सूत्रीकरण अर्थात सिंगल फेज रिटार्डेड एसिड सिस्टम (एसपीआरएएस) विकसित किया है

जो रिटार्डिंग सर्फैक्टेंट का उपयोग करके प्रतिक्रिया की दर को धीमा कर देता है और डीजल के उपयोग को पूरी तरह से समाप्त कर देता है।

- एस्फाल्टीन हटाने के लिए पर्यावरण अनुकूल वैकल्पिक विलायक का विकास।
- सीबीएम में प्रयुक्त फ्रैक द्रव के लिए उपयुक्त एंजाइम आधारित ब्रेकर का विकास।
- **मेहसाणा परिसंपत्ति में अत्यधिक बहिस्त्राव जल शोधन संयंत्र (एईडब्ल्यूटीपी) का सफलतापूर्वक कार्यान्वयन:** ओएनजीसी ने भाभा परमाणु अनुसंधान केन्द्र (बार्क), मुम्बई के सहयोग से प्रायोगिक पैमाने पर पूर्व–ईटीपी उत्पादित जल को पीने योग्य ग्रेड में परिवर्तित करने का प्रदर्शन किया है जिससे शोधन की लागत 40 रु प्रति लीटर रखते हुए 50–60% का उल्लेखनीय रिकवरी घटक प्राप्त हुआ है।
- **स्व सहायता प्राप्त प्लंजर लिफ्ट (एसएपीएल):** स्व सहायता प्राप्त प्लंजर लिफ्ट ऊर्जा के बाहरी स्रोत और अन्य सक्रिय विधियों की आवश्यकता के बिना कुओं के स्वचालित डी–लिक्विफैक्शन की एक तकनीक है जिससे निरंतर उत्पादन होता है। त्रिपुरा एसेट ने अगरतला डोम, कोनाबन और सुंदरबाड़ी क्षेत्रों के 20 कुओं में पायलट आधार पर प्लंजर लिफ्ट सिस्टम को सफलतापूर्वक चालू किया।
- स्टेबल आइसोटोप लैब हेतु फ्लैश आईआरएमएस (स्मार्ट ईए विकल्प के साथ सीएफ–ईए–आईआरएमएस) के लिए स्मार्ट ईए विकल्प के साथ जीसी और ईए इंटरफेस के साथ **''किफायती परिवहन के लिए दीर्घकालिक विकल्प प्रवाह आईसोटोप रेसियो मास स्पेक्ट्रोमीटर''** नामक अत्याधुनिक उपकरण खरीदे गए हैं और स्थापित किए गए हैं। यह ओएनजीसी की एक अनूठी केंद्रीकृत सुविधा है, जो सी, ओ, एस और नाइट्रोजन आइसोटोप के अध्ययन को सक्षम बनाती है।
- **ओआईएमएस–असम:** ऑनशोर इनोवेशन एंड मॉनिटरिंग स्फीयर (ओआईएमएस), दीनदयाल ऊर्जा भवन, नई दिल्ली में वास्तविक बुनियादी ढांचे (सहयोगपूर्ण स्क्रीन, सर्वर, आदि) के साथ स्थापित किया गया है, ताकि सह–विकसित समाधानों के कार्यान्वयन की सुविधा मिल सके, जिससे सह विकसित समाधानों के कार्यान्वयन को सुकर बनाया जा सके ताकि निर्णय लेने में आसानी हो सके और एसेट टीम के साथ पेन प्वाइंट पर प्रतिबिंबित हो तथा इसके समाधान के लिए विशेष रूप से विकसित प्रोटोटाइप समाधान हो। इससे विषय–वस्तु विशेषज्ञ (एसएमई), वांछनीय स्थानों में एसएमई के सह–स्थान, उत्पादन सुविधा से दूरस्थ और एक अल्प सूचना पर विक्रेता एसएमई सहायता तक त्वरित पहुंच की सुविधा प्राप्त होगी। पायलट आधार पर असम परिसंपत्ति के रुद्रसागर क्षेत्र के 10 कूपों के लिए बालू अंतर्वाह शमन के लिए एक प्रोटोटाइप विकसित किया गया था।
- **ड्रिलिंग करते समय आवरण (सीडब्ल्यूडी):** मुंबई अपतट के कूपों को कंडक्टर और सतह आवरण की अल्प लैडिंग के कारण सतही खंडों में एनपीटी का सामना करना पड़ रहा है। एनपीटी मुख्यतः पाइल हैमर असफल मामलों/सुरक्षा और समेकित संघटन के कारण है। 30'' कंडक्टर पाइलिंग मुद्दों और 20'' आवरण के लिए आगे ड्रिलिंग के मद्देनजर पायलट आधार पर 6 कूपों में 30'' और 20'' सीडब्ल्यूडी के लिए प्रस्ताव किया गया है। सभी 06 कुओं में सफलतापूर्वक सीडब्ल्यूडी किया गया। यह ऊर्ध्वाधर खोजपूर्ण कुओं के लिए एक सुरक्षित और तेज प्रौद्योगिकी साबित हुई है, दोनों चरणों के लिए ड्रिल स्ट्रिंग के रूप में आवरण का उपयोग करके यह हासिल की गई है। यह सतह रिसाव नुकसान और प्रारंभिक कुआ के चरणों के लिए संबंधित जटिलताओं के लिए समाधान है।
- **स्वचालित–ड्रिलर:** कई ड्रिलिंग मापदंडों का उपयोग करके ट्रेवेलिंग ब्लॉकों में चिकनाई और नीचे करने की सटीक क्रिया प्रदान किया जाता है और आरओपी में वृद्धि करते हुए उच्च गुणवत्ता वाले वेलबोर उत्पन्न करने के लिए लगातार ड्रिल लाइन पे–आउट फीड किया जाता है। इंस्टीट्यूट ऑफ ड्रिलिंग टेक्नोलॉजी, ओएनजीसी ने 1 वर्ष के लिए पायलट प्रोजेक्ट के रूप में टाइप–2 और उससे ऊपर के रिगों में ऑटो ड्रिलर सिस्टम/ई–वाइल्डकैट टीएम 2.0 को शामिल किया। इसे जोरहाट, अंकलेश्वर, राजमुंदरी, शिवसागर और अगरतला में से प्रत्येक में 1 रिग में स्थापित किया गया है।
- **ड्रिलिंग करते हुए लाइनर (एलडब्ल्यूडी):** लाइनर ड्रिलिंग एक एकीकृत सेवा समाधान है जो ड्रिलिंग समय और लागत को कम कर सकता है, अनुत्पादक समय (एनपीटी) को कम कर सकता है, परेशानी उत्पन्न करने वाले क्षेत्रों के माध्यम से ड्रिलिंग के जोखिम को कम कर सकता है, और यह सुनिश्चित करने में मदद करता है कि लाइनर कुल गहराई तक पहुंच जाए। 02 कुओं में सफलतापूर्वक एलडब्ल्यूडी किया गया।

- **रियल टाइम आंकड़ा प्रबंधन और निगरानी (आरटीडीएमएम)–असम:** महत्वपूर्ण ड्रिलिंग मापदंडों और इंजन, मड पंप, जनरेटर, डायनेमिक गैस ब्लेंडिंग और पूरे बेड़े के अन्य उपकरण मापदंडों के एकीकरण की निगरानी के लिए रियल टाइम डैशबोर्ड। यह समेकित करता है और उच्च एवं निम्न आवृत्ति डेटा बैंक का सृजन करता है।
- **ड्रिलिंग सेवाओं के लिए ''सॉफ्ट स्पीड–II प्रौद्योगिकी'', असम परिसंपत्ति:** कूप जीकेआईएक्स (रिग ईवी–2000–5) में शामिल किया गया और बाद में जीकेबीएक्स (रिग ईवी–2000–3) में परिचालन किया गया।
- **ड्रिलिंग सेवाओं के लिए अक्षीय दोलन उपकरण, असम परिसंपत्ति:** कूप एनजीडीएफ (रिग एम–6100–1) में शामिल किया गया और असम परिसंपत्ति में प्रचालनात्मक है।
- **रियल टाइम ड्रिलिंग प्रचालन केंद्र (आरटीडीओसी):** ओएनजीसी में सभी ड्रिलिंग गतिविधियों की निगरानी और पर्यवेक्षण करने और जटिलताओं से बचने के लिए हस्तक्षेप करने और शमन उपायों का सुझाव देने के लिए ड्रिलिंग प्रौद्योगिकी संस्थान में शुरू किया गया।
- **''थर्मोसेट राल'':** वेल# वीएडीए में नई तकनीक को लागू किया गया और जल क्षेत्र के सफल अलगाव को हासिल हुआ जिससे 0.25 एमएमएससीएमडी गैस अधिक उत्पादन हुआ।
- **रीमर सेवाओं के तहत 12¼ x 14¾:** ओएनजीसी के स्थल भाग में प्रथम बार एनवीवी#एए में 10½ के पीडीसी बिट के साथ रीमर सेवाओं के अंतर्गत उपयोग करते हुए 10½x10¼ से छिद्र को ड्रिल किया गया और बड़ा किया गया (ड्रिलिंग करते हुए एचईडब्लूडी–छिद्र विस्तार) और इस खंड की ड्रिलिंग 124 दिनों की योजना के मुकाबले 53 दिनों में पूरी की गई।
- **सीएसएस (चक्रीय स्टीम उद्दीपन) ईओआर तकनीक:** भारी तेल क्षेत्र से तेल उत्पादन बढ़ाने के लिए, मेहसाणा के लानवा क्षेत्र में इसे लागू किया जा रहा है, परियोजना ने महत्वपूर्ण प्रगति हुई है, जिसमें 12 कुओं की ड्रिलिंग के लिए योजना बनाई गई है, जिनमें से 8 पहले ही पूरे हो चुके हैं।
- **पैन इंडिया हाइड्रो फ्रैक्चरिंग डाटा सेंटर:** मेहसाणा आस्ति में लिंच#219 कुंआ में रियल टाइम हाइड्रो फ्रैक्चरिंग जॉब डेटा ट्रांसफर पायलट स्केल पर किया गया। इसके अलावा अपतटीय सहित अन्य कार्य केन्द्रों तक भी इसका विस्तार किया जाएगा।
- **रिटम–गन परफोरेशन प्रौद्योगिकी** कैम्बे के 5 कूपों में कार्यान्वित की गई और इसे मामूली रूप से सफल पाया गया। रिटम–गन एक संयोजन छिद्रित बंदूक/ऑक्सीडाइज़र रिलव है जिसे स्लीक–लाइन, इलेक्ट्रिक लाइन, क्वालिंग टयूबिंग या टयूबिंग के माध्यम से छिद्रित प्रणालियों के माध्यम से व्यक्त किया जा सकता है और पुराने कम दबाव वाले पुनः उत्पन्न करने वाले जलाशयों में अच्छी उत्पादकता को बढ़ाता है और संतुलित टीसीपी ऑपरेशन के साथ संयुक्त होने पर फायदेमंद साबित हुआ है।
- **प्लाज्मा पल्स प्रौद्योगिकी:** निकटवर्ती वेलबोर क्षति को दूर करने के लिए, भाभा परमाणु अनुसंधान केन्द्र की प्लाज्मा पल्स टूल प्रौद्योगिकी का उपयोग अहमदाबाद में 5 कुओं और मेहसाणा संपत्ति में 02 कुओं में किया जाता है।

ओएनजीसी ऊर्जा केंद्र:

1. **बायो–सीबीएम प्रक्रिया फील्ड अनुप्रयोग:** एस्सार ऑयल एंड गैस एक्सप्लोरेशन एंड प्रोडक्शन (ईओजीईपीएल), दुर्गापुर सीबीएम क्षेत्र में ओईसी द्वारा पांच (05) सीबीएम कुओं के लिए कार्य समाप्ति के बाद निगरानी की गई थी, जहां सीबीएम गैस उत्पादन बढ़ाने के लिए ओईसी और टेरी द्वारा बायो–सिमुलेशन माइक्रोबियल किया गया था।
2. **सीबीएम क्षेत्र में कार्बन डाइआक्साइड वैलोराइजेशन:** उत्साहजनक प्रयोगशाला परिणामों के आधार पर, कार्बन डाइआक्साइड के मीथेन में स्वस्थाने जैव–रूपांतरण के लिए ओईसी टेरी बायोप्रोसेस का क्षेत्र परीक्षण 25.09.2023 को ओएनजीसी सीबीएम वेल बीके#47 में किया गया जिसमें कार्बन डाइआक्साइड के प्रतिशत को कम करके उत्पादित गैस के कैलोरी मान में सुधार करने के लिए अधिक कार्बन डाइआक्साइड दर्ज की गई।
3. **एडवांस्ड एक्स–एफ्लुएंट वाटर ट्रीटमेंट टेक्नोलॉजी (एईडब्लूटीटी):** ओएनजीसी की मेहसाणा एसेट 28,000 एम^3/डी उत्पादित पानी के साथ लगभग 6,500 एम^3/डी कच्चे तेल का उत्पादन करती है। ओईसी द्वारा विघटित तेल हटाने के लिए उन्नत ऑक्सीकरण प्रक्रिया और घुले हुए लवणों को हटाने के लिए रिवर्स ऑस्मोसिस के आधार पर बहिस्त्राव शोधित जल को उपयोग योग्य जल (कृषि/औद्योगिक उपयोग के लिए उपयुक्त जल) में परिवर्तित करने के लिए बार्क मुम्बई के सहयोग से एक प्रौद्योगिकी विकसित की गई है।

यह डेमो संयंत्र 10 एम^3/दिन एक्स–ईटीपी पानी को संभाल सकता है और लगभग 50% रिकवरी फैक्टर के साथ 5 एम^3/दिन उपयोग योग्य पानी का उत्पादन कर सकता है। प्रसंस्करण की समग्र लागत लगभग ₹ 1.40 प्रति लीटर जल है। संयंत्र पहले ही एक्स–ईटीपी उत्पादित 6,00,000 लीटर से अधिक जल शोधित कर चुका है।

4. **हीलियम अन्वेषण और पायलट संयंत्र:** ओईसी ने हड्डा क्षेत्र, मध्य प्रदेश, विंध्य बेसिन में हीलियम अन्वेषण के लिए प्रक्रिया शुरू कर दी है। हीलियम और अन्य गैसों के लिए रासायनिक संरचना के विश्लेषण के लिए ओएनजीसी द्वारा ड्रिल किए गए कुएं हड्डा #06 से ओईसी द्वारा गैस के नमूने एकत्र किए गए थे। इसके अलावा, मध्य प्रदेश के दमोह क्षेत्र में और उसके आसपास हीलियम अन्वेषण के लिए 10,000 मीटर (लगभग 10–15 बोरहोल) की ड्रिलिंग, कोरिंग और लॉगिंग 2024–25 के दौरान की जाएगी।

5. **वैनेडियम रेडॉक्स फ्लो बैटरी (वीआरएफबी):** ओईसी ने आईपीएसएचईएम गोवा में आयोजित इंडिया एनर्जी वीक 2024 में आईआईटी मद्रास और मैसर्स हाई एनर्जी बैटरीज (एचईबी), त्रिची के सहयोग से 5 केवी/10 केवीएच वैनेडियम रेडॉक्स फ्लो बैटरी (वीआरएफबी) ऊर्जा भंडारण प्रणाली का भी प्रदर्शन किया है। उक्त बैटरी स्थापित की गई थी जो सभी प्रकार के ईवी (इलेक्ट्रिक वाहन) को चार्ज करने में सक्षम थी और विशेष रूप से दूरदराज के क्षेत्रों के लिए उपयुक्त थी जहां कोई ग्रिड पावर उपलब्ध नहीं है क्योंकि यह सौर पैनल चार्जिंग पर काम करता है। आईपीएसएचईएम गोवा में हाइड्रोजन रोड सुविधा के पास दोपहिया इलेक्ट्रिक वाहन को चार्ज करके बैटरी का प्रदर्शन किया गया था।

वैनेडियम रेडॉक्स फ्लो बैटरी (वीआरएफबी) एक प्रकार की रिचार्जेबल फ्लो बैटरी है जो वैनेडियम इलेक्ट्रोलाइट विलयन का उपयोग करके ऊर्जा को स्टोर करती है। पवन और सौर जैसे अक्षय ऊर्जा उत्पादन को व्यापक रूप से अपनाने के मद्देनजर वीआरएफबी की ऊर्जा भंडारण क्षमताएं पहले से ही बाजार में साबित हो चुकी हैं। वीआरएफबी प्रौद्योगिकी अपनी असीमित भंडारण क्षमता, लंबी बैटरी लाइफ, कम रखरखाव आवश्यकताओं, अनुकूलन क्षमता और लगभग न के बराबर पर्यावरणीय पदचिह्न के कारण ऑफ–ग्रिड पावर सिस्टम और माइक्रो–ग्रिड के लिए दीर्घकालिक समाधान प्रदान करती है। यह स्थिर अनुप्रयोगों के लिए आयातित लिथियम आयन बैटरी के लिए एक अच्छा विकल्प हो सकता है।



आईआईटी मद्रास ऊर्जा भंडारण प्रणाली और उच्च ऊर्जा बैटरी (एचईबी), त्रिची के सहयोग से 5 केडब्लू/10 केडब्लूएच वैनेडियम रेडॉक्स फ्लो बैटरी का प्रदर्शन (वीआरएफबी)

ओएनजीसी ऊर्जा केंद्र द्वारा शुरू की गई नई परियोजनाएं:

i. ओईसी और सीएसआईआर–आईआईपी के बीच 25.05.2023 को सहयोगी आरएंडडी परियोजना के लिए 'आंशिक रूप से ओपन-लूप आई-एस प्रक्रिया के माध्यम से थर्मो–केमिकल हाइड्रोजन जनरेशन जिसमें एच$_2$एस भस्मीकरण: प्रयोगशाला एकीकृत संचालन के लिए अलग-अलग खंडों का युग्मन' शीर्षक से समझौते पर हस्ताक्षर किए गए थे।

ii. सहयोगी अनुसंधान एवं विकास परियोजना जिसका शीर्षक श्योकारो/झरिया के तीन (03) सीमांत सीबीएम कुओं में मीथेन की वृद्धि के लिए आयन पर इन–सीटू रिटमुलेशन/बायो ऑगुलेशन के पुनर्वैधीकरण के लिए प्रदर्शनश था, के लिए ओईसी और टेरी के बीच समझौते पर 20.06.2023 को हस्ताक्षर किए गए थे, जिसकी शुरू होने की तारीख 01.07.2023 थी।

iii. सीएसआईआर खनिज और सामग्री प्रौद्योगिकी संस्थान, भुवनेश्वर के साथ "समुद्री जल से हाइड्रोजन के उत्पादन के लिए इलेक्ट्रोलाइटिक झिल्ली प्रक्रिया (चरण I: प्रयोगशाला पैमाने का अनुकूलन)" नामक एक सहयोगी परियोजना 14.11.2023 को शुरू की गई है।

iv. सीएसआईआर–खनिज और सामग्री प्रौद्योगिकी संस्थान, भुवनेश्वर के साथ "क्यूप्रस क्लोराइड के इलेक्ट्रोलिसिस के लिए स्केल–अप अध्ययन (चरण I)" नामक एक सहयोगी परियोजना 14.11.2023 को शुरू की गई है।

8.1.4. आरएंडडी अध्ययन के माध्यम से प्राप्त लाभ

ओएनजीसी द्वारा शुरू की गई सभी अनुसंधान एवं विकास परियोजनाओं ने ओएनजीसी की त्वरित और प्रभावी ईएंडपी गतिविधियों को सुगम बनाया। संस्थानों द्वारा किए गए अनुसंधान एवं विकास कार्यकलापों ने कंपनी में उपलब्ध अत्याधुनिक प्रौद्योगिकी का उपयोग करके मौजूदा पेट्रोलियम प्रांतों में नए तेल की खोज के माध्यम से भंडार में वृद्धि सहित उच्च सफलता–अनुपात

सुनिश्चित करके कंपनी के विकास को आगे ले जाने में मदद की है। अनुसंधान और विकास कार्यकलापों से रिकवरी कारक में सुधार, वृद्धिशील तेल लाभ, फ्रंटियर बेसिनों, गहरे समुद्री ब्लाकों में अन्वेषण की जटिल चुनौतियों को कम करने और गैर–परम्परागत और कम कार्बन ऊर्जा संसाधनों का दोहन करने में भी सहायता मिली है।

पूरी की गई अनुसंधान एवं विकास परियोजनाएं लागू की जाती हैं जो भूकंपीय आकड़ा प्रसंस्करण, व्याख्या, जटिल रिजर्वायर लक्षण–वर्णन, रिजर्वायर मॉडलिंग में डोमेन विशिष्ट चुनौतियां प्रदान करती हैं। विकसित एआई/एमएल आधारित सोल्युशन सक्षम होते हैं जिससे महत्वपूर्ण मूल्य संवर्धन और समय की बचत होती है।

8.1.5. गत तीन वर्षों में आरएंडडी व्यय

वित्त वर्ष	आरएंडडी व्यय (करोड़ रुपए में)
2021-22	531.58
2022-23	569.84
2023-24	686.68

8.2. ऑयल इंडिया लिमिटेड (ओआईएल)

ऑयल इंडिया लिमिटेड (ओआईएल) ने दुलियाजान, असम, भारत और गुवाहाटी, असम, भारत में ऊर्जा अध्ययन उत्कृष्टता केंद्र (सीओईईएस) में अपने फील्ड मुख्यालय में दो ज्ञान–आधारित अनुसंधान एवं विकास विभाग (आएएंडडी) की स्थापना की है। ये अनुसंधान एवं विकास केंद्र ऊर्जा उद्योग में आने वाली चुनौतियों के लिए विशेष और अभिनव अनुसंधान आधारित और लागत प्रभावी समाधान प्रदान करते हैं, विशेष रूप से ओआईएल की जरूरतों को पूरा करते हैं। दोनों केंद्र वैज्ञानिक और औद्योगिक अनुसंधान विभाग (डीएसआईआर), विज्ञान और प्रौद्योगिकी मंत्रालय, भारत सरकार द्वारा मान्यता प्राप्त हैं। सीओईईएस को पेट्रोलियम और प्राकृतिक गैस मंत्रालय के भारत के राजपत्र दिनांक 24 नवंबर 2020 के माध्यम से ईआर नीति, 2018 के अनुसार बढ़ी हुई रिकवरी परियोजनाओं की जांच और पुनरीक्षण करने के लिए एक नामित संस्थान के रूप में भी मान्यता दी गई है।

वित्त वर्ष 2023–24 में ओआईएल द्वारा शुरू किए गए कार्यकलाप निम्न प्रकार है:

8.2.1. ओआईएल द्वारा शुरू की गई इन–हाउस आरएंडडी परियोजनाएं

अन्वेषण और अनुसंधान परियोजनाएं:

i) **भूतल भू–रासायनिक पूर्वेक्षण:** मिट्टी के नमूनों में अधिशोषित गैस विश्लेषण पर ध्यान केंद्रित करते हुए एएस–ओएनएचपी–2021/2 और एएसओएनएचपी–2021/3 ब्लॉकों में आयोजित।

ii) **जलाशय निरंतरता अध्ययन:** बागजान तेल क्षेत्र में शुरू की गई।

iii) **भू–रासायनिक लक्षण वर्णन:** महेंद्रगंज, मेघालय से गैस, मिट्टी और चट्टान के नमूनों का विश्लेषण किया।

iv) **स्त्रोत शैल मूल्यांकन:** ओडीएचए स्थान में अच्छी तरह से मूल्यांकन किया गया दीमा हसाओ–1।

v) **इन–हाउस प्रौद्योगिकी कार्यान्वयन:** तेल और गैस के लिए माइक्रोबियल संवर्धित ऑयल रिकवरी (एमईओआर) और माइक्रोबियल जियो–प्रॉस्पेक्टिंग (एमपीओजी) का क्षेत्र कार्यान्वयन।

vi) **जैव–उद्दीपन अध्ययन:** अवशिष्ट तेल प्राप्ति के लिए मीथेनोजेनों के स्वस्थाने जैव–उद्दीपन की जांच की गई।

vii) **संवर्धित प्राप्ति विकास:** जैव सर्फेक्टेंट विकसित किए गए और कूप उद्दीपन तकनीकों पर अध्ययन किए गए।

viii) **प्रायोगिक परियोजनाएं:** एनएचके011डी+018 ब्लाक में पॉलीमर फ्लडिंग और एनएचके 079डी ब्लाक में कार्बन डाइऑक्साइड ईओआर का आयोजन किया।

ix) **व्यवहार्यता अध्ययन:** डिकोम–छाबुआ क्षेत्र में सीडब्ल्यूआई की प्रयोज्यता की जांच की और जैसलमेर बेसिन में कार्बन डाइऑक्साइड परिवहन और भंडारण व्यवहार्यता का अध्ययन किया।

x) **प्रौद्योगिकी परिनियोजन:** विभिन्न जलाशयों में बघेवाला और एलएसडब्ल्यूएफ में सीएसएस कार्यान्वित किया गया।

xi) **जलाशय प्रबंधन:** बाईपास किए गए तेल की पहचान करने और परिपक्व जलाशयों के नवीकरण के लिए सिमुलेशन अध्ययन किए गए।

xii) **निक्षेपण पर्यावरण विश्लेषण:** कुंआ केएलएन–23 में लाकाडोंग+थेरिया गठन का अध्ययन किया।

xiii) **संसाधन मूल्यांकन:** बेल पुरी–02 में मैसरल संरचना, विट्रीनाइट परावर्तन और स्त्रोत शैल संभाव्यता का विश्लेषण किया गया।

xiv) **पेट्रोफिजिकल मूल्यांकन:** बघेवाला क्षेत्र में अपर कार्बोनेट फार्मेशन सहित रिजर्वायर लक्षण वर्णन का मूल्यांकन किया गया।

xv) **जलाशय भू–रसायन:** भू–रसायन तकनीकों का उपयोग करते हुए जोराजन तेल क्षेत्र में निरंतरता अध्ययन किया गया।

xvi) **ईओआर प्रयोगशाला अध्ययन:** कार्बन डाइआक्साइड के साथ कैथलोनी क्रूड का न्यूनतम मिश्रयता दबाव निर्धारित किया।

xvii) **कम तापमान वाले तेल विलेय विपायसक का विकास:** ओआईएल, तेल क्षेत्र रसायन निर्माताओं के सहयोग से, एलटी–ओएसडी विकसित किया। पारंपरिक ओएसडी रसायनों की तुलना में 45 डिग्री सेल्सियस पर प्रभावी (केवल 60 डिग्री सेल्सियस पर प्रभावी)। तेल पायस से बेहतर जल पृथक्करण, दूरदराज के क्षेत्रों के लिए महत्वपूर्ण।

xviii) **जोरहाट में पंप स्टेशन 3 पर प्राकृतिक गैस के साथ हाइड्रोजन सम्मिश्रण:** ओआईएल ने जोरहाट में पंप स्टेशन पर भारत का पहला ग्रीन हाइड्रोजन पायलट संयंत्र स्थापित किया। पीएनजीआरबी ने जोरहाट में ओआईएल के बेस पंपिंग स्टेशन परिसर के भीतर घरेलू घरों में एमडीपीई नेटवर्क में हाइड्रोजन मिश्रण (2% वॉल्यूम हाइड्रोजन तक) की अनुमति दी। संशोधन का काम चल रहा है, सम्मिश्रण संचालन जल्द ही शुरू होगा।

8.2.2. नई प्रौद्योगिकी का समावेशन

2023–24 में, ओआईएल ने उद्योग की मांगों को पूरा करने के लिए आधुनिक बनाने और अत्याधुनिक तकनीक को शामिल करने के अपने प्रयासों को तेज कर दिया है। प्रमुख प्रगति में निम्न शामिल हैं:

i) **सीएमजी सश्वफ्टवेयर एकीकरण:** ओआईएल ने कंप्यूटर मॉडलिंग ग्रुप (सीएमजी), कैलगरी, कनाडा से उन्नत जलाशय सिमुलेशन सॉफ्टवेयर में निवेश किया है। यह सॉफ्टवेयर, जिसमें ब्लैक ऑयल के लिए सीएमजी आईएमईएक्स और कंपोजिशनल सिमुलेशन के लिए जीईएम शामिल है, जलाशय प्रबंधन के लिए आवश्यक परिष्कृत मॉडलिंग क्षमताओं के साथ ओआईएल को सशक्त बनाता है।

ii) **ईआर स्क्रीनिंग टूल अधिग्रहण:** ओआईएल ने पेट्रोलियम सॉफ्ट लिमिटेड, यूके से एक ईआर स्क्रीनिंग सॉफ्टवेयर हासिल किया है, जो वैश्विक स्तर पर विभिन्न ईओआर विधियों की स्क्रीनिंग और रैंकिंग के लिए अपनी क्षमता बढ़ाता है। यह उपकरण तकनीकी–आर्थिक मापदंडों के आधार पर व्यापक मूल्यांकन की सुविधा प्रदान करता है, जिससे जानकारी आधारित निर्णय लेने में सक्षम होता है।

iii) **कोर फ्लड सिस्टम कार्यान्वयन:** सीओईईएस में एक कोर फ्लड सिस्टम की शुरूआत ओआईएल को जलाशय–प्रतिनिधि स्थितियों के तहत एकल और मल्टीफेज कोर बाढ़ अध्ययन करने में सक्षम बनाती है। यह प्रणाली विभिन्न ईओआर विधियों के मूल्यांकन की सुविधा प्रदान करती है, जिसमें अन्यों के साथ पानी की बाढ़, बहुलक इंजेक्शन, एएसपी इंजेक्शन और गैस बाढ़ शामिल हैं। यह ईओआर कार्यनीतियों के अनुकूलन के लिए महत्वपूर्ण ब्राइन संवेदनशीलता, पारगम्यता, विस्थापन दक्षता और वृद्धिशील तेल प्राप्ति जैसे मापदंडों में महत्वपूर्ण अंतर्दृष्टि प्रदान करता है।

8.2.3. उद्योग–शैक्षणिक समुदाय सहयोग

i) पैन सीएसआईआर प्रयोगशालाओं के साथ सहयोग

- 2023 में, ओआईएल ने नई दिल्ली में पैन सीएसआईआर प्रयोगशालाओं के साथ एक समझौता (एमओयू) किया। यह सहयोग अन्वेषण, उत्पादन संचालन और वैकल्पिक ऊर्जा स्रोतों से संबंधित अनुसंधान परियोजनाओं पर केंद्रित है।
- परियोजनाओं में सीएसआईआर–आईआईपी, देहरादून और सीएसआईआर–एनसीएल, पुणे के सहयोग से मेथनॉल डीजल मिश्रण के लिए सिंथेटिक विमानन ईंधन और एडिटिव्स का विकास शामिल है।

ii) आईआईटी बॉम्बे के साथ सहयोग:

- ओआईएल जल प्रबंधन पर आईआईटी बॉम्बे के साथ परियोजनाओं में लगी हुई है, जिसमें ड्रिलिंग साइट अपशिष्ट जल प्रबंधन और उत्पादित जल शोधन के लिए प्रयोगशाला अध्ययन और प्रोटोटाइप विकास शामिल हैं।

iii) आईआईटी गुवाहाटी के साथ सहयोग:

- अनुसंधान पहलों में प्राकृतिक गैस पर हाइड्रोजन सम्मिश्रण का प्रभाव और तेल व गैस अनुप्रयोगों के लिए नैनो–सामग्रियों का विकास शामिल है। इसके अतिरिक्त, कम जल स्तर वाले जलाशयों के रासायनिक और कार्बन डाइआक्साइड इओआर पर अध्ययन जारी है।

iv) आरजीआईपीटी के साथ सहयोग:

- पूर्ण अध्ययनों में ऑर्गेनिक पेट्रोग्राफी, बायोस्ट्रेटिग्राफी, और वेल सादिया–1 में शैलों का पैलिनोलॉजी अध्ययन और बालीमारा क्षेत्र के लिए 3 डी जियो मैकेनिकल मॉडल विकास शामिल हैं।

v) **यूपीईएस के साथ सहयोग:**

- ओआईएल बायोहाइड्रोजन उत्पादन क्षमताओं के साथ सूक्ष्म जीवों के लिए हिमालयी हॉट–स्प्रिंग्स की खोज पर एक सहयोगी अध्ययन कर रहा है।

vi) **आईआईपीई विशाखापत्तनम के साथ सहयोग:**

- चल रहे सहयोगी अनुसंधान कृत्रिम प्रकाश संश्लेषण के माध्यम से कार्बन डाइआक्साइड के कुशल कैप्चर और हरे ईंधन में रूपांतरण के लिए 2 डी–3 डी हेटरोस्ट्रक्चर–आधारित हरे उत्प्रेरक पर केंद्रित है।

vii) **कुरुक्षेत्र विश्वविद्यालय के साथ सहयोग:**

- उपरातह में संभावित हाइड्रोकार्बन संचयन की पहचान करने के लिए, ओआईएल ने अपनी नई प्रौद्योगिकी प्रेरण नीति के एक भाग के रूप में कुरुक्षेत्र विश्वविद्यालय के साथ कम आवृत्ति निष्क्रिय भूकंपीय विधि का उपयोग करते हुए एक पायलट अध्ययन शुरू किया है।
- चरण–I और चरण–II के प्रायोगिक अध्ययन पर आधारित प्रारंभिक परिणामों से पता चलता है कि यह प्रौद्योगिकी अन्वेषण जोखिम को कम करने में महत्वपूर्ण भूमिका निभा सकती है।

viii) **अन्य सहयोगी पहलें:**

- विभिन्न विश्वविद्यालयों और अनुसंधान संस्थानों के साथ सहयोगात्मक परियोजनाएं चल रही हैं, जिनमें कार्बन डाइआक्साइड भंडारण क्षमता, भूवैज्ञानिक मानचित्रण, भूतापीय ऊर्जा निष्कर्षण और ईओआर योजनाओं के मूल्यांकन पर अध्ययन शामिल हैं।

8.2.4. ओआईएल द्वारा पंजीकृत पेटेंट

पेटेंट दस्तावेज कठिन या लंबे समय से चली आ रही समस्याओं के अनूठे समाधानों का वर्णन करते हैं। अनुदान के लिए अर्हता प्राप्त करने के लिए, ऐसे समाधानों को कम से कम कुछ पहलुओं में वास्तव में अद्वितीय और विश्व के लिए नया होना चाहिए। इसलिए, ओआईएल के लिए पेटेंट आवेदन दायर करना गर्व की बात है और ओआईएल को अब तक विभिन्न छह (6) देशों में 17 पेटेंट प्रदान किए गए हैं– भारत में सात (7), रूस में दो (2), संयुक्त राज्य अमेरिका में तीन (3), चीन में दो (2), यूरोपीय संघ में दो (2) और जापान में एक (1)। मध्यम से दीर्घकाल में, पेटेंट से ओआईएल की प्रौद्योगिकी क्षमता मजबूत होगी और भारत सरकार की पहल जैसे "मेक इन इंडिया" अभियान को मजबूत किया जा सकेगा।

8.2.4.1. वित्त वर्ष 2023–24 में ओआईएल द्वारा प्राप्त पेटेंट

क्र.स.	शीर्षक	देश	भारतीय पेटेंट सं.	प्रदान करने की तिथि
1	चरणबद्ध पायरोलिसिस –गैस क्रोमेटोग्राफी का उपयोग करते हुए विभिन्न परिपक्वता स्तरों पर केरोजीन को तेल/गैस में परिवर्तित करने को सुनिश्चित करने की पद्धति।	भारत	504804	30.01.2024
2	तेल भंडारों में जीवाणुगोजी औसत जैव नियंत्रण	भारत	469611	16.11.2023

8.2.4.2. वित्त वर्ष 2023–24 में ओआईएल द्वारा प्राप्त पेटेंट

क्र.सं.	शीर्षक	देश	आवेदन संख्या	आवेदन की तिथि
1	पॉलिमेरिक वैक्स निक्षेप प्रावरोधक	भारत	202311050247	25.07.2023
2	प्राकृतिक गैस के साथ हाइड्रोजन के मिश्रण से एसओएफसी का विद्युत सृजन को बढ़ाने की पद्धति	भारत	202331066053	02.10.2023
3	2डी–3डी हाइब्रिड एयरोजेल, विशेषकर 2डी मॉलिब्डेनम डिसल्फाइड–3डी ग्रेफिन एयरोजेल की तैयारी की प्रक्रिया	भारत	202341068689	12.10.2023
4	लचीला और धारणीय स्व–अनुसंधान संयंत्र इकाई और तत्संबंधी निर्माण हेतु प्रक्रिया	भारत	202341069311	14.10.2023
5	एसओएफसी का उपयोग करते हुए नियत तापमान पर तापीय ऊर्जा की आपूर्ति प्रणाली	भारत	202331071621	20.10.2023

8.2.5. विगत तीन वर्षों में आरएंडडी व्यय

वित्त वर्ष	आरएंडडी व्यय (करोड़ रुपए में)
2021-22	100.96
2022-23	179.03
2023-24	149.22

8.3. इंडियन ऑयल कार्पोरेशन लिमिटेड (आईओसीएल)

8.3.1. 1972 से अपने विशिष्ट इतिहास में, इंडियन ऑयल आरएंडडी ने प्रमुख उद्योग चुनौतियों का समाधान करके आत्मनिर्भरता के लक्ष्य का अथक प्रयास किया है। इसमें इन–हाउस अनुसंधान और विकास के माध्यम से आत्मनिर्भर भारत का समर्थन करने के लिए प्रौद्योगिकियों/उत्पादों के आयात को बदलना शामिल है। इसके अतिरिक्त, कार्बन–आधारित ऊर्जा विकल्पों को व्यावसायिक और पर्यावरणीय रूप से टिकाऊ समाधानों के साथ अनुकूलित करने, स्थानीयकरण करने और बदलने के माध्यम से ऊर्जा परिवर्तन की तैयारी पर ध्यान केंद्रित किया गया है। बाजार की मांगों को पूरा करना एक और प्राथमिकता है, जो प्रतिष्ठित अनुसंधान और शैक्षणिक संस्थानों के साथ सहयोग के माध्यम से विकास चक्रों में तेजी लाकर हासिल की जाती है। ज्ञान की सुरक्षा और व्यावसायीकरण के लिए इंडियन ऑयल आरएंडडी की प्रतिबद्धता आक्रामक पेटेंट और लाइसेंसिंग प्रयासों के माध्यम से स्पष्ट है।

अत्याधुनिक अनुसंधान विशेषज्ञता के मुख्य क्षेत्रों में आयोजित किया जाता है, जिसमें ईंधन और स्नेहक, शोधन प्रौद्योगिकी और उत्प्रेरक, और पेट्रोकेमिकल्स और पॉलिमर शामिल हैं। केंद्र के प्रयास नैनो प्रौद्योगिकी, सौर, जैव–ऊर्जा, हाइड्रोजन, ईंधन सेल और ऊर्जा भंडारण जैसे उभरते क्षेत्रों तक भी विस्तारित होते हैं, जो भविष्य के लिए हैं। फरवरी 2024 तक 1,721 दायर पेटेंट और 1,625 प्रभावी पेटेंटों के पर्याप्त पोर्टफोलियो के साथ, इंडियन ऑयल आरएंडडी ने नवाचार और प्रगति के प्रति अपने समर्पण को प्रदर्शित किया है। वर्ष 2023–24 के दौरान, इंडियन ऑयल के अनुसंधान एवं विकास केंद्र द्वारा काम की प्रमुख विशेषताएं इस प्रकार हैं:

8.3.2. **उत्प्रेरक और प्रक्रिया प्रौद्योगिकी विकास** में इंडियन ऑयल आरएंडडी सेंटर के योगदान ने "आत्मनिर्भर भारत" के तहत भारत की आत्मनिर्भरता को काफी बढ़ावा दिया है। बहुराष्ट्रीय निगमों के वर्चस्व वाले अत्यधिक प्रतिस्पर्धी क्षेत्रों में, इसके अभिनव समाधानों ने विदेशी लाइसेंसकर्ताओं पर निर्भरता कम कर दी है, जिससे स्वदेशी विशेषज्ञता को सशक्त बनाया जा सके और वैश्विक ऊर्जा परिदृश्य में भारत की स्थिति को मजबूत किया जा सके। 2023–24 में प्रमुख विकास निम्न हैं:

- पानीपत रिफाइनरी में जेडएसएम–5 एडिटिव, जेडएसएम–5 जिओलाइट, एल्यूमिना और डीएचडीटी/डीएचडीएस उत्प्रेरक संयंत्रों सहित उत्प्रेरक विनिर्माण संयंत्र (सीएमयू) की सफल शुरूआत, जो उत्प्रेरक निर्माण के शोधन में महत्वपूर्ण प्रगति को दर्शाता है।



- संयुक्त अनुसंधान एवं विकास ने संदर्भ गैसोलीन (ई0–ई85) के घरेलू उत्पादन को सक्षम किया, जिससे आयात निर्भरता कम हो गई।
- पारादीप रिफाइनरी में 300 केटीए इंड डीएसके यूनिट की स्थापना का काम चल रहा है जिसे आईओसीएल और ईआईएल द्वारा संयुक्त रूप से लाइसेंस प्राप्त है ताकि पाइपलाइन संगत मिट्टी तेल (पीसीके) का उत्पादन किया जा सके।
- आईओसीएल आरएंडडी ने लाइट नेफ्था आइसोमेराइजेशन के लिए एक अभूतपूर्व "मिक्स्ड मेटल ऑक्साइड" उत्प्रेरक पेश किया, जो रिफाइनरी क्षमताओं को बढ़ाया और आईएसओएम प्रौद्योगिकी के लाइसेंस में सक्षम बनाया।
- गुवाहाटी और डिगबोई रिफाइनरियों में उत्प्रेरक प्रदर्शन की वास्तविक समय निगरानी के लिए आरएंडडी काइनेटिक मॉडल (डीएचडीटी–एमओडी) के साथ एआई/एमएल तकनीकों को एकीकृत करते हुए डीएचडीटी डिजिटल ट्विन मॉडल विकसित किया, जो जेआर और जीआर डीएचडीटी/एनएचटी इकाइयों के लिए उत्प्रेरक जीवन मूल्यांकन में सहायता करता है।
- मथुरा और गुजरात रिफाइनरियों में ईटीपी इकाई में 'ईबीआईओएटी' प्रक्रिया के कार्यान्वयन के लिए बीडीईपी विकसित किए गए, मथुरा रिफाइनरी में उन्नयन परियोजनाएं, जिसमें खट्टा जल रिट्रूपर इकाई का सुधार, **ऑक्टामैक्स®** इकाई की अड़चनें दूर करना, और ऊर्जा बचत और कार्बन डाइऑक्साइड कमी के लिए ताप एकीकरण शामिल है।

- क्रूड एसे डेटा के भंडारण और पुनर्प्राप्ति को व्यवस्थित करने के लिए क्रूड एसे डेटाबेस प्रबंधन सॉफ्टवेयर (सीएडीएमएस) का विकास।

8.3.3. 2023–24 में, आईओसीएल आरएंडडी के अटूट समर्पण ने न केवल घरेलू आवश्यकताओं में आत्मनिर्भरता सुनिश्चित की, बल्कि लंबे जीवन, ऊर्जा–कुशल **स्नेहक और ग्रीस** के विकास को भी प्राथमिकता दी। लगभग 130 लुब्रिकेंट फॉर्मूलेशन जारी किए गए और 40 ओईएम अप्रूवल के साथ, हमारा ध्यान आयात प्रतिस्थापन को बढ़ावा देते हुए ग्राहकों की जरूरतों को पूरा करने पर रहता है।

8.3.4. केंद्रीय पेट्रोलियम और प्राकृतिक गैस तथा आवासन और नगरी कार्य मंत्री ने स्वदेशी रूप से उत्पादित **किफायती परिवहन के लिए दीर्घकालिक विकल्प विमानन ईंधन (एसएएफ)** द्वारा प्रचालित भारत की पहली वाणिज्यिक यात्री उड़ान प्राप्त की। एयर एशिया उड़ान के लिए एसएएफ मिश्रित विमानन टर्बाइन ईंधन (एटीएफ) की आपूर्ति इंडियन ऑयल द्वारा आरएंडडी केंद्र के सक्रिय समर्थन और प्राज इंडस्ट्रीज लिमिटेड के साथ साझेदारी में की गई थी।



यह उपलब्धि 2070 तक नेट जीरो उत्सर्जन प्राप्त करने के भारत के लक्ष्य की दिशा में एक महत्वपूर्ण कदम है। 23–24 में अन्य प्रमुख विकास इस प्रकार हैं:

- एशिया रोड रेसिंग चैम्पियनशिप 2024 के लिए टू व्हील्स मोटर रेसिंग (टीडब्लूएमआर) के साथ साझेदारी करते हुए एफआईएम मानकों के अनुरूप प्रीमियम रेसिंग फ्यूल "रटॉमैं" लॉन्च किया, जो वैश्विक रेसिंग इवेंट्स में एक महत्वपूर्ण छलांग है।



- ईडी5 और एमडी15 डीजल मिश्रणों के लिए अनुकूलित आईओसी कपलर, एमडी15 उत्पादन के साथ बीएमटीसी, आरडीएसओ, एनआरएल और एएल और टाटा जैसे ओईएम की आपूर्ति के लिए तीसरे पक्ष के ब्लेंडर में बढ़ाया गया। बीएमटीसी, आरडीएसओ और अशोक लीलैंड में सफल परीक्षण किए गए।
- रिफाइनरी, टर्मिनल और डिपो संचालन में प्रक्रिया कार्यान्वयन के लिए आरएचक्यू के लिए एक व्यापक रिपोर्ट के साथपेट उद्योग के लिए एमटीओ गुणवत्ता बढ़ाने के लिए लागत प्रभावी अवशोषक नियोजित।
- सेना के लिए अत्यधिक ठंड के मौसम में अनुप्रयोग के लिए गैस–एटीएफ आधारित लागत प्रभावी डीएचपीपी (जेड) फॉर्मूलेशन विकसित किया गया।
- एलपीजी पाइपलाइनों में संक्षारण अवरोध (सीआई) के लिए उत्पाद सूत्रीकरण जारी किया गया।
- आईओसी रिफाइनरियों में गैसोलीन में एलएसी खुराक के लिए प्रीमियम जीएमएफए फॉर्मूलेशन विकसित किया, पीएफआई के लिए अंतरराष्ट्रीय प्रयोगशालाओं में प्रमाणित, साथ ही परीक्षण बैचों के लिए उत्पादन की योजना बनायी गयी।
- आईओसीएल आरएंडडी ने विश्लेषणात्मक विधि एचएमई–गैस क्रोमैटोग्राफी द्वारा मिश्रित तरलीकृत पेट्रोलियम गैस (एलपीजी) ईंधन में डाइमिथाइल ईथर (डीएमई) सामग्री का मात्रात्मक निर्धारण विकसित किया है जिसे बीआईएस विधि के रूप में मुद्रण के लिए स्वीकार और अनुशंसित किया गया है।
- ऑफ–हाईवे वाहनों के लिए एक्स्ट्राग्रीन डीजल और ग्रीन कॉम्बो अवधारणा का विस्तार करने के लिए मैसर्स जेसीबी इंडिया लिमिटेड के साथ सहयोग किया। एनडीए ने स्नेहक, ऑक्सीजन युक्त ईंधन (इडी5), और एच2आईसीई सीईवी मूल्यांकन सहित परियोजनाओं के लिए हस्ताक्षर किए।
- भारी वाणिज्यिक वाहनों में ईडी5 / एमडी15 ईंधन के विकास और प्रदर्शन के लिए मैसर्स अशोक लेलैंड के साथ एमओसी पर हस्ताक्षर किए गए। आईओसीएल आरएंडडी में ईडी5 ईंधन के साथ सहनशीलता परीक्षण और केएसआरटीसी में एमडी 15 ईंधन के साथ क्षेत्र परीक्षण सफलतापूर्वक पूरे किए गए।

8.3.5. 2023–24 में, आरएंडडी में हमारे **पाइपलाइन अनुसंधान** ने उल्लेखनीय प्रगति हासिल की। 12 'जसीडीह–बरौनी उत्पाद पाइपलाइन (132 किमी) की मरम्मत के बाद, आरएंडडी ने सहयोगी प्रयासों के माध्यम से रिकॉर्ड 10–दिन की समय सीमा के भीतर तेजी से इनलाइन निरीक्षण (आईएलआई) किया। पेश किया

गया 'क्यूपीसीआर', हमारे इन-हाउस विकसित और पेटेंट किए गए रीयल-टाइम पोलीमरेज़ चेन रिएक्शन किट, संक्षारण पैदा करने वाले सूक्ष्म जीवों की सटीक मात्रा का तहराव सक्षम बनाता है और कई साइटों पर समस्या निवारण समर्थन प्रदान करता है। स्वदेशी आईपीआईजी उपकरणों ने रिकॉर्ड ~2000 किमी पाइपलाइन निरीक्षण की सुविधा प्रदान की। हमने पीयू कप के साथ-साथ रोलर समर्थन के साथ एक नया 30 आईपीआईजी उपकरण डिज़ाइन और सफलतापूर्वक क्षेत्र-परीक्षण किया, जो पारादीप-बालासोर पाइपलाइनों में इसकी अखंडता की पुष्टि करता है। 30" प्राकृतिक गैस पाइपलाइन के निरीक्षण के लिए क्रूड पाइपलाइनों के मौजूदा 28" आईपीआईजी का पुनः उपयोग करना हमारी अनुकूलन क्षमता को और प्रदर्शित करता है। इसके अतिरिक्त, हमने अल्ट्रासोनिक तकनीक-आधारित आईपीआईजी विकसित करने के लिए 5-एक्सिस यूटी स्कैनर सुविधा स्थापित की।

8.3.6. हमारे **पेट्रोकेमिकल्स और पॉलिमर** अनुसंधान ने 2023-24 में महत्वपूर्ण मील के पत्थर हासिल किए। स्वदेशी **एक्स्ट्राफ्लो®** डीआरए को एचपीसीएल, बीपीसीएल और एचएमईएल जैसे पाइपलाइन ऑपरेटरों को सफलतापूर्वक बेचा गया, जिससे 87 लाख रुपये की रॉयल्टी कमाई हुई। इसके अलावा, मध्य पूर्व में आयोजित एक्स्ट्राफ्लो® डीआरए के एक सफल परीक्षण ने उस क्षेत्र में बाजार विस्तार के लिए अपनी क्षमता का प्रदर्शन किया।

8.3.7. **नैनोटेक्नोलॉजी** (सूक्ष्म प्रौद्योगिकी) के क्षेत्र में, 2023-24 में महत्वपूर्ण प्रगति हुई। इसमें वाणिज्यिक परीक्षणों की योजना के साथ प्रोपेन / एलपीजी के लिए दहन दक्षता बढ़ाने के उद्देश्य से एक बेहतर पेरोव्स्काइट-आधारित नैनो-उत्प्रेरक के 5एमटी का स्केल-अप उत्पादन शामिल था। इसके अतिरिक्त, आशाजनक नैनो एडिटिव्स के साथ मिश्रित ऑटो एलपीजी का एआरएआई, पुणे में सफल परीक्षण और प्रमाणन किया गया, जो ईंधन अर्थव्यवस्था, शक्ति और त्वरण में उल्लेखनीय वृद्धि का प्रदर्शन करता है। इसके अलावा, मथुरा, पारादीप और पानीपत (पीएनसी) रिफाइनरियों में इंसुलेशन के अंतर्गत संक्षारण (सीयूआई) का मुकाबला करने के लिए नैनो- फोर्टिफाइड कोटिंग फॉर्मूलेशन के साथ परीक्षण पूरे किए गए, जिसमें आशाजनक परिणाम दिखा।

8.3.8. इंडियन ऑयल आरएंडडी सेंटर **वैकल्पिक ऊर्जा और नवीकरणीय ऊर्जा** समाधानों जैसे कृषि-अपशिष्ट से 2जी एथेनॉल, ऑटोमोबाइल के लिए ईंधन सेल प्रौद्योगिकी, कार्बन डाईआक्साइड से जैव-डीजल उत्पादन, सौर ऊर्जा और ऊर्जा भंडारण उपकरणों आदि में अथक रूप से काम कर रहा है। वैकल्पिक और नवीकरणीय ऊर्जा के क्षेत्र में, 2023-24 में निम्नलिखित उल्लेखनीय उपलब्धियां हासिल हुई



- मौजूदा टीएफएल कार्बन डाईआक्साइड कैप्चर संयंत्र में एंजाइम-असिस्टेड कार्बन डाईआक्साइड कैप्चर तकनीक 'ईसीओ,सोर्ब' का सफल प्रदर्शन किया गया, जिसके परिणामस्वरूप रेट्रोफिटिंग के बाद ऊर्जा दक्षता में उल्लेखनीय 21% सुधार हुआ।
- सीबीजी के उत्पादन के लिए केंद्रीय पेट्रोलियम और प्राकृतिक गैस तथा आवासन और नगरी कार्य मंत्री तथा उत्तर प्रदेश के मुख्यमंत्री द्वारा गोरखपुर में 200 टीपीडी धान के पुआल आधारित संयंत्र का निर्माण और चालू किया गया।
- फसल अवशेषों के स्व-स्थाने अपघटन के लिए माइक्रोबियल मिश्रण 'स्टबबोरस' का विकास और सफल क्षेत्र परीक्षण जो एक लघु सुविधा पटल के भीतर फसल रोटेशन की सुविधा और जिला कृषि विभागों द्वारा मान्य है।
- भारत की पहली हरित हाइड्रोजन ईंधन सेल बसों का उद्घाटन इंडिया गेट पर केंद्रीय पेट्रोलियम और प्राकृतिक गैस तथा आवासन और नगरी कार्य मंत्री द्वारा किया गया। इंडियन ऑयल टाटा मोटर्स लिमिटेड से 15 ईंधन सेल बसों की सोर्सिंग कर रहा है। बसें दिल्ली-एनसीआर में निर्दिष्ट मार्गों पर चलेंगी और लगभग 3 लाख किलोमीटर की दूरी तय करेंगी। यह भारत में पहली ऐसी पहल है जहां ईंधन सेल बसों को प्रचालित करने के लिए 350 बार के उच्च दबाव पर ग्रीन हाइड्रोजन का वितरण किया जा रहा है।



8.3.9. इंडियन ऑयल की **स्टार्टअप योजना** ने 2023–24 में महत्वपूर्ण उपलब्धि हासिल की। 36 परियोजनाओं के कार्यान्वयन और 61.32 करोड़ रुपये की प्रतिबद्ध निधि मूल्य के साथ, नवाचार कार्य में प्रगति हुई। 75 से अधिक आईपीआर सृजित हुए, जिनमें पेटेंट, कॉपीराइट, ट्रेडमार्क और डिजाइन शामिल हैं। इसके अतिरिक्त, मार्च 2023 में शुरू किए गए 'ग्रीन रिज़ॉल्व–अमृत काल अध्याय' ओपन इनोवेशन चैलेंज ने वित्तपोषण और योजना तैयार करने के छह प्रस्तावों का चयन किया, जो ऊर्जा क्षेत्र में अभिनव समाधानों को बढ़ावा देने के लिए इंडियन ऑयल की प्रतिबद्धता को प्रदर्शित करता है।

8.3.10. विगत तीन वर्षों में आरएंडडी व्यय

वित्त वर्ष	आरएंडडी व्यय (करोड़ रुपए में)
2021-22	576.55
2022-23	698.21
2023-24	946.14

8.4. भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड (बीपीसीएल)

8.4.1. ग्रेटर नोएडा, उत्तर प्रदेश में भारत पेट्रोलियम के कॉर्पोरेट अनुसंधान एवं विकास केंद्र (सीआरडीसी) तथा मुंबई में उत्पाद और अनुप्रयोग विकास केंद्र (पीएंडएडी) दो अनुसंधान प्रभाग हैं जो अनुसंधान गतिविधियों के माध्यम से व्यवसायों के मूल्य वर्धन में सक्रिय रूप से शामिल है। "आत्मनिर्भर भारत" के एक भाग के रूप में, सीआरडीसी ने विभिन्न नवीन और विशिष्ट उत्पादों/प्रक्रियाओं को विकसित किया है और इनका व्यावसायीकरण करने के लिए आक्रामक रूप से काम कर रहा है। अप्रैल 2023 से मार्च 2024 के दौरान निम्नलिखित गतिविधियाँ की गईं:

- भारत सरकार की "आत्मनिर्भर भारत" पहल के हिस्से के रूप में, बीपीसीएल की कॉर्पोरेट आरएंडडी टीम ने फीडस्टॉक के रूप में इन–हाउस ऐक्रेलिक एसिड का उपयोग करके सुपर एब्जॉर्बेंट पॉलिमर (एसएपी) की प्रक्रिया रसायन विज्ञान में महारत हासिल की है, जिसका उपयोग विभिन्न स्वच्छता उत्पादों जैसे डायपर और अन्य असंयम उत्पादों में किया जाता है, जिसमें अपने स्वयं के वजन से कई गुना पानी को अवशोषित करने की उत्कृष्ट क्षमता होती है। उत्पाद को शुरू करने के लिए, बीपीसीएल ने पहले कोच्चि रिफाइनरी में 200 टन/वार्षिक पायलट संयंत्र चालू किया था। पायलट संयंत्र ऑपरेशन पर प्राप्त अनुभव के आधार पर, वाणिज्यिक पैमाने के एसएपी संयंत्र के लिए बुनियादी इंजीनियरिंग पैकेज विकसित किया गया है।
- ग्रीन हाइड्रोजन उत्पादन के लिए इको–सिस्टम विकास के हिस्से के रूप में, इलेक्ट्रोलाइजर घटकों के प्रदर्शन मूल्यांकन और बेंचमार्किंग के लिए विभिन्न प्रकार के इलेक्ट्रोलाइजर सिस्टम स्थापित किए जा रहे हैं। त्वरित स्केल–अप और स्वदेशी इलेक्ट्रोलाइजर निर्माण के लिए, भाभा परमाणु अनुसंधान केंद्र के साथ एक समझौता किया गया है। तदनुसार, भाभा परमाणु अनुसंधान केन्द्र (बार्क) इलैक्ट्रोलाइजर प्रौद्योगिकी का 05 मेगावाट पैमाने पर स्केल–अप वाणिज्यिक संस्थापना में निष्पादित किया जा रहा है। इंडिया एनर्जी वीक में, बीपीसीएल आरएंडडी ने ग्रीन हाइड्रोजन उत्पादन के लिए बार्क के साथ संयुक्त रूप से विकसित स्वदेशी क्षारीय इलेक्ट्रोलाइजर का प्रदर्शन किया।



- पूर्ण ग्रीन हाइड्रोजन मूल्य श्रृंखला को विकसित और प्रदर्शित करने के लिए, बीपीसीएल ने केरल सरकार के साथ कोचीन इंटरनेशनल एयरपोर्ट लिमिटेड (सीआईएएल), कोच्चि, केरल के पास एक एकीकृत ग्रीन हाइड्रोजन संयंत्र और हाइड्रोजन री–फ्यूलिंग स्टेशन स्थापित करने के लिए एक समझौता किया है। इस सुविधा में हाइड्रोजन प्रचालित वाहनों को ईंधन देने में सक्षम जल इलेक्ट्रोलिसिस के माध्यम से उत्पादित 200 एनएम3/एच ग्रीन हाइड्रोजन का उत्पादन और वितरण करने की क्षमता होगी।
- जलवायु परिवर्तन के प्रभावों को कम करने के मिशन में, प्राकृतिक गैस पाइपलाइनों में हाइड्रोजन सम्मिश्रण की खोज दुनिया भर में एक संभावित समाधान के रूप में की जा रही है ताकि निकट भविष्य में उत्सर्जन में कमी और हाइड्रोजन प्रौद्योगिकियों जैसे इलेक्ट्रोलाइज़र के लिए प्रारंभिक बाजार पहुंच प्राप्त की जा सके। बीपीसीएल बड़े पैमाने पर अपनाने के लिए तकनीकी–वाणिज्यिक व्यवहार्यता स्थापित करने के लिए प्राकृतिक गैस नेटवर्क में ग्रीन हाइड्रोजन सम्मिश्रण की पायलट परियोजना पर काम कर रहा है।
- ईंधन की खपत को अनुकूलित करने के माध्यम से आयात पर देश की निर्भरता को कम करने के लिए, बीपीसीएल आरएंडडी टीम ने बेहतर ताप दक्षता के

साथ पीएनजी बर्नर विकसित किया है। नए ऊर्जा कुशल पीएनजी खाना पकाने के स्टोव में 74% तक ताप दक्षता है, जो बाजार में उपलब्ध स्टोव की तुलना में 10–15% अधिक है।

- हाइड्रोजन प्राप्त करने के लिये भारत एच2शेप मेम्ब्रेन टेक्नोलॉजी: हाइड्रोजन सबसे महंगी ऊर्जा उपयोगिता में से एक है। हाइड्रोजन के उपयोग को अधिकतम करने के लिए, सीआरडीसी ने रिफाइनरी से निकलने वाले गैस से हाइड्रोजन प्राप्त करने के लिए एक उपयुक्त झिल्ली–आधारित इकाई विकसित की है। झिल्ली के क्षेत्र परीक्षणों के परिणामस्वरूप 70–75% की प्राप्ति दर के साथ, फीड में 90–92% से हाइड्रोजन शुद्धता में 99.5% की वृद्धि हुई।
- भारत हाईगी डिएरेशन टेक्नोलॉजी को बॉयलर फीड वाटर (बीएफडब्ल्यू) के कुशल वातन के लिए विकसित किया गया था। पिछले साल मुंबई रिफाइनरी के सीडीयू 4 संयंत्र में 150 टीपीडी के वाणिज्यिक पैमाने के डेमो संयंत्र को चालू करने के बाद, 2,500 टीपीडी के वाणिज्यिक पैमाने के डिएरेटर स्थापित करने के प्रयास जारी हैं। इसके परिणामस्वरूप कार्बन डाइआक्साइड में प्रति वर्ष 50,000 टन की बचत हो सकती है।
- जैव–रिफाइनरी उप–उत्पाद धारा का मूल्यवर्धनरू बीपीसीएल के शुरू किए जाने वाले बारगढ 2जी संयंत्र से उत्पादित बॉयलर राख का मूल्यवर्धन करने के लिए, ~70% की दक्षता के साथ चावल की भूसी की राख से अवक्षेपित सिलिका उत्पादन के लिए एक इन–हाउस प्रक्रिया विकसित की गई थी। वाणिज्यिक पैमाने पर उत्पादन प्रक्रिया विकसित की गई है और टायर विनिर्माण स्थल पर परीक्षण किया गया है।
- स्वच्छ ईंधनः हरित और स्वच्छ ईंधन की बढ़ती आवश्यकता के कारण, बीपीसीएल सीआरडीसी इन–हाउस विकसित एडिटिव्स का उपयोग करके एथेनोल मिश्रित डीजल पर काम कर रहा है। बीपीसीएल ने बीपीसीएल रिटेल आउटलेट में सहयोगियों–अशोक लेलैंड, यूपीएसआरटीसी और टाटा मोटोकॉर्प के साथ पायलट स्तर पर उत्पादों को शुरू किया। ईंधन का पायलट परीक्षण निष्पादित किया जा रहा है।
- बीपीसीएल कॉर्पोरेट आरएंडडी और मैसर्स आस्पेन टेक्नोलॉजी ने आस्पेन एचवाईएसवाईएस और सीआरडीसी द्वारा विकसित क्रूड परख भविष्यवाणी उपकरण–बीपीएमएआरआरके® के एकीकरण के लिए एक सहयोग समझौते पर हस्ताक्षर किए। इस साझेदारी का उद्देश्य कच्चे तेल रिफाइनरों को वास्तविक समय की निगरानी और अनुकूलन समाधान प्रदान करना है। इस एकीकरण की प्रभावकारिता स्थापित करने के लिए, एचवाईएसवाईएस–बीपीएमएआरआरके® एकीकरण का उपयोग करके डिजिटल दिवन मॉडल का एक मामला अध्ययन किया जा रहा है। यह एकीकृत समाधान उत्पाद की गुणवत्ता सस्ता होने से रोकेगा और क्रूड आसवन इकाइयों के मार्जिन को अधिकतम करेगा।
- सीआरडीसी विकसित के मॉडल विभिन्न क्रूड के लिए प्रयोगों द्वारा आवश्यक हफ्तों के समय की तुलना में मिनटों के भीतर क्रूड संगतता और कई क्रूड के अनुकूलन की त्वरित और सटीक भविष्यवाणी के लिए एक वेब–आधारित सॉफ्टवेयर है। सॉफ्टवेयर को बीपीसीएल के उत्पाद के रूप में शुरू किया गया था और इसे पूरे इंटरनेट (https://www.bpcl.kmodel.in) पर उपलब्ध कराया गया है। के मॉडल वास्तविक समय के आधार पर अर्थशास्त्र, उपलब्धता और प्रसंस्करण व्यवहार्यता के आधार पर एक इष्टतम मिश्रण तक पहुंचने में सक्षम बनाता है, जिससे त्वरित समय में कई कच्चे तेल मिश्रण विकल्पों के एक साथ मूल्यांकन को बढ़ावा मिलता है और अधिक सूचित निर्णय लिया जाता है। यह उपकरण की स्थिति, सुचारू संचालन, ऊर्जा की बचत और कार्बन पदचिह्न को कम करने के लिए रिफाइनरी हेतु संगत कच्चे तेल मिश्रण डालने की सुविधा भी प्रदान करता है।
- एनोड ग्रेड कोक उत्पादनरू सीआरडीसी ने रिफाइनरी की विलंबित कोकर इकाइयों से एनोड ग्रेड कोक उत्पादन की प्रक्रिया की जानकारी को सफलतापूर्वक विकसित और प्रदर्शित किया है। कोच्चि रिफाइनरी में 4,500 मीट्रिक टन एनोड ग्रेड कोक उत्पादन परीक्षण सफलतापूर्वक किया गया।
- भारत सरकार की 'आत्मनिर्भर भारत' पहल के हिस्से के रूप में बीपीसीएल का कॉर्पोरेट अनुसंधान एवं विकास केंद्र रिफाइनिंग क्षेत्र में उपयोग किए जाने वाले विभिन्न प्रक्रिया रसायनों और उत्प्रेरकों के स्वदेशीकरण की दिशा में लगातार काम कर रहा है। इस संदर्भ में, सीआरडीसी ने मौजूदा रिफाईनिंग उत्पाद पोर्टफोलियो से सीटेन इम्प्रूवर के उत्पादन की प्रक्रिया को सफलतापूर्वक विकसित किया है। उत्पाद को प्रयोगशाला पैमाने पर विकसित किया गया था और बाद में प्रदर्शन पैमाने पर प्रदर्शित किया गया था। इसी तरह, ऑक्सो–अल्कोहल उत्पादन के लिए समरूप वरण उत्प्रेरक विकसित करने के प्रयास किए जा रहे हैं।

8.4.2. गत तीन वर्षों में आरएंडडी व्यय

वित्त वर्ष	आर एंड डी व्यय (करोड़ रुपए में)
2021-22	77.76
2022-23	71.68
2023-24	95.87

8.5. हिन्दुस्तान पेट्रोलियम कार्पोरेशन लिमिटेड (एचपीसीएल)

8.5.1. एचपीसीएल ने नवाचार के माध्यम से ऊर्जा और रसायनों को सभी के लिए सुलभ बनाने के मुख्य उद्देश्य से 2018 में बेंगलुरु में अपने प्रतिष्ठित एचपी ग्रीन आरएंडडी सेंटर (एचपीजीआरडीसी) की स्थापना की है। एचपीजीआरडीसी अत्याधुनिक अनुसंधान करने के लिए सभी उन्नत उपकरणों, पायलट संयंत्रों और सुविधाओं के साथ अत्याधुनिक प्रयोगशालाओं से लैस है। अनुसंधान के मुख्य क्षेत्रों में शोधन प्रौद्योगिकियों, उत्पादों और उत्प्रेरक, पेट्रो रसायनों और पॉलिमर, लुब्रिकेंट को विकसित करना, कम महत्व की धाराओं, नवाचार पृथक्करण प्रौद्योगिकियां, प्रक्रिया गहनता, कार्बन कैप्चर, नवीकरणीय ऊर्जा और वैकल्पिक ऊर्जा का उन्नयन शामिल है। एचपीजीआरडीसी रिफाइनरी यूनिटों, कच्चे तेल के मूल्यांकन, उत्प्रेरक परीक्षण और चयन, सल्फर प्रजातिकरण, स्ट्रीम अध्ययनों संबंधी उत्प्रेरक समय आदि के लिए ट्रबल शूटिंग सेवाओं के माध्यम से भारत और विदेशों में विभिन्न रिफाइनरियों को उन्नत तकनीकी सहायता भी प्रदान करता है। इसके अतिरिक्त, एचपीजीआरडीसी नई प्रयोगशाला अर्थात नई प्रयोगशाला अर्थात बिटुमेन और फुटपाथ अनुसंधान में उत्कृष्टता केंद्र (सीओई) की स्थापना कर रहा है।

केन्द्र ने अब तक भारत और विदेश में संचयी रूप से 547 पेटेंट दायर किए हैं और 210 पेटेंट प्राप्त किए हैं। जनवरी 2023–मार्च 2024 की अवधि के दौरान, 140 पेटेंट दायर किए गए हैं और 61 पेटेंट प्रदान किए गए हैं।

एचपीजीआरडीसी ने विकसित उत्पादों, उत्प्रेरक और प्रौद्योगिकियों के व्यावसायीकरण पर विशेष जोर देते हुए मौजूदा और नए व्यावसायिक क्षेत्रों के लिए समाधान देने के उद्देश्य से नवाचार जारी रखा। उल्लेखनीय रूप से जहां नवाचार मानदंड अब तक के उच्चतम स्तर पर पहुंच गए हैं, वहीं उत्पादों के व्यावसायीकरण में भी 3 गुना वृद्धि के साथ सर्वकालिक उच्च स्तर देखा गया है।

एचपीजीआरडीसी द्वारा 7 प्रतिष्ठित मान्यताएं/पुरस्कार प्राप्त हुए, जिनमें पेट्रोलियम और प्राकृतिक गैस मंत्रालय से सर्वश्रेष्ठ स्वदेशी विकसित प्रौद्योगिकी श्रेणी के तहत 'स्वदेशी पीएसए पीएलसी प्रौद्योगिकी के व्यावसायीकरण' और पेट्रोलियम और प्राकृतिक गैस मंत्रालय से आरएंडडी संस्थान श्रेणी में सर्वश्रेष्ठ नवाचार के तहत 'एचपी–एचसीएनजी प्रौद्योगिकी' के लिए दो सीएचटी नवाचार पुरस्कार 2022–23 शामिल हैं।





"एचपी–बीसीए: एफसीसी यूनिट में गाद कम करने हेतु योज्य" हेतु फिक्की पुरस्कार; "एचपी–डीडब्लूए: प्रोपेन डिवेक्सिंग यूनिट के लिए डिवेक्सिंग साधन" हेतु एफआईपीआई ऑयल एंड गैस इन्नोवेटर वार्षिक पुरस्कार 2022; "एचपी–बायोरेमीडिया: तैलीय गाद के संवर्धित बायोरेमीडियेशन के लिए जैव योज्य" हेतु 2024 का गोल्डन पिकॉक इन्नोवेटिव उत्पाद/सेवा पुरस्कार; भारतीय राष्ट्रीय सुरक्षा परिषद् से सुरक्षा पुरस्कार–2023 में "प्रशंसा पत्र"; रिन्युवेबल एनर्जी इंडिया एक्सपो, नई दिल्ली में "अग्रणी आरई प्रौद्योगिकी/उत्पाद नवाचार" की श्रेणी के अंतर्गत "एचपी–आरएएमपी प्रौद्योगिकी"।

वर्ष के दौरान निम्नलिखित प्रौद्योगिकी शुरू करने संबंधी गतिविधियां की गईं:

- सर गंगाराम अस्पताल, नई दिल्ली में एचपी–एमओ2–IV (3टीपीडी मेडिकल ऑक्सीजन संयंत्र) जिसे आंतरिक रूप से विकसित प्रेशर स्विंग एडसॉर्प्शन (पीएसए) प्रक्रिया के आधार पर डिजाइन किया गया है।





ख) दुनिया भर के प्रतिभागियों के साथ 9–11 मई 2023 को आयोजित बायोगैस बैठक से अंतर्राष्ट्रीय ऊर्जा एजेंसी (आईईए) टास्क 37 एनर्जी की मेजबानी की गई

ग) 5वें संस्करण वाली नई पीढ़ी विचार प्रतियोगिता (एनजीआईसी) आयोजित की गई थी जिसमें पूरे भारत में विभिन्न शैक्षणिक संस्थानों से 700 विचारों को प्राप्त किया गया, उनकी संवीक्षा की गई और पुरस्कृत किया गया इसी अवधि के दौरान, एचपीजीआरडीसी ने 17 नए उत्पादों/

- वीआर में हाईगैस मॉडल–2 जो ईंधन गैस से एच2एस हटाने के लिए एक घूर्णन पैक बेड (आरपीबी) आधारित अवशोषण प्रक्रिया है, एचपीजीआरडीसी ने तेल और गैस क्षेत्र, जैव ईंधन प्रौद्योगिकी और शैक्षणिक संस्थानों में नवाचार को बढ़ावा देने में प्रमुख भूमिकाएं निभाई हैं जो निम्नवत हैं:

क) 17–18 अक्टूबर 2023 के दौरान "ऊर्जा परिवर्तन में तेल और गैस क्षेत्र की आरएंडडी की भूमिका" संबंधी पहली सीएचटी–गतिविधि समिति बैठक (एसीएम) की मेजबानी की गई

प्रौद्योगिकियों का व्यावसायिक प्रदर्शन किया है (इसके साथ ही प्रौद्योगिकियों और उत्पादों के प्रदर्शन की संख्या 60 हो गई है), जिनका विवरण नीचे दिया गया है:

- **एचपी एक्वाओकेयर:** मिनरल स्केल डिपॉज़िट बहुत आम है और इससे औद्योगिक जल प्रणालियों में लगातार समस्या का सामना करना पड़ता है और इकाइयों की दक्षता में बाधा आती है। एचपीजीआरडीसी ने व्यापक रासायनिक शोधन

पैकेज "एचपी एक्वाओकेयर" विकसित किया है। एचपी एक्वाओकेयर एक पेटेंट उत्पाद है; 3डी समन्वय साइटों के साथ नव बहु–कार्यात्मक बहुलक योजक शामिल है, जिससे अधिक क्रिस्टल विकास विरूपण और स्केल प्रिकर्सरों के साथ बेहतर कीलेटन होता है। कठोरता नियंत्रित और बेहतर स्केल निषेध करता है; सामान्य और गर्तन्यास जंक को नियंत्रित करता है; बहुत प्रभावी सूक्ष्मजीवविज्ञानी दूषण नियंत्रित करता है।

- **एचपी–एनस्कोर:** एचपीजीआरडीसी ने भारी तेल सेवा में टैंकों/इकाइयों के अनुप्रयोग को निष्क्रिय करने के लिए एक नया और लागत प्रभावी योजक पैकेज एचपी एनस्कोर विकसित किया है। ऐसे टैंकों की साफाई के लिए पारंपरिक प्रक्रिया समय लेने वाली, जनशक्ति केंद्रित होती है और इसमें खतरनाक हाइड्रोकार्बन के हैंडलिंग और निपटान की आवश्यकता होती है। एचपी एनस्कोर एक अनूठा और उन्नत सूत्रीकरण है जो भारी डामर कीचड़ को घोल सकता है और इसे संसाधित करने योग्य तेल में परिवर्तित कर सकता है। एडिटिव का क्षेत्र परीक्षण एचपीसीएल की मुंबई रिफाइनरी में सफलतापूर्वक किया गया, जहां डामर टैंक से टैंक बॉटम स्लज का 80% हटा दिया गया और साथ ही सफाई का समय भी तीन सप्ताह कम हो गया।

- **एचपी प्राइमर:** एचपीजीआरडीसी ने 80 डिग्री सेल्सियस तक अनुप्रयोगों के लिए एक टिकाऊ और संवर्धित संक्षारण प्रतिरोधी प्राइमर विकसित किया है। उच्च तन्यता शक्ति के साथ, पेंट अधिक टिकाऊ होगा। इसके अलावा, योजक की अंतर्निहित परतदार संरचना धातु की सतह पर संक्षारक आयनों के पारगम्यता में देरी करेगी जिससे संक्षारण प्रतिरोध बढ़ जाएगा। इन–हाउस फॉर्मूलेशन व्यावसायिक रूप से उपयोग किए जाने वाले प्राइमरों की तुलना में प्रतिक्रिया मूल्यों में तीन क्रम सुधार दर्शा रहा है। सबसे उपयुक्त योगों की पहचान करने के लिए आगे का विश्लेषण किया गया था। यह पारंपरिक जिंक सिलिकेट प्राइमर कोटिंग पर सतह सहिष्णु और प्रतिरोधी कोटिंग है।

- **एचपी पीपीडी–यूएलएसडी:** एचपी पीपीडी यूएलएसडी को अत्यधिक कम सल्फर वाला डीजल (यूएलएसडी) के लिए एक बहाव बिंदु अवसाद सूत्रीकरण के रूप में विकसित किया गया है। यह योजक ठंडे तापमान में मोम क्रिस्टल के गठन को रोकता है या देरी करता है और यह सुनिश्चित करता है कि डीजल ईंधन स्वतंत्र रूप से प्रवाहित हो और पाइपलाइनों, फिल्टर और इंजन नोजल के बंद होने से बचा जा सके। विकसित पीपीडी यूएलएसडी वाणिज्यिक की तुलना में 36% लागत प्रभावी है। अब तक एमआर के लिए 63 मीट्रिक टन एचपी पीपीडी यूएलएसडी की आपूर्ति की गई है और ~1 करोड़ रूपए का लागत लाभ हुआ है।

- **एचपी सोलरओकरे:** सौर पैनल सफाई समाधान उच्च स्तर की रोगाणुरोधी प्रभावशीलता और न्यूनतम संक्षारण प्रवृत्तियों के साथ बेहतर सफाई दक्षता प्रदर्शित करता है। इसके अतिरिक्त, पतला करने वाले पदार्थ को बाह्य एनएबीएल मान्यता प्राप्त प्रयोगशाला द्वारा कठोर परीक्षण और प्रमाणन से गुजरना पड़ा है।

- **एचपी निकट्रीट:** यह एक नया योजक सूत्रीकरण है जिसका उपयोग एफसीसी इकाइयों में उत्प्रेरक में निकेल की डीहाइड्रोजनीकरण गतिविधि को नियंत्रित करने/निष्क्रिय करने के लिए किया जा सकता है और इस तरह इकाई में शुष्क गैस उत्पादन को कम किया जा सकता है। मुंबई और विशाख रिफाइनरी में परीक्षण अन्य वाणिज्यिक विकल्पों के समान प्रदर्शन का संकेत देते हैं।

- **एचपी–पीएमए:** प्रोपलीन मैक्सिमाइजेशन एडिटिव अद्वितीय योजक है जिसके माध्यम से एफसीसी इकाई में प्रोपलीन उत्पादन को बढ़ाया जा सकता है। एडिटिव को स्केल–अप किया गया था और टोल निर्माण किया गया और क्षेत्र परीक्षणों ने डेल्टा प्रोपलीन को 5% उत्प्रेरक इन्वेंट्री चेंजओवर पर 0.45डब्लूटी% की वृद्धि दी है।

- **एचपी–सीओपी:** सीओ प्रमोटर योजक आमतौर पर एफसीसी पुनर्योजी में कार्बन को सीओ2 में पूर्ण रूपांतरित करने के लिए उपयोग किया जाता है। योजक बाजार में उपलब्ध चीजों की तुलना में 50% तक कम लागत वाला समाधान है।

- **एचपी फ्रॉस्ट फ्री:** एचपी फ्रॉस्ट–फ्री विंडशील्ड बर्फ/फ्रॉस्ट को तुरंत पिघला देता है और ठंडी जलवायु वाले क्षेत्रों में ड्राइवर को साफ साफ देखने का अनुभव प्रदान करता है। अद्वितीय गैर–संक्षारक सूत्रीकरण इजी–टू–स्प्रे पैकेजिंग में उपलब्ध है। हैंडलिंग की सहजता और बेहतर प्रभावशीलता एचपी फ्रॉस्ट–फ्री को आपकी यात्रा में एक विश्वसनीय साथी बनाती है।

- **एचपी फ्रॉस्ट शील्ड:** एचपी फ्रॉस्ट–शील्ड एक अनूठा सूत्रीकरण है जो ठंडे जलवायु वाले क्षेत्रों में वाहन विंडशील्ड पर रात भर पाला (फ्रॉस्ट) के बनने को रोकता है। सूत्रीकरण पानी के लिए संपर्क का एक अस्थायी अवरोध प्रदान करता है, जो पाला जमा होने को कम करने में मदद करता है।

उपयोगकर्ता के अनुकूल पैकेजिंग में उपलब्ध यह गैर–संक्षारक सूत्रीकरण आपकी यात्रा में एक विश्वसनीय भागीदार है।

- **एचपी बोइलमैक्स:** एचपी बोइलमैक्स को घनीभूत पानी में मौजूद अम्लीय यौगिकों का मुकाबला करने के लिए तैयार किया गया है, जिससे पीएच स्तर में वृद्धि होती है। उत्पाद में अमाइन को बेअसर करने की क्षमता होती है, जिससे पानी के पीएच को इसकी बेहतर न्यूट्रलाइजिंग क्षमता और स्टीम व पानी के चरणों के बीच बढ़े हुए वितरण गुणांक के आधार पर प्रभावी ढंग से नियंत्रित किया जाता है। क्षेत्र परीक्षणों में, इन–हाउस विकसित एडिटिव एचपी–बोइलमैक्स ने पारंपरिक वाणिज्यिक योजक की तुलना में लगभग 25% की कमी के साथ कम खुराक पर बेहतर प्रदर्शन किया है।
- **एचपी पावर क्लीन:** एचपी पावर क्लीन एसआई इंजन के कार्यनिष्पादन को बढ़ाने के लिए डिजाइन किया गया एक अत्याधुनिक बहुक्रियाशील गैसोलीन योजक है। बेहतर डिटर्जेंसी और डिस्पर्सेंट गुणों का लाभ उठाते हुए, एचपी पावर क्लीन बेहतर परिणाम देता है: इनटेक वाल्व डिपॉजिट में 90% से अधिक की कमी, ब्रेक थर्मल दक्षता में 3.3% सुधार और ईंधन की खपत में 3.1% की कमी। एनओएक्स, एचसी, सीओ और पीएम (NOx, HC, CO और PM) उत्सर्जन के संदर्भ में उत्सर्जन भी काफी कम हो जाता है।
- **एचपी ईजीआईएन:** एचपी–ईजीआईएन निर्जल एथेनॉल और गैसोहोल माध्यम के लिए एक नव और लागत प्रभावी संक्षारण अवरोधक है। इसका निर्माण पारंपरिक वाणिज्यिक उत्पादों की तुलना में कम खुराक के स्तर की अनुमति देता है, जिससे प्रभावकारिता से समझौता किए बिना लागत बचत हो सकती है। विभिन्न तापमानों और स्थानों पर एचपी–ईजीआईएन का सफल परीक्षण इसकी विश्वसनीयता तथा परिचालन और वितरण नेटवर्क के भीतर व्यापक अनुप्रयोग की क्षमता को रेखांकित करता है। एचपी–ईजीआईएन को अपनाने से एथेनॉल मिश्रणों के भंडारण और परिवहन में शामिल बुनियादी ढांचे की दीर्घ जीवन और कार्यनिष्पादन में वृद्धि हो सकती है, जिससे अंततः अधिक टिकाऊ औद्योगिक प्रथाओं में योगदान हो सकता है।
- **एचपी शाइन प्रो:** एचपी शाइन प्रो सभी उद्देश्य पेंटिंग अनुप्रयोगों के लिए एक प्रीमियम पेंट को पतला करने वाला पदार्थ (थीनर) है। एचपी–शाइन प्रो थिनर की विलायकता में काफी सुधार करने के लिए अद्वितीय फॉर्मूलेशन से प्रभावित है। यह बदले में पेंट सकुलनों को कम करता है और चिकनी सतह सुनिश्चित करता है। चूंकि सतह की अस्थिरता कम हो जाती है, इसलिए इसकी चमक बढ़ जाती है। सतह पर बेहतर आसंजन भी पेंट परत को एक समान रखने में मदद करता है, जिससे यांत्रिक स्थिरता को बढ़ाने के साथ–साथ प्रतीति में सुधार होता है।
- **एचपी–बीसीए:** एफसीसी इकाइयों के लिए बॉटम्स क्रैकिंग एडिटिव ट्रेडमार्क युक्त उत्प्रेरक है जिसे भारी हाइड्रोकार्बन को मूल्यवान उत्पादों में उन्नयन करने के लिए डिजाइन किया गया है। मुंबई और विशाख रिफाइनरी एफसीसी इकाई में बॉटम्स में 0.5–0.75डब्लूटी% की कमी के साथ फील्ड ट्रायल पूरा हो गया है। फिक्की पुरस्कार उत्प्रेरक प्रौद्योगिकी के लिए प्राप्त किया गया था।
- **एचपी नैनोलाइट:** अत्यधिक दबाव अनुप्रयोग के लिए हल्के रंग के ग्रीज हेतु नैनो योजक। उत्कृष्ट एंटी–वीयर, घर्षण रोधी, संवर्धित कार्यनिष्पादन के साथ चरम दबाव गुण। आधार ग्रीस के रंग को बनाए रखने में मदद करता है। केटल्स की आवधिक सफाई की कोई आवश्यकता नहीं होती है। सभी प्रकार के ग्रीस के साथ संगत। घर्षण के गुणांक और निशान लगने दोनों में 20% की कमी। जोके और वेल्ड लोड में 60% वृद्धि।
- **एचपी नैनोकोट:** खारा वातावरण के लिए क्षय शमन के लिए नैनो–एडिटाइज्ड पेंट। उद्योग बेंचमार्क की तुलना में उच्च प्रतिक्रिया और बॉन्ड की मजबूती। खारा वातावरण में भी बेहतर प्रदर्शन प्रदान करता है। तीन परत पारंपरिक कोटिंग प्रणाली को केवल दो परतों द्वारा प्रतिस्थापित किया जा सकता है। परिचालन जीवन में वृद्धि।

वर्ष 2023–24 के दौरान, 26 नए ल्यूब आधारित फॉर्मूलेशन शुरू और व्यावसायीकरण किए गए हैं.

वित्त वर्ष 2023–24 के दौरान, आरएंडडी में ग्लोबल टेक्नोलॉजी सेंटर (जीटीसी) ने मुंबई और विशाख रिफाइनरियों की कुल 16 इकाइयों के कार्यनिष्पादन की निगरानी की है, जिसने न केवल लाइसेंसदाताओं के साथ तकनीकी सेवा समझौते को रोकने में मदद की, बल्कि एचपीसीएल रिफाइनरियों को समय पर और उन्नत मूल्य संवर्धन सेवाएं भी प्रदान कीं।

इन–हाउस विकसित प्रक्रिया की वैश्विक पहुंच के लिए, मैसर्स केबीआर, यूएसए के साथ प्रौद्योगिकी साझेदारी समझौते (टीपीए) पर हस्ताक्षर किए गए थे, जो डीकार्बोनाइजेशन (कार्बन कैप्चर) के लिए वैश्विक स्तर पर इन–हाउस विकसित हाईगैस प्रौद्योगिकी की लाइसेंसिंग और विपणन के लिए था।

8.5.2. गत तीन वर्षों में आरएंडडी व्यय

वित्त वर्ष	आरएंडडी व्यय (करोड़ रुपए में)
2021-22	364
2022-23	320
2023-24	352

8.6. गेल (इंडिया) लिमिटेड

8.6.1. आरएंडडी और नई प्रौद्योगिकियां

प्राकृतिक गैस उद्योग में अनुसंधान एवं विकास और नई प्रौद्योगिकियों का एकीकरण उद्योग विशिष्ट कारकों जैसे कि बढ़े हुए पर्यावरणीय विनियमों को पूरा करने, प्राकृतिक गैस मूल्य श्रृंखला के डीकार्बोनाइजेशन, प्रक्रिया और लागत का इष्टतम उपयोग और नए संसाधनों में वृद्धि आदि द्वारा प्रचालित होता है। भारत में प्राकृतिक गैस अग्रणी कंपनियों में से एक कंपनी के रूप में गेल, वर्तमान और भविष्य के व्यावसायिक हितों को पूरा करने के लिए अपनी कॉर्पोरेट और व्यावसायिक कार्यनीतियों के साथ संरेखण में पहचाने गए महत्वपूर्ण क्षेत्रों में विभिन्न अनुसंधान परियोजनाओं का अनुसरण करता है ताकि लंबे समय में हमारे प्रतिस्पर्धात्मक लाभ को बढ़ाया जा सके। इस पहलू में, इस वर्ष गेल ने निम्नलिखित अनुसंधान विषयों पर ध्यान केंद्रित किया है।

- **ई–मीथेन उत्पादन:**

  नवीकरणीय ऊर्जा हेतु भारत के ऊर्जा परिवर्तन के लिए ऊर्जा आपूर्ति और गतिशीलता के बीच मजबूत क्षेत्र युग्मन पूर्व–आवश्यकता है। भारत में उपलब्ध एनजी पी/एल के विशाल नेटवर्क को ध्यान में रखते हुए, ई–मीथेन (पावर–टू–मीथेन) या सिंथेटिक प्राकृतिक गैस का उत्पादन भारत में क्षेत्र युग्मन के लिए एक विकल्प है। ई–मीथेन उत्पादन योजना में नवीकरणीय हाइड्रोजन का उपयोग डायरेक्ट एयर कैप्चर (डीएसी) विधियों से प्राप्त किए गए कार्बन डाईआक्साइड के प्रत्यक्ष हाइड्रोजनीकरण या केंद्रित कार्बन डाईआक्साइड कार्बन डाईआक्साइड स्रोत से प्राप्त कार्बन डाईआक्साइड के लिए किया जा सकता है। इस प्रकार, ई–मीथेन उत्पादन में ग्रीनहाउस गैस कार्बन डाइऑक्साइड (सी ओ 2) के अतिरिक्त उपयोग को प्राप्त करना संभव है जो जलवायु संरक्षण लक्ष्य में योगदान देता है। कार्बन डाईआक्साइड हाइड्रोजनीकरण प्रतिक्रिया में उत्पाद चयनात्मकता उत्प्रेरक की इलेक्ट्रॉनिक संरचना द्वारा नियंत्रित होती है। परिवर्तन धातुओं के डोपिंग और मिश्र धातु के माध्यम से उत्प्रेरक की इलेक्ट्रॉनिक संरचना को संशोधित करके, विभिन्न प्रतिक्रिया मार्ग प्राप्त किए जा सकते हैं। इसलिए, इस प्रक्रिया के लिए अत्यधिक कुशल और स्थिर उत्प्रेरक का विकास समय की आवश्यकता है। इस पहल के तहत, गेल विभिन्न संरचित समर्थनों ए आई 2 ओ 3, एस आई ओ 2, एम जी ए आई 2 ओ 4, जेड आर ओ 2, टी आई ओ 2, एल ए 2 ओ 3 और सी ई ओ 2 का उपयोग करके उच्च दक्षता और मजबूत छप–समर्थित उत्प्रेरक विकसित कर रहा है। इस परियोजना को सीएसआईआर–आईआईपी देहरादून के सहयोग से आगे बढ़ाया जा रहा है। वर्तमान शोध कार्य की सफलता इन मीथेनेशन प्रक्रिया द्वारा बायोगैस में प्रमुख घटकों और शक्तिशाली जीएचजी, कार्बन डाईआक्साइड में से एक को पाइपलाइन–गुणवत्ता वाले बायोमीथेन (मीथेन, 90 वोल्युम% न्यूनतम) में परिवर्तित करने का अवसर प्रदान करती है।

- **हाइड्रोजन उत्पादन:**

  स्वच्छ हाइड्रोजन से ऊर्जा मूल्य श्रृंखला को डीकार्बोनाइज करने में महत्वपूर्ण भूमिका निभाने की उम्मीद है। हालांकि, हाइड्रोजन की लागत को कम करने के लिए इलेक्ट्रोलाइजर तकनीक में महत्वपूर्ण शोध चुनौतियों को दूर करने की आवश्यकता है। इस पहलू में, पॉलिमर आधारित प्रोटॉन एक्सचेंज मेम्ब्रेन (पीईएम) वाटर इलेक्ट्रोलिसिस यानी पीईएमडब्ल्यूई प्रौद्योगिकी सबसे आकर्षक है क्योंकि यह पारंपरिक क्षारीय जल इलेक्ट्रोलिसिस (एडब्ल्यूई) प्रौद्योगिकी की तुलना में कम ओमिक प्रतिरोध, उच्च वर्तमान घनत्व और परिचालन दबाव के मामले में स्पष्ट रूप से बढ़ाया प्रदर्शन दिखाती है। हालांकि, पीईएमडब्ल्यूई उपकरणों की बड़े पैमाने पर तैनाती काफी हद तक सक्रिय, स्थिर और कम लागत वाले इलेक्ट्रो उत्प्रेरक की कमी से बाधित है।

  इसलिए, इस क्षेत्र में हमारे शोध प्रयास कम लागत वाली लेकिन सक्रिय मिट्टी प्रचुर मात्रा में धातु–आधारित उत्प्रेरक, विशेष रूप से परिवर्तन धातु (टीएम) आधारित उत्प्रेरकों की जांच पर केंद्रित हैं। तदनुसार, गेल दोषपूर्ण और धातु मिश्रित ऑक्साइड का उपयोग करके उच्च दक्षता वाले गैर–नोबल धातु ऑक्साइड आधारित विद्युत उत्प्रेरकों के संश्लेषण को लक्षित कर रहा है जो कम क्षमता के साथ और उच्च वर्तमान घनत्व के तहत अम्लीय स्थितियों में काम करते हैं। यह परियोजना सेंटर फॉर नैनो एंड सॉफ्ट मैटर साइंसेज (सीईएनएस), बेंगलुरु के सहयोग से की जा रही है, जो विज्ञान और प्रौद्योगिकी विभाग (डीएसटी) के तहत एक स्वायत्त अनुसंधान संस्थान है।

- **पीईएम ईंधन सेल:**

  पीईएम ईंधन सेल कम ऑपरेटिंग तापमान, उच्च शक्ति घनत्व और आसान स्केल–अप जैसी लाभप्रद विशेषताओं के कारण परिवहन, स्थिर और पोर्टेबल अनुप्रयोगों के लिए अगली पीढ़ी के बिजली स्रोतों के रूप में भरोसेमंद प्रौद्योगिकी रही है। पीईएम ईंधन सेल की व्यापक तैनाती के लिए वर्तमान प्रौद्योगिकी बाधाओं में पीटी आधारित उत्प्रेरकों की स्थायित्व और लागत शामिल है।

  इस पहलू में गेल पीईएम ईंधन सेल के लिए पीटी आधारित उत्प्रेरकों हेतु स्वदेशी स्केलेबल सिंथेटिक प्रोटोकॉल के विकास के लिए सीईएनएस बैंगलुरु के साथ सहयोग कर रहा है ।

  इसके अतिरिक्त, गेल 1 किलोवाट पीईएम ईंधन सेल के स्वदेशी विकास के लिए आईओसीएल और हाई एनर्जी बैटरी प्राइवेट लिमिटेड, त्रिची के सहयोग से उच्च प्रौद्योगिकी केन्द्र (सीएचटी) के माध्यम से सहयोगात्मक अनुसंधान कार्य भी कर रही है। इस परियोजना का मुख्य उद्देश्य इलेक्ट्रोकैटलिस्ट में बहुत कम मात्रा में पीटी लोडिंग (0.4एमजी/सेमी2) का उपयोग करना है। इसके अलावा, इस परियोजना का उद्देश्य कोबाल्ट आधारित उत्प्रेरक का उपयोग करके सोडियम बोरोहाइड्राइड हाइड्रोलिसिस के माध्यम से नेफियन और हाइड्रोजन उत्पादन के विकल्प के रूप में प्रयोगशाला पैमाने के प्रोटोटाइप स्पीक आधारित झिल्ली का विकास करना भी है।

- **हाइड्रोजन का रासायनिक भंडारण:**

  हाइड्रोजन का सुरक्षित, व्यावहारिक और किफायती भंडारण, साथ ही परिवहन में आसानी, एक सफल हाइड्रोजन अर्थव्यवस्था के रास्ते में चुनौतियां बनी हुई हैं। तरल कार्बनिक हाइड्रोजन वाहक (एलओएचसी) हाइड्रोजन के थोक भंडारण के लिए हाइड्रोजन के रासायनिक भंडारण के लिए एक अत्यंत आकर्षक विकल्प का प्रतिनिधित्व करते हैं।

  इस दिशा में, गेल सीएसआईआर–एनसीएल के सहयोग से तरल कार्बनिक हाइड्रोजन वाहक के रूप में अमाइन और अल्कोहल के हाइड्रोजनीकरण/डीहाइड्रोजनीकरण के लिए लागत प्रभावी परिवर्तन धातु उत्प्रेरकों के विकास के लिए एक अनुसंधान परियोजना चला रहा है जिससे हाइड्रोजन का व्यावहारिक और सस्ता भंडारण हो सके।

- **सोलर कुकिंग प्रणाली:**

  स्वच्छ कुकिंग मिशन के तहत भारत सरकार की पहल में भाग लेने के उद्देश्य से, गेल ने ग्रामीण अनुप्रयोग के लिए उपयुक्त आगमनात्मक हीटिंग तंत्र और ताप ऊर्जा भंडारण आधारित खाना पकाने की प्रणाली का उपयोग करके 1 किलोवाट सौर पीवी कुकिंग प्रणाली के दो प्रोटोटाइप विकसित करने का लक्ष्य रखा है। सीएसआईआर–केंद्रीय मैकेनिकल इंजीनियरिंग अनुसंधान संस्थान (सीएमईआरआई) दुर्गापुर और सीएसआईआर–केंद्रीय इलेक्ट्रॉनिक्स इंजीनियरिंग अनुसंधान संस्थान (सीईईआरआई), जयपुर केंद्र के सहयोग से इन पहलों को आगे बढ़ाया जा रहा है।

- **तेल, गैस और ऊर्जा में उत्कृष्टता केंद्र (सीओई–ओजीई)**

  गेल आईआईटी–बॉम्बे में तेल, गैस और ऊर्जा में उत्कृष्टता केंद्र (सीओई–ओजीई) में विभिन्न मिशन मोड अनुसंधान परियोजनाओं को भी आगे बढ़ा रहा है। सीओई–ओजीई की स्थापना सभी केंद्रीय तेल और गैस पीएसयू द्वारा उद्योग से संबंधित आरएंडी कार्यों को पूरा करने के लिए की गई थी। वर्तमान में गेल तेल और गैस पीएसयू के अन्य भागीदारों के सहयोग से 9 मिशन मोड परियोजनाओं, पी/एल प्रणाली की संरचनात्मक स्वास्थ्य निगरानी, ली आयन बैटरी का विकास, डीकार्बोनाइजेशन, ई–ईंधन, ओलेफिन के लिए मीथेन और तेल एवं गैस पाइपलाइन निगरानी के लिए टूल चेन पर विचार करते हुए पेट्रोलियम रिफाइनरियों/पेट्रोकेमिकल इकाइयों का जीवन चक्र मूल्यांकन में भाग ले रहा है।

- **पेटेंट:**

  वित्त वर्ष 2023–24 में, गेल को हमारे पहले के काम के लिए 12 पेटेंट प्रदान किए गए हैं और आज तक गेल के पास हमारे अद्वितीय अभिनव उत्पादों, प्रक्रिया और अवधारणाओं के लिए कुल 32 पेटेंट (29 भारतीय +3 विदेशी) पोर्टफोलियो है।

8.6.2. पिछले तीन वर्षों में आरएंडडी व्यय

वित्त वर्ष	आरएंडडी व्यय (करोड़ रुपए में)
2021-22	243.70
2022-23	180.71
2023-24	250.20

8.7. नूमालीगढ़ रिफाइनरी लिमिटेड (एनआरएल)

8.7.1. एनआरएल रिफाइनरी प्रचालनों के सभी पहलुओं में तकनीकी उत्कृष्टता के कार्पोरेट उद्देश्यों को पूरा करने, नए मूल्य वर्धित उत्पादों का विकास करने और मौजूदा पेट्रोलियम उत्पादों की गुणवत्ता का उन्नयन करने के लिए प्रौद्योगिकीय आदानों को उपलब्ध कराने हेतु शिक्षाविदों और अनुसंधान संगठनों के साथ भागीदारी के माध्यम से सीमित अनुसंधान और विकास कार्यकलाप कर रहा है।

एनआरएल द्वारा वर्तमान में अपनाई जा रही नई उत्पाद विकास और अनुसंधान पहलें इस प्रकार हैं:

क) आईआईटी गुवाहाटी में किफायती परिवहन के लिए दीर्घकालिक विकल्प सामग्री के लिए एनआरएल उत्कृष्टता केंद्र

एनआरएल ने विभिन्न रिफाइनरी और जैव रिफाइनरी धाराओं से पर्यावरणीय रूप से टिकाऊ सामग्रियों के विकास के लिए अनुसंधान एवं विकास गतिविधियों को पूरा करने के लिए आईआईटी गुवाहाटी में 'एनआरएल सेंटर ऑफ एक्सीलेंस फॉर सस्टेनेबल मटीरियलश (एनआरएल–सीओई एसएम) की स्थापना की। हाल ही में, एनआरएल सीओई में बायो–डिग्रेडेबल पॉलीमर पर एक प्रायोगिक संयंत्र स्थापित किया गया है जिसमें जैव अपघटीय प्लास्टिक जैसे ब्लोन फिल्म मशीन, इंजेक्शन मोल्डिंग, थर्मोफॉर्मिंग, कास्ट फिल्म एक्सट्रूडर आदि के डाउनस्ट्रीम प्रसंस्करण से संबंधित कई उपकरण हैं। पायलट संयंत्र में सामान्य और जैव अपघटीय पॉलिमर दोनों से कैरी बैग, खिलौने, कटलरी, सजावटी सामान आदि सहित विभिन्न प्रकार की वस्तुओं का निर्माण करने की सुविधा है।

एनआरएल–सीओई के तहत 'तेल और बायोरिफाइनरी धाराओं से टिकाऊ सामग्री का विकास' पर एक शोध परियोजना चलाई जा रही है। यह परियोजना अब तक कुछ नवीन विधियों या प्रक्रियाओं का आविष्कार करने में सफल रही है।

ख) काजीरंगा विश्वविद्यालय और फ्रंटियर विज्ञान और अनुप्रयोग संस्थान के साथ अनुसंधान सहयोग:

एनआरएल ने काजीरंगा विश्वविद्यालय (केयू) और इंस्टीट्यूट ऑफ फ्रंटियर साइंस एंड एप्लीकेशन (आईएफएसए) के साथ 'पूर्वोत्तर भारत में पवन ऊर्जा क्षमता का आकलन' नामक एक अनुसंधान परियोजना को पूरा करने के लिए सहयोग के लिए एक समझौता ज्ञापन (एमओए) पर हस्ताक्षर किए हैं। यह उत्तर पूर्व भारत में पवन ऊर्जा क्षमता की व्यवस्थित खोज के लिए अपनी तरह का पहला सहयोग है। एमओए के अनुसार, काजीरंगा विश्वविद्यालय, इंस्टीट्यूट ऑफ फ्रंटियर साइंस एंड एप्लीकेशन (आईएफएसए) के तकनीकी सहयोग और एनआरएल से वित्त पोषण में, परियोजना को लागू करेगा जिसका उद्देश्य तीन साल की अवधि के लिए मोबाइल लिडार निगरानी का उपयोग करके नदी के वातावरण में उत्तर पूर्व भारत संबंधी भरोसेमंद पवन ऊर्जा मूल्यांकन डेटा विकसित करना है।

ग) इंजीनियर्स इंडिया लिमिटेड (ईआईएल) के साथ आरएंडडी सहयोग

क. नया उत्पाद विकास: एनआरएल और ईआईएल ने रिफाइनरी की अमोनिया समृद्ध खट्टी गैसों से जलीय अमोनिया के उत्पादन के लिए प्रौद्योगिकी के संयुक्त विकास और वाणिज्यीकरण के लिए एक समझौता ज्ञापन (एमओए) पर हस्ताक्षर किए। एनआरएल सल्फर रिकवरी यूनिट (एसआरयू) के संचालन पर ईआईएल के डिजाइन ज्ञान और एनआरएल की विशेषज्ञता का उपयोग करके जलीय अमोनिया उत्पादन के लिए एक संयंत्र स्थापित करेगा।

ख. ओवरग्राउंड लिक्विड सल्फर लॉक: उपरी तल सल्फर सील डिजाइन करने पर ईआईएल की विशेषज्ञता का उपयोग करते हुए एनआरएल के एसआरयू में स्थापित करने के लिए 70 किलोग्राम प्रति घंटे तरल सल्फर प्रवाह को संभालने के लिए ग्राउंड सल्फर सील के ऊपर डिजाइन किया जाएगा।

घ) सीएसआईआर के साथ आरएंडडी सहयोगरू एनईआईएसटी

एनआरएल रिफाइनरी के जल फुट प्रिंट को कम करने और मूल्य वर्धित रसायनों का उत्पादन करने के उद्देश्य से वैज्ञानिक और औद्योगिक अनुसंधान परिषद के तहत पूर्वोत्तर विज्ञान और प्रौद्योगिकी संस्थान, जोरहाट के साथ अनुसंधान सहयोग के ढांचे के अंतर्गत 'खट्टे और स्ट्रीप जल से फिनोल को हटाने, इसका पुनः उपयोग और मूल्य संवर्धन' पर एक अनुसंधान एवं विकास परियोजना चला रहा है। खोखले फाइबर झिल्ली मॉड्यूल को डिजाइन और विकसित करके लैब स्केल प्रयोगों को सफलतापूर्वक आयोजित किया गया है। एनआरएल स्थल पर संस्थापना के लिए एक प्रायोगिक प्रदर्शन सुविधा विकसित की जा रही है।

ङ) सेंट एडमंड महाविद्यालय, शिलांग में अनुसंधान परियोजना

एनआरएल ने कच्चे तेल, हाइड्रोकार्बन भंडारण टैंक बॉटम स्लज और ईटीपी हाइड्रोकार्बन कीचड़ और इसके पर्यावरणीय जैव प्रौद्योगिकी निहितार्थों के

जैव–उपचार में सायनो बैक्टीरिया के उपयोग पर अनुसंधान कार्य के लिए सेंट एडमंड महाविद्यालय, शिलांग को नियुक्त किया है। इस परियोजना का उद्देश्य कच्चे तेल, हाइड्रोकार्बन भंडारण टैंक नीचे कीचड़ और ईटीपी हाइड्रोकार्बन कीचड़ के जैव–उपचार में सायनो बैक्टीरिया का उपयोग है।

एनआरएल से एकत्र किए गए सायनो बैक्टीरिया के नमूनों के संवर्धन पर महत्वपूर्ण विकास हासिल किए गए हैं और हाइड्रोकार्बन कीचड़ पर संवर्धित बैक्टीरिया के साथ जैव–संचय अध्ययन की जांच की जा रही है।

8.7.2. उपर्युक्त आरएंडडी कार्यकलापों का अपेक्षित परिणाम:

क. जैव अपघटीय प्लास्टिक का उत्पादन:

जैव अपघटीय प्लास्टिक के उत्पादन के लिए स्वदेशी प्रौद्योगिकी के विकास से गैर–जैव अपघटीय पॉलीथीन–आधारित पैक एजिंग को बदलने में मदद मिलेगी और ठोस कचरे से प्रदूषण को कम करने में योगदान मिलेगा। जैव अपघटीय प्लास्टिक बायो रिफाइनरी से एक मूल्य वर्धित स्ट्रीम होगी, जिसे एनआरएल के एक संयुक्त उद्यम असम बायो रिफाइनरी प्राइवेट लिमिटेड (एबीआरपीएल) द्वारा कार्यान्वित किया जा रहा है। इस परियोजना का उद्देश्य बायो रिफाइनरी के उपोत्पाद फुरफुरल स्ट्रीम को जैव अपघटीय पॉलिमर, पॉलीकैप्रोलैक्टोन (पीसीएल) में परिवर्तित करना है।

इस परियोजना के तहत अनुसंधान गतिविधियों के परिणाम के रूप में निम्नलिखित पेटेंट लागू होते हैं।

क. फुरफुरल को हाइड्रोक्सीमिथाइल फुरफुरल में बदलने के लिए नोवल उत्प्रेरक (एसपीईईके)

ख. फुरफुरल, एचएमएफ, फॉर्मलिन, लेवुलिनिक एसिड के मिश्रण से एचएमएफ के शुद्धिकरण के लिए नई प्रक्रिया।

ख. पवन ऊर्जा की क्षमता की खोज:

टर्बाइन स्तर पर नदी पर्यावरण में बहु–स्तरीय और बहु–स्थल उच्च आवृत्ति अवलोकन और विश्लेषण के माध्यम से लिडार प्रौद्योगिकी का उपयोग करके पवन ऊर्जा क्षमता का आकलन पहनीय पवन ऊर्जा स्थापन हेतु संगत असम के लिए विश्वसनीय पवन ऊर्जा डेटाबेस प्रदान करेगा। परियोजना के परिणामों का उपयोग असम में वाणिज्यिक पवन ऊर्जा उत्पादन को उत्प्रेरित करने के लिए किया जा सकता है। इस प्रकार इस परियोजना में असम के लिए महत्वपूर्ण सामाजिक–आर्थिक लाभ की बड़ी संभावना है। अवधारणा के प्रमाण के रूप में वर्तमान परियोजना के साथ, इसे उत्तर–पूर्व के व्यापक क्षेत्रों को कवर करने के लिए भी आसानी से बढ़ाया जा सकता है।

ग. जलीय अमोनिया का उत्पादन:

एनआरएल और ईआईएल द्वारा संयुक्त रूप से विकसित स्वदेशी प्रौद्योगिकी का उपयोग करते हुए खट्टा जल स्ट्रिपर की एनएच3 समृद्ध एसिड गैस की अपशिष्ट धारा से जलीय अमोनिया (25% एनएच3) का उत्पादन, एंजाइमों के उचित निष्पादन के लिए पीएच बनाए रखने हेतु जैव रिफाइनरी में जलीय अमोनिया की आवश्यकता को पूरा करेगा।

घ. ओवर ग्राउंड सल्फर सील संबंधी प्रौद्योगिकी विकास:

ओवरग्राउंड सल्फर सील प्रौद्योगिकी के विकास और वाणिज्यीकरण से रिफाइनरियों को सल्फर रिकवरी यूनिटों में तरल सल्फर के तरल–गैस चरण पृथक्करण में सुधार करने में मदद मिलेगी। इससे एसओएक्स उत्सर्जन में भी कमी आएगी।

ङ. सोर जल और स्ट्रीप्ड जल से फेनोल को हटाने की प्रौद्योगिकी:

सोर और स्ट्रीप जल से फेनोल को हटाने के लिए प्रौद्योगिकी के विकास से जल पदचिह्न में कमी आएगी और साथ ही रिफाइनरी से मूल्य वर्धित रसायन, फेनोल का उत्पादन होगा। फेनोल हटाने के लिए प्रौद्योगिकी का प्रयोगशाला स्तर पर प्रदर्शन सफलतापूर्वक पूरा कर लिया गया है और एनआरएल स्थल पर प्रदर्शन के लिए एक पायलट संयंत्र का डिजाइन और संविरचन तैयार है।

च. साइनो बैक्टेरियल कल्चर के माध्यम से जैवोपचारण:

भंडारण टैंक तल और बहिस्राव जल शोधन संयंत्र से हाइड्रोकार्बन कीचड़ के जैवोपचारण में सायनो बैक्टीरिया का उपयोग खतरनाक कचरे के स्थायी प्रबंधन में मदद करेगा।

8.7.3. गत तीन वर्षों में आरएंडडी व्यय

वित्त वर्ष	आरएंडडी व्यय (करोड़ रुपए में)
2021-22	2.73
2022-23	2.09
2023-24	3.08

8.8. मंगलोर रिफाइनरी और पेट्रोकैमिकल्स लिमिटेड (एमआरपीएल), मंगलोर

8.8.1. एमआरपीएल के नवाचार प्रयास मुख्य रूप से प्रौद्योगिकी सह उत्प्रेरक विकास, प्रक्रिया इष्टतमीकरण और विशिष्ट उत्पादों के निर्माण, आर्टिफिशियल इंटेलिजेंस/मशीन लर्निंग परियोजनाओं पर या तो इन–हाउस पहल या सम्मानित संस्थानों के साथ सहयोगी परियोजनाओं के माध्यम से केंद्रित हैं। उल्लेखनीय रूप से, एमआरपीएल अग्रणी संस्थानों जैसे एनसीएल–पुणे, आईआईटी–गुवाहाटी, आईआईसीटी हैदराबाद, एनआईटीके–सुरथकल, सिपेट–चेन्नै और एनएमएएमआईटी, एनआईटीटीई के साथ मिलकर अनुसंधान उद्यम चला रही है, ताकि नवाचार को आगे बढ़ाया जा सके और वैज्ञानिक सीमाओं प्रगति हो सके।

अब तक की तिथि तक, एमआरपीएल ने कुल 22 पेटेंट दायर किए हैं और 7 पेटेंट प्रदान किए गए हैं। वित्तीय वर्ष 2023–24 में, एमआरपीएल ने 4 नए पेटेंट दायर किए और इसी अवधि के दौरान 2 पेटेंट प्रदान किए गए।

एमआरपीएल के नवाचार प्रयास मुख्य रूप से निम्नलिखित प्रमुख क्षेत्रों में हैं,

8.8.2. आर्टिफिशियल इंटेलिजेंस (एआई)/मशीन लर्निंग (एमएल) परियोजनाएं

एमआरपीएल नवाचार टीम ने उपज, ऊर्जा और प्रवाह क्षमता में सुधार के लिए एआई और एमएल को पहले सिद्धांत के साथ मिलाकर नोवल एल्गोरिदम का आविष्कार किया है। एमआरपीएल अपनी प्रक्रिया इकाइयों में एआई आधारित रियल टाइम ऑप्टिमाइजर पेश करने वाली पहली रिफाइनरी है और पहले ही नोवल एल्गोरिदम के लिए 2 पेटेंट दायर कर चुकी है। पॉलीप्रोपाइलीन, पावर संयंत्र और पीएफसीसी इकाइयों में वास्तविक समय ऑप्टिमाइजर लागू किए गए हैं। वास्तविक समय ऑप्टिमाइजरों की योजनाओं के साथ–साथ पूर्ण एआई/एमएल–आधारित निर्देशात्मक रखरखाव प्राप्त करने के लिए एक रोडमैप निर्धारित किया गया है। महत्वपूर्ण रोटरी मशीनों में से एक (हाइड्रो प्रोसेसिंग यूनिट के लिए रीसायकल गैस कंप्रेसर) के लिए एआई/एमएल आधारित प्रिस्क्रिप्टिव रखरखाव उपकरण वित्त वर्ष 2023–24 में पूरा हो गया है। रोटरी उपकरण विश्वसनीयता के लिए, महत्वपूर्ण मशीनों के लिए कंपन सेंसर स्थापित किए जा रहे हैं, जो भविष्यसूचक मॉडल 2024–25 तक पूरा होने के लिए निर्धारित है। इलेक्ट्रिकल और इंस्ट्रूमेंटेशन एसेट्स के लिए भी इसी तरह की कार्रवाई चल रही है।

8.8.3. आइसोब्यूटाइल बेंजीन हेतु संसाधन प्रौद्योगिकी विकास

एमआरपीएल ने आइसो–ब्यूटाइल बेंजीन (आई–बीबी) सिंथेसिस के लिए अपनी इन–हाउस प्रौद्योगिकी के अग्रणी विकास के साथ फार्मास्युटिकल घटक संश्लेषण के क्षेत्र में एक महत्वपूर्ण उपलब्धि हासिल की है। इस अभिनव प्रक्रिया में एमआरपीएल इनोवेशन सेंटर में एक नए डिजाइन किए गए उत्प्रेरक की उपस्थिति में टोल्यूनि के साइड चेन अल्काइलेशन का रूपांतरण शामिल है। सूक्ष्म अनुसंधान और नवाचार के माध्यम से, एमआरपीएल ने एक उत्प्रेरक का निर्माण किया है जो न केवल टोल्यूनि के रूपांतरण को अधिकतम करता है बल्कि आइसोब्यूटाइल बेंजीन के उत्पादन के प्रति असाधारण चयनात्मकता भी प्रदर्शित करता है। आइसोब्यूटाइल बेंजीन, एक महत्वपूर्ण सक्रिय औषधीय घटक, एक एंटीएनालजेसिक औषधि ब्रूफेन को तैयार करने में महत्वपूर्ण के रूप में कार्य करता है। यह उल्लेखनीय नवाचार फार्मास्युटिकल संश्लेषण प्रौद्योगिकियों को आगे बढ़ाने के लिए एमआरपीएल की अटूट प्रतिबद्धता को रेखांकित करता है, जिससे स्वदेशी औषधीय विकास और रोगी देखभाल को बढ़ाने का मार्ग प्रशस्त होता है। फिलहाल एमआरपीएल आईबीबी डेमो संयंत्र लगाने की प्रक्रिया में है।

8.8.4. डियोड्रिंग रिफाइनरी ऑफ–गैसेज

एमआरपीएल की पेटेंट फोटो–कैटेलिटिक प्रक्रिया रिफाइनरी ऑफ–गैस स्ट्रीम्स से गंधयुक्त उत्सर्जन को कम करने के लिए लागत प्रभावी और पर्यावरण के अनुकूल समाधान प्रदान करती है, जिससे रसायनों या स्क्रबिंग एजेंटों की आवश्यकता समाप्त हो जाती है। यह यात्रा 2018 में प्रूफ–ऑफ–कॉन्सेप्ट अध्ययन के साथ शुरू हुई, जिससे वित्तीय वर्ष 2022–23 तक एक प्रदर्शन–स्तरीय डिओडोरिंग फोटो–कैटेलिटिक रिएक्टर (डीपीसीआर) का विकास हुआ, जिसमें 6 (टीआरएल6) के प्रौद्योगिकी तत्परता स्तर का प्रदर्शन किया गया। इससे प्राप्त अंतर्दृष्टि का लाभ उठाते हुए, एमआरपीएल ने डब्ल्यूएओ क्षेत्र में एफ्लुएंट ट्रीटमेंट संयंत्र (ईटीपी) के लिए एक वाणिज्यिक डिओडोरिंग यूनिट (डीईओयू) तैयार किया, जिसे नवंबर 2023 में चालू किया गया और यूनिट गीली डब्ल्यूएओ इकाई से उत्सर्जित गंध को प्रभावी ढंग से कम करती है, जो गंधशमन में सफल रही है। यह नवाचार एमआरपीएल के स्थिरता और पर्यावरणीय रूप से जिम्मेदार रिफाइनरी प्रथाओं के प्रति समर्पण को रेखांकित करता है।

8.8.5. जलाशयों से तेल के रिसाव से तेल निकालने के लिए सुपरहाइड्रोफोबिक सामग्री

एमआरपीएल ने तेल रिसाव से तेल निकालने के लिए विशेष रूप से तैयार किए गए सुपरहाइड्रोफोबिक स्पंज के विकास के साथ एक और उल्लेखनीय नवाचार हासिल किया है। यह पेटेंट विधि पर्यावरण उपचार प्रयासों में एक महत्वपूर्ण उपलब्धि है। एमआरपीएल का कौशल इस तकनीक को तेल अवशोषित करने वाली

स्कीमर में एकीकृत करने का है, जो जल निकायों से तेल निकालने के कार्यों में क्रांति लाने के लिए तैयार है। ईटीपी में उपचारित प्रवाह तालाब में इस स्किमर की सफल स्थापना और प्रदर्शन इसकी प्रभावकारिता और बहुमुखी प्रतिभा को उजागर करता है। इसके साथ, एमआरपीएल की पहल व्यापक पैमाने पर तेल प्रदूषण को दूर करने का वादा करती है, जो पर्यावरणीय प्रबंधन और टिकाऊ प्रथाओं के प्रति समर्पण को प्रदर्शित करती है।

8.8.6. प्लास्टिक सर्क्यूलेरिटी

सीएसआईआर–एनसीएल के साथ एक सहयोगी अनुसंधान कार्य 24 मई 2023 को शुरू हुआ, जो विभिन्न प्लास्टिक कचरे के डीपोलीमराइजेशन और अपसाइक्लिंग पर केंद्रित था। पॉलीथीन टेरेफ्थेलेट (पीईटी, मुख्य रूप से खनिज पानी की बोतलों में इस्तेमाल किया जाने वाला प्लास्टिक) डिपोलीमराइजेशन के लिए प्रूफ–ऑफ–कॉन्सेप्ट आर एंड डी, जिसके परिणामस्वरूप इसका मोनोमर बीआईएस–2–हाइड्रॉक्सीएथिल–टेरेफ्थेलेट सफलतापूर्वक पूरा हो गया है। पीईटी डिपोलीमराइजेशन के लिए एक पेटेंट 19 सितंबर 2023 को दायर किया गया था। यह अभिनव दृष्टिकोण प्लास्टिक से घटक मोनोमर्स की प्राप्ति पर केंद्रित है, जो क्षेत्र में एक महत्वपूर्ण प्रगति को चिह्नित करता है। एमआरपीएल की तकनीक प्लास्टिक में मौजूद मोनोमर्स को कुशलतापूर्वक अलग करके और निकालने के द्वारा इन सीमाओं को दूर करने का वादा करती है, जिससे सामग्री को उच्च गुणवत्ता वाले उत्पादों में पुनर्नवीनीकरण किया जा सकता है या गुणवत्ता में न्यूनतम नुकसान के साथ विनिर्माण प्रक्रिया में पुनः पेश किया जा सकता है। वित्तीय वर्ष 2024–25 में पीईटी डिपोलीमराइजेशन के लिए एक पायलट संयंत्र स्थापित करने की योजना चल रही है।

8.8.7. उच्च कार्यनिष्पादन वाला पॉलीप्रोपिलीन

परियोजना का उद्देश्य ऑटोमोबाइल उद्योगों में एबीएस, एसबीएस जैसे इंजीनियरिंग प्लास्टिक को प्रतिस्थापित करने के लिए पॉलीप्रोपाइलीन के गुणों में सुधार करना है और इसे सिपेट के सहयोग से किया जाता है। पीओसी 2022–23 में पूरा हो गया है और पेटेंट दायर किया गया है। वर्तमान में, नुरखा जानकारी के विकास, ऑटोमोबाइल ग्राहकों को आश्वस्त करने के लिए प्रोटो–टाइपिंग और वुडप्लास्टिक मिश्रित दरवाजे, ध्वनि–प्रूफ पैनल आदि के लिए बहुलक समग्र अनुप्रयोग का विस्तार करने पर परियोजना का दूसरा चरण सिपेट के साथ किया जा रहा है।

8.8.8. विगत तीन वर्षों में आरएंडडी व्यय

वित्त वर्ष	आरएंडडी व्यय (करोड़ रुपए में)
2021-22	1.01
2022-23	0.57
2023-24	5.11

8.9. इंजीनियर्स इंडिया लिमिटेड (ईआईएल)

8.9.1. इंजीनियर्स इंडिया लिमिटेड द्वारा आरएंडडी

ईआईएल का अनुसंधान एवं विकास प्रभाग 1970 से कार्य कर रहा है। प्रारंभ में प्रभाग डेस्कटॉप अनुसंधान, प्रक्रिया मॉडलिंग और सिमुलेशन के माध्यम से प्रक्रिया इंजीनियरिंग सेवाओं के लिए इन–हाउस क्षमता निर्माण में लगा हुआ था। गुड़गांव में अनुसंधान एवं विकास केंद्र पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय तथा वैज्ञानिक सलाहकार समिति की सिफारिश पर स्थापित किया गया था और 1988–89 में काम करना शुरू कर दिया था। अनुसंधान एवं विकास केंद्र उपकरण उन्मुख अनुसंधान के लिए और प्रौद्योगिकियों के अवशोषण और अनुकूलन की सुविधा के लिए एक राष्ट्रीय सुविधा है। इसके अलावा, सहयोगी अनुसंधान करने के लिए, रकेल अप कार्यप्रणाली विकसित करना और हार्डवेयर परीक्षण और नैदानिक सेवाएं प्रदान करना प्रमुख अनिवार्य था।

इन प्रयासों के परिणामस्वरूप महत्वपूर्ण हार्डवेयर डिजाइनों के साथ–साथ 40 से अधिक प्रक्रिया प्रौद्योगिकियों का विकास हुआ है। आर एंड डी केंद्र भारत सरकार की पहल जैसे मेक इन इंडिया और आत्मनिर्भर भारत के साथ अच्छी तरह से संरेखित होता है, जिसका उद्देश्य राष्ट्र को तकनीकी केंद्र बनने की दिशा में प्रेरित करना है। ईआईएल–आर एंड डी अपने गुरुग्राम आर एंड डी केंद्र में प्रौद्योगिकियों के विकास के माध्यम से तेल, गैस और ऊर्जा के क्षेत्र में भारत को आत्मनिर्भर बनाने के लिए हमेशा अग्रणी रहा है। ऊर्जा परिवर्तन के इस युग में, ईआईएल आर एंड डी ने नवीकरणीय और टिकाऊ ऊर्जा क्षेत्रों को आगे बढ़ाने के लिए पहल की है और 2070 तक नेट–जीरो की ओर देश को ले जाने के लिए एक मार्ग तैयार किया है, जबकि साथ ही कंपनी के लिए नए व्यावसायिक रास्ते सुनिश्चित किए हैं।

8.9.2. चालू वर्ष से मार्च, 2024 तक के दौरान प्रौद्योगिकी वाणिज्यिकरण प्रयास

सहयोग से विकसित विभिन्न आंतरिक विकसित प्रौद्योगिकियों/प्रौद्योगिकियों के वाणिज्यीकरण के लिए निरंतर प्रयास किए जाते हैं। इनमें से कुछ में शामिल हैं:

- नुमालीगढ़ रिफाइनरी में जलीय अमोनिया यूनिट की स्थापना।
- ईआईएल द्वारा लाइसेंस प्राप्त एनआरएल एसआरयू और टीजीटीयू की कमीशनिंग और पीजीटीआर गतिविधियां।
- नायरा एनर्जी लिमिटेड में सीडीयू–2 सुधार के अंतर्गत इंगहॉग के लिए बेसिक इंजीनियरिंग डिजाइन पैकेज (बीईडीपी) की आपूर्ति।
- एचपीसीएल–वीआर में एलपीजी शोधन प्रौद्योगिकी के लिए मालिकाना कान्ट्रेक्टर का नवीनीकरण।
- कोच्चि रिफाइनरी में सुपर एब्जॉर्बेंट पॉलीमर (एसएपी) उत्पादन संयंत्र के लिए बीईडीपी।

8.9.3. प्रौद्योगिकी संबंधों को मजबूती प्रदान करने के लिए किए गए उपाय

ईआईएल ने अनुसंधान संगठनों, शैक्षिक संस्थानों तथा अन्य कारपोरेट के अनुसंधान स्कंधों के साथ सहक्रियात्मक क्षमता का विस्तार किया है। सहयोगी प्रयास विभिन्न क्षेत्रों में किए जाते हैं जहां ऊर्जा गहनता, नवीकरणीय ऊर्जा, सीसीयूएस आदि जैसी महत्वपूर्ण जरूरतों का भी समाधान किया जाता है। निम्नलिखित नए टाई–अप को औपचारिक रूप दिया गया:

- भारत और विदेशों में विभिन्न औद्योगिक क्षेत्रों में नवीकरणीय ऊर्जा को एकीकृत करने में लागत प्रतिस्पर्धी तकनीकी समाधान प्रदान करने के लिए बुनियादी डिजाइन, विस्तार इंजीनियरिंग और परियोजना प्रबंधन और निर्माण पर्यवेक्षण सेवाओं सहित संयुक्त रूप से विपणन और ग्राहक आर्डरों को सुरक्षित करने हेतु सहयोग के लिए सनराइज ग्रुप के साथ समझौता ज्ञापन पर हस्ताक्षर किए गए।
- वैज्ञानिक सूचनाओं के आदान–प्रदान, संयुक्त अनुसंधान, हाइड्रोकार्बन, पेट्रोकेमिकल्स, ऊर्जा प्रौद्योगिकी के क्षेत्र में प्रदर्शन को प्रोत्साहित करने और एचपीसीएल द्वारा विकसित प्रौद्योगिकियों/संयुक्त रूप से विकसित प्रौद्योगिकियों के व्यावसायीकरण के लिए एचपीसीएल के साथ समझौता ज्ञापन पर हस्ताक्षर किए गए।
- बीपीसीएल द्वारा जुटाई गयी जानकारी पर बीएफडब्ल्यू के लिए हाईजी डी–वातन प्रौद्योगिकी के लिए संयुक्त प्रौद्योगिकी के विकास के लिए बीपीसीएल के साथ समझौता ज्ञापन पर हस्ताक्षर किए गए।
- कार्बन डाइआक्साइड को मूल्यवान रसायनों में बदलने, कार्बन डाइआक्साइड के उत्प्रेरक रूपांतरण और रसायनों के लिए लिग्नो–सेल्यूलोसिक बायोमास के लिए उत्प्रेरक प्रक्रिया के विकास जैसे पारस्परिक हित के क्षेत्रों में अनुसंधान के लिए सहयोगी गतिविधियों के लिए आईआईटी रुड़की के साथ समझौता ज्ञापन पर हस्ताक्षर किए गए।
- आईआईटी बॉम्बे और पीएसयू तेल कंपनियों के बीच तेल, गैस और ऊर्जा (सीओई ओजीई) में उत्कृष्टता केंद्र के लिए समझौता ज्ञापन 1 जनवरी 2029 तक बढ़ाया गया।
- वित्त वर्ष 2023–24 के लिए सदस्यता का नवीनीकरण:
  - प्रोसेस साइंस टेक्नोलॉजी सेंटर (पीएसटीसी), टेक्सास विश्वविद्यालय, अमेरिका द्वारा शुरू किया गया एक उद्योग–अकादमिक सहयोगी अनुसंधान कार्यक्रम
  - फ्रैक्शनेशन रिसर्च इनकॉर्पोरेटेड (एफआरआई), ओक्लाहोमा, अमेरिका में स्थित एक गैर–लाभकारी सहकारी अनुसंधान संगठन
  - प्रोसेस इंटीग्रेशन रिसर्च कंसोर्टियम (पीआईआरसी), मैनचेस्टर यूके विश्वविद्यालय

8.9.4. चालू वर्ष से मार्च 2024 तक के दौरान शुरू की गई प्रौद्योगिकी विकास परियोजनाएं

अनुसंधान एवं विकास प्रभाग उभरती हुई प्रौद्योगिकी रूपरेखा की निरंतर निगरानी करता है और प्रौद्योगिकी विकास के लिए प्रासंगिक क्षेत्र में पहल करता है। शुरू की गई कुछ नई परियोजनाएं और चल रही परियोजनाएं नीचे दी गई हैं:

- एसओ2 रिलपेज को टीजीटीयू क्वेंच कॉलम में रोकने के लिए प्रक्रिया का विकास।
- बेहतर संचालन और ऊर्जा इष्टतमीकरण के लिए नए सीडीयू–वीडीयू कॉन्फिगरेशन का डिजाइन।
- मल्टी–डाउनकमर ट्रे के लिए डिजाइन क्षमताओं का विकास।
- हरित हाइड्रोजन शुद्धिकरण के लिए डीई–ऑक्सो रिएक्टर प्रौद्योगिकी का विकास।
- कोयले के लंबे परिवहन के लिए स्लरी पाइपलाइन हेतु डिजाइन पद्धति का विकास।
- मॉडल बायोमास तेल से हरित हाइड्रोजन संश्लेषण के लिए बहु–कार्यात्मक अनुरूप विषम उत्प्रेरक विकास।

- प्राकृतिक गैस से दुर्लभ गैस प्राप्त करने की प्रक्रिया का विकास।

8.9.5. ईआईएल ने पेटेंट और ट्रेडमार्क रूप दोनों में आईपीआर सृजित किया है

मार्च 2024 तक, 46 लाइव पेटेंट और 36 आवेदन लंबित अनुदान हैं। पेटेंट पोर्टफोलियो का मुख्य आकर्षण यह है कि लगभग 65% दायर पेटेंट का व्यावसायीकरण किया गया है। इसके अलावा, 4 लंबित अनुदानों के साथ 25 ट्रेडमार्क प्रदान किए गए आईपीआर पोर्टफोलियो में जोड़ते हैं।

पूर्व में दायर किए गए निम्न पेटेंटों को इस वर्ष मंजूरी दी गई:

- जमीन के ऊपर गैस रहित करने के साथ तरल सल्फर सील के लिए एक विधि और उपकरण
- प्री–फ्लैश ड्रम में डी–फोमिंग चक्रवाती उपकरण
- उच्च राख कोयले को संभालने वाले द्रवित बिस्तर गैसीफायर के लिए चपटा प्लेट प्रकार वितरक
- एक डेसाल्टर बरतन
- समवर्ती डाउनफ्लो ट्रिकल बेड रिएक्टर के लिए नोवल गैस–तरल इनलेट विसारक
- पानी के डीऑक्सीजनेशन के लिए उपकरण और उसकी प्रक्रिया
- कम दबाव वाले तरल पदार्थ को पुनर्प्राप्त करने और अलग करने के लिए एक उपकरण
- एक प्रणाली का उपयोग करके की गई प्रक्रिया में ऊर्जा के इष्टतमीकरण की विधि
- कार्बन डाईआक्साइड समृद्ध धारा का उपयोग करके क्षारीय अपशिष्ट जल के निष्प्रभावीकरण के लिए एक उपकरण और प्रक्रिया
- उच्च दबाव, तापमान और नमी सामग्री संश्लेषण गैस नमूनाकरण की एक प्रणाली और प्रक्रिया
- उच्च शुद्धता वाले कार्बन डाईआक्साइड की प्राप्ति के साथ मेथनॉल उत्पादन हेतु अत्यधिक राख वाले भारतीय कोयले से सिनगैस के शुद्धिकरण की एक प्रणाली और प्रक्रिया
- ताप प्राप्ति हेतु एक आत्मनिर्भर प्रक्रिया और प्रणाली तथा ईंधन को कम करके दक्षता में सुधार
- ऊष्मागतिकीय चक्र का प्रयोग करते हुए मौजूदा गैस टर्बाइन से विद्युत उत्पादन को अधिकतम करना
- चुंबकीय क्षेत्र की उपस्थिति में हाइड्रोडायनामिक गुहिकायन के आधार पर जल अनुकूलन उपकरण और विधि
- एक अग्नि प्रज्ज्वलित हीटर प्रणाली के लिए एक वायु वितरण वाहिनी प्रणाली
- एक अग्नि प्रज्ज्वलित हीटर के लिए एक दृश्यमान रिसाव–रहित विस्फोट दरवाजा व्यवस्था

इस वर्ष से मार्च 2024 के दौरान निम्नलिखित नए पेटेंट दायर किए गए हैं:

- हाइड्रोजन सल्फाइड समृद्ध हाइड्रोकार्बन प्रणाली से उत्पन्न व्ययित कास्टिक स्ट्रीम के शोधन की एक विधि और प्रणाली
- जलाशय के लिए एक अस्तर प्रणाली
- अवरूद्ध माइक्रो–लिग्निन ट्रबलशूटिंग निवारण का मुकाबला करने के लिए दूसरी पीढ़ी (2जी) एथेनॉल जैव–रिफाइनरियों के लिए नव अनुरूप आसवन टॉवर इंजीनियरिंग डिजाइन
- कम ईंधन खपत के साथ कच्चे तेल प्रसंस्करण के लिए सौर ऊर्जा आधारित प्रक्रिया और उपकरण
- परिवेशी परिस्थितियों में कच्चे तेल के भूमिगत भंडारण की एक विधि, जो पर्याप्त सुरक्षा स्तर प्रदान करते हुए सभी ओर से संरक्षित हो
- वैक्यूम आसवन इकाई में निम्न ग्रेड ऊष्मा का उपयोग करना
- एबुलेटेड बेड अवशिष्ट हाइड्रोक्रैकर से कुल अपरिवर्तित तेल को संसाधित करने के लिए विलंबित कोकर यूनिट का पुन उपयोग करना
- जीएचजी उत्सर्जन का अनुमान लगाने की विधि और प्रणाली
- औद्योगिक हीटर लगाने की एक प्रणाली
- हैंगिंग डाउनकॉमर्स के साथ आसवन कॉलम
- दुर्गम दीवार ट्यूब हैंगर सहारे को बाहरी रूप से समायोजित करने की एक प्रणाली
- कुशल तापांतरण के लिए नव घाप–गुंबददार सब काउंटर करंट प्लेट एयर प्रीहीटर
- अग्नि प्रज्ज्वलित हीटर

8.9.6. मार्च 2024 के अनुसार स्टार्टअप पहल

ईआईएल आरएंडडी ईआईएल की स्टार्टअप पहल 'ईएनजीएसयूआई' के संचालन द्वारा भारत में

स्टार्ट–अप इको सिस्टम को पोषित करने के लिए भारत सरकार के फ्लैगशिप कार्यक्रम के लिए पूरी तरह से प्रतिबद्ध है। एनजीएसयूआई के तहत, ईआईएल स्टार्टअप को बौद्धिक, ढांचागत और वित्तीय सहायता प्रदान कर रहा है। ईआईएल हाइड्रोकार्बन, आईटी और आईआईओटी, नवीकरणीय ऊर्जा और भंडारण, नैनो–सामग्री, अपशिष्ट से ऊर्जा, स्वास्थ्य सुरक्षा और पर्यावरण के क्षेत्र में काम कर रहे स्टार्टअप परियोजनाओं को निधि प्रदान करता है। 9 आईआईटी और 4 एनआईटी ने ईआईएल के स्टार्टअप इंडिया पहल में पंजीकरण कराया है। अब तक तिथि तक 6 दौर में कुल 27 परियोजनाओं को वित्तपोषित किया जा चुका है। हाल ही में, सातवें दौर के प्रस्तावों की जांच प्रक्रिया चल रही है।

8.9.7. गत 3 वर्षों में आरएंडडी व्यय

वित्त वर्ष	आरएंडडी व्यय (करोड़ रुपए में)
2021-22	28.54
2022-23	30.09
2023-24	29.12

8.10. चेन्नै पेट्रोलियम कार्पोरेशन लिमिटेड (सीपीसीएल)

8.10.1. कंपनी के संचालन के सभी पहलुओं में तकनीकी रूप से सबसे आगे रहने के लिए सीपीसीएल के कॉर्पोरेट उद्देश्य के अनुरूप, सीपीसीएल आरएंडडी केंद्र जुलाई 1984 में स्थापित किया गया था।

अपनी स्थापना के बाद से, सीपीसीएल आरएंडडी मुख्य रूप से निम्नलिखित क्षेत्रों में केंद्रित है।

- डाउनस्ट्रीम हाइड्रोकार्बन क्षेत्र में नए उत्पाद/प्रक्रिया विकास
- किफायती परिवहन के लिए दीर्घकालिक विकल्प विकास, नवीकरणीय ऊर्जा, जैव ईंधन आदि जैसे अनुसंधान के प्रमुख क्षेत्रों में अकादमिक/अनुसंधान संस्थान के साथ सहयोगात्मक अनुसंधान परियोजनाएं,
- रिफाइनरी प्रक्रिया ट्रबलशूटिंग के लिए समाधान प्रदान करना
- नई क्रूड जांच आंकड़ा सृजन

8.10.2. आरएंडडी विशेषताएं:

शैवाल से नवीकरणीय कच्चे और तरल हाइड्रोकार्बन ईंधन के पायलट पैमाने पर उत्पादन का प्रदर्शन किया।

निम्न के वाणिज्यिक उत्पादन के लिए विकसित प्रक्रिया

- डीआरडीओ के लिए मिसाइल ईंधन
- इसरो के लिए रॉकेट प्रणोदक
- खनिज तारपीन का तेल
- माइक्रोक्रिस्टलाइन मोम
- फार्मा ग्रेड हेक्सेन

सीपीसीएल आरएंडडी के पास रिफाइनिंग क्षेत्र में विविध अनुसंधान क्षेत्रों में अपने क्रेडिट के लिए 8 पेटेंट है और वर्ष 2022–23 के दौरान निम्नलिखित पेटेंट दायर किए गए है:

एयर ब्रीदिंग इंजन अनुप्रयोगों के लिए कम सुगंधित और अत्यधिक कम सल्फर वाले जेट ईंधन बनाने की प्रक्रिया।

वर्तमान में सीपीसीएल आरएंडडी निम्नलिखित क्षेत्रों में सक्रिय रूप से काम कर रहा है:

- विभिन्न प्रकार के रबर प्रोसेस ऑयल (आरपीओ) का उत्पादन
- रिफाइनरी धाराओं से डीएसमैटाइज्ड तरल पदार्थ के उत्पादन के लिए प्रक्रिया विकास
- एलओबीएस/वैक्स उत्पादन के लिए वैकल्पिक फीडस्टॉक पहचान
- आरजीआईपीटी संस्थान के साथ सहयोगात्मक मोड में प्रयुक्त खाद्य तेल से संक्षारण अवरोधक के विकास के लिए प्रक्रिया को बढ़ाना।
- राजीव गांधी पेट्रोलियम प्रौद्योगिकी संस्थान (आरजीआईपीटी) के साथ सहयोगात्मक मोड में बायोमास से नैनो सेल्यूलोज के उत्पादन की प्रक्रिया को बढ़ाना।

8.10.3. गत तीन वर्षों में आरएंडडी व्यय

वित्त वर्ष	आरएंडडी व्यय (करोड़ रुपए में)
2021-22	7.15
2022-23	9.72
2023-24	10.72


DEMAG





अध्याय 9

जैव ईंधन

9 जैव ईंधन

9.1. गैर परंपरागत ऊर्जा

भारत दुनिया की सबसे तेजी से बढ़ती अर्थव्यवस्थाओं में से एक है। विकास के उद्देश्य आर्थिक विकास, इक्विटी और मानव कल्याण पर केंद्रित हैं। सामाजिक आर्थिक विकास के लिए ऊर्जा एक महत्वपूर्ण निवेश है। किसी देश की ऊर्जा संबंधी कार्यनीति का उद्देश्य दक्षता और सुरक्षा तथा ऐसी पहुंच उपलब्ध कराना होता है जो पर्यावरण अनुकूल हो और ऊर्जा उत्पादन के लिए प्राथमिक संसाधनों का इष्टतम मिश्रण हो। जीवाश्म ईंधन अगले कुछ दशकों में हमारे देश में ऊर्जा परिदृश्य में प्रमुख भूमिका निभाते रहेंगे। हालांकि, परंपरागत या जीवाश्म ईंधन संसाधन सीमित, गैर–नवीकरणीय, प्रदूषणकारी हैं और इसलिए, विवेकपूर्ण तरीके से उपयोग किए जाने की आवश्यकता है। दूसरी ओर, नवीकरणीय ऊर्जा संसाधन स्वदेशी, गैर–प्रदूषणकारी और वस्तुतः अक्षय हैं। भारत प्रचुर मात्रा में नवीकरणीय ऊर्जा संसाधनों से संपन्न है। इसलिए, उनके उपयोग को हर संभव तरीके से प्रोत्साहित किया जाना चाहिए। जैव ईंधन नवीकरणीय बायोमास संसाधनों से प्राप्त होते हैं और इसलिए, किफायती परिवहन के लिए दीर्घकालिक विकल्प विकास को बढ़ावा देने और उच्च आर्थिक विकास से जुड़े परिवहन ईंधन हेतु तेजी से बढ़ती आवश्यकताओं को पूरा करने के साथ–साथ भारत की विशाल ग्रामीण आबादी की ऊर्जा जरूरतों को पूरा करने में पारंपरिक ऊर्जा स्रोतों को अनुपूरित करने के लिए एक कार्यनीतिक लाभ प्रदान करते हैं।

9.2. एथेनोल मिश्रित पेट्रोल (ईबीपी) कार्यक्रम

सरकार तेल विपणन कंपनियों (ओएमसीज) के माध्यम से एथेनोल मिश्रित पेट्रोल (ईबीपी) कार्यक्रम कार्यान्वित कर रही है जिसके तहत ओएमसीज 20% तक एथेनोल की प्रतिशतता के साथ एथेनोल मिश्रित पेट्रोल की बिक्री करती हैं। 2001 में, भारत सरकार ने तीन पायलट परियोजनाएं शुरू कीं, महाराष्ट्र में दो और उत्तर प्रदेश में एक ताकि केवल उनके संबंधित आपूर्ति क्षेत्रों के तहत खुदरा दुकानों को एथेनोल मिश्रित पेट्रोल की आपूर्ति की जा सके। प्रायोगिक परियोजनाओं के माध्यम से उपर्युक्त क्षेत्र परीक्षणों के अलावा, अनुसंधान एवं विकास अध्ययन भी साथ–साथ किए गए थे। प्रायोगिक परियोजनाएं और अनुसंधान एवं विकास अध्ययन दोनों सफल रहे और पेट्रोल के साथ 5% तक एथेनोल के मिश्रण और वाहनों में एथेनोल मिश्रित पेट्रोल के उपयोग को सुनिश्चित किया। तदनुसार, भारत सरकार ने 01.01.2003 से 5% एथेनोल मिश्रित पेट्रोल की बिक्री के लिए नौ राज्यों और चार संघ राज्य क्षेत्रों में एथेनोल मिश्रित पेट्रोल की आपूर्ति करने का संकल्प लिया है।

इस कार्यक्रम का उद्देश्य कई परिणाम प्राप्त करना है जैसे:

- पर्यावरण संबंधी चिंताओं को दूर करना,
- आयात निर्भरता को कम करना, और
- कृषि क्षेत्र को बढ़ावा देना,

एथेनॉल की आपूर्ति बढ़ाने के लिए, सरकार ने दिनांक 10 दिसंबर, 2014 को पेट्रो रसायन विधि सहित सेलुलोसिक और लिग्नो–सेलुलोसिक सामग्री जैसे शीरे से इतर अन्य गैर–खाद्य फीडस्टॉक्स से उत्पादित एथेनॉल की खरीद करने का निर्णय लिया। ई. बी. पी. कार्यक्रम के अंतर्गत एथेनॉल का मूल्य निर्धारण करने का भी निर्णय लिया गया।

ई.एस.वाई. वर्ष 2018–19 में एथेनॉल उत्पादन के लिए चीनी और चीनी सिरप को पहली बार अनुमति दी गई थी ताकि उद्योग को अपने अतिरिक्त स्टॉक को समाप्त करने में सहायता मिल सके। इसके अतिरिक्त, ई.एस.वाई. वर्ष 2020–21 में, भारतीय खाद्य निगम (एफसीआई) में उपलब्ध अधिशेष चावल और मक्का को भी एथेनॉल के उत्पादन के लिए अनुमति दी गई थी। इन निर्णयों से, ई. बी.पी. कार्यक्रम के लिए एथेनॉल की उपलब्धता में उल्लेखनीय वृद्धि हुई।

एथेनॉल आपूर्ति वर्ष (ईएसवाई) 2021–22 (01.12.2021–30.11–2022) के दौरान पेट्रोल में 433.6 करोड़ लीटर एथेनॉल मिश्रित किया गया, जिसके परिणामस्वरूप पीएसयू ओएमसी द्वारा मिश्रण प्रतिशत 10.02% रहा। सार्वजनिक क्षेत्र की ओएमसी ने नवंबर 2022 की लक्ष्य तिथि से काफी पहले जून, 2022 में

पेट्रोल में एथेनॉल के 10% मिश्रण का लक्ष्य प्राप्त कर लिया। इसके अतिरिक्त, ईएसवाई वर्ष 2022–23 के दौरान, पीएसयू ओएमसी ने पेट्रोल में 500 करोड़ लीटर से अधिक एथेनॉल मिश्रण किया, जिससे मिश्रण प्रतिशत 12.06% रहा। ओएमसी ने दिनांक 06 फरवरी, 2023 से ई20 (20% एथेनॉल मिश्रित) पेट्रोल की बिक्री भी शुरू कर दी है और यह ईंधन संपूर्ण देश में 13,500 से अधिक खुदरा दुकानों में बेचा जाता है। ई–100 ईंधन संपूर्ण देश में 180 से अधिक खुदरा दुकानों में भी बेचा जा रहा है।

9.2.1. जैव ईंधन के उपयोग को बढ़ाने के लिए, भारत में एथेनोल सम्मिश्रण 2020–25 के लिए एक अंतर–मंत्रालयी समिति एक रोडमैप द्वारा तैयार किया गया था और विश्व पर्यावरण दिवस यानी 5 जून, 2021 को सार्वजनिक प्रतिक्रिया के लिए रखा गया था। यह रोडमैप सभी हितधारकों को एक साथ लाकर पेट्रोल में 20% ऐथेनोल मिश्रण के लक्ष्य को प्राप्त करने के लिए मार्गदर्शन प्रदान करता है। इसके अलावा, जैव ईंधन पर राष्ट्रीय नीति–2018 को जून, 2022 में संशोधित किया गया था जिसमें अन्य बातों के साथ–साथ शामिल हैं:

i) जैव–ईंधनों के उत्पादन के लिए अधिक फीडस्टॉक की अनुमति देना,

ii) पेट्रोल में एथेनोल के 20% सम्मिश्रण के लक्ष्य को 2030 से बढ़ाकर ईएसवाई–2025–26 करना,

iii) विशेष आर्थिक क्षेत्रों (एसईजेड)/निर्यातोन्मुख इकाइयों (ईओयू) में स्थित इकाइयों द्वारा मेक इन इंडिया कार्यक्रम के तहत देश में जैव–ईंधन के उत्पादन को बढ़ावा देना, और

iv) विशिष्ट मामलों में जैव–ईंधनों के निर्यात के लिए अनुमति प्रदान करना।

9.3. किफायती परिवहन के लिए दीर्घकालिक विकल्प विमानन ईंधन (एसएएफ)/जैव–विमानन टर्बाइन ईंधन (जैव–एटीएफ)

सरकार ने शुरूआत में विमानन टर्बाइन ईंधन (एटीएफ) में एसएएफ के 1%, 2% और 5% सम्मिश्रण का सांकेतिक लक्ष्य निर्धारित किया है, जो क्रमशः 2027, 2028 और 2030 से अंतरराष्ट्रीय उड़ानों के लिए प्रभावी होगा। स्वदेशी रूप से उत्पादित एसएएफ मिश्रण विमानन टर्बाइन ईंधन का उपयोग करके पुणे से दिल्ली के बीच भारत की पहली वाणिज्यिक उड़ान 19 मई, 2023 को सफलतापूर्वक भरी गई।

9.4. दूसरी पीढ़ी (2जी) का एथेनोल

2018 में घोषित जैव–ईंधन संबंधी राष्ट्रीय नीति का उद्देश्य ईएसवाई 2025–26 तक पेट्रोल में एथेनोल के 20% मिश्रण को प्राप्त करने के सांकेतिक लक्ष्यों के साथ जैव–ईंधन का त्वरित संवर्धन है। इसलिए, पेट्रोल के साथ मिश्रण के उद्देश्य से देश में एथेनोल के उत्पादन को अधिकतम करने के लिए, एथेनोल उत्पादन बढ़ाने के लिए अन्य विकल्पों/मार्गों का पता लगाने की आवश्यकता है। सरकार ने पेट्रोरसायन मार्ग सहित सेल्यूलोसिक और लिंगो–सेल्यूलोज सामग्री जैसे शीरे के अलावा अन्य गैर–खाद्य फीडस्टॉक से उत्पादित एथेनोल की खरीद की पहले ही अनुमति दे दी है।

ईबीपी कार्यक्रम के लिए एथेनोल की बढ़ती मांग को पूरा करने के लिए लिग्नो–सेल्यूलोसिक बायोमास को दूसरी पीढ़ी (2जी) एथेनोल के भावी स्त्रोत के रूप में माना जा रहा है। विज्ञान और प्रौद्योगिकी विभाग के तहत एक स्वायत्त संगठन, प्रौद्योगिकी सूचना, पूर्वानुमान और मूल्यांकन परिषद (टीआईईएफएसी) की रिपोर्ट के अनुसार, देश भर में अधिशेष बायोमास की उपलब्धता है जिसे आमतौर पर किसानों द्वारा अपशिष्ट निपटान गतिविधि के रूप में जलाया जा रहा है जो पर्यावरण प्रदूषण में भी योगदान दे रहा है।

2जी जैव–रिफाइनरियों की स्थापना को प्रोत्साहित करने के उद्देश्य से, सरकार ने लिंगो सेल्युलोसिक बायोमास और अन्य अक्षय फीडस्टॉक का उपयोग करते हुए एकीकृत जैव–एथेनोल परियोजनाओं को वित्तीय सहायता प्रदान करने के लिए प्रधानमंत्री जी–वन (जैव ईंधन–वातावरण अनुकूल फसल अवशेष निवारण) योजना नामक एक स्कीम शुरू की है। इस योजना के तहत, सरकार से 1969.50 करोड़ रुपये के वित्तीय योगदान के साथ बारह वाणिज्यिक पैमाने की 2जी एथेनोल परियोजनाएं और 10 प्रदर्शन पैमाने की परियोजनाएं स्थापित की जाएंगी।

इस स्कीम के अंतर्गत, सार्वजनिक और निजी क्षेत्र की कंपनियों को द्वितीय पीढ़ी (2जी) जैव–एथेनोल की छह वाणिज्यिक परियोजनाओं और 2जी एथेनोल की चार निदर्शन परियोजनाओं के लिए वित्तीय सहायता

अनुमोदित की गई है। पानीपत में आईओसीएल का 2जी एथेनोल संयंत्र पहले ही राष्ट्र को समर्पित किया जा चुका है।

9.5. विश्व जैव ईंधन दिवस

पारंपरिक जीवाश्म ईंधन के विकल्प के रूप में गैर–जीवाश्म ईंधन के महत्व के बारे में जागरूकता पैदा करने और जैव ईंधन क्षेत्र में सरकार द्वारा किए गए विभिन्न प्रयासों को उजागर करने के लिए हर साल 10 अगस्त को विश्व जैव ईंधन दिवस मनाया जाता है। इस वर्ष का विषय "जैव ईंधन–एक स्थायी भविष्य के लिए ईंधन" था। विश्व जैव ईंधन दिवस के अवसर पर, तेल और गैस उद्योग की ओर से इंडियन ऑयल ने विश्व जैव ईंधन दिवस के अवसर पर जैव ईंधन पर एक वेबिनार का आयोजन किया।

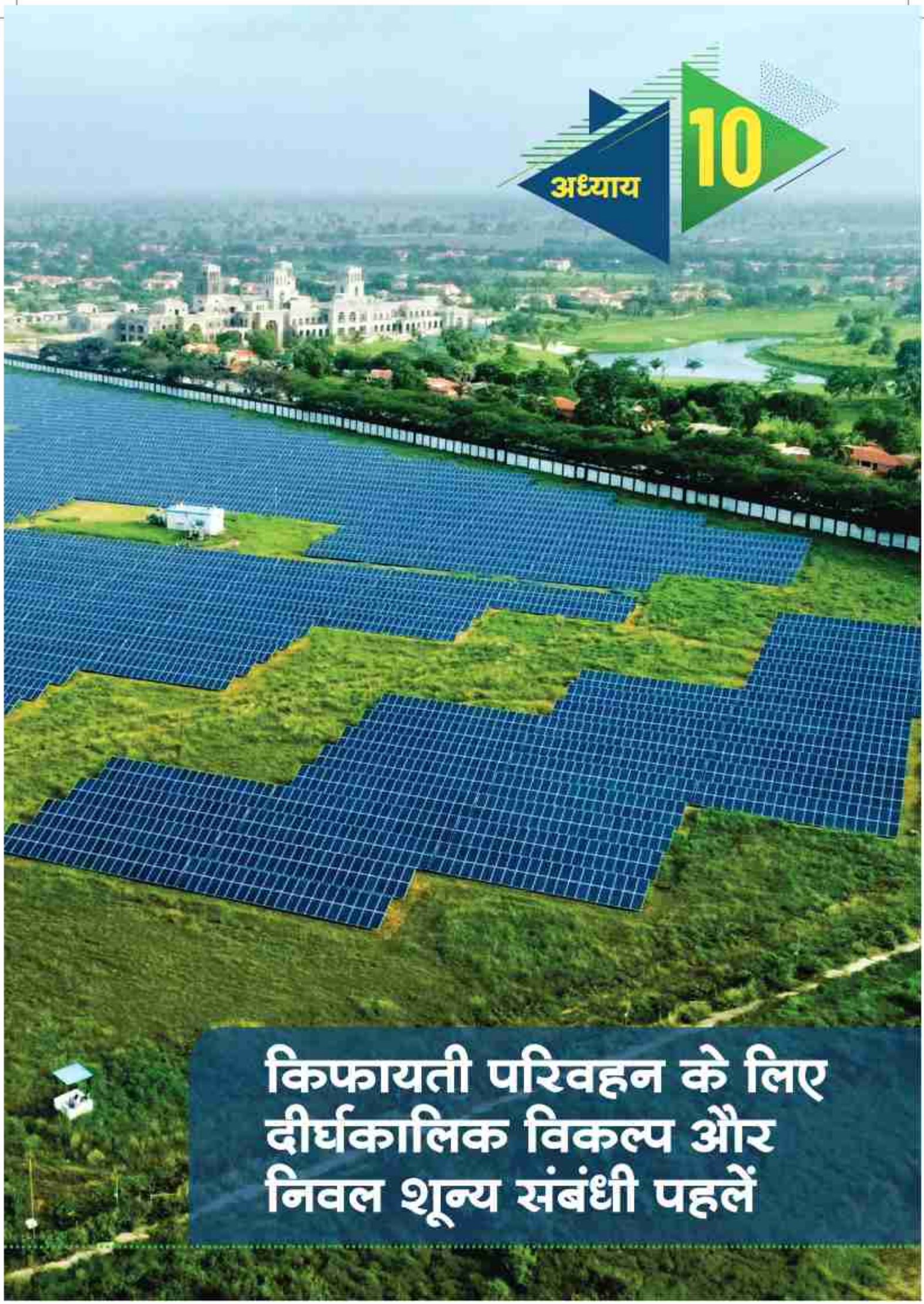




बीपीसीएल की बायो–रिफाइनरी
बरगढ़, ओडिशा



साणंद एलपीजी बॉटलिंग संयंत्र में
आईओसीएल का सौर ऊर्जा संयंत्र


अध्याय 10
किफायती परिवहन के लिए
दीर्घकालिक विकल्प और
निवल शून्य संबंधी पहलें

10 किफायती परिवहन के लिए दीर्घकालिक विकल्प और निवल शून्य संबंधी पहलें

10.1. भारत ने आधार वर्ष 2005 की तुलना में वर्ष 2030 तक अपने सकल घरेलू उत्पाद की उत्सर्जन तीव्रता को 45% तक कम करने और वर्ष 2070 तक निवल शून्य उत्सर्जन तक पहुंचने के महत्वाकांक्षी लक्ष्य की घोषणा की है। भारत ने यह भी घोषणा की है कि वह वर्ष 2030 अपनी विद्युत आवश्यकताओं का पचास प्रतिशत नवीकरणीय ऊर्जा स्रोतों से पूरा करेगा, जिसमें 500 गीगावाट नवीकरणीय ऊर्जा क्षमता स्थापित करना शामिल है।

सरकार ने नवीकरणीय ऊर्जा (सौर/पवन), जैव ईंधन (एथेनॉल, संपीड़ित बायोगैस का मिश्रण) और राष्ट्रीय हाइड्रोजन मिशन की हिस्सेदारी बढ़ाने जैसी कई पहलें की हैं। सरकार एथेनॉल मिश्रित पेट्रोल (ईबीपी) कार्यक्रम के तहत पेट्रोल में एथेनॉल और एसएटीएटी योजना के तहत सीबीजी के मिश्रण को बढ़ावा दे रही है। देश में 2जी एथेनॉल के उत्पादन के लिए पीएम जी–वन योजना शुरू की गई है। सरकार ने राष्ट्रीय ग्रीन हाइड्रोजन मिशन की घोषणा की है, जिसका उद्देश्य वर्ष 2030 तक 5 एमएमटीपीए ग्रीन हाइड्रोजन का उत्पादन करने के लक्ष्य के साथ ग्रीन हाइड्रोजन को बढ़ावा देना और इसके निर्यात सहित संबंधित अवसंरचना का प्रतिपादन/विकास करना है। इसके अलावा, ऊर्जा–गहन क्षेत्रों में ऊर्जा दक्षता में सुधार के लिए अर्थव्यवस्था, पीएटी (प्रदर्शन, प्राप्ति और व्यापार) योजना देश में सफलतापूर्वक प्रचालित की जा रही है। पीएटी व्यापार योग्य ऊर्जा बचत प्रमाणपत्रों के माध्यम से अर्थव्यवस्था के ऊर्जा–गहन क्षेत्रों में विशिष्ट ऊर्जा खपत को कम करने के लिए एक बाजार–आधारित नियामक उपकरण है। रिफाइनरी क्षेत्र को पीएटी में वर्ष 2015 के चक्र–2 (2016–17 से 2018–19) की शुरूआत से शामिल किया गया था।

तेल और गैस अर्थव्यवस्था के कठिन क्षेत्रों में से एक है, जहां डीकार्बोनाइजेशन विकल्प सीमित हैं और इन्हें प्राप्त करना कठिन है। हालांकि, विभिन्न सरकारी तेल कंपनियों ने स्कोप–1 और 2 उत्सर्जन को शामिल करते हुए निवल शून्य प्रचालनात्मक उत्सर्जन बनने के लक्ष्य को प्राप्त करने की योजना तैयार की है।

10.2. किफायती परिवहन के लिए दीर्घकालिक विकल्प (सतत)

i. सरकार ने 1 अक्टूबर 2018 को "किफायती परिवहन के लिए किफायती परिवहन के लिए दीर्घकालिक विकल्प विकल्प (सतत)" पहल शुरू की है, जिसका उद्देश्य विभिन्न अपशिष्ट/बायोमास स्रोतों से संपीड़ित बायोगैस (सीबीजी) के उत्पादन के लिए एक पारिस्थितिकी तंत्र स्थापित करना और प्राकृतिक गैस के साथ इसके उपयोग को बढ़ावा देना है। इस पहल के तहत, तेल और गैस विपणन कंपनियां (ओजीएमसी) संभावित उद्यमियों से सीबीजी खरीदने के लिए रुचि की अभिव्यक्ति (ईओआई) आमंत्रित करती हैं।

ii. यह पहल गोबरधन योजना, स्वच्छ भारत मिशन/आत्मनिर्भर भारत/निवल शून्य उत्सर्जन के लक्ष्य के अनुरूप है। बायोगैस/सीबीजी क्षेत्र के विकास के लिए 'समग्र सरकार' दृष्टिकोण अपनाया जा रहा है। विभिन्न मंत्रालयों और विभागों द्वारा प्रदान किए गए कुछ समर्थनों में– नवीन और नवीकरणीय ऊर्जा मंत्रालय (एमएनआरई) के राष्ट्रीय जैव ऊर्जा कार्यक्रम की छत्रक योजना के तहत सभी प्रकार के सीबीजी/बायोगैस संयंत्रों को केंद्रीय वित्तीय सहायता; स्वच्छ भारत मिशन नगरी 2.0 योजना के तहत आवास और नगरी कार्य मंत्रालय द्वारा ठोस अपशिष्ट प्रबंधन के लिए राज्यों और संघ राज्य क्षेत्रों को एमएसडब्ल्यू आधारित सीबीजी संयंत्रों पर अतिरिक्त केंद्रीय सहायता; उर्वरक विभाग द्वारा जैविक उर्वरक को बढ़ावा देने की नीति के तहत सीबीजी परियोजनाओं से उत्पादित किण्वित जैविक खाद पर ₹1,500/एमटी की दर से बाजार विकास सहायता; कृषि मशीनीकरण और फसल अवशेष प्रबंधन योजना पर उप मिशन के तहत कृषि और किसान कल्याण विभाग द्वारा बायोमास एकत्रीकरण मशीनरी पर प्रोत्साहन; आरबीआई द्वारा प्राथमिकता क्षेत्र ऋण के तहत सीबीजी परियोजनाओं का वर्गीकरण; सीपीसीबी द्वारा मामले–दर–मामले के आधार पर सीबीजी परियोजनाओं को 'श्वेत श्रेणी' के अंतर्गत वर्गीकृत करना; मिश्रित सीएनजी में निहित संपीड़ित बायो गैस पर संदत्त जीएसटी की राशि पर उत्पाद शुल्क में छूट–शामिल हैं।

iii. पेट्रोलियम और प्राकृतिक गैस मंत्रालय ने सीजीडी नेटवर्क में सीएनजी के साथ सीबीजी के सिंक्रनाइजेशन के लिए नगर गैस वितरण (सीजीडी) नेटवर्क के संपीड़ित प्राकृतिक गैस (परिवहन) और पाइप्ड प्राकृतिक गैस (घरेलू) खंडों की आपूर्ति के लिए घरेलू गैस के सह–मिश्रण के लिए दिशानिर्देश जारी किए हैं।

iv. इसके अलावा, सरकार ने वित्त वर्ष 2023–24 से वित्त वर्ष 2026–27 तक 04 वर्षों की अवधि के लिए बायोमास के संग्रह का समर्थन करने के लिए

बायोमास एकत्रीकरण मशीनरी की खरीद के लिए सीबीजी उत्पादकों को वित्तीय सहायता प्रदान करने की योजना को मंजूरी दी है। योजना के दिशानिर्देश दिनांक 02.02.2024 को जारी किए गए हैं। अब तक 5 सीबीजी परियोजनाओं को स्वीकृति पत्र प्राप्त हो चुका है।

v. देश में सीबीजी के उत्पादन और खपत को बढ़ावा देने के लिए, राष्ट्रीय जैव ईंधन समन्वय समिति (एनबीसीसी) ने दिनांक 24.11.2023 को सीजीडी क्षेत्र के सीएनजी (परिवहन) और पीएनजी (घरेलू) खंडों में सीबीजी के चरणबद्ध अनिवार्य मिश्रण की शुरूआत करने का अनुमोदन दिया। सीबीजी मिश्रण दायित्व (सीबीओ) वित्त वर्ष 2024–2025 तक स्वैच्छिक रहेगा और अनिवार्य मिश्रण दायित्व वित्त वर्ष 2025–26 से शुरू होगा। वित्त वर्ष 2025–26, 2026–27 और 2027–28 के लिए सीबीओ को कुल सीएनजी/पीएनजी खपत का क्रमशः 1%, 3% और 4% रखा जाएगा। 2028–29 से सीबीओ 5% होगा।

i. शहरी गैस वितरण (सीजीडी) नेटवर्क में सीबीजी के प्रवेश के लिए पाइपलाइन अवसंरचना (डीपीआई) के विकास हेतु योजना दिशानिर्देश 26 जून 2024 को जारी किए गए।

ii. 1 जुलाई 2024 तक, 71 सीबीजी/बायोगैस संयंत्र क्रियशील हो चुके हैं, जिनकी कुल उत्पादन क्षमता लगभग 450 मीट्रिक टन प्रतिदिन है। 200 से अधिक खुदरा आउटलेट से सीबीजी की बिक्री शुरू हो चुकी है। औद्योगिक ग्राहकों को भी सीबीजी की आपूर्ति की जा रही है। सीबीजी–सीजीडी समन्वय योजना के तहत, गेल ने 77 त्रिपक्षीय करारों पर हस्ताक्षर किए हैं और सीजीडी नेटवर्क के 33 भौगोलिक क्षेत्रों में सीबीजी की बिक्री शुरू हो चुकी है।

10.3. कार्बन कैप्चर, उपयोग और भंडारण (सीसीयूएस)

जलवायु परिवर्तन शमन में कार्बन कैप्चर, उपयोग और भंडारण (सीसीयूएस) की भूमिका दो दशकों से अधिक समय से चर्चा का विषय रही है। यह देखते हुए कि यह तकनीक उत्सर्जन को कम करने में क्या भूमिका निभा सकती है, जलवायु परिवर्तन पर अंतर–सरकारी पैनल (आईपीसीसी) की 1.5 डिग्री सेल्सियस ग्लोबल वार्मिंग पर विशेष रिपोर्ट और निवल–शून्य पर देशों द्वारा की गई हाल की घोषणाओं ने इस तकनीक के समर्थकों को उत्साहित किया है। भारत ने भी वर्ष 2070 तक निवल शून्य राष्ट्र बनने की प्रतिबद्धता जताई है। ग्लासगो में 26वें सीओपी को संबोधित करते हुए, माननीय प्रधानमंत्री जी ने वर्ष 2070 तक निवल शून्य उत्सर्जन की प्राप्ति करने सहित जलवायु परिवर्तन को कम करने के लिए पंचामृत की घोषणा की। फलस्वरूप, सौर, पवन, हाइड्रोजन जैसे नवीकरणीय और वैकल्पिक ऊर्जा स्रोतों को बढ़ावा देने, बी–VI मानदंडों को अपनाने के माध्यम से वाहनों से उत्सर्जन को कम करने, ग्रीन क्षेत्र में वृद्धि करने, अनुसंधान और विकास को बढ़ावा देने, सीसीएस/सीसीयूएस जैसी कार्बन तटस्थ तकनीकों को अपनाने सहित विभिन्न कदम प्रभावी होते जा रहे हैं। सीसीयूएस/सीसीएस जलवायु परिवर्तन को कम करने वाली तकनीकों में से एक के रूप में उभरा है। सीसीयूएस तकनीक और संबंधित भूवैज्ञानिक आकलन की क्षमता को समझने के लिए विगत में कुछ सीमित प्रयास किए गए हैं। हालांकि, यूएसए की कार्बन डाइऑक्साइड एन्हांस्ड ऑयल रिकवरी (सीओ$_2$–ईओआर) परियोजना के बाद से, लगभग पांच दशकों के वैश्विक विकास का लाभ उठाने के बावजूद, पूंजी की उच्च लागत सीसीयूएस तकनीक को अपनाने में एक महत्वपूर्ण बाधा रही है। तकनीकी पहलुओं के अतिरिक्त, राजनीतिक–आर्थिक पहलू भी न्यून कार्बन परिवर्तन में सीसीयूएस अपनाने का मार्ग तैयार करने में महत्वपूर्ण भूमिका निभाते हैं। भारत एक मूल्य संवेदनशील बाजार है, सीसीयूएस के कारण वहन की जाने वाली अतिरिक्त लागत अधिक व्यापक नीतिगत संदर्भ में हानिकारक हो सकती है। भावी निवल शून्य उद्देश्य और पर्यावरण के प्रति सुदृढ़ प्रतिबद्धता को देखते हुए, भारत के लिए अपनी कार्बन गहनता को और कम करने के विकल्पों की जांच करना आवश्यक है, जिसके लिए सीसीएस/सीसीयूएस एक महत्वपूर्ण विकल्प हो सकता है।

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के अंतर्गत आने वाले सीपीएसई जैसे कि ओआईएल, आईओसीएल, बीपीसीएल, एचपीसीएल, गेल, ओएनजीसी, ईआईएल ने 2 जनवरी, 2019 को आईआईटी बॉम्बे के साथ आईआईटी बॉम्बे में तेल गैस और ऊर्जा में उत्कृष्टता केंद्र (सीओई–ओजीई) स्थापित करने के लिए एक समझौता ज्ञापन पर हस्ताक्षर किए। इस समझौता ज्ञापन के तहत, एक मिशन मोड परियोजना शुरू की जा रही है जिसका उद्देश्य सीओ2 भंडारण क्षमता का अनुमान लगाना और सीओ$_2$ भंडारण के लिए जोखिम–मूल्यांकन–और–प्रबंधन ढांचा विकसित करना है। सीओ$_2$ अंतःक्षेपण के लिए जलाशय की प्रतिक्रिया को सटीक रूप से अनुकरण करने के लिए चयनित क्षेत्र के डाटा पर संख्यात्मक और प्रयोगशाला अध्ययन किए जाएंगे। यह परियोजना वर्तमान में मई 2023 से प्रगति पर है और इसकी अनुमानित अवधि 24 माह है।

तेल और गैस पीएसयू द्वारा की गई पहल इस प्रकार हैं:

ओएनजीसी : ओएनजीसी डीकार्बोनाइजेशन के लिए एक प्रमुख संवर्धक के रूप में सीसीयूएस को प्राथमिकता दे रहा है। सीओ$_2$ भंडारण और परिपक्व क्षेत्रों से तेल उत्पादन बढ़ाने से संबंधित साझेदारी और पहलों की खोज करके, ओएनजीसी अपने प्रचालन को स्थायी परिपाटियों के साथ संरेखित करता है और अपनी

प्रतिस्पर्धी बढ़त को सुदृढ़ करता है। गाबार में प्रस्तावित सीसीयूएस परियोजना में वर्ष 2040 तक 10% तेल लाभ और 5 से 6 मिलियन टन सीओ, की संचयी स्वविवेजन क्षमता की संभाव्यता है। इसके अलावा, सीसीयूएस के अनुसंधान एवं विकास कार्य को करने के लिए केडीएमआईपीई में एक प्रयोगशाला स्थापित की गई है। प्रयोगशाला कोयले में गैस अवशोषण अध्ययनों पर भी कार्य कर रही है, जो सीओ2 के लिए एक उत्कृष्ट जाल के रूप में भी कार्य कर सकता है क्योंकि यह अपनी रंध्र परिमाण क्षमता से अधिक भंडारण की सुविधा प्रदान करता है।

ऑयल इंडिया लिमिटेड: ओआईएल राजस्थान के तनोट क्षेत्र में सीओ, के स्थायी भंडारण के लिए उपयुक्त जलाशयों/जलभृतों की पहचान के लिए व्यवहार्यता अध्ययन करने का आशय रखता है। इसने जलवायु परिवर्तन से निपटने हेतु उत्सर्जन शमन उपकरण के रूप में पूर्वोत्तर भारत में सीसीयूएस विकसित करने हेतु मेसर्स इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल) के साथ एक समझौता ज्ञापन पर हस्ताक्षर किए हैं। इस संबंध में आईओसीएल की डिगबोई रिफाइनरी के करीब मकुम–उत्तरी हापजन क्षेत्र में सीओ, ईओआर को कार्यान्वित करने के लिए व्यवहार्यता अध्ययन शुरू किया जा रहा है। औद्योगिक स्रोतों/वायुमंडल से प्रभावी कार्बन कैप्चर के लिए आईआईपीई, विशाखापत्तनम के साथ संयुक्त रूप से नई प्रौद्योगिकी विकास के हिस्से के रूप में कार्बन कैप्चर और उपयोग (सीसीयू) पर परियोजना शुरू की गई है। प्रयोगशाला प्रतिपादन के सफल विकास पर, बड़े पैमाने पर सीओ, कैप्चर और उपयोग की व्यवहार्यता का अध्ययन करने के लिए एक प्रायोगिक संयंत्र स्थापित किया जाएगा। ओआईएल ने दो समझौता–ज्ञापन–एक एनटीपीसी विद्युत संयंत्रों के पड़ोसी क्षेत्रों में सीओ, पृथक्करण की संभावना पर एनटीपीसी के साथ, तथा दूसरा सीसीएस/सीसीयूएस की संभावना का पता लगाने में द्विपक्षीय सहयोग विकसित करने के लिए मेसर्स लिंडे जीएमबीएच, जर्मनी के साथ–पर हस्ताक्षर किए हैं।

आईओसीएल: इंडियन ऑयल ने एक उन्नत एंजाइम समर्थित विलायक–आधारित सीओ, कैप्चर तकनीक (ई सीओ, एसओआरबी) विकसित की है जो प्रोपराइटरी एंजाइम और विलायक पर आधारित है जो पुनर्जनन के लिए आवश्यक ऊर्जा को कम करते हुए सीओ, कैप्चर की दक्षता को सहक्रियात्मक रूप से बढ़ाता है। इसने सीओ, खनिजकरण पर आधारित सीसीयू की प्रक्रिया के हाइड्रोलिक रिटेंशन टाइम (एचआरटी) को कम करते हुए खनिजकरण दक्षता को बढ़ाने के लिए एक न्यून ऊर्जा जैव उत्प्रेरित सीओ, खनिजकरण विधि भी विकसित की है।

बीपीसीएल: बीपीसीएल रिफाइनरी फ्लयू गैसों और सीओ, के अन्य बिंदु स्रोतों से सीओ, को कैप्चर करने के लिए नए सॉल्वेंट्स का उपयोग करके सिम्युलेटेड मूविंग बेड और हाई–जी रोटेटिंग पैक्ड अवधारणा जैसी नवीन ऊर्जा–कुशल प्रक्रियाओं की खोज कर रहा है, जिसमें सीओ2 संरचना 3–20 वेंटेज की सीमा में है। बीपीसीएल ने सीएसटी के साथ मिलकर मेसर्स कैलीचे को 'प्रकाश संश्लेषक बैक्टीरिया का उपयोग करके कार्बन कैप्चर और उपयोग' के लिए समर्थन दिया है, जो एक जैव–उत्प्रेरक मार्ग है जिसमें सीओ, को कैप्चर करना और मूल्यवर्धित उत्पादों में रूपांतरण को लक्षित किया जा रहा है। सीओ, चक्रीय अर्थव्यवस्था की स्थापना के लिए सीओ, को बायोमास में परिवर्तित करने के लिए सीबीजी संयंत्रों के लिए इस पद्धति का विस्तार किया जा सकता है। बीपीसीएल आईआईटी, बॉम्बे द्वारा विकसित उन्नत कार्बन कैप्चर और उपयोग (सीसीयू) तकनीक की भी खोज कर रहा है।

एचपीसीएल: एचपीसीएल ने स्कोप–1 और स्कोप–2 उत्सर्जन के लिए वर्ष 2040 के अपने निवल–शून्य लक्ष्य के अनुरूप अपने प्रचालन के डी–कार्बोनाइजेशन के लिए एक रोडमैप तैयार किया है। इस रोडमैप में बहु–ऊर्जा ग्रीन और न्यून कार्बन निगम की ओर परिवर्तन पर विशेष ध्यान दिया गया है।

स्कोप 1 और 2 के तहत वर्ष 2040 तक निवल शून्य प्राप्त करने के लिए निम्नलिखित प्रमुख संवर्धक निम्नानुसार हैं:

- रिफाइनरियों और अन्य प्रचालन स्थानों में नवीकरणीय ऊर्जा का उपयोग करना
- रिफाइनरियों में हाइड्रोजन आवश्यकताओं को ग्रीन हाइड्रोजन से प्रतिस्थापित करना
- रिफाइनरियों और अन्य प्रचालन स्थानों पर अपने स्वयं के संचालन में ऊर्जा दक्षता बढ़ाना
- फ्लेयर गैस उत्सर्जन को कम करना
- रिफाइनरियों में प्राकृतिक गैस के उपयोग को सीबीजी से प्रतिस्थापित करना
- कार्बन कैप्चर, उपयोग और भंडारण (सीसीयूएस)

सीपीसीएल: मौजूदा ग्रे हाइड्रोजन उत्पादन इकाइयों से सी ओ 2 (लगभग 400 टीपीडी) को कैप्चर करने के लिए व्यवहार्यता अध्ययन शुरू किया गया है। इस परियोजना से सीओ, उत्सर्जन में 1,20,000 टन कार्बन–डाई–ऑक्साइड उत्सर्जन की कमी आने का अनुमान है।

एनआरएल: मौजूदा ग्रे हाइड्रोजन इकाई की एसएमआर गैस से कैप्चर की गई सीओ, जो लगभग 180 टीपीडी (60000 टीपीए) सीओ, है, एक नई सीओ उत्पादन इकाई के हिस्से के रूप में ऑयल इंडिया लिमिटेड द्वारा उनके अपरिष्कृत तेल के अन्वेषण में ईओआर गतिविधि के लिए उपयोग की जाएगी।

गेल: गेल ने सूक्ष्म–शैवाल के माध्यम से 1 टीपीडी सीओ2 को कैप्चर करने के लिए मेसर्स सीआईएमएफआर, धनबाद के सहयोग से पाटा में एक प्रायोगिक संयंत्र स्थापित किया है। सीओ2 को कैप्चर करने और मूल्यवर्धित उत्पादों के लिए रूपांतरण में उनकी प्रभावशीलता के लिए सूक्ष्म–शैवाल की विभिन्न प्रजातियों का विश्लेषण किया जा रहा है। गेल ने गेल में प्रचालनात्मक डीकार्बोनाइजेशन के लिए परियोजनाओं की संयुक्त रूप से अन्वेषण, पहचान, मूल्यांकन और कार्यान्वयन के लिए दिनांक 18.07.2023 को मेसर्स लैंजाटेक इंक, यूएसए के साथ एक समझौता ज्ञापन पर हस्ताक्षर किए हैं। बायो–एथेनॉल के उत्पादन के लिए प्रायोगिक / वाणिज्यिक संयंत्र स्थापित करने के लिए मेसर्स लैंजाटेक के साथ चर्चा चल रही है।

10.4. ग्रीन हाइड्रोजन

ग्रीन हाइड्रोजन विभिन्न क्षेत्रों, मौसमों और सेक्टरों में घरेलू रूप से प्रचुर मात्रा में नवीकरणीय ऊर्जा संसाधनों का उपयोग करने में सक्षम हो सकती है, जो ईंधन के रूप में या औद्योगिक फीडस्टॉक के रूप में कई उपयोग धाराओं का संभरण कर सकती है। यह पेट्रोलियम रिफाइनिंग, उर्वरक उत्पादन, इस्पात निर्माण आदि में जीवाश्म ईंधन से प्राप्त फीडस्टॉक को सीधे प्रतिस्थापित कर सकती है। हाइड्रोजन ईंधन से चलने वाले दूरगामी ऑटोमोबाइल और समुद्री जहाज गतिशीलता क्षेत्र के डीकार्बोनाइजेशन को सक्षम कर सकते हैं।

तेल और गैस पीएसयू द्वारा की गई पहल इस प्रकार हैं:

आईओसीएल: इंडियनऑयल, बिल्ड ओन ऑपरेट (बीओओ) आधार पर पानीपत में अपना पहला ग्रीन हाइड्रोजन संयंत्र (10केटीपीए) स्थापित कर रहा है। स्वच्छ ऊर्जा स्रोत के रूप में हाइड्रोजन ने जो महत्वपूर्ण गति प्राप्त की है, उसे देखते हुए आईओसीएल की भावी योजनाओं में टाटा मोटर्स लिमिटेड द्वारा विकसित 15 ईंधन सेल बसों (एफसीबी) पर व्यापक परीक्षण शामिल हैं, जो 3 लाख किलोमीटर तक चलेंगी, जिनमें विभिन्न हितधारकों को शामिल किया गया है। इसमें रक्षा और पर्यटन सार्वजनिक परिवहन सहित यात्री परिवहन के लिए ईंधन सेल बस संचालन शामिल है। इसके अलावा, 4 ईंधन सेल बसों को परीक्षण के लिए गुजरात के वडोदरा में परिनियोजित किया जाएगा और वडोदरा में इंडियनऑयल हाइड्रोजन रिफ्यूलिंग स्टेशन (एचआरएस) में ईंधन भरा जाएगा।

इंडियनऑयल ने हाइड्रोजन बाजार को बढ़ावा देने और ईंधन सेल वाहनों के लिए अत्याधुनिक ईंधन भरने की सुविधाएँ प्रदान करके हितधारकों को प्रोत्साहित करने के लिए एक सामरिक पहल के रूप में वाहन में ईंधन भरने वाले स्टेशनों के लिए हाइड्रोजन अवसंरचना की स्थापना की है। अवसंरचना विन्यास में इलेक्ट्रोलिसिस, प्राकृतिक गैस सुधार और शुद्धिकरण इकाइयों से प्राप्त हाइड्रोजन के साथ–साथ संपीड़न, भंडारण और वितरण सुविधाएँ शामिल हैं।

एचपीसीएल: हिंदुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड (एचपीसीएल) ने वर्ष 2019–20 में ग्रीन हाइड्रोजन (जीएच2) पारिस्थितिकी तंत्र में अपना कदम रखा है। यह वह समय था जब इसके अग्रणी एचपी ग्रीन आरएंडडी सेंटर (एचपीजीआरडीसी) ने एक प्रोटॉन एक्सचेंज मेम्ब्रेन (पीईएम) इलेक्ट्रोलाइजर स्थापित किया था। यह अनुसंधान एवं विकास के लिए हाइड्रोजन प्रसंस्करण के लिए हाइड्रोजन की पूरी कैप्टिव आवश्यकता को पूरा करने के लिए था, जो इसके कैप्टिव सौर ऊर्जा संयंत्र द्वारा प्रचालित था।

एचपीसीएल ने अपनी विशाख रिफाइनरी में एक इलेक्ट्रोलाइजर संयंत्र स्थापित किया है, जिसे 24 जुलाई, 2024 को चालू किया गया है। एचपीसीएल एमएनआरई के एसआईजीएचटी 2बी कार्यक्रम के तहत 5 केटीपीए क्षमता के लिए निविदा जारी करने की प्रक्रिया में है।

एमआरपीएल: एमआरपीएल 500 टीपीए क्षमता वाला एक ग्रीन हाइड्रोजन संयंत्र स्थापित कर रहा है, जिसके वर्ष 2026–27 तक चालू होने की संभावना है। साइट 2बी योजना के तहत, एमआरपीएल ने जून 2024 में 10 केटीपीए क्षमता के लिए निविदा जारी की गई है।

सीपीसीएल: सीपीसीएल बीओओ आधार पर 2 केटीपीए ग्रीन हाइड्रोजन यूनिट स्थापित कर रहा है, जिसके वर्ष 2026–27 तक चालू होने की संभावना है। ग्रीन हाइड्रोजन उत्पादन क्षमता को राष्ट्रीय ग्रीन हाइड्रोजन अधिदेश के अनुरूप वर्ष 2030 तक क्रमिक रूप से 10 केटीपीए तक बढ़ाया जाएगा।

एनआरएल: एनआरएल ईपीसी आधार पर 2.4 केटीपीए ग्रीन हाइड्रोजन संयंत्र स्थापित कर रहा है, जिसे जून 2025 तक चालू करने का लक्ष्य है। एनआरएल एमएनआरई की साइट 2बी योजना के तहत बीओओ आधार पर 5 केटीपीए ग्रीन हाइड्रोजन स्थापित करने और रिफाइनरी में उपयोग के लिए ग्रीन हाइड्रोजन की आपूर्ति करने के लिए निविदा जारी कर रहा है।

बीपीसीएल: बीपीसीएल बीना रिफाइनरी में ग्रीन हाइड्रोजन उत्पादन के लिए लगभग 5 मेगावाट का इलेक्ट्रोलाइजर संयंत्र स्थापित कर रहा है। बीपीसीएल अनुसंधान एवं विकास (आरएंडडी) ने स्वदेशी अल्कलाइन इलेक्ट्रोलाइजर तकनीक को मेगावाट पैमाने पर बढ़ाने और प्रदर्शन के लिए बीएआरसी के साथ एक समझौता ज्ञापन पर हस्ताक्षर किए हैं। इसके अलावा, इस तकनीक पर आधारित 1 मेगावाट का इलेक्ट्रोलाइजर डेमो संयंत्र बनाया जा रहा है। बीपीसीएल ने ग्रीन हाइड्रोजन आधारित गतिशीलता के प्रदर्शन के लिए कोचीन इंटरनेशनल एयरपोर्ट लिमिटेड के साथ एक समझौता ज्ञापन पर हस्ताक्षर किए हैं।



गेल: गेल ने नगर गैस डिस्ट्रीब्यूशन ग्रिड में हाइड्रोजन मिश्रण की भारत की पहली परियोजना शुरू की है। मध्य प्रदेश राज्य के इंदौर में अवंतिका गैस लिमिटेड (एजीएल) के नगर गैस स्टेशन पर सीएनजी नेटवर्क में हाइड्रोजन का दो प्रतिशत और पीएनजी नेटवर्क में हाइड्रोजन का 5 प्रतिशत मिश्रण किया जा रहा है। गेल ने मध्य प्रदेश के गेल विजयपुर में 1.4 केटीपीए (4.3 टीपीडी) ग्रीन हाइड्रोजन उत्पादन की क्षमता वाला अपना पहला ग्रीन हाइड्रोजन संयंत्र स्थापित किया है। शुरुआत में इस इकाई से उत्पादित हाइड्रोजन का उपयोग प्राकृतिक गैस के साथ-साथ विजयपुर में मौजूदा संयंत्र में चल रही विभिन्न प्रक्रियाओं और उपकरणों में कैप्टिव उद्देश्य के लिए ईंधन के रूप में किया जाएगा। इसके अलावा, इस हाइड्रोजन को उच्च दाब वाले कैस्केड के माध्यम से आस-पास के भौगोलिक क्षेत्रों में खुदरा ग्राहकों तक पहुँचाने की योजना है।



पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के सचिव द्वारा गेल के 10 मेगावाट ग्रीन हाइड्रोजन संयंत्र का उद्घाटन (मध्य प्रदेश में प्रायोगिक परियोजना के रूप में 4.3 टीपीडी पीईएम इलेक्ट्रोलाइजर आधारित संयंत्र की स्थापना)

10.5. प्रयुक्त तेल में चक्रीय अर्थव्यवस्था परिपाटियां

1. प्रयुक्त तेल में चक्रीय अर्थव्यवस्था:

पिछले दो दशकों में प्रयुक्त तेल में चक्रीय अर्थव्यवस्था की अवधारणा ने गति पकड़ी है, जिसमें तेल विपणन कंपनियाँ न केवल प्रयुक्त तेल से प्राप्त पुनर्शोधित तेल का उपयोग स्नेहक के निर्माण के लिए करती हैं, बल्कि सुरक्षित और स्वस्थ भविष्य के लिए बहुमूल्य पेट्रोलियम भंडार का संरक्षण भी करती हैं। इसके अलावा, पुनर्चक्रण में निष्कर्षण और विनिर्माण प्रक्रियाओं में जलाए जाने वाले जीवाश्म ईंधन की मात्रा को कम करके वैश्विक जलवायु परिवर्तन की दर को कम करने की क्षमता है। यह पारिस्थितिकी तंत्र में कार्बन फुटप्रिंट को कम करने में मदद करता है।

प्रयुक्त स्नेहक के पुनर्शोधन से पर्यावरणीय और आर्थिक दोनों लाभ हो सकते हैं। बेस ऑयल के निर्माण के लिए प्रयुक्त तेल का पुनर्शोधन, ईंधन के रूप में उपयोग के लिए प्रयुक्त तेल को पुनर्संसाधित करने की तुलना में अधिक ऊर्जा की बचत करता है। प्रयुक्त तेल से पुनर्शोधित बेस ऑयल के निर्माण के लिए आवश्यक ऊर्जा, वर्जिन बेस ऑयल का उत्पादन करने के लिए अपरिष्कृत तेल को परिष्कृत करने के लिए आवश्यक ऊर्जा का केवल एक तिहाई है। इसलिए, संसाधनों के संरक्षण के साथ-साथ अपशिष्ट को कम करने और पर्यावरण को होने वाले नुकसान को कम करने के मामले में बहुत-से लोगों द्वारा पुनर्शोधन को एक अधिमानी विकल्प माना जाता है।

भारतीय ल्यूब ऑयल का बाजार करीब 3.2 एमएमटी का है और सीपीसीबी (केंद्रीय प्रदूषण नियंत्रण बोर्ड) के पास उपलब्ध आंकड़ों के अनुसार, भारत में 400 से अधिक अधिकृत री-रिफाइनर (रीसाइक्लर) कार्य कर रहे हैं और पुनर्शोधित तेल के उत्पादन के लिए इनकी संयुक्त क्षमता 1.5 एमएमटीपीए से अधिक है। इस प्रकार, भारत में प्रयुक्त तेलों को संसाधित करने के लिए पर्याप्त पुनर्शोधन क्षमता है।

2. प्रयुक्त तेल पुनर्चक्रण की वर्तमान स्थिति:

भारत में आरआरबीओ (पुनर्शोधित बेस ऑयल) के उत्पादन के लिए उपयोग की जाने वाली तकनीक से केवल ग्रुप I आरआरबीओ का उत्पादन होता है। पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय (एमओईएफ एंड सीसी) द्वारा प्रयुक्त (स्नेहन) तेल में चक्रीय अर्थव्यवस्था के कार्यान्वयन के लिए जारी दिनांक 18.09.2023 की राजपत्र अधिसूचना के अनुसार, प्रयुक्त तेल के लिए विस्तारित उत्पादक उत्तरदायित्व (ईपीआर) दिनांक 01.04.2024 से प्रभावी हो गया है। अधिसूचना के अनुसार, सभी स्नेहक उत्पादकों को प्रयुक्त तेल का संग्रह और पुनर्चक्रण सुनिश्चित करना अनिवार्य है और तदनुसार उनके लिए ईपीआर लक्ष्य निर्धारित किए गए हैं। भारतीय बाजार में बेचे जाने वाले तैयार स्नेहक के आधार पर स्नेहक विनिर्माताओं द्वारा आवश्यक ईपीआर लक्ष्यों का निर्धारित प्रतिशत 5% से बढ़कर 50% हो जाएगा। इस विनियामक प्रयास के लिए प्रयुक्त स्नेहक तेलों के संग्रहण, प्रसंस्करण और वितरण के लिए एक व्यापक प्रणाली की आवश्यकता है, ताकि चक्रीय अर्थव्यवस्था को प्राप्त करने के लिए उच्च गुणवत्ता वाले ग्रुप I और ग्रुप II आरआरबीओ का उत्पादन किया जा सके।

3. प्रयुक्त तेल में चक्रीय अर्थव्यवस्था के कार्यान्वयन की दिशा में ओएमसी द्वारा की गई विभिन्न पहलें नीचे सूचीबद्ध की गई हैं:

क) आरआरबीओ की खरीद के लिए कई निविदाएँ जारी की गई हैं और तदनुसार उत्पाद खरीदे गए हैं।

ख) प्रयुक्त तेलों में चक्रीय अर्थव्यवस्था शुरू करने के तरीकों और साधनों पर चर्चा करने के लिए विभिन्न रि-रिफाइनरों के साथ वेबिनार, बैठकें

ग) आरआरबीओ के साथ तैयार किए गए स्नेहक को स्वीकार करने के लिए ऑटोमोबाइल ओईएम के साथ बातचीत शुरू की।

घ) ओएमसी ने आरआरबीओ के बीआईएस विनिर्देशों को अंतिम रूप देने और जारी करने के लिए बीआईएस बैठक में भाग लिया।

ङ) ईपीआर प्रयुक्त तेल पर चैनल भागीदारों/ग्राहकों/ऑटो ओईएम के बीच जागरूकता उत्पन्न की।

च) सोसाइटी ऑफ इंडियन ऑटोमोबाइल मैन्युफैक्चरर्स (एसआईएएम) और महाराष्ट्र प्रदूषण नियंत्रण बोर्ड द्वारा संयुक्त रूप से आयोजित "विस्तारित विनिर्माता जिम्मेदारी व्यवस्था: ऑटोमोटिव उद्योग में एक किफायती परिवहन के लिए दीर्घकालिक विकल्प चक्रीय अर्थव्यवस्था को बढ़ावा देने के लिए एक अभिनव नीतिगत साधन" पर कार्यशाला में भाग लिया।

4. आरआरबीओ के आधार पर ओएमसी द्वारा लॉन्च किए गए विभिन्न ग्रेड निम्नानुसार हैं:

क. आईओसीएल: आईओसीएल ने अब तक पुनर्शोधित बेस ऑयल के साथ चार स्नेहक-सर्वो रफ्तार (वाणिज्यिक वाहनों के लिए), सर्वो ग्रीनमाइल (पेट्रोल वाहनों के लिए), सर्वो 4टी ग्रीन (फोर स्ट्रोक बाइक इंजन ऑयल) और सर्वो ट्रैक्टर ग्रीन (ट्रैक्टर इंजन ऑयल)-लॉन्च किए हैं जिसमें 25% तक पुनर्शोधित बेस ऑयल है। सर्वो 4टी ग्रीन को खुदरा बाजार से अच्छी प्रतिक्रिया मिली है। इसके अलावा, वर्ष 2024-25 में हाइड्रोलिक और गियर ऑयल श्रेणी में नए उत्पाद लॉन्च किए जाएंगे। अप्रैल, 2023 से अब तक 1,600 किलोलीटर आरआरबीओ की खरीद की गई है और लगभग 9,000 किलोलीटर आरआरबीओ मिश्रित स्नेहकों की बिक्री की गई है।

ख. एचपीसीएल: एचपीसीएल ने हाइड्रोलिक ऑयल एन्वलो ग्रीन 68, एपीआई एसएन के अनुरूप पैसेंजर कार इंजन ऑयल, एपीआई सी14+ के अनुरूप डीजल इंजन ऑयल, हाइड्रोलिक ऑयल और इंडस्ट्रियल गियर ऑयल लॉन्च किए हैं। इसके अलावा, एचपीसीएल ने खुदरा बाजार में आगे की बिक्री के लिए आरआरबीओ से बने 105 किमी उत्पाद के खरीद ऑर्डर को भी अंतिम रूप दिया है।

ग. बीपीसीएल: बीपीसीएल ने दोपहिया वाहनों के लिए इंजन ऑयल, पैसेंजर कारों के लिए इंजन ऑयल, थ्री-व्हीलर्स के लिए डीजल इंजन ऑयल, भारी वाणिज्यिक वाहनों के लिए इंजन ऑयल और हाइड्रोलिक ऑयल लॉन्च किया है। इसके अलावा, आरआरबीओ के साथ तैयार किए गए स्नेहक के मिश्रित ग्रेड की बिक्री के लिए 48 किमी आरआरबीओ खरीदा है। अब तक कुल 151 किमी आरआरबीओ आधारित स्नेहक बेचे जा चुके हैं।

5. ईपीआर कानून को लागू करने के लिए तेल विपणन कंपनियों द्वारा अतिरिक्त प्रयास:

तेल विपणन कंपनियों ने सभी हितधारकों के साथ बातचीत शुरू कर दी है और प्रयुक्त तेल के उचित निपटान के लिए बल्क जनरेटर के साथ, प्रयुक्त तेल के संग्रह के लिए एग्रीगेटर्स के साथ और तेल विपणन कंपनियों को आरआरबीओ और ईपीआर प्रमाणपत्रों के निरंतर प्रवाह के लिए रिसाइकिलर्स के साथ बैठकें आयोजित की गई हैं।

10.6. सतत विकास

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के अंतर्गत आने वाले तेल पीएसयू प्रतिस्पर्धात्मक लाभ को बढ़ाने, निवेशकों को आकर्षित करने, लचीले व्यवसाय मॉडल बनाने तथा सतत और समावेशी वैश्विक अर्थव्यवस्था में योगदान देने के उद्देश्य से अपनी भावी कार्यनीतियों और व्यावसायिक संचालन में ईएसजी कारकों को एकीकृत कर रहे हैं। तेल पीएसयू अपने प्रचालन और गतिविधियों में सर्वोत्तम परिपाटियों को लागू करके अपने ईएसजी उद्देश्यों को प्राप्त करने के लिए प्रतिबद्ध हैं। ईएसजी प्रदर्शन को राष्ट्रीय और अंतर्राष्ट्रीय साथियों के साथ लगातार बेंचमार्क किया जाता है। इस संबंध में गतिविधियों/उपलब्धियों की रूपरेखा नीचे दी गई है:

1. आईओसीएल

- इंडियन ऑयल बहुआयामी दृष्टिकोण के माध्यम से ईएसजी के लिए प्रतिबद्ध है जिसमें ऊर्जा दक्षता, नवीकरणीय ऊर्जा, अपशिष्ट प्रबंधन, जैव विविधता संरक्षण आदि शामिल हैं। कंपनी ने ऊर्जा संरक्षण परियोजनाओं को क्रियान्वित करके, प्राकृतिक गैस को बढ़ावा देकर, नवीकरणीय ऊर्जा के उपयोग, वृक्षारोपण आदि के माध्यम से परिहार/शमन/ऑफसेट के माध्यम से वित्त वर्ष 2023-24 के दौरान अपने जीएचजी उत्सर्जन को 4.5 मिलियन मीट्रिक टन कॉर्बन डाइ ऑक्साइड तक कम किया है।

इंडियन ऑयल के ईएसजी प्रदर्शन की मुख्य विशेषताएं

पर्यावरण	सामाजिक	अभिशासन
ब्लूमबर्ग एनईएफ वैश्विक ऊर्जा परिवर्तन स्कोर में इंडियन ऑयल शीर्ष भारतीय तेल और गैस कंपनी के रूप में उभरी	**30,321** स्थायी कर्मचारी और कामगार	इंडियनऑयल **संयुक्त राष्ट्र ग्लोबल कॉम्पैक्ट (यूएनजीसी)** का एक हस्ताक्षरकर्ता सदस्य है।
2023 में सीडीपी में **बी रेटिंग**	**320.41 मिलियन** मानव–घंटे	**99.99%** ग्राहक शिकायतें बंद की गई
कुल **~6%** विद्युत मांग नवीकरणीय ऊर्जा उत्पादन से पूरी की गई	**₹457.71** करोड़ वित्त वर्ष 2023–24 के दौरान सीएसआर व्यय	सुशासन के लिए **12** बोर्ड समितियां
इंडियनऑयल की सभी अवस्थितियों पर **100% ऊर्जा कुशल प्रकाश व्यवस्था**	**0.024** स्थायी कर्मचारियों के लिए लोस्ट टाइम इंजरी फ्रिक्वेंसी आवृत्ति दर (एलटीआईएफआर)	**2** महिला निदेशक
~60 लाख जीवंत वृक्ष	**117.66 लाख** सीएसआर लाभार्थी	**12.50%** महिला निदेशक
1,20,000 एमटीसीओ2ई वृक्षारोपण के माध्यम से कार्बन स्ववियोजन	**सीएसआर फोकस क्षेत्रों में निम्नलिखित शामिल हैं** सुरक्षित पेयजल और जल संसाधनों का संरक्षण, स्वास्थ्य देखभाल और स्वच्छता, शिक्षा और रोजगार बढ़ाने वाले व्यावसायिक कौशल, ग्रामीण विकास, पर्यावरण स्थिरता, महिलाओं और सामाजिक/आर्थिक रूप से पिछड़े समूहों का सशक्तिकरण आदि।	वित्त वर्ष 2023–24 के दौरान **390** सतर्कता जागरूकता सत्र आयोजित किए गए।
~41.6 बिलियन लीटर अपशिष्ट जल का पुनर्चक्रण	प्रत्येक इकाई/क्षेत्र/मुख्यालय स्तर पर **पीओएसएच के कार्यान्वयन** के लिए आंतरिक समितियां, जिनकी अध्यक्षता वरिष्ठ स्तर की महिला कार्मिक हैं।	**30+ वर्ष** निदेशक मंडल का औसत अनुभव
~7.24 बिलियन लीटर वित्त वर्ष 2023–24 में अनुमानित वर्षा जल संचयन	**₹202 करोड़** प्रशिक्षण पर किया गया व्यय	कर्मचारियों और स्टाफ सदस्यों को कवर करने वाली **शिकायत निवारण नीति**
~₹409.5 करोड़ नवीकरणीय ऊर्जा और ग्रीन प्रयासों में निवेश	सुरक्षा संस्कृति को बढ़ाने के लिए इंडियनऑयल में **स्वास्थ्य, सुरक्षा और पर्यावरण (एच,एस एंड ई)** नीति लागू की गई	**100%** भ्रष्टाचार से संबंधित जोखिम के लिए संचालन स्थलों का मूल्यांकन किया गया
4.5 एमएमटीसीओ2ई+ जीएचजी उत्सर्जन में बचाव/कमी/शमन	**42.46%** एमएसएमई/एमएसई से खरीद लक्ष्य के सापेक्ष 25% अधिक	**शून्य मामले** वित्त वर्ष 2023–24 के दौरान दर्ज प्रतिस्पर्धा–विरोधी व्यवहार
3,52,299 मीट्रिक टन खतरनाक अपशिष्ट का पुनः उपयोग	**9,66,239** प्रशिक्षण एवं विकास में निवेश किए गए घंटे	**390** सतर्कता जागरूकता कार्यक्रम आयोजित किये गये
सीआईआई–ग्रीनको द्वारा जीरो वेस्ट टू लैंडफिल प्रमाणन रतलाम टर्मिनल, बिजनौर टर्मिनल, मैसूर और कल्याणी बॉटलिंग संयंत्र के लिए प्राप्त	**95%+** स्थायी कर्मचारियों को विभिन्न यूनियन/एसोसिएशन के अंतर्गत कवर	

- इंडियन ऑयल की नवीकरणीय ऊर्जा क्षमता, जिसमें पवन और सौर ऊर्जा शामिल है, 247 मेगावाट से अधिक हो गई है, जिसमें 5,000 करोड़ से अधिक के निवेश के साथ 1 गीगावाट तक आगे विस्तार की योजना है। इंडियनऑयल ने ग्रिड और/या ऑफ–ग्रिड नवीकरणीय ऊर्जा आधारित विद्युत परियोजनाओं को विकसित करने के लिए एनटीपीसी के साथ इंडियनऑयल एनटीपीसीग्रीन एनर्जी प्राइवेट लिमिटेड (आईएनजीईएल) नाम से एक संयुक्त उद्यम का गठन किया है। मई 2024 में, न्यून कार्बन, अभिनव, स्वच्छ और किफायती परिवहन के लिए दीर्घकालिक विकल्प ऊर्जा संचालन करने के लिए एक नया डब्ल्यूओएस "टेरा क्लीन लिमिटेड" निगमित किया गया, जो इसकी ग्रीन पहल को आगे बढ़ाने के लिए अपनी प्रतिबद्धता को प्रदर्शित करता है।

- गैर–पारंपरिक ऊर्जा के क्षेत्र में, इंडियनऑयल ने ई–100, 2जी और 3जी एथेनॉल और प्रयुक्त कुकिंग तेल से बायोडीजल आदि सहित जैव ईंधन के साथ प्रगति की है। इंडियनऑयल पहली भारतीय कंपनी है जिसने कमर्शियल सीबीजी ब्रांड 'इंडीग्रीन' लॉन्च किया है। इस ब्रांड के तहत इंडियनऑयल की सीबीजी की बिक्री वर्ष 2023–24 में 7.8 टीएमटी तक पहुंच गई। वर्ष के दौरान, इंडियनऑयल ने गोरखपुर और हिंगोनिया में दो सीबीजी संयंत्र स्थापित किए हैं। इससे क्रियाशील सीबीजी संयंत्र की कुल संख्या 31 हो गई है। इंडियनऑयल ने वित्त वर्ष 2023–24 में किफायती परिवहन के लिए दीर्घकालिक विकल्प के तहत 650 से अधिक आशय पत्र (एलओआई) जारी किए हैं। जून 2024 में, आईओसी जीपीएस रिन्यूएबल्स प्राइवेट लिमिटेड नामक एक अन्य संयुक्त उद्यम कंपनी को जैविक अपशिष्ट को सीबीजी में बदलने के लिए उन्नत बायोगैस तकनीकों को एकीकृत करने के लिए निगमित किया गया था।

- वर्ष के दौरान, कंपनी ने भारत में किफायती परिवहन के लिए दीर्घकालिक विकल्प विमानन ईंधन (एसएएफ) और एथेनॉल, सीबीजी, बायोडीजल, बायो–बिटुमेन आदि से युक्त अन्य जैव ईंधन संयंत्रों की स्थापना के लिए 50:50 संयुक्त उद्यम कंपनी के गठन के लिए प्राज इंडस्ट्रीज के साथ सहयोग किया। इसके अलावा, इंडियनऑयल पानीपत में 86.8 टीएमटीपीए क्षमता का एसएएफ संयंत्र स्थापित कर रहा है, जिसमें लैंजाजेट की अल्कोहल टू जेट (एटीजे) तकनीक का लाभ उठाया जा रहा है। यह संयंत्र अपना फीडस्टॉक 1जी और 3जी एथेनॉल से भी प्राप्त करेगा, जो पूरक कार्बन लाभ प्रदान करता है, जो इसकी किफायती परिवहन के लिए दीर्घकालिक विकल्पता में योगदान देता है।

- हाइड्रोजन अर्थव्यवस्था की दिशा में अपने प्रयासों में, इंडियनऑयल ने एलएंडटी और रीन्यू के साथ मिलकर ग्रीन हाइड्रोजन परियोजनाओं और इसके डेरिवेटिव पर ध्यान केंद्रित करने के लिए एक संयुक्त उद्यम कंपनी जीएच4 इंडिया प्राइवेट लिमिटेड का गठन किया है। इंडियनऑयल कंपनी अपनी पानीपत रिफाइनरी में 10 केटीपीए ग्रीन हाइड्रोजन संयंत्र विकसित कर रही है। इसके बाद वर्ष 2030 तक, कंपनी की योजना 350 केटीए ग्रीन हाइड्रोजन क्षमता बनाने की है, जो इसकी कुल हाइड्रोजन उत्पादन क्षमता का 50% होगी। कंपनी ने वर्ष के दौरान भारत की पहली ग्रीन हाइड्रोजन ईंधन सेल बस लॉन्च करके ग्रीन हाइड्रोजन क्षेत्र में अपनी नेतृत्व आकांक्षा का प्रदर्शन किया और वर्तमान में दिल्ली–एनसीआर क्षेत्र में 15 ईंधन सेल बसों का संचालन कर रही है।

- चक्रीय अर्थव्यवस्था के क्षेत्र में, इंडियनऑयल ने "अनबॉटल्ड" अभियान शुरू किया है जो पीईटी बोतलों को टिकाऊ कपड़ों में परिवर्तित करने पर केंद्रित है। इसके अलावा, इंडियनऑयल ने 'साइक्लोप्लास्ट' के रूप में जाना जाने वाला पुनर्चक्रित प्लास्टिक का अपना ब्रांड पेश किया जो पुनर्चक्रित पेट्रोकेमिकल्स को वर्जिन प्लास्टिक के साथ एकीकृत करता है, जो विनिर्माण और उपभोग में जिम्मेदार निपटान और पुनः उपयोग को बढ़ावा देता है। इसके अतिरिक्त, कंपनी की अभिनव अपशिष्ट प्रबंधन पहलों के परिणामस्वरूप लैंडफिल से 90% से अधिक अपशिष्ट को हटाया जा सका है।

- इंडियनऑयल की जल प्रबंधन पहलों में उपचारित अपशिष्ट जल का उपयोग, वर्षा जल संचयन और सीवेज उपचार संयंत्रों की स्थापना शामिल है, जो महत्वपूर्ण जल पुनः उपयोग और संरक्षण में योगदान देता है। प्राकृतिक जल के संरक्षण की हमारी प्रतिबद्धता के हिस्से के रूप में, मथुरा रिफाइनरी मथुरा सीवेज ट्रीटमेंट संयंत्र (एसटीपी) से उपचारित अपशिष्ट जल का पुनः उपयोग कर रही है। मथुरा एसटीपी ने यमुना नदी से प्राकृतिक जल की खपत को ~50% कम करने में मदद की है, जबकि गुजरात रिफाइनरी राजीव नगर एसटीपी से उपचारित अपशिष्ट जल का उपभोग कर रही है, जिससे माही नदी से 25% प्राकृतिक जल की निकासी को कम करने में मदद मिली है।

- जैव विविधता के प्रति इंडियनऑयल की प्रतिबद्धता लाखों वृक्ष लगाने और अन्य संरक्षण परियोजनाओं के अलावा चीतों को फिर से लाने के प्रयासों में स्पष्ट है। एक ग्रीन ग्रह में योगदान देने के हमारे प्रयासों के हिस्से के रूप में, इंडियनऑयल ने वर्ष 2023–24 के दौरान 15 लाख से अधिक वृक्ष लगाए

है और अनुमान है कि वित्त वर्ष 2023–24 के अंत तक हमारी संगठनात्मक सीमाओं के भीतर और बाहर लगभग 60 लाख वृक्ष बचे रहेंगे, जिसके परिणामस्वरूप ~0.12 मिलियन मीट्रिक टन कार्बन डाइ ऑक्साइड उत्सर्जन कम होगा। इस प्रकृति–आधारित समाधान (एनबीएस) के माध्यम से, वृक्षारोपण कार्बन डाइऑक्साइड को अवशोषित करने और वन्यजीवों के लिए आवास प्रदान करने और पारिस्थितिकी तंत्र के समग्र स्वास्थ्य में सुधार करने के लिए ऑक्सीजन छोड़ने में मदद करता है। इंडियनऑयल, पर्यावरण, वन और जलवायु संरक्षण मंत्रालय द्वारा शुरू किए गए ग्रीन क्रेडिट कार्यक्रम के माध्यम से बंजर वन भूमि पर वृक्षारोपण भी कर रहा है।

- इंडियनऑयल भारतीय प्रतिभूति और विनिमय बोर्ड (सेबी) की गैर–वित्तीय रिपोर्टिंग आवश्यकताओं का अनुपालन व्यावसायिक उत्तरदायित्व और किफायती परिवहन के लिए दीर्घकालिक विकल्पता रिपोर्ट (बीआरएसआर) के माध्यम से करता है, जो पारदर्शी तरीके से हितधारकों को गैर–वित्तीय डाटा, योजनाओं और प्रदर्शन के बारे में बताता है। इंडियनऑयल की तृतीय पक्ष द्वारा आश्वासित बीआरएसआर 2023–24 को https://iocl.com/business.responsibility.report पर देखा जा सकता है।

2. बीपीसीएल

एक अग्रणी महारत्न पीएसयू के रूप में, बीपीसीएल की कार्यनीति निवल शून्य में परिवर्तन के लिए भारत की प्रतिबद्धता पर केंद्रित है। भारत में असंख्य विकासात्मक चुनौतियों और तेजी से अस्थिर बाजारों के साथ, हम एक

बीपीसीएल के ईएसजी प्रदर्शन की मुख्य बातें

पर्यावरण	सामाजिक	अभिशासन
#8वां स्थान डॉव जोन्स सस्टेनेबिलिटी इंडेक्स (डीजेएसआई) तेल और गैस क्षेत्र। भारत में पहला स्थान और विश्व स्तर पर 8वां स्थान	**8506** स्थायी कर्मचारी और कामगार	**277** सतर्कता जागरूकता सत्र
बी **सीडीपी द्वारा रैंक किया गया प्रबंधन स्तर** (पूर्व में कार्बन डिस्क्लोजर प्रोजेक्ट)	**117.54 मिलियन मानव–घंटे** रिफाइनरियों में लोस्ट टाइम एक्सीडेंट्स (एलटीए) के बिना	**99.82%** ग्राहक शिकायतें बंद की गईं
4.4% (कुल खपत की गई बिजली में से) नवीकरणीय ऊर्जा उत्पादन का हिस्सा	**₹152.21 करोड़** सीएसआर व्यय	**3** महिला निर्देशक
71.05 मेगावाट ऊर्जा कुशल प्रकाश व्यवस्था	**0** स्थायी कर्मचारियों के लिए लोस्ट टाइम इंजरी फ्रिक्वेंसी आवृत्ति दर (एलटीआईएफआर)	**100%** भ्रष्टाचार से संबंधित जोखिम के लिए संचालन स्थलों का मूल्यांकन
10.5 लाख आज तक लगाए गए वृक्ष	**71,52,010** सीएसआर लाभार्थियों की कुल संख्या	सभी बोर्ड स्तरीय समितियों का नेतृत्व स्वतंत्र निदेशक करते हैं।
23,600 एमटीसीओ2ई वृक्षारोपण के माध्यम से कार्बन स्वांगीकरण	**सीएसआर के पांच फोकस क्षेत्र निम्नलिखित हैं** 1. स्वास्थ्य एवं स्वच्छता 2. शिक्षा 3. पर्यावरण स्थिरता 4. कौशल विकास 5. सामुदायिक विकास	सुदृढ़ शिकायत निवारण प्रणाली सार्वजनिक डोमेन में उपलब्ध है
13.49 लाख वर्गमीटर **वर्षा जल संचय के लिए** जलग्रहण क्षेत्र	कॉर्पोरेट, क्षेत्रीय और रिफाइनरी स्तर पर **पीओएसएच समितियां क्रियाशील हैं**	जनहित प्रकटीकरण और मुखबिर संरक्षण संकल्प (पीआईडीपीआई) को बीपीसीएल में लागू किया गया है

पर्यावरण	सामाजिक	अभिशासन
106 हजार किलो लीटर अपशिष्ट जल का पुनर्चक्रण किया गया	**मानव अधिकार नीति** तैयार और सार्वजनिक डोमेन पर प्रकाशित की गई।	
640 टीकेएल (हजार किलो लीटर) वर्षा जल संचयन	सुरक्षा संस्कृति को बढ़ाने के लिए बीपीसीएल में कॉर्पोरेट सुरक्षा प्रबंधन प्रणाली लागू की गई	
4,891 मीट्रिक टन विस्तारित उत्पादक उत्तरदायित्व (ईपीआर) के अंतर्गत प्लास्टिक निपटान	25% के लक्ष्य के सापेक्ष एमएसएमई/एमएसई से 33.7% से अधिक खरीदारी	
8.64 एमएमटीसीओ2ई जीएचजी उत्सर्जन में कमी		
90,387 मीट्रिक टन खतरनाक अपशिष्ट का पुनः उपयोग		
सभी प्रचालन विपणन और रिफाइनरी स्थानों के लिए **जीरो वेस्ट टू लैंडफिल प्रमाणन।** **कोच्चि रिफाइनरी** सितंबर 2024 तक अपेक्षित है		
100% ईईएल मुंबई रिफाइनरी, बीना रिफाइनरी, पाइपलाइन, रिटेल, एलपीजी, एविएशन एसबीयू, कोच्चि रिफाइनरी और लुब्रिकेंट्स व्यवसाय में मार्च 2025 तक		

ऊर्जा प्रबंधन

₹ 1,299.58 करोड़ नवीकरणीय ऊर्जा 2023–24 में संस्वीकृत नवीकरणीय ऊर्जा परियोजनाओं में अनुमोदित कैपेक्स	**~200.7 हजार टीजे ऊर्जा की खपत**

	विशिष्ट ऊर्जा खपत (एमबीएन में)		
	बीना	**मुंबई**	**कोच्चि**
वित्त वर्ष 2022-23	68.0	62.7	63.9
वित्त वर्ष 2023-24	67.2	60.9	62.6
% परिवर्तन	~1.17% की कमी	~2.87% की कमी	~2.03% की कमी

"उचित परिवर्तन" की आवश्यकता से अवगत हैं जो लोगों को साथ लेकर चलता है क्योंकि हम सामूहिक रूप से एक नई ऊर्जा अर्थव्यवस्था की ओर बढ़ते हैं।

ऊर्जा दक्षता एक प्रमुख प्राथमिकता है, जो पर्यावरणीय लक्ष्यों और रिफाइनरियों में संभावित लागत में कमी से प्रेरित है। ऊर्जा संसाधन प्रबंधन और किफायती परिवहन के लिए दीर्घकालिक विकल्प ऊर्जा स्रोतों पर बीपीसीएल का सामरिक ध्यान हमारे दीर्घकालिक मूल्य निर्माण में महत्वपूर्ण भूमिका निभाता है। कुशल ऊर्जा उपयोग को प्राथमिकता देकर, नवीकरणीय ऊर्जा को अपनाकर और स्वच्छ स्रोतों की ओर बढ़ते हुए, हम पर्यावरणीय स्थिरता सुनिश्चित करते हैं, लागत बचत को बढ़ावा देते हैं, प्रतिस्पर्धा को बढ़ावा देते हैं और कंपनी को भावी विकास के लिए तैयार करते हैं। ऊर्जा संरक्षण (ईएनसीओएन) योजनाएँ सभी तीन बीपीसीएल रिफाइनरियों में शुरू की गई हैं, जिससे विशिष्ट ऊर्जा खपत में उल्लेखनीय कमी आई है।

ऊर्जा परिवर्तन

नवीकरणीय ऊर्जा व्यवसाय इकाई बीपीसीएल के स्वच्छ ऊर्जा लक्ष्यों को आगे बढ़ा रही है, जिसका लक्ष्य कंपनी के ऊर्जा मिश्रण को ग्रीन विकल्पों के साथ विविधता प्रदान करना और एक एकीकृत ऊर्जा कंपनी के रूप में विकसित करना है। वर्ष 2023–24 में स्वीकृत निम्नलिखित परियोजनाओं के लिए ₹ 1299.58 करोड़ का पूंजीगत परिव्यय आवंटित किया गया था।

स्वीकृत परियोजनाएँ

- उत्तर प्रदेश के प्रयागराज में ग्राउंड माउंटेड सौर परियोजना
- मध्य प्रदेश और महाराष्ट्र में पवन ऊर्जा परियोजनाएँ
- केरल के कोच्चि में एकीकृत ग्रीन हाइड्रोजन संयंत्र और हाइड्रोजन री–फ्यूलिंग स्टेशन

जल प्रबंधन

34,685 हजार किलोलीटर कुल जल उपभोग	**6.4 लाख किलोलीटर** वर्षा जल संचय	**13.49 लाख वर्ग मीटर** वर्षा जल संचय के लिए जलग्रहण क्षेत्र वर्ष–दर–वर्ष 12.89% की वृद्धि

बीपीसीएल के संचालन में जल की महत्वपूर्ण भूमिका है, जो शोधन प्रक्रियाओं और शीतलन प्रणालियों का समर्थन करता है। प्रभावी जल प्रबंधन पर्यावरणीय प्रभाव को कम करके, लागत कम करके, उत्पादकता बढ़ाकर और जल की कमी और विनियमन से संबंधित जोखिमों का प्रबंधन करके बीपीसीएल के मूल्य सृजन को बढ़ाता है। यह सामरिक दृष्टिकोण उत्पादन को अनुकूलित करता है, दक्षता बढ़ाता है और बीपीसीएल के वित्तीय प्रदर्शन को सुदृढ़ करता है। कुशल जल प्रबंधन को बढ़ावा देने के लिए, हमने वर्षा जल संचयन (आरडब्ल्यूएच) क्षमता बढ़ाने और जल के अन्य स्रोतों पर निर्भरता कम करने की दिशा में लगातार निवेश और कार्य किया है।

अपशिष्ट प्रबंधन

1,15,862 मीट्रिक टन खतरनाक अपशिष्ट पुनर्चक्रण	**4891 मीट्रिक टन** प्लास्टिक अपशिष्ट एकत्र किया गया और ब्रांड स्वामी के रूप में ईपीआर के अंतर्गत बीपीसीएल ल्यूब्स व्यवसाय इकाई के माध्यम से पुनःप्रसंस्करण किया गया।

बीपीसीएल सभी प्रचालनों में 5आर सिद्धांतों (रिफ्यूज अर्थात् इनकार करना, रिड्यूस अर्थात् कम करना, रियूज अर्थात् पुनः उपयोग करना, रिपर्पज अर्थात् उद्देश्य का पुनः निर्धारण और रिसाइकिल अर्थात् पुनर्चक्रण) का पालन करता है। हम पर्यावरणीय प्रभाव को कम करने, प्रचालनात्मक अपशिष्ट की पहचान करने, उसे अलग करने, पुनर्चक्रण करने और नैतिक रूप से निपटान करने के लिए कुशल अपशिष्ट प्रबंधन को प्राथमिकता देते हैं। हम उपचार, भंडारण और निपटान सुविधाओं (टीएसडीएफ) द्वारा सुगम सुरक्षित लैंडफिलिंग विधियों को अपनाते हुए, तेल युक्त मिट्टी या तेल युक्त अवशेषों जैसे खतरनाक अपशिष्टों का जिम्मेदाराना निपटान सुनिश्चित करते हैं। खतरनाक और गैर–खतरनाक अपशिष्टों का उपचार और पुनः उपयोग पर्यावरण, वन और जलवायु संरक्षण मंत्रालय, केंद्रीय प्रदूषण नियंत्रण बोर्ड और राज्य प्रदूषण नियंत्रण बोर्ड के विनियमों के अनुपालन में किया जाता है। हम सभी रिफाइनरियों और विपणन स्थानों के लिए 'जीरो वेस्ट टू लैंडफिल' प्रमाणन प्राप्त करने के लिए समर्पित हैं, कोच्चि रिफाइनरी को सितंबर 2024 तक यह प्रमाणन मिलने की उम्मीद है।

जैव विविधता प्रबंधन

1,60,000 वृक्ष वित्त वर्ष 2024 में लगाए गए	**23,600 एमटीसीओ2ई** कुल कार्बन स्वविवेजन

बीपीसीएल का लक्ष्य वृक्ष लगाकर जैव विविधता पर पड़ने वाले प्रभाव को कम करना है। इस वर्ष, हमने मियावाकी तकनीक, सीड बॉम्बिंग और पारंपरिक तरीकों का उपयोग करके हरित आच्छादन और जैव विविधता को बढ़ाने के लिए 160,000 से अधिक वृक्ष लगाए। बीपीसीएल की साइटों पर हमारे संचयी वृक्षों की संख्या अब 1.03 मिलियन वृक्ष से अधिक है, जो 23,600 एमटीसीओ2ई को स्वविवेजित करके सीओ2 सिंक को बढ़ाते हैं। बीना रिफ़ाइनरी और मध्य प्रदेश राज्य वन विभाग ने जुलाई से शुरू करके 5 वर्षों में ₹1.96 करोड़ के कुल निवेश के साथ कंजिया रेंज, खुरई, वनमंडल उत्तर सागर, मध्य प्रदेश में 90 हेक्टेयर हरित पट्टी विकसित करने के लिए एक समझौता ज्ञापन पर हस्ताक्षर किए।

सामाजिक: समावेशी भविष्य के प्रति प्रतिबद्धता

बीपीसीएल में, हम एक समावेशी कार्यस्थल को प्राथमिकता देते हैं, जो विविधता का प्रदर्शन करता है और अपनेपन की एक सुदृढ़ संस्कृति को बढ़ावा देता है। हमारी पहल हमारे कर्मचारियों के कल्याण और सुरक्षा को सुनिश्चित करने के लिए डिजाइन की गई हैं, जबकि हम जिन समुदायों की सेवा करते हैं, उनके साथ सक्रिय रूप से जुड़ते हैं। मानवाधिकारों और नैतिक श्रम परिपाटियों के सिद्धांतों को अपनाकर, हम समाज के उत्थान वाली पहलों के लिए समर्पित हैं। हम एक ऐसा कार्यस्थल विकसित करते हैं जो न केवल समावेशिता और विविधता को महत्व देता है बल्कि खुले संवाद और सहयोग को भी बढ़ावा देता है। इसके अतिरिक्त, हमारी प्रतिबद्धता समुदाय–प्रचालित परोपकारी प्रयासों तक फैली हुई है, जिससे हम व्यापक समुदाय पर एक सार्थक और सकारात्मक प्रभाव के लिए लगातार प्रयास कर सकते हैं और सतत विकास में योगदान दे सकते हैं।

वित्त वर्ष 2023–24 की मुख्य विशेषताएं

8,506 स्थायी कर्मचारी और कामगार	**3,930 मानव घंटे** एचएसएसई पर 2794 प्रतिभागियों को प्रशिक्षित किया गया
100% स्वास्थ्य एवं सुरक्षा उपायों तथा कौशल उन्नयन पर प्रशिक्षित कर्मचारी एवं कामगार (अस्थायी कामगारों सहित)	**100%** स्थायी कर्मचारियों और कामगारों को मानवाधिकार मुद्दों और नीति पर प्रशिक्षित किया गया
117.54 मिलियन रिफाइनरियों में एलटीए के बिना संयुक्त मानव–घंटे	**0** कर्मचारियों के लिए रिपोर्ट योग्य लोस्ट टाइम इंजरी फ्रीक्वेंसी दर (आरएलटीआईएफआर)
₹152.21 करोड़ सीएसआर व्यय	

10.7. कर्मचारी संतुष्टि संवर्धन (ईएसई)

बीपीसीएल में, हमारे पास कर्मचारी कल्याण का समर्थन करने के उद्देश्य से कई प्रमुख पहल हैं। रोशनी प्लस कर्मचारियों और उनके परिवारों के लिए गोपनीय मनोवैज्ञानिक परामर्श सेवाएँ प्रदान करता है। एसिटीलाइफ कार्य–जीवन संतुलन, माइंडफुलनेस और स्वस्थ आदतों पर एक्टिवलाइफ वेबिनार और ऑफलाइन सेमिनार आयोजित करता है, जिससे लगभग 2,166 प्रतिभागियों को लाभ मिला है। सहकारी मित्र 68 नामित कर्मचारियों को भावनात्मक प्राथमिक चिकित्सा प्रदाता के रूप में नियुक्त करता है, मानसिक स्वास्थ्य जागरूकता को बढ़ावा देता है और विभिन्न बीपीसीएल स्थानों पर सहायता प्रदान करता है। नव चयनित सहकर्मीमित्रों को अपने साथियों का समर्थन करने में अपने कौशल को बढ़ाने के लिए विशेष प्रशिक्षण दिया जाता है।

10.8. व्यावसायिक स्वास्थ्य और सुरक्षा

बीपीसीएल का आदर्श कथन, "सेफ्टी फर्स्ट, सेफ्टी मस्ट", सुरक्षा, स्वास्थ्य, संरक्षा और पर्यावरण के प्रति हमारी प्रतिबद्धता को रेखांकित करता है, जो एक जिम्मेदार कंपनी के रूप में हमारे संचालन का केंद्रबिंदु है, जो विकसित हो रहे ईएसजी पहलुओं को संबोधित करते हैं। हमारा लक्ष्य शून्य घटनाएं, प्रभावी हाइड्रोकार्बन शमन, संबंधित खतरों में कमी और संचालन में निरंतर सुधार हासिल करना है। सुरक्षा और संरक्षा हमारी संस्कृति में गहराई से समाहित है, और हम अपने कामगारों और कर्मचारियों के लिए जोखिमों की पहचान करने और उन्हें कम करने के लिए अथक प्रयास करते हैं, जिससे एक सुरक्षित और संरक्षित कार्य परिवेश सुनिश्चित होता है। बीपीसीएल ने विभिन्न प्रचालन स्तरों (प्रचालन स्थान, क्षेत्रीय / मुख्यालय और कॉर्पोरेट स्तर) पर 3–स्तरीय स्वास्थ्य, सुरक्षा और पर्यावरण (एचएसई) समितियाँ स्थापित की हैं। ये समितियाँ नियमित रूप से सुरक्षा प्रोटोकॉल की समीक्षा करती हैं, घटनाओं की जाँच करती हैं और सुरक्षा उपायों को बढ़ाने के लिए सुधार की सिफारिश करती हैं।

10.9. स्वास्थ्य, सुरक्षा और पर्यावरण (एचएसई) पहल

प्रशिक्षण कार्यक्रम: बीपीसीएल ओआईएसडी–एसटीडी–154 और वैधानिक / नियामक दिशा–निर्देशों (एमओयू लक्ष्य) के अनुसार कर्मचारियों और संविदाकारों के लिए व्यापक सुरक्षा प्रशिक्षण कार्यक्रम आयोजित करता है, जिसमें अग्नि सुरक्षा, प्राथमिक चिकित्सा, आपातकालीन प्रतिक्रिया और खतरनाक सामग्रियों के सुरक्षित संचालन जैसे विषय शामिल हैं। ये कार्यक्रम सुनिश्चित करते हैं कि हर कोई सुरक्षा मानकों को बनाए रखने के लिए भली–भांति सुसज्जित है।

समय–समय पर स्वास्थ्य जांच: बीपीसीएल कर्मचारियों के लिए नियमित स्वास्थ्य जांच शिविर आयोजित करता है, जिसमें स्वास्थ्य समस्याओं का शीघ्र पता लगाने और इनके उपचार पर ध्यान केंद्रित किया जाता है। इन शिविरों में सामान्य स्वास्थ्य जांच, विशेष परीक्षण और स्वास्थ्य पेशेवरों के साथ परामर्श शामिल हैं।

व्यावसायिक स्वास्थ्य केंद्र: प्रमुख प्रचालन स्थलों पर, बीपीसीएल ने तत्काल स्वास्थ्य सेवाएं प्रदान करने और कर्मचारियों के स्वास्थ्य की निगरानी करने के लिए चिकित्सा पेशेवरों के साथ व्यावसायिक स्वास्थ्य केंद्र स्थापित किए हैं।

10.10. आपातकालीन तैयारी और प्रतिक्रिया

मॉक ड्रिल: अग्नि, रिसाव और प्राकृतिक आपदाओं जैसी आपातकालीन स्थितियों के लिए कर्मचारियों को तैयार करने के लिए पीएनजीआरबी ईआरडीएमपी विनियम 2010 के अनुसार नियमित मॉक ड्रिल आयोजित की जाती हैं। ये अभ्यास सुनिश्चित करते हैं कि कर्मचारी निकासी प्रक्रियाओं और आपातकालीन प्रतिक्रिया कार्यों में पारंगत हैं।

आपातकालीन प्रतिक्रिया दल: बीपीसीएल ने विभिन्न प्रकार की आपात स्थितियों से निपटने के लिए सुसज्जित आपातकालीन प्रतिक्रिया दलों को प्रशिक्षित किया है। इन दलों को नियमित रूप से प्रशिक्षित किया जाता है और नवीनतम प्रतिक्रिया तकनीक संबंधी ज्ञान से अवगत कराया जाता है।

सुरक्षा संपरीक्षा और निरीक्षण: संभावित खतरों की पहचान करने और सुरक्षा मानकों के अनुपालन को सुनिश्चित करने के लिए नियमित आंतरिक/बाहरी सुरक्षा संपरीक्षा और निरीक्षण किए जाते हैं। ये सक्रिय उपाय सुधारात्मक कार्रवाइयों को तुरंत लागू करने में मदद करते हैं।

जोखिम आकलन: बीपीसीएल के प्रचालन में संभावित सुरक्षा जोखिमों की पहचान करने और उन्हें कम करने के लिए हैजॉप, एचआईआरए, क्यूआरए आदि जैसी विभिन्न तकनीकों का उपयोग करके विस्तृत जोखिम आकलन किया जाता है। यह सक्रिय दृष्टिकोण दुर्घटनाओं को रोकने और सुरक्षित कार्य परिवेश सुनिश्चित करने में मदद करता है।

10.11. जागरूकता और संचार

सुरक्षा बुलेटिन और अलर्ट: बीपीसीएल सुरक्षा बुलेटिन जैसे निर्देश, सलाह, खतरों की पहचान, स्मरण श्रृंखला, परिदृश्य आधारित शिक्षा और अलर्ट प्रसारित करता है ताकि कर्मचारियों को सुरक्षा परिपाटियों, संभावित खतरों और पिछली घटनाओं से सीखे गए सबक के बारे में सूचित किया जा सके।

सुरक्षा अभियान: सुरक्षित ड्राइविंग, व्यक्तिगत सुरक्षा उपकरण (पीपीई) का उपयोग और कार्यस्थल एर्गोनॉमिक्स जैसे विशिष्ट सुरक्षा पहलुओं पर जोर देने के लिए समय-समय पर सुरक्षा अभियान चलाए जाते हैं।

10.12. बीपीसीएल में सुरक्षा जागरूकता सप्ताह

बीपीसीएल कर्मचारियों और संविदागत कर्मचारियों के लिए अभ्यास, सेमिनार और प्रतियोगिताओं के माध्यम से कार्यस्थल सुरक्षा को बढ़ावा देने के लिए प्रत्येक वर्ष 4 मार्च को राष्ट्रीय सुरक्षा दिवस मनाता है। सुरक्षा सप्ताह कार्यशालाओं, प्रश्नोत्तरी, पोस्टर प्रतियोगिताओं और सुरक्षित कार्य परिवेश पर जोर देने के लिए शपथ समारोहों के साथ इस फोकस को आगे बढ़ाता है।

व्यावसायिक स्वास्थ्य और सुरक्षा के प्रति बीपीसीएल की प्रतिबद्धता सुरक्षा जोखिम के प्रबंधन और स्वस्थ कार्य परिवेश को बढ़ावा देने में इसके व्यापक और सक्रिय दृष्टिकोण के माध्यम से स्पष्ट है। अपने सुरक्षा कार्यक्रमों में लगातार सुधार करके और सभी स्तरों पर कर्मचारियों को शामिल करके, बीपीसीएल का लक्ष्य शून्य-घटना कार्यस्थल सुनिश्चित करना और सुरक्षा उत्कृष्टता की संस्कृति को बढ़ावा देना है।

3. एचपीसीएल

एचपीसीएल अपनी कार्यनीतियों और व्यावसायिक प्रचालनों में ईएसजी कारकों को एकीकृत कर रहा है, ताकि प्रतिस्पर्धात्मक लाभ को बढ़ाया जा सके, निवेशकों को आकर्षित किया जा सके, लचीले व्यावसायिक मॉडल बनाए जा सकें तथा अधिक किफायती परिवहन के लिए दीर्घकालिक विकल्प और समावेशी वैश्विक अर्थव्यवस्था में योगदान दिया जा सके। एचपीसीएल अपने प्रचालन और गतिविधियों में सर्वोत्तम परिपाटियों को लागू करके अपने ईएसजी उद्देश्यों को प्राप्त करने के लिए प्रतिबद्ध है। ईएसजी प्रदर्शन को लगातार राष्ट्रीय और अंतर्राष्ट्रीय समकक्षों के साथ बेंचमार्क किया जाता है।

एचपीसीएल के ईएसजी प्रदर्शन की मुख्य विशेषताएं

पर्यावरण	सामाजिक	अभिशासन
21%वृद्धि एस एंड पी ग्लोबल रेटिंग स्कोर में	**8154** स्थायी कर्मचारी और कामगार	**~45,000** सतर्कता जागरूकता सप्ताह के दौरान हितधारकों की भागीदारी
वर्ष 2040 तक निवल शून्य स्कोप 1 और 2 उत्सर्जन	**3.45%** स्वैच्छिक टर्नओवर दर	**99.5%** ग्राहक शिकायतें बंद की गईं।
208 मेगावाट स्थापित नवीकरणीय विद्युत क्षमता (सौर एवं पवन)	**0.073** रिपोर्ट योग्य लोस्ट टाइम इंजरी फ्रीक्वेंसी रेट (आरएलटीआईएफआर)	**15.3%** पूरे बोर्ड भर में लैंगिक विविधता
21.52 करोड़ किलोवाट घंटा कुल नवीकरणीय ऊर्जा उत्पादन (सौर औऔर पवन)	कर्मचारियों को व्यावसायिक स्वास्थ्य सुरक्षा प्रशिक्षण पर **समझौता ज्ञापन अनुपालन मानदंड को पार किया गया**	**100%** भ्रष्टाचार से संबंधित जोखिम के लिए प्रचालन स्थलों का मूल्यांकन किया गया

पर्यावरण	सामाजिक	अभिशासन
3% कुल खपत की गई बिजली में नवीकरणीय बिजली का हिस्सा	**1472 अधिकारी** एनएससी–एचपीसीएल–सैट प्राप्त किया	**ईआरएम फ्रेमवर्क** सीओएसओ 2017 और आईएसओ 31000:2018 मानकों के अनुरूप
~14.4 लाख अब तक लगाए गए वृक्ष	सुरक्षा संस्कृति को बढ़ाने के लिए एचपीसीएल में **कॉर्पोरेट सुरक्षा प्रबंधन प्रणाली लागू की गई है**	**आईएसओ 27001:2022** प्रमाणित डाटा केंद्र
490+ रिफाइनरियों और विपणन स्थानों में वर्षा जल संचयन संरचनाएं	**भेद्यता सूचकांक** रिफाइनरियों में कार्यान्वित	**शून्य** 2023–24 में डाटा उल्लंघन के मामले
1204 हजार किलोलीटर रिफाइनरियों में पुनर्चक्रित अपशिष्ट जल	**59217** परिवहन कार्यबल को तकनीकी और व्यवहारिक प्रशिक्षण के लिए प्रदान किए गए मानव दिवस	**सुदृढ़ शिकायत निवारण प्रणाली** सार्वजनिक डोमेन में उपलब्ध है
1200 टीकेएल वर्षा जल संचयन	**1,107 अभ्यर्थी** राष्ट्रीय प्रशिक्षुता प्रशिक्षण योजना के अंतर्गत जीएटी/टीएटी/डीएटी के रूप में कार्यरत	
9.7 टीएमटी प्लास्टिक अपशिष्ट के संग्रहण के परिणामस्वरूप सरकार द्वारा अधिदेशित ईपीआर लक्ष्य को पार किया गया	**₹111.94 करोड़** सीएसआर व्यय	
8.1 एमएमटीसीओ2ई कम किया गया जीएचजी उत्सर्जन (स्कोप 1 + स्कोप 2 + स्कोप 3)	**₹16.14 करोड़** 13 आकांक्षी जिलों में सीएसआर व्यय	
370 टीपीए विशाख रिफाइनरी में प्रायोगिक ग्रीन हाइड्रोजन संयंत्र (पूरा होने के अग्रिम चरण में)	**~32.3 लाख** सीएसआर लाभार्थियों की कुल संख्या	
25+ प्रमाणित ग्रीन भवन	**मानव अधिकारों पर नीति** सार्वजनिक डोमेन पर जारी	
बायो डीजल 35 एसओडी स्थानों पर डीजी सेटों में उपयोग किया गया	**41.24%** एमएसई से खरीद	
100+ स्थान आईएसओ 50001–ऊर्जा प्रबंधन प्रणाली	**12,724** ग्रामीण उपभोक्ताओं तक एलपीजी की पहुंच बढ़ाने के लिए एचपी सखी को जोड़ा गया	
150+ स्थान आईएसओ 14001–ऊर्जा प्रबंधन प्रणाली	**~1,32,185** मूल्य श्रृंखला भागीदारों के लिए आयोजित जागरूकता/प्रशिक्षण कार्यक्रम	
35 ग्रीनको प्रमाणन के साथ विपणन स्थान		

जलवायु परिवर्तन और निवल शून्य कार्यनीति

एचपीसीएल ने विश्व प्रसिद्ध सलाहकार की मदद से अपनी पर्यावरण कार्यनीति पूरी कर ली है। इसने स्कोप–1 और स्कोप–2 उत्सर्जन के लिए वर्ष 2040 के अपने निवल शून्य लक्ष्य के अनुरूप अपने प्रचालन के डी–कार्बोनाइजेशन के लिए एक रोडमैप तैयार किया है। इस रोडमैप में बहु–ऊर्जा ग्रीन और न्यून कार्बन निगम की ओर परिवर्तन पर विशेष ध्यान दिया गया है। वर्ष के दौरान, एचपीसीएल के स्कोप 1 और 2 जीएचजी उत्सर्जन स्टैंडअलोन आधार पर क्रमशः 4.72 और 1.06 मिलियन टीसीओ2ई थे।

एचपीसीएल ने निवल शून्य की प्राप्ति के लिए प्रमुख संवर्धकों, जैसे कि अपने स्वयं के प्रचालन में ऊर्जा दक्षता बढ़ाना, रिफाइनरियों में नवीकरणीय ऊर्जा का उपयोग करना, हाइड्रोजन की आवश्यकताओं को ग्रीन हाइड्रोजन से प्रतिस्थापित करना, फ्लेयर गैस उत्सर्जन को कम करना, सीसीयूएस आदि की पहचान की है। उत्सर्जन तीव्रता में कमी लाने की दिशा में, निगम नवीकरणीय ऊर्जा और भंडारण, बायोगैस, जैव ईंधन, पेट्रोकेमिकल्स और ग्रीन हाइड्रोजन जैसे विभिन्न व्यावसायिक क्षेत्रों की खोज कर रहा है।

वर्ष के दौरान, एचपीसीएल (ईंधन और बिजली) में कुल ऊर्जा खपत 63.37 मिलियन गीगावाट थी। एचपीसीएल ने रिफाइनरियों में ऊर्जा संरक्षण उपकरणों पर लगभग ₹407 करोड़ का पूंजी निवेश किया और अपनी रिफाइनरियों में 1,32,136 एसआरएफटी (पिछली योजनाओं के निर्वाह सहित) ऊर्जा बचत हासिल की।

विशाख रिफाइनरी में 370 टीपीए प्रायोगिक ग्रीन हाइड्रोजन संयंत्र पूरा होने के अग्रिम चरण में है। हरित पट्टी को बनाए रखने और बढ़ाने पर अथक ध्यान देने के कारण, एचपीसीएल अपने स्थानों पर 1,793 एकड़ हरित पट्टी तक पहुँच गया। वर्ष के दौरान कंपनी का नवीकरणीय ऊर्जा पोर्टफोलियो 208.2 मेगावाट (107.3 सौर + 100.9 पवन) तक पहुँच गया। निवल शून्य के अपने दृष्टिकोण में, एचपीसीएल के 35 टर्मिनलों/डिपो ने अपने डीजी सेटों के लिए 100% बायोडीजल का उपयोग करना शुरू कर दिया।

वित्त वर्ष 2023–24 के दौरान, एचपीसीएल ने अपने 17,618 (80%) खुदरा आउटलेट को सौर ऊर्जा से प्रचालित किया है, एमएस में 12% एथेनॉल मिश्रण किया है, सतत के तहत संचयी रूप से 9 सीबीजी संयंत्रों का संचालन किया है, अपनी मूल्य श्रृंखला में बैटरी स्वैपिंग स्टेशनों सहित 3,603 ईवी चार्जिंग सुविधाएँ स्थापित की हैं।

अपनी ऊर्जा परिवर्तनन यात्रा में तेजी लाने के लिए, एचपीसीएल ने एक नया 'ऊर्जा परिवर्तन प्रकोष्ठ' स्थापित किया है, जो निगम के निवल–शून्य लक्ष्यों को प्राप्त करने के लिए समर्पित है। एचपीसीएल को अपने नवीकरणीय और ग्रीन ऊर्जा पोर्टफोलियो के लिए पूर्ण स्वामित्व वाली सहायक कंपनी की स्थापना के लिए विनियामक अनुमोदन प्राप्त हुआ है और उसने एचपीसीएल रिन्यूएबल एंड ग्रीन एनर्जी लिमिटेड का निगमन किया है। एचपीसीएल की वर्ष 2030 तक अपने नवीकरणीय पोर्टफोलियो को 10 गीगावाट तक बढ़ाने और नए 1जी, 2जी और सीबीजी संयंत्रों के माध्यम से जैव–ईंधन पोर्टफोलियो को बढ़ाने की महत्वाकांक्षी योजना है।

एचपीसीएल उन्नत/वैकल्पिक ईंधन में फुटप्रिंट का विस्तार करके ग्रीन और उभरते अवसरों का लाभ उठा रहा है। जैव ईंधन में अपनी उपस्थिति बढ़ाने के लिए एचपीसीएल द्वारा अपने स्तर पर तथा उद्यमियों की भागीदारी से विभिन्न जैव ईंधन परियोजनाओं का क्रियान्वयन किया जा रहा है। खुदरा आउटलेट के सौरीकरण, रिफाइनरियों की प्रचालन आवश्यकताओं को पूरा करने के लिए नवीकरणीय ऊर्जा के बढ़ते उपयोग, दोनों रिफाइनरियों में बिजली आयात के लिए अवसंरचना की स्थापना आदि के माध्यम से नवीकरणीय ऊर्जा में विस्तार किया जा रहा है।

संधारणीयता

एचपीसीएल वर्ष 2014 में सीआईआई ग्रीन कंपनी (ग्रीनको) रेटिंग के लिए स्वेच्छा से चयन करने वाली पीएसयू में पहली कंपनी है। यह प्रणाली किसी प्रचालन इकाई के प्रदर्शन का मूल्यांकन : प्रबंधन प्रणाली, ऊर्जा दक्षता, जल संरक्षण, नवीकरणीय ऊर्जा, ग्रीनहाउस गैस उत्सर्जन, अपशिष्ट प्रबंधन, सामग्री संरक्षण, पुनर्चक्रण और पुनर्चक्रण–क्षमता, ग्रीन आपूर्ति श्रृंखला, उत्पाद प्रबंधन, पर्यावरण के लिए नवाचार, ग्रीन अवसंरचना और पारिस्थितिकी के मापदंडों पर करती है। 10 वर्षों की अवधि में कुल 35 स्थानों को प्रमाणित किया गया है। एचपीसीएल के विभिन्न स्थानों पर 25 से अधिक प्रमाणित ग्रीन भवन भी हैं।

एचपीसीएल ने संगठन स्तर पर अपने एसबीयू के एचएसई कार्यों में एकीकृत प्रबंधन प्रणाली (आईएमएस) (आईएसओ 9001, 14001 और 45001) लागू की है। एचपीसीएल रिफाइनरियों और 150 से अधिक विपणन स्थानों ने आईएसओ 14001 मानकों के आधार पर अंतरराष्ट्रीय स्तर पर स्वीकृत पर्यावरण प्रबंधन प्रणाली को लागू किया है। एचपीसीएल ने अपनी मुंबई रिफाइनरी और 100 से अधिक विपणन स्थानों पर आईएसओ 50001 ऊर्जा प्रबंधन प्रणाली भी लागू की है।

उद्योग की सर्वोत्तम परिपाटियों के अनुरूप विभिन्न स्थानों पर खतरनाक अपशिष्ट उपचार और निपटान प्रणालियाँ उपलब्ध हैं। पर्यावरण की सुरक्षा सुनिश्चित करने के लिए प्रमुख स्थानों पर अपशिष्ट जल के उपचार और पुनर्चक्रण के लिए अत्याधुनिक अपशिष्ट उपचार संयंत्र उपलब्ध हैं। वर्ष के दौरान, एचपीसीएल ने 9,700 मीट्रिक टन से अधिक प्लास्टिक अपशिष्ट को

पुनः एकत्रित करके सरकार द्वारा निर्धारित विस्तारित उत्पादक उत्तरदायित्व के 8,000 मीट्रिक टन के लक्ष्य को पार कर लिया।

प्रमुख प्रतिष्ठानों पर पलायक उत्सर्जन की निगरानी और नियंत्रण के लिए स्टीमशील कार्बनिक यौगिक (वीओसी) निगरानी और रिसाव परिचयन और मरम्मत (एलडीएआर) कार्यक्रम जैसी सर्वश्रेष्ठ तकनीकों को अपनाया गया है। विभिन्न आपूर्ति स्थानों और खुदरा आउटलेट पर स्टीम पुनर्प्राप्ति प्रणाली (वीआरएस) स्थापित की गई हैं।

पर्यावरण और परिवेशी वायु गुणवत्ता में गैसीय उत्सर्जन की लगातार निगरानी नवीनतम तकनीकों के उपयोग से की जाती है, जिसमें प्रमुख स्थानों पर नियामक एजेंसियों को वास्तविक समय डाटा हस्तांतरण शामिल है। उत्सर्जन और वायु गुणवत्ता की ऑनलाइन निगरानी में विचलन की निगरानी और सुधार के लिए अलर्ट की एक प्रणाली है।

एचपीसीएल जल संरक्षण के लिए रिड्यूस, रीयूज, रीसाइकिल और रिचार्ज की तकनीकों का उपयोग करता है। वित्त वर्ष 2023–24 के दौरान, एचपीसीएल में प्राकृतिक जल की निकासी 13,130 हजार किलोलीटर थी, जबकि एचपीसीएल स्थानों ने विभिन्न वर्षा जल संचयन तकनीकों का उपयोग करके 1,200 हजार किलोलीटर से अधिक वर्षा जल का संचयन किया।

बीआरएसआरः एचपीसीएल अपनी आंतरिक नीतियों और लागू बाहरी विनियमों का पालन करते हुए पारदर्शी तरीके से व्यवसाय का संचालन करता है। कंपनी अपने प्रचालन को राष्ट्रीय जिम्मेदार व्यावसायिक आचरण दिशा–निर्देश (एनजीआरबीसी) सिद्धांतों के अनुरूप प्रचालित करती है।

एचपीसीएल वित्तीय वर्ष 2011–12 से पिछले 12 वर्षों से जीआरआई आधारित किफायती परिवहन के लिए दीर्घकालिक विकल्पता रिपोर्ट के रूप में सार्वजनिक डोमेन में अपने किफायती परिवहन के लिए दीर्घकालिक विकल्पता प्रदर्शन का पारदर्शी तरीके से प्रकटीकरण कर रहा है। एचपीसीएल की संधारणीयता पहल और रिपोर्ट को पिछले 12 वर्षों के दौरान कई पुरस्कार प्राप्त हुए हैं।

एचपीसीएल ने वित्त वर्ष 2022–23 से भारतीय प्रतिभूति और विनियम बोर्ड (सेबी) के दिशा–निर्देशों के अनुसार बीआरएसआर प्रकाशित करना शुरू किया। वित्त वर्ष 2023–24 में, एचपीसीएल अपने प्रदर्शन का प्रकटीकरण संशोधित बीआरएसआर प्रारूप पर कर रहा है, जिसका आश्वासन प्रतिष्ठित तृतीय पक्ष द्वारा दिया गया है। एचपीसीएल अपने हितधारकों को ₹ पूंजी के रूप में अपनी मूल्य सृजन प्रक्रिया को समग्र रूप से बताने के लिए एकीकृत रिपोर्टिंग ढांचे पर आधारित अपनी पहली एकीकृत वार्षिक रिपोर्ट भी जारी कर रहा है।

निगम को अतिरिक्त व्यावसायिक चुनौतियों और जोखिमों से निपटने में सक्षम बनाने के लिए, संगठन में एक प्रभावी और व्यावहारिक उद्यम जोखिम प्रबंधन (ईआरएम) ढांचा संस्थागत रूप दिया गया है, जिसका ध्यान लचीलापन और निरंतर मूल्य सृजन प्राप्त करने पर है। एचपीसीएल का ईआरएम ढांचा सीओएसओ 2017 और आईएसओ 31000:2018 जैसे स्थापित और मान्यता प्राप्त जोखिम प्रबंधन सिद्धांतों के अनुरूप है।

एचपीसीएल में, हितधारक इनपुट (सहयोग, ज्ञान और विशेषज्ञता) कंपनी के आर्थिक सामाजिक या पर्यावरणीय प्रभाव को संबोधित करने के लिए कार्यनीति तैयार करने में महत्वपूर्ण भूमिका निभाते हैं। कंपनी संरचित सहयोग और संचार के माध्यम से अपने हितधारकों के साथ निरंतर और दीर्घकालिक संबंध बनाने का प्रयास करती है।

सामाजिक

वित्त वर्ष 2023–24 के दौरान, एचपीसीएल ने अपनी मानवाधिकार नीति जारी की और संयुक्त राष्ट्र वैश्विक समझौते (यूएनजीसी) पर हस्ताक्षरकर्ता भी बना रहा। 31 मार्च, 2024 तक एचपीसीएल के कर्मचारियों की संख्या 8,154 थी, जिसमें 10.38% महिला कर्मचारी थीं। वर्ष के दौरान स्वैच्छिक टर्नओवर दर 3.54% थी। कर्मचारियों की क्षमताओं और संविदागत कर्मचारियों, टीटी क्रू, रिटेल आउटलेट सीएसए और एलपीजी डिलीवरी मैन के अपने विस्तारित कार्यबल की क्षमताओं को बढ़ाने के लिए निरंतर आधार पर प्रशिक्षण कार्यक्रम, जागरूकता सत्र, संधारणीयता प्रश्नोत्तरी, समाचार पत्र और तकनीकी बुलेटिन आयोजित किए गए।

निगम ने कर्मचारियों को व्यावसायिक स्वास्थ्य और सुरक्षा प्रशिक्षण पर समझौता ज्ञापन अनुपालन पैरामीटर को पार कर लिया। एक उल्लेखनीय उपलब्धि के रूप में, 1,472 अधिकारियों ने राष्ट्रीय सुरक्षा परिषद – एचपीसीएल सुरक्षा योग्यता परीक्षा (एनएससी – एचपीसीएल सैट) दी, जिसमें सुरक्षा पर 40 से अधिक मानकों / विनियमों / दिशानिर्देशों से 10 मॉड्यूल में 700 से अधिक पृष्ठों की सामग्री है। एचपीसीएल ने वर्ष में प्रति व्यक्ति 58.3 प्रशिक्षण घंटे हासिल किए।

एचपीसीएल ने वर्ष के दौरान अपने कर्मचारियों और विस्तारित कार्यबल के लिए अपनी कल्याणकारी पहलों को जारी रखा। कंपनी के 100% कर्मचारियों ने संतुलित स्कोर कार्ड पद्धति के आधार पर वस्तुनिष्ठ मूल्यांकन, कैरियर की प्रगति और व्यक्तिगत क्षमताओं के विकास के लिए प्रदर्शन मूल्यांकन किया।

एचपीसीएल हमेशा से ही विवेकशील निगम रहा है, जिसका दृढ़ विश्वास है कि ग्राहक और व्यावसायिक प्राथमिकताएँ सामाजिक प्रतिबद्धताओं और समावेशी विकास के साथ सह–अस्तित्वपूर्ण परिवहन के लिए दीर्घकालिक विकल्पों में रह सकती हैं। समुदायों के विकास और कल्याण को बढ़ावा देने के लिए,

एचपीसीएल सक्रिय रूप से सोच–समझकर तैयार किए गए सामाजिक कार्यक्रमों की विविध श्रृंखला में संलग्न है।

वर्ष के दौरान, एचपीसीएल ने सीएसआर पर ₹111.9 करोड़ व्यय किए, जिसमें से ₹16.14 करोड़ 13 आकांक्षी जिलों में व्यय किए गए। इन पहलों ने 32 लाख से अधिक व्यक्तियों के जीवन को प्रभावित किया। एचपीसीएल ने प्रधानमंत्री उज्ज्वला योजना के तहत 10.7 करोड़ रिफिल भी उपलब्ध कराए, जिससे समाज को खाना पकाने के स्वच्छ ईंधन की आपूर्ति हुई।

एचपीसीएल प्रमुख औद्योगिक ग्राहकों के साथ मिलकर आपूर्ति श्रृंखला में संधारणीयता की सर्वोत्तम परिपाटियों के आदान–प्रदान के माध्यम से ईएसजी परिपाटियों को अपनाने के लिए सहयोग कर रहा है। विस्तारित कार्यबल (डीलर, वितरक, ग्राहक सेवा सहायक, डिलीवरीमैन आदि) के जागरूकता स्तर और क्षमताओं को बढ़ाने के लिए 1,32,185 प्रशिक्षण कार्यक्रम और जागरूकता सत्र आयोजित किए गए।

टिप्पणी: इस रिपोर्ट में उल्लिखित पर्यावरण और सामाजिक प्रदर्शन के आंकड़े एचपीसीएल से संबंधित है।

4. ओएनजीसी

31 मार्च, 2024 तक, ओएनजीसी बाजार पूंजीकरण के हिसाब से शीर्ष 20 सूचीबद्ध भारतीय कंपनियों में से एक है। इसलिए, कंपनी ने ओएनजीसी लिमिटेड के लिए स्टैंडअलोन आधार पर मूल केपीआई सहित बीआरएसआर विकसित किया है। हालाँकि कंपनी को व्यावसायिक जिम्मेदारी और किफायती परिवहन के लिए दीर्घकालिक विकल्पता रिपोर्टिंग प्रस्तुत करना आवश्यक है, लेकिन इसकी ईएसजी पहल केवल अनुपालन से कहीं आगे है। वित्तीय वर्ष 2023–24 में, कंपनी ने संगठनात्मक परिवर्तन के लिए पहलों को लागू किया है जो वर्ष 2038 तक निवल शून्य उत्सर्जन प्राप्त करने के अपने उद्देश्य का समर्थन करेंगे।

ओएनजीसी के ईएसजी प्रदर्शन की मुख्य विशेषताएं

पर्यावरण	सामाजिक	अभिशासन
ओएनजीसी का **डीकार्बोनाइजेशन रोडमैप** सार्वजनिक डोमेन में जारी किया गया।	**1.81%** कुल राजस्व में से कर्मचारियों और कामगारों के कल्याणकारी उपायों पर व्यय	**31** वित्त वर्ष 2023–24 के दौरान प्रदान किए गए पेटेंट
2038 तक निवल शून्य स्कोप 1 और 2 के लिए–ओएनजीसी द्वारा लिया गया लक्ष्य।	**0.34 और 0.15** कर्मचारियों और कामगारों के लिए क्रमशः लोस्ट टाइम इंजरी फ्रीक्वेंसी रेट (एलटीआईएफआर)।	**2** महिला निर्देशक
0.25 एमएमटीसीओ2ई उत्सर्जन की बचत	**0.21 और 0.39** कर्मचारियों और कामगारों के लिए क्रमशः कुल रिकॉर्ड योग्य कार्य–संबंधित चोट आवृत्ति दर (टीआरआईएफआर)	**शिकायत निवारण तंत्र** बाह्य एवं आंतरिक हितधारकों के लिए सार्वजनिक डोमेन में उपलब्ध है।
237.8 मिलियन यूनिट नवीकरणीय ऊर्जा बिजली उत्पादन	**0** वित्त वर्ष 23–24 में दर्ज मृत्यु	ओएनजीसी को विभिन्न जल आधारित ड्रिलिंग तरल पदार्थों की तैयारी में उपचारित अपशिष्ट जल के उपयोग और जल उत्पादन के लिए **गोल्डन पीकॉक इको–इनोवेशन अवार्ड से सम्मानित किया गया।**
3,643,649 गीगाजूल विभिन्न ऊर्जा दक्षता पहलों के माध्यम से वित्त वर्ष 2024 तक संसूचित ऊर्जा बचत	**100%** कर्मचारियों और कामगारों को मानवाधिकार मुद्दों और नीति पर प्रशिक्षण।	ओएनजीसी ने अपने सभी वेंडरों और आपूर्तिकर्ताओं से सभी वैधानिक और मानवाधिकार कानूनों जैसे बाल–श्रम कानून, उचित वेतन, बलपूर्वक श्रम आदि के अनुपालन के संबंध में लिखित शपथपत्र लिया है।

पर्यावरण	सामाजिक	अभिशासन
		उपरोक्त के अतिरिक्त, सभी परियोजनाएं जिनका मूल्य ₹1000 से अधिक है, में एक सत्यनिष्ठा समझौता शामिल होता है जिसमें क्रेता और आपूर्तिकर्ता दी गी निविदा की प्रक्रिया और सामान्य रूप से सत्यनिष्ठा, निष्पक्षता और पारदर्शिता के हित में कुछ नियमों को पालन करने के लिए बाध्य होते हैं।
192.8 मेगावाट 31 मार्च 2024 तक नवीकरणीय ऊर्जा की कुल स्थापित क्षमता का (सौर: 39.8 मेगावाट और पवन: 153 मेगावाट)	**यूएनजीसी हस्ताक्षरकर्ता** ओएनजीसी संयुक्त राष्ट्र ग्लोबल कॉम्पैक्ट पर हस्ताक्षरकर्ता है।	
3,367 टीजे उत्पन्न सुविधा में फ्लेयर गैस रिकवरी और प्रक्रिया अनुकूलन से ऊर्जा की बचत।	**58%** इनपुट, सीधे एमएसएमई/लघु उत्पादकों से, जिसमें 0.84% महिला एमएसई से और 0.50% एससी/एसटी एमएसई से।	
75.9 मिलियन यूनिट (एमयू) ओएनजीसी के विभिन्न कार्य केंद्रों में वित्त वर्ष 2023–24 के दौरान संस्थापित 5,049 एलईडी लाइटों से वार्षिक बिजली की बचत। ओएनजीसी में अब तक कुल 3.6 लाख एलईडी लाइटें लगाई जा चुकी हैं।	**35600** ओएनजीसी की सीएसआर पहल के माध्यम से लाभान्वित लाभार्थी, जो अधिकांशतः कमजोर समुदायों से थे।	
100% उत्पादों की सूची में उत्पाद से संबंधित पर्यावरणीय और सामाजिक मापदंडों, तथा सुरक्षित और जिम्मेदार उपयोग के बारे में जानकारी शामिल होती है।	**₹613.6 करोड़** वित्त वर्ष 2023–24 में सीएसआर व्यय।	
सहयोग ओएनजीसी ने अपनी ऋणग्रस्त विद्युत परियोजनाओं को साकार करने के लिए 27 सितंबर 2023 को एनटीपीसी ग्रीन एनर्जी लिमिटेड (एनजीईएलद्ध के साथ एक समझौता ज्ञापन (एमओयूद्ध पर हस्ताक्षर किए। ऊर्जा परिवर्तन की दिशा में नवीकरणीय ऊर्जा उद्देश्यों को पूरा करने के लिए समझौता ज्ञापन पर हस्ताक्षर किए गए हैं। समझौता ज्ञापन में मुख्य रूप से अपतटीय पवन और अन्य क्षेत्रों पर ध्यान केंद्रित करते हुए नवीकरणीय ऊर्जा परियोजनाओं की व्यवहार्यता और स्थापना का पता लगाया जाएगा।	**ओएनजीसी के सीएसआर प्रभाव क्षेत्र: सूचना सुरक्षा**	

पर्यावरण	सामाजिक	अभिशासन
सहयोग भारत में नवीकरणीय ऊर्जा, जल विद्युत और पंप भंडारण जल विद्युत परियोजना विकास के क्षेत्रों में सहयोग करने के लिए ओएनजीसी ने 9 अगस्त 2023 को एसजेवीएन ग्रीन एनर्जी लिमिटेड (एसजीईएल) के साथ समझौता ज्ञापन (एमओयू) पर हस्ताक्षर किए।	**650,402 घंटे** कर्मचारियों और कामगारों को प्रशिक्षण	
ऊर्जा परिवर्तन ओएनजीसी का इरादा कार्बन उत्सर्जन को कम करने के उद्देश्य से ऊर्जा परिवर्तन परियोजनाओं में 2030 तक ₹1 लाख करोड़ और 2038 तक संचयी रूप से ₹2 लाख करोड़ निवेश करने का है।	**ग्रेट प्लेस टू वर्क प्रमाणन**	
ओएनजीसी ने केडीएमआईपीई में एक समर्पित **कार्बन कैप्चर यूटिलाइजेशन एंड स्टोरेज (सीसीयूएस)** प्रयोगशाला का उद्घाटन किया और आईआईटी बॉम्बे में कार्बन कैप्चर एंड यूटिलाइजेशन में राष्ट्रीय उत्कृष्टता केंद्र (एनसीआई सीसीसीयू) के साथ तीन वर्ष की कार्यनीतिक अनुसंधान संविदा पर हस्ताक्षर किए।	**आईएसओ प्रमाणन** **प्रचालन संयंत्रों में सभी कार्यस्थल** आईएसओ 9001 (गुणवत्ता प्रबंधन प्रणाली), आईएसओ 14001 (पर्यावरण प्रबंधन प्रणाली) और आईएसओ 45001 (व्यावसायिक स्वास्थ्य और सुरक्षा) प्रमाणित है।	
सीओपी 28 के दौरान तेल एवं गैस डीकार्बोनाइजेशन चार्टर पर हस्ताक्षरकर्ता	**शून्य** वित्त वर्ष 2023–24 में डाटा का उल्लंघन	
वर्ष 2030 तक अपस्ट्रीम मीथेन उत्सर्जन शून्य करना		
वर्ष 2030 तक नियमित रूप से फ्लेयरिंग परिपाटी को समाप्त करना		
322 ऊर्जा संपरीक्षा वित्त वर्ष 2023–24 में आंतरिक ऊर्जा संपरीक्षक के माध्यम से ओएनजीसी के विभिन्न रिगों/प्रतिष्ठानों में संपन्न।		
अपने उपयोगी काल के अंत तक पहुंच चुके इलेक्ट्रॉनिक उपकरणों और सहायक उपकरणों का जिम्मेदारीपूर्वक निपटान सुनिश्चित करने के लिए **ई–अपशिष्ट नीति लागू की गई।**		
जीवन चक्र मूल्यांकन निम्नलिखित 4 प्रभाव श्रेणियों के लिए छह उत्पादों हेतु किया गया: जलवायु परिवर्तन, अम्लीकरण, प्राकृतिक का सुपोषण और समुद्री यूट्रोफिकेशन।		

नीचे कंपनी की ईएसजी पहलों का विवरण दिया गया है, जो एनजीआरबीसी के नौ सिद्धांतों के साथ गहन रूप से संबद्ध हैं, जो बीआरएसआर का आधार बनती हैं।

बीआरएसआर कोर

ओएनजीसी ने बीआरएसआर को सफलतापूर्वक विकसित किया है, जिसमें 09 मुख्य विशेषताओं के अंतर्गत नए पेश किए गए 23 कोर केपीआई शामिल हैं, जैसा कि नीचे दर्शाया गया है



बीआरएसआर कोर को अपनाने के लिए, कंपनी ने एक व्यापक डाटा संग्रह और प्रबंधन प्रणाली बनाई, जिसमें सुनिश्चित करते हुए विभाग–वार डाटा टैम्प्लेट शामिल किया गया है कि इसमें सबसे प्रासंगिक जानकारी शामिल है। कंपनी ने बीआरएसआर कोर आवश्यकताओं के बारे में डाटा स्वामियों की समझ को बेहतर बनाने, दृष्टिकोण को सुव्यवस्थित करने और आंतरिक निगरानी प्रणालियों को विकसित नियामक आवश्यकताओं के साथ संरेखित करने के लिए बीआरएसआर पर विभाग–व्यापी प्रशिक्षण भी आयोजित किया।

उचित आश्वासन

कंपनी ने सेबी के परिपत्र (सेबी/एचओ/सीएफडी/सीएफडी–एसईसी–2/पी/सीआईआर/2023/122, दिनांक 12 जुलाई, 2023) बीआरएसआर कोर केपीआई के अनुलग्नक 1 के अनुसार व्यवसाय उत्तरदायित्व और किफायती परिवहन के लिए दीर्घकालिक विकल्पता रिपोर्ट पर उचित आश्वासन प्राप्त किया है, जो सटीक ईएसजी डाटा प्रबंधन के प्रति प्रतिबद्धता दर्शाता है। उचित आश्वासन की सीमा में स्टैंडअलोन आधार पर ओएनजीसी लिमिटेड शामिल है। इसके अलावा, कंपनी ने जीआरआई मानक 2021 के अनुसार तैयार आईआर पर सीमित आश्वासन भी प्राप्त किया है। आईआर के लिए रिपोर्टिंग सीमा में ओएनजीसी के अतिरिक्त ओएनजीसी विदेश, एमआरपीएल, ओपीएएल और ओटीपीसी शामिल हैं।

नीतिगत प्रतिबद्धता

कंपनी ने नीतिगत प्रतिबद्धताएं शुरू की हैं जो एनजीआरबीसी के नौ सिद्धांतों के अनुरूप हैं। कंपनी ने सिद्धांत 5: 'व्यवसायों को मानवाधिकारों का सम्मान और प्रचार करना चाहिए' के अनुरूप अपनी मानवाधिकार नीति शुरू की है। नीतिगत प्रतिबद्धताओं के साथ–साथ, कंपनी के पास नीति कार्यान्वयन और निगरानी के लिए सुस्थापित प्रणालियाँ और प्रक्रियाएँ हैं।

सिद्धांतवार प्रदर्शन: सारांश

सिद्धांत 1: व्यवसायों को ईमानदारी के साथ और नैतिक, पारदर्शी और जवाबदेह तरीके से आचरण और शासन करना चाहिए।

ओएनजीसी में व्यावसायिक नैतिकता कंपनी के निदेशकों और वरिष्ठ प्रबंधन कार्मिकों के लिए आचार संहिता, रिश्वत विरोधी प्रबंधन नीति और धोखाधड़ी रोकथाम नीति द्वारा निर्देशित है। ये नीतियाँ राष्ट्रीय और अंतर्राष्ट्रीय विनियमों द्वारा समर्थित हैं।

1. मुख्य सतर्कता अधिकारी के पास कंपनी में नैतिक और जवाबदेह व्यावसायिक परिपाटियों को सुनिश्चित करने की सर्वोच्च जिम्मेदारी है।

2. ओएनजीसी के निदेशक मंडल के 100% सदस्यों ने एनजीआरबीसी के नौ सिद्धांतों के अनुरूप तकनीकी और प्रबंधकीय प्रशिक्षण प्राप्त किया।

3. रिपोर्टिंग अवधि में ओएनजीसी लिमिटेड के किसी भी निदेशक के विरुद्ध व्यावसायिक नैतिकता उल्लंघन के कोई ऐसे मामले नहीं थे, जिनमें अनुशासनात्मक कार्रवाई की आवश्यकता हो।

4. कंपनी ने मूल्य श्रृंखला भागीदारों के साथ व्यावसायिक नैतिकता विषयों पर प्रशिक्षण भी आयोजित किया। प्रशिक्षण में रिश्वत विरोधी प्रबंधन, सतर्कता और पारदर्शिता और खरीद नीति पहल जैसे विषय शामिल थे।

सिद्धांत 2: व्यवसायों को किफायती परिवहन के लिए दीर्घकालिक विकल्प और सुरक्षित तरीके से माल और सेवाएं प्रदान करनी चाहिए।

1. वित्त वर्ष 2023–24 में, कंपनी ने व्यवसाय के पर्यावरणीय और सामाजिक प्रभावों को कम करने के लिए आर एंड डी निवेश का 100% उपयोग किया। ये निवेश कार्बन कैप्चर उपयोग और भंडारण, प्रक्रिया सुधार, जल प्रबंधन आदि जैसी ग्रीन प्रौद्योगिकी पर केंद्रित थे।

2. कंपनी ने 'प्लास्टिक पैकेजिंग वाले सामान के आयातक' के रूप में कंपनी के ईपीआर दायित्व के अनुरूप एक अपशिष्ट प्रबंधन योजना भी विकसित की है। अपशिष्ट प्रबंधन योजना अपशिष्ट न्यूनीकरण, पृथक्करण, अपशिष्ट उत्पादन की निगरानी और सुरक्षित निपटान पहल पर केंद्रित है।

3. कंपनी ने 05 उत्पादों का जीवनचक्र मूल्यांकन किया है, जो कि अपरिष्कृत तेल, प्राकृतिक गैस, एलपीजी, नेफ्था और सी2–सी3 हैं। जीवनचक्र मूल्यांकन ने निम्नलिखित 4 प्रभाव श्रेणियों: जलवायु परिवर्तन, अम्लीकरण, प्राकृतिक जल का यूट्रोफिकेशन और समुद्री यूट्रोफिकेशन पर उत्पादों के प्रभाव का आकलन किया। अध्ययन के दौरान, सभी पैरामीटर उद्योग मानक के अंतर्गत पाए गए, इस प्रकार, उपरोक्त प्रभाव श्रेणियों से संबंधित चयनित उत्पादों के लिए कोई महत्वपूर्ण मुद्दे की पहचान नहीं की गई।

सिद्धांत 3: व्यवसायों को अपने मूल्य श्रृंखलाओं में शामिल सभी कर्मचारियों के कल्याण का सम्मान करना चाहिए और उसे बढ़ावा देना चाहिए।

1. कंपनी के 100% कर्मचारी और कामगार (स्थायी और स्थायी को छोड़कर अन्य) स्वास्थ्य बीमा द्वारा कवर किए जाते हैं।

2. कंपनी की 100% महिला कर्मचारी और श्रमिक (स्थायी और स्थायी को छोड़कर अन्य) मातृत्व लाभ प्राप्त करते हैं, जबकि 100% स्थायी पुरुष कर्मचारी पितृत्व लाभ प्राप्त करते हैं।

3. वित्त वर्ष 2023–24 में, कंपनी ने कर्मचारियों और कामगारों के कल्याण के उपायों पर कुल राजस्व का 1.81% व्यय किया।

4. कंपनी एक समान अवसर नियोक्ता है और दिव्यांगजन अधिकार अधिनियम, 2016 के अनुसार इसकी समान अवसर नीति है।

5. कंपनी ने आईएसओ 9001, आईएसओ 45001 और आईएसओ 14001 मानकों के आधार पर एक स्वास्थ्य, सुरक्षा और पर्यावरण (एचएसई) प्रबंधन प्रणाली लागू की है।

6. कंपनी ने वित्त वर्ष 2023–24 में कर्मचारियों के लिए 0.34 और कामगारों के लिए 0.15 की लॉस्ट टाइम इंजरी फ्रिक्वेंसी रेट (एलटीआईएफआर) (प्रति दस लाख व्यक्ति घंटे) दर्ज की।

7. कंपनी ने वित्त वर्ष 2023–24 में कर्मचारियों के लिए 0.21 और कामगारों के लिए 0.39 की कुल रिकॉर्ड करने योग्य कार्य–संबंधित चोट आवृत्ति दर (टीआरआईएफआर) दर्ज की।

8. कंपनी ने वित्त वर्ष 2023–24 में शून्य मृत्यु दर दर्ज की।

सिद्धांत 4: व्यवसायों को अपने सभी हितधारकों के हितों का सम्मान करना चाहिए और उनके प्रति उत्तरदायी होना चाहिए।

1. कंपनी ने पाँच (05) प्रमुख आंतरिक और बाहरी हितधारक समूहों के साथ जुड़कर हितधारक सहभागिता का आयोजन किया। इनमें कर्मचारी, ग्राहक, शेयरधारक, निवेशक और समुदाय शामिल हैं। हितधारक परामर्श से प्राप्त इनपुट का उपयोग ओएनजीसी द्वारा पर्यावरण और सामाजिक विषयों की पहचान और प्रबंधन का समर्थन करने के लिए किया जाता है।

2. कंपनी ने 16 महत्वपूर्ण विषयों की पहचान की है, जिनमें से शीर्ष पाँच विषय नीचे दिए गए हैं:

- जलवायु परिवर्तन और ऊर्जा परिवर्तन
- ऊर्जा और उत्सर्जन प्रबंधन
- अपशिष्ट प्रबंधन
- न्यून कार्बन और किफायती परिवहन के लिए दीर्घकालिक विकल्प उत्पाद

- जल प्रबंधन

सिद्धांत 5: व्यवसायों को मानवाधिकारों का सम्मान और संवर्धन करना चाहिए

1. कंपनी के 100% कर्मचारियों और कामगारों (स्थायी और स्थायी को छोड़कर अन्य) को मानवाधिकार मुद्दों और नीति पर प्रशिक्षित किया गया है।
2. वित्त वर्ष 2023–24 में, कंपनी द्वारा महिला कर्मचारियों और कामगारों को भुगतान किया गया सकल वेतन कंपनी द्वारा भुगतान किए गए कुल वेतन का 7.29% था।
3. कंपनी ने महिलाओं का कार्यस्थल पर लैंगिक उत्पीड़न (निवारण, प्रतिषेध और प्रतितोष) अधिनियम, 2013 के अनुरूप कंपनी में लैंगिक उत्पीड़न की घटनाओं को रोकने के लिए एक प्रणाली स्थापित की है। रिपोर्टिंग वर्ष में, कंपनी ने लैंगिक उत्पीड़न के छह (06) मामले दर्ज किए, जो कुल महिला कर्मचारियों और कामगारों का 0.29% था।

सिद्धांत 6: व्यवसायों को पर्यावरण का सम्मान करना चाहिए तथा पर्यावरण के संरक्षण और बहाली का प्रयास करना चाहिए।

क) कंपनी बीआरएसआर कोर आवश्यकताओं के अनुरूप ऊर्जा, उत्सर्जन, जल और अपशिष्ट जैसे पर्यावरणीय मापदंडों की निगरानी करती है। नीचे वित्त वर्ष 2023–24 में पर्यावरणीय मापदंडों के लिए तीव्रता दरें दी गई हैं:

- ऊर्जा तीव्रता (जीजे/आईएनआर मिलियन): 85.22
- जल तीव्रता (केएल/आईएनआर मिलियन): 12.09
- जीएचजी उत्सर्जन तीव्रता (एमटीसीओ2 समतुल्य/मिलियन आईएनआर): 6.77
- अपशिष्ट तीव्रता (कुल अपशिष्ट उत्पन्न/राजस्व): 0.099

ख) वर्ष 2038 तक ओएनजीसी की निवल शून्य कार्यनीति

- बेसलाइन वर्ष वित्त वर्ष 2021–22 के लिए स्कोप–1, स्कोप–2 और स्कोप–3 के लिए पूर्ण इंवेंट्राइजेशन किया गया।
- कच्चे तेल, प्राकृतिक गैस, प्रसंस्कृत प्राकृतिक गैस, सी2–सी3 मिश्रण, एलपीजी, नेफ्था, एटीएफ, केरोसीन, डीजल, ईथेन, प्रोपेन और ब्यूटेन के लिए जीवन चक्र प्रभाव आकलन किया गया। एलसीआईए का उद्देश्य इन उत्पादों के संपूर्ण जीवन चक्र से जुड़े पर्यावरणीय प्रभाव का मूल्यांकन करना है। एलसीए अध्ययन के परिणाम चार प्रभाव श्रेणियों– जलवायु परिवर्तन, अम्लीकरण, समुद्री यूट्रोफिकेशन और प्राकृतिक जल यूट्रोफिकेशन के संदर्भ में प्रस्तुत किए गए हैं।
- चरण–1 में किए गए जीएचजी इंवेंट्राइजेशन के आंकड़ों के आधार पर, परिसंपत्तिवार उत्सर्जन की गणना की गई है। उत्सर्जन हॉटस्पॉट की पहचान करने के लिए परिसंपत्तिवार उत्सर्जन प्रक्षेपण को और नीचे ड्रिल किया गया है, जिसका उपयोग वर्ष 2038 तक स्कोप 1 और 2 उत्सर्जन को रोकने के लिए सबसे कुशल डीकार्बोनाइजेशन लीवर की पहचान करने के लिए किया गया था रोडमैप में डी–कार्बोनाइजेशन लीवर की एक श्रृंखला शामिल है जो सामरिक रूप से लघु, मध्यम और दीर्घकालिक क्षितिज में फैली हुई है। ये लीवर आरई हाइब्रिड, सीसीयूएस, ग्रीन हाइड्रोजन, बायोफ्यूल्स, बीईएसएस और ईवी है जिन्हें ओएनजीसी के संचालन के विभिन्न पहलुओं को संबोधित करने के लिए डिज़ाइन किया गया है, जिससे उत्सर्जन में कमी के लिए एक व्यापक और चरणबद्ध दृष्टिकोण सुनिश्चित होता है।

ग) मीथेन रिसाव का पता लगाना और उसे कम करना

- ओएनजीसी सीओपी28 में ओजीडीसी का भी हस्ताक्षरकर्ता है। ओजीडीसी पर हस्ताक्षर करके, ओएनजीसी ने वर्ष 2030 तक निवल शून्य संचालन, नियमित फ्लेयरिंग को समाप्त करने और अपस्ट्रीम मीथेन उत्सर्जन को लगभग शून्य करने के लिए कदम उठाने की प्रतिबद्धता जताई है।
- ओएनजीसी ने टोटलएनर्जीस के साथ एक सहयोग करार पर हस्ताक्षर किए हैं, ताकि टोटलएनर्जीस की अग्रणी एयूएसईए (पर्यावरण एप्लीकेशन के लिए एयरबोर्न अल्ट्रालाइट स्पेक्ट्रोमीटर) तकनीक का उपयोग करके मीथेन उत्सर्जन के परिचयन और मापन अभियान चलाए जा सकें। हम किसी अधिष्ठापन में उन विशेष क्षेत्र का पता लगाने के लिए टोटलएनर्जीस की पेटेंट तकनीक एयूएसईए का उपयोग करके ड्रोन सर्वेक्षण करने की योजना बना रहे हैं, जहाँ मीथेन उत्सर्जन हो रहा है। रिमोट सेंसिंग और एरियल सर्वेक्षणों के माध्यम से अभिचिह्नित हॉटस्पॉट के आधार पर, पाइपलाइन और अन्य उपकरणों में विशिष्ट रिसाव का पता लगाने के लिए जमीनी

सर्वेक्षण किए जाते हैं जो पलायक मीथेन उत्सर्जन का स्रोत हैं।

घ) कार्बन कैप्चर, उपयोग और भंडारण (सीसीयूएस)

- कंपनी कार्बन कैप्चर, उपयोग और भंडारण (सीसीयूएस) को डीकार्बोनाइजेशन के लिए एक प्रमुख संवर्धक के रूप में भी प्राथमिकता दे रही है। सीओ2 भंडारण और परिपक्व क्षेत्रों से तेल उत्पादन बढ़ाने से संबंधित साझेदारी और पहलों की खोज करके, ओएनजीसी अपने प्रचालन को किफायती परिवहन के लिए दीर्घकालिक विकल्प परिपाटियों के साथ संरेखित करता है और अपनी प्रतिस्पर्धी बढ़त को सुदृढ़ करता है। गांधार में प्रस्तावित सीसीयूएस परियोजना में वर्ष 2040 तक 10% तेल लाभ और 5 से 6 मिलियन टन सीओ2 की संचयी स्वविवेजन क्षमता की संभाव्यता है।

- इसके अलावा, सीसीयूएस के अनुसंधान एवं विकास कार्य को करने के लिए केडीएमआईपीई में एक प्रयोगशाला स्थापित की गई है। प्रयोगशाला कोयले में गैस अवशोषण के अध्ययन पर भी कार्य कर रही है, जो सीओ2 के लिए एक उत्कृष्ट ट्रैप के रूप में भी कार्य कर सकता है क्योंकि यह अपनी छिद्र मात्रा क्षमता से अधिक भंडारण की सुविधा प्रदान करता है।

ङ) की गई ग्रीन पहलें:

- **प्रदर्शन संयंत्र/आर एंड डी संयंत्र:** जुलाई 2024 में नंदसन ईटीपी, मेहसाना, गुजरात में ग्रीन हाइड्रोजन उत्पादन संयंत्र के लिए उपकरण और मशीनरी प्राप्त हुई है। निर्माण और कमीशनिंग का कार्य प्रगति पर है। यह संयंत्र हाइड्रोकार्बन कूप के उत्पादित जल से ग्रीन हाइड्रोजन का उत्पादन करेगा।

- **टाटीपाका रिफाइनरी ग्रीन हाइड्रोजन संयंत्र:** ओएनजीसी टाटीपाका रिफाइनरी में इलेक्ट्रोलाइजर रूट के माध्यम से ग्रीन हाइड्रोजन के उत्पादन की खोज कर रही है।

- **40 केटीए ग्रीन हाइड्रोजन ग्रीन क्षेत्र परियोजनाएं:** ओएनजीसी, एमआरपीएल के साथ ग्रीन हाइड्रोजन ऑफटेक व्यवस्था और मंगलुरु में एक ग्रीन क्षेत्र परियोजना की स्थापना के बारे में चर्चा कर रही है। एमआरपीएल को 10% ग्रीन हाइड्रोजन की आपूर्ति की व्यवहार्यता का आकलन करने के लिए ओएनजीसी और एमआरपीएल दोनों के सदस्यों से बनी एक संयुक्त कार्य समिति का गठन किया गया है।

च) ऊर्जा दक्षता पहलें

- ओएनजीसी ने प्रक्रिया अनुकूलन, फ्लेयर गैस रिकवरी और ऊर्जा-कुशल उपकरणों के माध्यम से ऊर्जा की खपत को कम करने के लिए वित्त वर्ष 2023-24 में निम्नलिखित पहल की। इन पहलों से कुल वार्षिक बचत 3,643,649 गीगाजूल और ₹12 करोड़ बताई गई।

- **नवीकरणीय ऊर्जा:** वित्त वर्ष 2023-24 के दौरान कैम्बे और काकीनाडा में स्थापित कुल सौर ऊर्जा 3 मेगावाट है। उत्पादित नवीकरणीय ऊर्जा 2.82 एमयू है। 31 मार्च 2024 तक नवीकरणीय ऊर्जा की कुल स्थापित क्षमता लगभग 192.8 मेगावाट (सौर: 39.8 मेगावाट और पवन: 153 मेगावाट) थीष

- **उरण में फ्लेयर गैस रिकवरी और प्रक्रिया अनुकूलन:** उरण में फ्लेयर गैस रिकवरी और प्रक्रिया अनुकूलन के कारण 86.2 एमएमएससीएम गैस की बचत हुई है, जिसके परिणामस्वरूप 3,367 टेराजूल की ऊर्जा बचत हुई है।

- **डायनेमिक गैस ब्लेंडिंग सिस्टम:** अंकलेश्वर परिसंपत्ति के तीन ड्रिलिंग रिग (अंकलेश्वर ई-1400-7, ई1400-3 और ईवी-2000-2) में डायनेमिक गैस ब्लेंडिंग सिस्टम चालू किया गया और ईवी-2000-3 रिग, असम एसेट में कार्यान्वयन के अंतिम चरण में है। हमने स्टैक उत्सर्जन में बड़ी कमी के साथ-साथ एचएसडी खपत में 45% की कमी दर्ज की। जोरहाट परिसंपत्ति में तीन ड्रिलिंग रिग में से दो में डीजीबी सिस्टम को लागू करने की भी योजना बनाई है। सभी ड्रिलिंग रिग के लिए भविष्य की खरीद विशिष्टताओं के लिए इस पद्धति पर विचार किया जा रहा है।

- **एलईडी लाइटिंग:** एलईडी लाइटिंग कार्यक्रम के कार्यान्वयन के तहत ओएनजीसी के विभिन्न कार्य केंद्रों में वित्त वर्ष 2023-24 के दौरान 5,049 एलईडी लाइटें संस्थापित की गईं। ओएनजीसी में अब तक कुल 3.6 लाख एलईडी लाइटें संस्थापित की जा चुकी हैं। इससे प्रतिवर्ष लगभग 75.9 मिलियन यूनिट (एमयू) विद्युत ऊर्जा की बचत होती है तथा ₹540 मिलियन की मौद्रिक बचत होती है।

छ) आपूर्तिकर्ता सहभागिता और स्कोप-3 में कमी

- ओएनजीसी किफायती परिवहन के लिए दीर्घकालिक विकल्पता और पर्यावरण संरक्षण के

लिए पूरी तरह प्रतिबद्ध है। इस प्रतिबद्धता का अभिन्न अंग संपूर्ण आपूर्ति श्रृंखला को ग्रीन बनाना है। मूल्यवान आपूर्तिकर्ताओं सहित सभी हितधारकों के सामूहिक प्रयास किफायती परिवहन के लिए दीर्घकालिक विकल्पता उद्देश्यों को प्राप्त करने में अपरिहार्य हैं। ओएनजीसी आपूर्तिकर्ता उत्सर्जन प्रकटीकरण पर केंद्रित एक पहल शुरू कर रहा है। हालाँकि यह पहल स्वैच्छिक है, लेकिन यह निश्चित रूप से स्कोप–3 उत्सर्जन में कमी लाने में सहायक होगी।

सिद्धांत 7: जब व्यवसाय सार्वजनिक और विनियामक नीति को अमल में लाने में कार्यरत हों, तो उन्हें ऐसा जिम्मेदारी और पारदर्शिता के साथ करना चाहिए।

1. **कंपनी के पास निम्नलिखित संघों की सदस्यता है, जिनके माध्यम से वह सार्वजनिक नीति का पक्ष–समर्थन करती है:**

- यूनाइटेड नेशंस ग्लोबल कॉम्पैक्ट नेटवर्क इंडिया (यूएनजीसीएनआई)
- फेडरेशन ऑफ इंडियन चैंबर्स ऑफ कॉमर्स एंड इंडस्ट्री (फिक्की)
- कॉन्फेडरेशन ऑफ इंडियन इंडस्ट्रीज (सीआईआई)
- स्टैडिंग कॉन्फ्रेंस ऑन पब्लिक एंटरप्राइजेज (स्कोप)
- फेडरेशन ऑफ इंडियन पेट्रोलियम इंडस्ट्री (एफआईपीआई)

सिद्धांत 8: व्यवसायों को समावेशी विकास और न्यायसंगत विकास को बढ़ावा देना चाहिए

1. कंपनी द्वारा प्राप्त इनपुट का 58% सीधे एमएसएमई/छोटे उत्पादकों से प्राप्त किया जाता है, जिसमें 0.84% महिला एमएसई से और 0.50% एससी/एसटी एमएसई से प्राप्त होता है।
2. कंपनी सार्वजनिक खरीद नीति 2012 (पीपीपी–2012) और स्थानीय सामग्री नीति (पीपी–एलसी 2020) से संबद्ध खरीद वरीयता में उल्लिखित दिशानिर्देशों के अनुसार सूक्ष्म और लघु उद्यमों (एमएसई) और श्रेणी 1 के स्थानीय आपूर्तिकर्ताओं को वरीयता देते हुए हमारी खरीद परिपाटियों में स्थानीय सामग्री को बढ़ावा देने को प्राथमिकता देती है।
3. कंपनी द्वारा भुगतान की गई 24.81% मजदूरी अर्ध–नगरी क्षेत्रों में कार्यरत कर्मचारियों और कामगारों को दी गई, जो छोटे नगरों में रोजगार सृजन को दर्शाती है।
4. कंपनी ने अपनी सीएसआर पहलों के माध्यम से लगभग 35,600 लाभार्थियों को लाभान्वित किया, जिनमें से अधिकांश लाभार्थी कमजोर समुदायों से थे। वित्त वर्ष 2023–24 में कंपनी का कुल सीएसआर व्यय ₹ 6,136 मिलियन था।
5. कंपनी की सीएसआर पहल और कार्यक्रम निम्नलिखित प्रभाव क्षेत्रों के साथ संरेखित हैं:



सिद्धांत 9: व्यवसायों को अपने उपभोक्ताओं के साथ जिम्मेदारी से जुड़ना चाहिए और उन्हें मूल्य प्रदान करना चाहिए

1. कंपनी को वित्त वर्ष 2023–24 में डाटा गोपनीयता, विज्ञापन, साइबर सुरक्षा, अनुचित व्यापार परिपाटियों आदि से संबंधित कोई उपभोक्ता शिकायत नहीं मिली।
2. ओएनजीसी के पास साइबर सुरक्षा पर एक सुपरिभाषित और सुव्यवस्थित सूचना सुरक्षा नीति है।
3. कंपनी के 100% उत्पादों में उत्पाद से संबंधित पर्यावरणीय और सामाजिक मापदंडों और सुरक्षित और जिम्मेदार उपयोग के बारे में जानकारी अंकित होती है।

5. गेल

एक जिम्मेदार ऊर्जा कंपनी होने के नाते और अपने डी–कार्बोनाइजेशन लक्ष्यों को और तेज करने के लिए, गेल ने वर्ष 2040 तक स्कोप–1 और 2 उत्सर्जन में 100% कमी और स्कोप–3 उत्सर्जन में 35% कमी हासिल करने के लिए एक विज्ञान–आधारित निवल–शून्य कार्रवाई योजना विकसित की है। हाल ही में, गेल ने अपने निवल–शून्य लक्ष्य को और आगे बढ़ाया है और वर्ष 2035 तक स्कोप–1 और 2 उत्सर्जन में 100% कमी लाने का लक्ष्य रखा है।

निवल–शून्य लक्ष्यों को प्राप्त करने के लिए, गेल ने निम्नलिखित न्यूनीकरण संवर्धकों की पहचान की है:

- मौजूदा एनजी आधारित उपकरणों का विद्युतीकरण
- नवीकरणीय ऊर्जा (आरई)
- ग्रीन हाइड्रोजन
- संपीड़ित बायो गैस (सीबीजी)
- बैटरी ऊर्जा भंडारण प्रणाली (बीईएसएस)
- सीओ, मूल्य निर्धारण–प्रत्यक्ष बिक्री और मूल्य–वर्धित उत्पाद
- ऊर्जा दक्षता में सुधार
- वनरोपण
- ऑफसेटिंग

ग्रीन हाइड्रोजन और सीसीयूएस

ग्रीन हाइड्रोजन और सीसीयूएस के क्षेत्रों में, निवल–शून्य लक्ष्य प्राप्त करने के लिए निम्नलिखित पहलें की गई हैं:

- गेल ने विजयपुर (मध्य प्रदेश) में 4.3 टीपीडी ग्रीन हाइड्रोजन का उत्पादन करने के लिए 10 मेगावाट पीईएम इलेक्ट्रोलाइजर चालू किया है।
- गेल ने पाटा (उत्तर प्रदेश) में अपने पेट्रोकेमिकल संयंत्र में 1 टीपीडी क्षमता के माइक्रोएल्गी के माध्यम से सीओ, कैप्चर के लिए एक प्रायोगिक संयंत्र भी चालू किया है।
- गेल में प्रचालन डीकार्बोनाइजेशन के लिए परियोजनाओं की संयुक्त रूप से खोज, पहचान, मूल्यांकन और कार्यान्वयन के लिए मेसर्स लैंजाटेक इंक, यूएसए के साथ समझौता ज्ञापन पर हस्ताक्षर किए गए हैं। सीओ, से एथेनॉल संयंत्र स्थापित करने के लिए आगे की चर्चा चल रही है।

चक्रीय अर्थव्यवस्था परिपाटियां

गेल यह सुनिश्चित करता है कि अपशिष्ट पदार्थों का निपटान इस तरह से किया जाए कि पर्यावरण और मानव स्वास्थ्य पर उनका प्रभाव कम से कम हो। हम संसाधन–कुशल प्रौद्योगिकी को लागू करके अपने प्रचालन में एक चक्रीय अर्थव्यवस्था को लागू करने का प्रयास करते हैं। हम प्रभावी अपशिष्ट प्रबंधन परिपाटियों का पालन करते हैं, जिसमें सभी साइटों पर खतरनाक और गैर–खतरनाक अपशिष्ट को कम करना, पुनः उपयोग करना, पुनर्चक्रण करना और जिम्मेदारी से निपटान करना शामिल है।

स्रोत पर अपशिष्ट में कमी के अवसरों की पहचान करने के लिए नियमित अपशिष्ट संपरीक्षा की जाती है। प्रचालनात्मक सुधारों के माध्यम से अपशिष्ट उत्पादन को कम किया जाता है। गेल अपने कर्मचारियों, मूल्य–श्रृंखला भागीदारों और समुदायों के बीच सोशल मीडिया सहित विभिन्न चैनलों के माध्यम से जागरूकता फैलाता है।

प्राकृतिक गैस और एलएचसी पारेषण और विपणन के मामले में कोई पैकेजिंग शामिल नहीं है। पॉलिमर पैकेजिंग के संबंध में, गेल विस्तारित उत्पादक उत्तरदायित्व (ईपीआर) के माध्यम से सीपीसीबी/यूपीपीसीबी द्वारा प्रदान किए गए लक्ष्यों के अनुसार ईपीआर प्रमाणपत्रों की खरीद करके अपनी जिम्मेदारी पूरी कर रहा है।

ईएसजी प्रयास और बीआरएसआर पहलें

गेल का संधारणीय रिपोर्टिंग सफर

गेल वर्ष 2011 से स्वैच्छिक रूप से वार्षिक संधारणीय रिपोर्ट प्रकाशित कर रहा है, जिसमें कंपनी के पर्यावरण, सामाजिक और अभिशासन (ईएसजी) प्रदर्शन का विवरण दिया गया है। गेल संधारणीय रिपोर्टिंग के माध्यम से अपनी कार्यनीति, लक्ष्यों, उद्देश्यों और प्रदर्शन के बारे में जानकारी का प्रकटीकरण करने का प्रयास करता है। यह पारदर्शिता गेल के एक किफायती परिवहन के लिए दीर्घकालिक विकल्प व्यवसाय मॉडल को विकसित करने के प्रयास का हिस्सा है जो इसके हितधारकों के लिए दीर्घकालिक मूल्य उत्पन्न करता है।

गेल के ईएसजी प्रदर्शन की मुख्य विशेषताएं

पर्यावरण	सामाजिक	अभिशासन
गेल **16,243 किलोमीटर** एनजी **पाइपलाइन और 2,040 किमी एलपीजी पाइपलाइन** का एक नेटवर्क प्रचालित करता है। पाइपलाइन परिवहन ट्रकों/रेल द्वारा एलएचसी के परिवहन की आवश्यकता को समाप्त करके उत्सर्जन में कमी लाने में मदद करता है।	गेल ने सीएसआर पहल के तहत मुख्य रूप से नीचे उल्लिखित फोकस क्षेत्रों में ₹175.71 करोड़ व्यय किए: • गेल आरोग्य (स्वास्थ्य सेवा, स्वच्छता और स्वच्छ पेयजल)	वित्त वर्ष 2023–24 के लिए **93.5%** के आंतरिक लक्ष्य की तुलना में **95.75%** एचएसई स्कोर प्राप्त किया।

पर्यावरण	सामाजिक	अभिशासन
वित्त वर्ष 2023–24 में गेल की बाजार हिस्सेदारी गैस ट्रांसमिशन में **~65%** और गैस व्यापार में **~48%** थी।	• गेल उज्ज्वल (शिक्षा केन्द्रित पहल) • गेल ग्रीन (पर्यावरण पहल) • गेल सशक्त (महिला सशक्तिकरण पहल) • गेल कौशल (कौशल प्रशिक्षण पहल) • गेल सक्षम (दिव्यांगजनों एवं बुजुर्गों से संबंधित पहल) • गेल उन्नति (शिक्षा केन्द्रित पहल)	
गेल के पास **118 मेगावाट** पवन ऊर्जा और **17 मेगावाट** सौर ऊर्जा की स्थापित क्षमता है।	वित्त वर्ष 2023–24 में गेल की **सीएसआर परियोजनाओं** के माध्यम से **13 लाख** से अधिक लोगों का लाभ मिला।	**शून्य** रिपोर्ट योग्य लोस्ट टाइम इंजरी फ्रीक्वेंसी रेट (आरएलटीआईएफआर)
विजयपुर (मध्य प्रदेश) में 4.3 टीपीडी ग्रीन हाइड्रोजन का उत्पादन करने के लिए 10 मेगावाट पीईएम इलेक्ट्रोलाइजर चालू किया गया।	**एमएसई से ₹1,963 करोड़** के सामान की खरीद की गई, जो **कुल खरीद** का लगभग **56.51%** है।	वित्त वर्ष 2023–24 में, गेल को सीपीजीआरएएमएस पोर्टल के माध्यम से आंतरिक और बाहरी हितधारकों से 214 शिकायतें प्राप्त हुईं, और इनमें से **100%** का तुरंत समाधान किया गया।
निवल–शून्य कार्यनीति का लक्ष्य वर्ष 2035 तक **स्कोप–1 और स्कोप–2 उत्सर्जन** में **100%** कमी और वर्ष 2040 तक स्कोप–3 उत्सर्जन में 35% की कमी हासिल करना है।	वित्त वर्ष 2023–24 में महिला उद्यमियों के स्वामित्व वाले एमएसएमई से खरीद **3.11%** से बढ़कर **6.65%** हो गई।	वित्त वर्ष 2023–24 में **नियंत्रक और महालेखापरीक्षक** (सीएजी) से लगातार 15वें वर्ष **शून्य टिप्पणियां** प्राप्त हुई हैं।
गेल ने वर्ष 2030 तक **1.7 गीगावाट** नवीकरणीय ऊर्जा लक्ष्य निर्धारित किया है।	वित्त वर्ष 2023–24 में गेल का **ग्राहक संतुष्टि सूचकांक 89%** से बढ़कर **91%** हो गया।	**मूडीज इंटरनेशनल, सिंगापुर** ने भारत की श्रेष्ठ रेटिंग के समतुल्य स्थिर दृष्टिकोण के साथ **'बीएए3'** की दीर्घकालिक कॉर्पोरेट जारीकर्ता रेटिंग प्रदान की।
74,000 किलो लीटर अपशिष्ट जल का पुनर्चक्रण किया गया		
पर्यावरण जागरूकता और कर्मचारी विकास पर **₹50 लाख** व्यय किए गए।		
प्राकृतिक जल की खपत को कम करने के लिए उत्तर प्रदेश के पाटा में **जीरो लिक्विड डिस्चार्ज (जेडएलडी)** परियोजना कार्यान्वित की जा रही है।		
गेल ने वित्त वर्ष 2023–24 में **1.85 लाख** से अधिक वृक्ष लगाए।		

गेल की संधारणीय रिपोर्ट अंतर्राष्ट्रीय पेट्रोलियम उद्योग पर्यावरण संरक्षण संघ (आईपीआईईसीए) दिशा–निर्देशों के नवीनतम संस्करण के अनुसार हैं, जो एक वैश्विक तेल और गैस उद्योग संघ है जो पर्यावरण और सामाजिक मुद्दों पर ध्यान केंद्रित करता है। ये रिपोर्टें जीआरआई संधारणीय रिपोर्टिंग मानकों, सतत लेखा मानक बोर्ड (एसएएसबी), सतत मानक बोर्ड (आईएसएसबी), जिम्मेदार व्यावसायिक आचरण पर राष्ट्रीय दिशानिर्देश (एनजीआरबीसी) सिद्धांत, अमेरिकी पेट्रोलियम संस्थान (एपीआई) दिशानिर्देश, आईएसओ 26000:2010, संयुक्त राष्ट्र वैश्विक समझौता (यूएनजीसी) (बीआरएसआर) आवश्यकताएं, जलवायु–संबंधित वित्तीय प्रकटीकरण पर टास्क फोर्स (टीसीएफडी) और सेबी की व्यावसायिक जिम्मेदारी और किफायती परिवहन के लिए दीर्घकालिक विकल्पता रिपोर्टिंग का भी पालन करती हैं।

गेल की संधारणीय रिपोर्ट एक बाहरी आश्वासन एजेंसी द्वारा आश्वस्त की जाती हैं। संधारणीय रिपोर्ट की लेखा परीक्षा एए1000एएस वी3 मानक के अनुसार टाइप 2 मध्यम स्तर के अनुसार की जाती है। आश्वासन प्रक्रिया में कई साइटों, कार्यालयों, कॉर्पोरेट विभागों में भौतिक दौरे और कई स्थानों पर वर्चुअल बैठकें शामिल होती हैं, ताकि प्रदान किए गए डाटा की पुष्टि की जा सके। गेल की संधारणीय रिपोर्ट गेल की वेबसाइट: www.gailonline.com पर देखी जा सकती है।

सेबी द्वारा अधिदेशित बीआरआर / बीआरएसआर

गेल वित्तीय वर्ष 2012–13 से किफायती परिवहन के लिए दीर्घकालिक विकल्प के क्षेत्र में किए जा रहे कार्यों का विवरण प्रदान करने वाली वार्षिक रिपोर्ट के एक भाग के रूप में व्यावसायिक उत्तरदायित्व रिपोर्ट (बीआरआर) प्रकाशित कर रहा है। गेल की बीआरएसआर को एक बाहरी आश्वासन एजेंसी द्वारा भी आश्वासन दिया जाता है। आश्वासन लेखा परीक्षक विभिन्न कार्यालयों में संधारणीय सॉफ्टवेयर के माध्यम से प्राप्त डाटा को सत्यापित करता है और उचित आश्वासन देने के लिए गेल की प्रमुख साइटों का दौरा भी करता है। बीआरएसआर में लागू आश्वासन बिंदुओं को शामिल करने के बाद लेखा परीक्षक द्वारा आश्वासन प्रमाणपत्र प्रदान किया जाता है।

ग्रीनको रेटिंग को अपनाना

ग्रीन कंपनी रेटिंग सिस्टम एक ऐसे दृष्टिकोण का समर्थन करता है जो किफायती परिवहन के लिए दीर्घकालिक विकल्प प्रदर्शन पर आधारित है। यह रेटिंग सिस्टम ऊर्जा दक्षता, नवीकरणीय ऊर्जा, जीएचजी शमन, सामग्री संरक्षण आदि जैसे मानदंडों के आधार पर कंपनियों के पारिस्थितिक पहलुओं का मूल्यांकन करता है।

गेल ने अपने प्रचालन स्थलों पर ग्रीनको रेटिंग लागू की है जो उत्पादों, सेवाओं और प्रचालनों को अधिक संधारणीय बनाने के बारे में नेतृत्व और मार्गदर्शन प्रदान करती है। कंपनी के आंतरिक और बाहरी हितधारकों को नवीनतम ग्रीन अवधारणाओं पर प्रशिक्षित किया जाता है ताकि वे अपने प्रचालन में बेहतर सिस्टम और वैश्विक सर्वोत्तम परिपाटियों को लागू कर सकें। गेल की निम्नलिखित साइटों को सीआईआई ग्रीनको रेटिंग से मान्यता प्राप्त है:

- **प्लैटिनम प्रमाणन:** दाभोल–बेंगलुरु पाइपलाइन
- **स्वर्ण प्रमाणन:** पाटा पेट्रोकेमिकल संयंत्र
- **रजत प्रमाणन:** विजयपुर गैस प्रसंस्करण संयंत्र, वाघोडिया गैस प्रसंस्करण संयंत्र, गांधार गैस प्रसंस्करण संयंत्र, झाबुआ कंप्रेसर स्टेशन और विजाग–सिकंदराबाद पाइपलाइन
- **कांस्य:** छैन्सा कंप्रेसर स्टेशन

ईएसजी रेटिंग

वर्ष 2024 में, गेल को लंदन स्टॉक एक्सचेंज ग्रुप सस्टेनेबिलिटी इंडेक्स के एक भाग के रूप में एफटीएसई4गुड इंडेक्स सीरीज में लगातार शामिल किया गया है, जो तेल और गैस क्षेत्र में सुदृढ़ ईएसजी परिपाटियों को प्रदर्शित करता है। गेल ने जलवायु परिवर्तन श्रेणी के तहत सीडीपी ग्लोबल ईएसजी रेटिंग में "सी" से "बी" स्तर तक स्तरोन्नत करके एक महत्वपूर्ण उपलब्धि भी हासिल की है।

6. एमआरपीएल

- एमआरपीएल ने वर्ष 2038 को निवल शून्य लक्ष्य वर्ष निर्धारित किया है और निवल शून्य कार्यनीति और इसके कार्यान्वयन योजना के विकास की प्रक्रिया में है।
- एमआरपीएल ने विभिन्न ऊर्जा दक्षता सुधार उपायों को लागू किया है, जिसके परिणामस्वरूप वित्त वर्ष 2023–24 में कुल 35,387 एसआरएफटी ईंधन की बचत हुई है, जो उत्सर्जन में 112,885 मीट्रिक टन सीओ2 की कमी के बराबर है।
- नवीकरणीय ऊर्जा पहलों में, एमआरपीएल ने रिफाइनरी कॉम्प्लेक्स में 6.06 मेगावाट, एरोमैटिक कॉम्प्लेक्स में 2.5 मेगावाट और डिसेलिनेशन यूनिट में 0.2 मेगावाट की सौर क्षमता स्थापित की है। वित्त वर्ष 2023–24 में, एमआरपीएल ने 7,890 मेगावाट

सौर ऊर्जा उत्पन्न की और कुल 16,241 मेगावाट (आयातित सौर ऊर्जा सहित) की खपत की।

- एमआरपीएल ने रिफाइनरी और एरोमैटिक कॉम्प्लेक्स में स्वच्छ ईंधन के रूप में एलएनजी का उपयोग करने के लिए अवसंरचना में निवेश किया है, जिसमें 0.8 एमएमएससीएमडी आरएलएनजी आयात करने की क्षमता है। इसमें रिफाइनरी के भीतर एलएनजी मीटरिंग स्किड्स और संबंधित सुविधाएं स्थापित करना शामिल है। प्राकृतिक गैस का उपयोग अब हाइड्रोजन उत्पादन इकाई में और रिफाइनरी एवं एरोमैटिक कॉम्प्लेक्स में गैस टर्बाइनों के लिए ईंधन के रूप में किया जाता है। एमआरपीएल ने 22 मेगावाट गैस टरबाइन को प्राकृतिक गैस पर चलाने के लिए परिवर्तित किया है, और 37 मेगावाट की एक अन्य गैस टरबाइन पहले से ही प्राकृतिक गैस के उपयोग के लिए डिज़ाइन की गई है।
- ग्रीन ऊर्जा के क्षेत्र में, एमआरपीएल 500 टीपीए क्षमता की इलेक्ट्रोलाइज़र आधारित ग्रीन हाइड्रोजन इकाई स्थापित करने की दिशा में आगे बढ़ रहा है। एमआरपीएल नवीन और नवीकरणीय ऊर्जा मंत्रालय (एमएनआरई) की एसआईजीएचटी–2बी योजना के तहत बीओओ आधार पर ग्रीन हाइड्रोजन की खरीद के साथ आगे बढ़ रही है।
- कंपनी का लक्ष्य नवीकरणीय ऊर्जा के आयात के लिए अपने ग्रिड विद्युत अवसंरचना को महत्वपूर्ण रूप से बढ़ाना है, जिससे वर्ष 2027–28 तक क्षमता 28 मेगावाट से बढ़कर 102 मेगावाट हो जाएगी। इस पहल से 1,65,321 एमटीओई की बचत होने तथा उत्सर्जन में 5,27,373 मीट्रिक टन सीओ2 की कम होने का अनुमान है।
- एमआरपीएल ने रिफाइनरी के भीतर 20 केएलपीडी की क्षमता वाला बायो–एटीएफ संयंत्र स्थापित करने की योजना बनाई है, जिसमें पाम स्टीयरिन, प्रयुक्त कुकिंग ऑयल (यूसीओ) तथा वृक्ष–जनित तेल जैसे फीडस्टॉक का उपयोग किया जाएगा। इस पहल से जीएचजी उत्सर्जन में लगभग 77% की कमी आने की उम्मीद है, जिसके परिणामस्वरूप खनिज एटीएफ उत्पादन की तुलना में प्रति वर्ष लगभग 25,310 टीसीओ2 की कमी होगी।
- स्ववियोजन: 75 एकड़ के वनरोपण सहित 699 एकड़ ग्रीन बेल्ट। सीओ2 स्ववियोजन प्रति वर्ष 5,854 टीसीओ2 के बराबर होगा।

अन्य संधारणीय पहलें

जल प्रबंधन:

- एमआरपीएल के पास 40 एमएलडी की स्थापित क्षमता का विलवणीकरण संयंत्र है। वित्त वर्ष 2023–24 में 1,04,86,090 घनमीटर विलवणीकृत जल का उपयोग किया गया।
- एमआरपीएल अपने प्रचालन में नगर निगम के एसटीपी जल का उपयोग करके प्राकृतिक जल की खपत को कम करने पर ध्यान केंद्रित कर रहा है। वित्त वर्ष 2023–24 में कंपनी ने 60,12,092 घनमीटर एसटीपी जल का उपयोग किया है।
- एमआरपीएल बागवानी के लिए एमआरपीएल के उपचारित अपशिष्ट जल के उपयोग की व्यवहार्यता का अध्ययन करने के लिए कृषि विश्वविद्यालय के साथ सहयोग कर रहा है।

एमआरपीएल के ईएसजी प्रदर्शन की मुख्य विशेषताएं

पर्यावरण	सामाजिक	अभिशासन
ऊर्जा • कुल ऊर्जा खपत: 71,638,375.41 गीगाजूल • ऊर्जा तीव्रता: 4.33 गीगाजूल/मीट्रिक टन कच्चे तेल का प्रसंस्करण और 68.10 गीगाजूल/₹ मिलियन टर्नओवर • नवीकरणीय ऊर्जा से खपत ऊर्जा: 53,682 गीगाजूल • ऊर्जा संरक्षण और दक्षता पहल के माध्यम से 14,80,592 गीगाजूल ऊर्जा की बचत हुई	**कर्मचारियों की संख्या** • कुल कार्यबल: 2,548 **लैंगिक विविधता** • महिला कार्यबल का: 10.19% **दिव्यांगजन** • दिव्यांगों का प्रतिशत: 1.8% **सीएसआर** • कुल सीएसआर व्यय: ₹204.8 मिलियन • लाभार्थियों की संख्या: 18,762 से अधिक • अल्प सुविधा प्राप्त और वंचित समूहों के लाभार्थियों का प्रतिशत: 62%	• वित्त वर्ष 2023–24 में हितों के टकराव के संबंध में **शून्य** शिकायतें • वित्त वर्ष 2023–24 में प्रतिस्पर्धा–विरोधी आचरण से संबंधित कोई मुद्दा नहीं • वित्त वर्ष 2023–24 में रिश्वतखोरी/भ्रष्टाचार का कोई आरोप नहीं
जीएचजी उत्सर्जन • स्कोप 1: 55,15,578 टीसीओ2ई • स्कोप 2: 1,53,542 टीसीओ2ई		

पर्यावरण	सामाजिक	अभिशासन
• उत्सर्जन तीव्रता: 0.34 टीसीओ2ई / मीट्रिक टन प्रसंस्कृत कच्चा तेल और 5.39 टीसीओ2ई / ₹ मिलियन टर्नओवर • जीएचजी उत्सर्जन में कमी: नवीकरणीय ऊर्जा के उपयोग, ऊर्जा दक्षता उपायों और ग्रीन बेल्ट के विकास से 1.35 लाख टन सीओ2ई की कमी। **अपशिष्ट प्रबंधन** • कुल उत्पन्न अपशिष्ट: 14,445 मीट्रिक टन • पुनर्चक्रण और पुनः उपयोग के माध्यम से पुनर्प्राप्त अपशिष्ट: 64.98% • भूमि भरण में शून्य अपशिष्ट का लक्ष्य प्राप्त किया गया • अपशिष्ट तीव्रता: 0.00087 मीट्रिक टन अपरिष्कृत का प्रसंस्करण और 0.014 मीट्रिक टन / ₹ मिलियन टर्नओवर • अपशिष्ट तीव्रता में कमी: वित्त वर्ष 2022–23 की तुलना में वित्त वर्ष 2023–24 में 7.69% **जल प्रबंधन** • जल खपत: 23,976,074 मीटर³ • जल तीव्रता: 1.45 मीटर³ / मीट्रिक टन अपरिष्कृत का प्रसंस्करण और 22.79 मीटर³ / ₹ मिलियन टर्नओवर • विलवणीकरण संयंत्र की क्षमता बढ़ाकर 40 एमएलडी की गई • 3.6 एमजीडी नगरपालिका एसटीपी जल का उपयोग किया गया • पुनर्चक्रित एवं पुनः उपयोग: 68.6% • वित्त वर्ष 2023–2024 के लिए 2,166 मीट्रिक टन का ईपीआर लक्ष्य हासिल कर लिया गया है, जबकि वित्त वर्ष 2022–2023 के लिए यह 1,304 मीट्रिक टन था।	**प्रशिक्षण** • कुल 54,663.5 घंटे प्रशिक्षण प्राप्त किया गया। • व्यावसायिक स्वास्थ्य और सुरक्षा प्रशिक्षण पर प्रशिक्षण घंटे: 35% • प्रशिक्षण पर व्यय की गई कुल राशि: ₹ 288 लाख • व्यावसायिक स्वास्थ्य एवं सुरक्षा प्रशिक्षण पर व्यय राशि: 9.07 लाख **सुरक्षा** • लोस्ट टाइम इंजरी फ्रीक्वेंसी रेट (एलटीआईएफआर)–0.08 प्रति मिलियन कार्य घंटे **मानव अधिकार** • मानवाधिकार उल्लंघन की शून्य घटनाएं **मूल्य श्रृंखला भागीदार** • 25% मूल्य श्रृंखला साझेदार जागरूकता कार्यक्रमों के अंतर्गत कवर किये गये • एमएसएमई से खरीद: 34.20% • अनुसूचित जाति / अनुसूचित जनजाति (एससी / एसटी) एमएसई से खरीद 0.67% थी, • महिला एमएसई से खरीद 0.81% थी।	

7. बामर लॉरी

- बामर लॉरी के संधारणीय उद्देश्य इसके समग्र व्यावसायिक लक्ष्यों के साथ सहज रूप से एकीकृत हैं और इसका संधारणीय रोडमैप सभी हितधारकों के हितों की रक्षा पर केंद्रित है। कंपनी अपनी प्रक्रियाओं और प्रतिष्ठानों में अपने कार्बन फुटप्रिंट को कम करने और ग्राहकों के लिए उत्पादों और समाधानों को डिजाइन करने में निवेश कर रही है ताकि वे अपने कार्बन फुटप्रिंट को कम कर सकें। हमने ऊर्जा प्रबंधन, उत्सर्जन प्रबंधन, जल प्रबंधन, अपशिष्ट प्रबंधन, कर्मचारी स्वास्थ्य और सुरक्षा, सामुदायिक विकास और कॉर्पोरेट प्रशासन को बढ़ाने के लिए कई पहलें की हैं। बामर लॉरी ने पिछले वर्ष (अर्थात् वित्त वर्ष 2022–23) से वार्षिक रिपोर्ट में व्यवसाय संधारणीय और उत्तरदायित्व रिपोर्ट (बीआरएसआर) प्रकाशित करना शुरू किया, जो कंपनी की वेबसाइट पर उपलब्ध है।
- बामर लॉरी ने अपने प्रचालन में सततता को बढ़ावा देने के लिए–सौर ऊर्जा में निवेश करने से लेकर विनिर्माण प्रक्रियाओं और जल उपयोग को अनुकूलित करने तक–कई पहलें की हैं। कार्बन फुटप्रिंट को कम करने के लिए, हमारी कार्यनीतियों में पारंपरिक ऊर्जा स्रोतों को नवीकरणीय ऊर्जा स्रोतों से प्रतिस्थापित करना, ऊर्जा–कुशल विनिर्माण प्रक्रियाओं, वीएफडी (चर आवृत्ति ड्राइव), मोटर, लाइट और भवनों को अपनाना और कार्बन ऑफसेट विनिर्माण प्रक्रियाओं में निवेश करना शामिल है। सततता नीति के अनुरूप, हमारी कंपनी ने अब तक

1,046 किलोवाट क्षमता का सौर ऊर्जा संयंत्र स्थापित किया है। इससे जीवाश्म ईंधन आधारित ऊर्जा पर निर्भरता कम करने में मदद मिलती है और ऊर्जा के नवीकरणीय स्रोतों का उपयोग करके हमारी ऊर्जा आवश्यकता को पूरा किया जाता है। भारत भर में एसबीयू–औद्योगिक पैकेजिंग के 4 संयंत्रों ने एलडीओ के स्थान पर पीएनजी/एलपीजी का उपयोग किया है।

- जल उपयोग को कम करने और अपशिष्ट को कम करने के लिए उठाए गए प्रमुख कदमों में कम प्रवाह वाले उपकरणों का उपयोग, जल रहित मूत्रालय, अपशिष्ट जल का पुनर्चक्रण, अपशिष्ट जल संयंत्रों के माध्यम से उपचार और वर्षा जल संचयन प्रणाली को लागू करना आदि शामिल है। अपशिष्ट जल का उपचार और निपटान वैधानिक आवश्यकताओं के अनुरूप है।
- बामर लॉरी पर्यावरण संरक्षण अधिनियम, 1986 में निर्धारित वायु उत्सर्जन मानदंडों का सख्ती से पालन करता है।
- खतरनाक अपशिष्ट का निपटान खतरनाक और अन्य अपशिष्ट (प्रबंधन और सीमा पार आवागमन) नियम, 2016 के अनुसार सख्ती से किया जाता है। कंपनी के सभी संयंत्र और प्रमुख प्रतिष्ठान पर्यावरण मानकों आईएसओ 14001 के लिए प्रमाणित हैं।
- हम अपने संगठन के भीतर एकल–उपयोग वाले प्लास्टिक को कम करने पर लगातार ध्यान केंद्रित कर रहे हैं।
- हम उत्पादों के लिए प्लास्टिक के उपयोग को कम करने और किफायती परिवहन के लिए दीर्घकालिक विकल्प विकल्पों की खोज करने के लिए नियमित रूप से हितधारकों के साथ सहकार्य हैं।
- बीआरएसआर को प्रकाशित करने के अलावा, कंपनी के पास एक ईएसजी समिति है, जिसकी संचालन समिति के सदस्य निदेशक मंडल के सदस्यगण हैं।

बामर लॉरी एंड कंपनी लिमिटेड के ईएसजी प्रदर्शन की मुख्य विशेषताएं

पर्यावरण	सामाजिक	अभिशासन
3.58 % (कुल खपत की गई बिजली में से) नवीकरणीय ऊर्जा उत्पादन का हिस्सा	**857** स्थायी कर्मचारी	**65** सतर्कता जागरूकता सत्र
100% सभी बीएल संयंत्रों और इकाइयों के लिए ऊर्जा कुशल प्रकाश व्यवस्था	**₹ 4.41 करोड़** सीएसआर व्यय	**97.00%** बंद की गई ग्राहक शिकायतें
30 % स्थायी स्रोत से प्राप्त इनपुट सामग्री का प्रतिशत	**1** स्थायी कर्मचारियों के लिए रिपोर्ट योग्य लॉस्ट टाइम इंजरी फ्रीक्वेंसी रेट (आरएलटीआईएफआर)	**1** महिला निदेशक
758.74 मीट्रिक टन विस्तारित उत्पादक उत्तरदायित्व (ईपीआर) के अंतर्गत प्लास्टिक निपटान	**21000** सीएसआर लाभार्थियों की कुल संख्या	**100 %** भ्रष्टाचार से संबंधित जोखिम के लिए मूल्यांकित प्रचालन स्थल
422.77 एमटीसीओ2ई **सतत रूप से प्राप्त इनपुट सामग्री के प्रतिशत के 30%** में जीएचजी उत्सर्जन में कमी	**सीएसआर के पांच फोकस क्षेत्रों में** स्वास्थ्य और स्वच्छता, आजीविका, कौशल विकास, सामुदायिक विकास शामिल हैं	सभी बोर्ड स्तरीय समितियों का गठन कंपनी अधिनियम 2013, सेबी विनियमों और डीपीई दिशानिर्देशों के लागू प्रावधानों के अनुसार किया गया है।
758.74 मीट्रिक टन विस्तारित उत्पादक उत्तरदायित्व (ईपीआर) के अंतर्गत प्लास्टिक निपटान **422.77 एमटीसीओ2ई** जीएचजी उत्सर्जन में कमी	कॉर्पोरेट, क्षेत्रीय स्तर पर **पीओएसएच समिति का गठन** सुरक्षा संस्कृति को बढ़ाने के लिए बीएलसीएल में कॉर्पोरेट सुरक्षा प्रबंधन प्रणाली लागू की गई है	सुदृढ़ शिकायत निवारण प्रणाली सार्वजनिक डोमेन में उपलब्ध है। सार्वजनिक हित प्रकटीकरण और मुखबिर संरक्षण संकल्प (पीआईडीपीआई) को बामर लॉरी एंड कंपनी लिमिटेड में लागू किया गया है।
	एमएसएमई/एमएसई से 25% के लक्ष्य के सापेक्ष 12.28% से अधिक खरीदारी।	

8. सीपीसीएल

सीपीसीएल पर्यावरण, सामाजिक और अभिशासन (ईएसजी) सिद्धांतों के लिए प्रतिबद्ध है, जिसका उपयोग कंपनी की किफायती परिवहन के लिए दीर्घकालिक विकल्पता और नैतिक प्रभाव का आकलन करने के लिए किया जाता है। भारतीय प्रतिभूति और विनिमय बोर्ड (सेबी) द्वारा अधिदेशित व्यावसायिक उत्तरदायित्व और स्थिरता रिपोर्टिंग (बीआरएसआर) ढांचा भारतीय कंपनियों को उनके ईएसजी प्रदर्शन का प्रकटीकरण करने में मार्गदर्शन करता है।

सीपीसीएल के ईएसजी प्रदर्शन की मुख्य विशेषताएं

पर्यावरण	सामाजिक	अभिशासन
1) राष्ट्रीय सुरक्षा परिषद द्वारा **व्यावसायिक स्वास्थ्य, सुरक्षा और पर्यावरण** में उत्कृष्टता के लिए **सम्मान पुरस्कार** 2) भारतीय उद्योग परिसंघ– दक्षिणी क्षेत्र (सीआईआई.एएसआर) द्वारा **ऊर्जा/ कार्बन फुटप्रिंट** श्रेणी में **विशेष पुरस्कार** 3) भारतीय उद्योग परिसंघ द्वारा ईएचएस (पर्यावरण **स्वास्थ्य और सुरक्षा**) में उत्कृष्टता के लिए प्रतिष्ठित **स्वर्ण पुरस्कार**	1) सामुदायिक विकास में उत्कृष्ट सीएसआर गतिविधि के लिए **महात्मा फाउंडेशन** (आदित्य बिड़ला समूह) द्वारा महात्मा पुरस्कार 2023 2) अनुसूचित जाति–अनुसूचित जनजाति के स्वामित्व वाले सूक्ष्म और लघु उद्यमों से की गई खरीद के लिए सूक्ष्म, लघु और मध्यम उद्यम **मंत्रालय द्वारा प्रशंसा प्रमाण पत्र** (वित्त वर्ष 2022–23 के लिए ₹ 100 करोड़ से ₹1,000 करोड़ के बीच कुल खरीद की श्रेणी)। 3) तमिलनाडु श्रम अध्ययन संस्थान (टीआईएलएस), तमिलनाडु द्वारा **वर्ष 2023 का सर्वश्रेष्ठ मानव संसाधन नेतृत्वकर्ता पुरस्कार**	जनहित प्रकटीकरण और मुखबिर संरक्षण संकल्प (**पीआईडीपीआई**) को सीपीसीएल में लागू किया गया है।
22 पवन चक्कियाँ, 17.6 मेगावाट विलवणीकरण संयंत्र की विद्युत आवश्यकताओं को पूरा करने के लिए **6 किलोवाट घंटा रूफटॉप पवनचक्की** कॉर्पोरेट कार्यालय में संस्थापित	**54.9 मिलियन** सुरक्षित मानव घंटे	**महिला प्रकोष्ठ** महिला कर्मचारियों की शिकायतों को निपटाने के लिए सक्रिय रूप से कार्य कर रहा है **पीओएसएच** पीओएसएच के अंतर्गत 0 शिकायतें
2.3 मेगावाट भवनों और रिफाइनरी परिसर में ग्राउंड माउंडेट और रूफटॉप सौर पैनल	**1,647** दुर्घटना–मुक्त दिवस	**79% स्कोर** कर्मचारी संतुष्टि सर्वेक्षण **1.3%** न्यून कर्मचारी पलायन दर
5.8 एमजीडी समुद्री जल विलवणीकरण परियोजना	**10,920** मानव घंटे प्रशिक्षण	**साइबर सुरक्षा संचालन केंद्र** डिजिटल सुरक्षा बढ़ाने के लिए शुरू
सीओ2 में 0.22 मीट्रिक टन की कमी आरएलएनजी खपत बढ़ाकर	**₹ 20.11 करोड़** सीएसआर व्यय	**11 वेंडर विकास कार्यक्रम** एमएसएमई, महिला स्वामित्व वाले और सामाजिक रूप से पिछड़े उद्यमों को समर्थन देने के लिए आयोजित।

पर्यावरण	सामाजिक	अभिशासन
15,000 वृक्ष पिछले 5 वर्षों के दौरान लगाए गए **176 एकड़** ग्रीन पट्टी के रूप में स्थापित	**सीएसआर के प्रमुख फोकस क्षेत्र** 1) स्वास्थ्य एवं स्वच्छता 2) शिक्षा 3) पर्यावरण स्थिरता 4) कौशल विकास 5) अवसंरचना विकास 6) सामुदायिक विकास	**0 लंबित निवेशक शिकायतें** सभी 947 शिकायतों का समाधान **लोक शिकायत प्रबंधन** वित्त वर्ष 2023–24 के लिए प्राप्त सभी 18 शिकायतों का समय पर निपटान
शून्य निस्सरण उपचारित व्यापारिक अपशिष्टों के लिए	**52.05%** एमएसएमई खरीद **6.76% खरीद** एससी/एसटी स्वामित्व वाले उद्यमों से **3.3% खरीद** महिलाओं के स्वामित्व वाले उद्यमों से	**सतर्कता एवं नैतिक अभिशासन–सतर्कता जागरूकता सप्ताह** का आयोजन, भ्रष्टाचार विरोधी पहलों को बढ़ावा देना, तथा पारदर्शिता सुनिश्चित करने और भ्रष्टाचार को रोकने के लिए सतर्कता अधिकारियों को नियमित प्रशिक्षण देना।
2-5 एमजीडी एशिया का पहला नगरी सीवेज पुनःशोधन संयंत्र		**जोखिम प्रबंधन समिति (आरएमसी)** जलवायु परिवर्तन, साइबर सुरक्षा और विनियामक अनुपालन जैसे प्रमुख जोखिमों पर ध्यान केंद्रित करते हुए जोखिम प्रबंधन योजनाओं और नीतियों की देखरेख करती है।
87.5 अब तक का सबसे कम ऊर्जा तीव्रता सूचकांक		
प्राकृतिक जल पर शून्य निर्भरता और वित्त वर्ष 2023–24 में जल उपयोग में 7.1 एमजीडी से 6.6 एमजीडी की कमी		

सीपीसीएल एक वार्षिक एकीकृत रिपोर्ट प्रकाशित करता है जिसमें वित्तीय और गैर–वित्तीय (ईएसजी) सूचनाएं समेकित होती हैं, जो मूल्य सृजन के लिए एक समग्र दृष्टिकोण को दर्शाती है। यह रिपोर्ट अंतर्राष्ट्रीय एकीकृत रिपोर्टिंग परिषद (आईआईआरसी) और वैश्विक रिपोर्टिंग पहल (जीआरआई) जैसे अंतर्राष्ट्रीय मानकों के अनुरूप है, जो व्यापक और मानकीकृत ईएसजी प्रकटीकरण सुनिश्चित करती है। कंपनी के किफायती परिवहन के लिए दीर्घकालिक विकल्पता प्रयास संयुक्त राष्ट्र किफायती परिवहन के लिए दीर्घकालिक विकल्प विकास लक्ष्यों (एसडीजी) से भी जुड़े हुए हैं, जो वैश्विक किफायती परिवहन के लिए दीर्घकालिक विकल्पता उद्देश्यों में इसके योगदान को रेखांकित करते हैं।

इसके अलावा, यह रिपोर्ट कंपनी अधिनियम 2013 की आवश्यकताओं, भारतीय लेखा मानकों और सेबी विनियमों का पालन करती है, जो पारदर्शिता और कानूनी अनुपालन सुनिश्चित करती है। सीपीसीएल के बीआरएसआर प्रकटीकरण स्वतंत्र आश्वासन से गुजरते हैं, जो रिपोर्ट किए गए ईएसजी डाटा की विश्वसनीयता को बढ़ाते हैं। कंपनी अपने व्यवसाय और हितधारकों के लिए सबसे प्रासंगिक ईएसजी मुद्दों की पहचान करने और उन्हें प्राथमिकता देने के लिए एक भौतिकता मूल्यांकन करती है, जिससे केंद्रित और प्रभावी किफायती परिवहन के लिए दीर्घकालिक विकल्पता प्रयास सुनिश्चित होते हैं। सीपीसीएल निवेशकों, कर्मचारियों, ग्राहकों और समुदायों सहित हितधारकों के साथ सक्रिय रूप से सहकार्य करता है, ताकि उनकी ईएसजी चिंताओं और अपेक्षाओं को समझा और संबोधित किया जा सके।

9. ओवीएल

जैव विविधता संरक्षण

- **एमईसीएल, कोलंबिया:** जीव–जंतुओं और वनस्पतियों पर वास्तविक समय के डाटा को एकत्र करने के लिए, हमने सघन वन पारिस्थितिकी तंत्र के भीतर एक प्रौद्योगिकी–प्रचालित निगरानी परियोजना को लागू किया। बायोसेंसर क्षेत्र के रूप में नामित, यह क्षेत्र हमारे तेल क्षेत्र के आसपास वन्यजीव विविधताओं को ट्रैक करते हुए वन आवरण को संरक्षित और सुरक्षित करने के लिए एक महत्वपूर्ण उपकरण के रूप में कार्य करता है। प्रजातियों की विविधता के संकेतकों की निगरानी करके, हमने, विशेष रूप से पिछले कुछ वर्षों में पक्षियों की आबादी में उल्लेखनीय वृद्धि के साथ, वर्ष 2023 में उत्साहजनक परिणाम प्राप्त किए हैं।
- सीपीओ–5, कोलंबिया: ओएनजीसी विदेश ने कोलंबिया के कैंबुरायो मेटा में अपने सीपीएच स्थान पर स्थानीय गैलापागासलानेरस कछुए की प्रजाति पर एक जागरूकता कार्यक्रम आयोजित किया। प्रजातियों की पहचान, देखभाल और घोंसले की पहचान पर केंद्रित प्रशिक्षण सत्रों के माध्यम से, सभी कर्मचारियों को इस लुप्तप्राय सरीसृप प्रजाति के बारे में बहुमूल्य ज्ञान प्राप्त हुआ। गैलापागासलानेरस, अन्य सभी पोडोक्नेमिस प्रजातियों के साथ, वन्य जीवों और वनस्पतियों की लुप्तप्राय प्रजातियों में अंतर्राष्ट्रीय व्यापार पर कन्वेंशन (सीआईटीईएस 2017) के परिशिष्ट–II के तहत संरक्षित है। ओएनजीसी विदेश पर्यावरण अधिकारियों के निर्देशानुसार सभी गैलापागासलानेरा को सीपीएच स्थान पर उनके आवास में वापस लाने के लिए प्रतिबद्ध है।

पर्यावरण संरक्षण

तेल और गैस उद्योग में एक अग्रणी कंपनी के रूप में, ओएनजीसी विदेश लिमिटेड सुकर्सल कोलम्बियाना ने कार्बन उत्सर्जन और फ्लेयर गैस में कमी के लिए वैकल्पिक परियोजनाओं को लागू किया है। उत्पादित गैस के उपयोग के लिए माइक्रो–टरबाइन स्थापित किया गया है।

सीपीओ–5 क्षेत्र कुछ ड्रिलिंग कूपों के पैड के लिए सौर ऊर्जा आधारित फोटोवोल्टिक आधारित प्रकाश व्यवस्था का उपयोग कर रहा है और ड्रिलिंग गतिविधियों के दौरान प्रभावी उपचार और उसी के पुनः उपयोग के साथ जल खपत को कम कर रहा है।

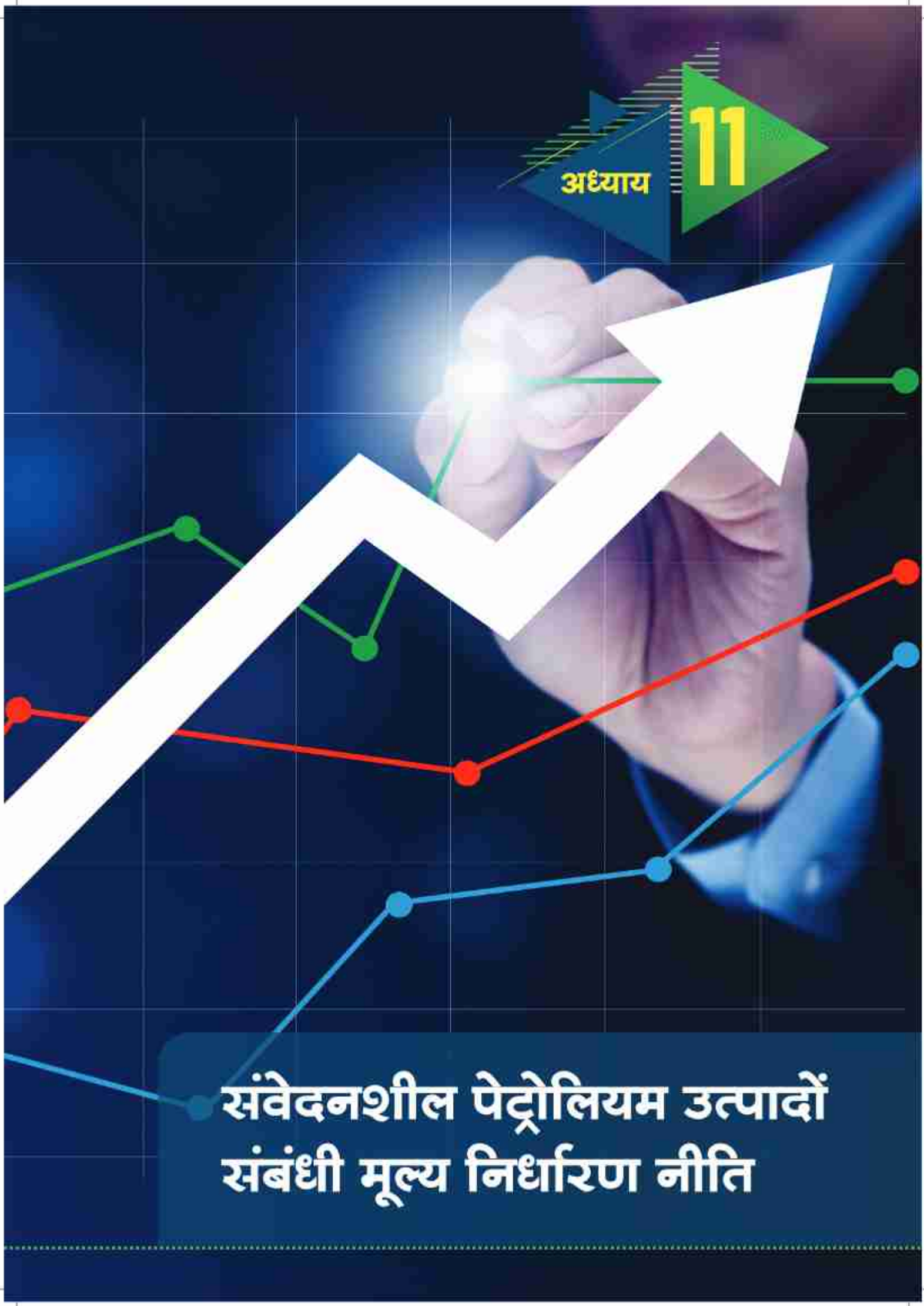
ओएनजीसी विदेश के ईएसजी प्रदर्शन की मुख्य विशेषताएं

पर्यावरण	सामाजिक	अभिशासन
ओएनजीसी विदेश ने कोलंबिया के मानसरोवर एनर्जी कंपनी लिमिटेड (एमईसीएल) में वनस्पति एवं जीव संरक्षण परियोजना के लिए सार्वजनिक क्षेत्र उपक्रम श्रेणी में **रजत पुरस्कार** जीता।	16 प्रोजेक्ट्स और एचक्यू में 60.9 मिलियन मानव कार्य घंटों के लिए 0.07 एलटीआईएफ।	सभी बोर्ड स्तरीय समितियों की अध्यक्षता स्वतंत्र निदेशक कर रहे हैं।
कुल **100%** जल पुनर्चक्रण और पुनः उपयोग	विदेश कर्मचारियों के लिए रिपोर्ट योग्य लोस्ट टाइम इंजरी फ्रीक्वेंसी रेट (आरएलटीआईएफआर)	कोई ग्राहक शिकायत नहीं
सीपीओ–5 कोलंबिया में ओएनजीसी विदेश प्रचालन के लिए एआरएल सुरा कोलंबिया द्वारा एचएसई उत्कृष्टता का प्रमाण पत्र	थरजाथ बेस कैंप के आसपास सीएसडी प्राथमिक स्वास्थ्य देखभाल केंद्रों के माध्यम से प्रति वर्ष 24,000–30,000 रोगियों को चिकित्सा सेवा प्रदान की गई। दक्षिण सूडान में वर्ष के दौरान टीकाकरण और नेत्र चिकित्सा शिविरों का आयोजन किया गया। बैटरी 3, म्यूले वेलास्केज़, कोलंबिया के निकट स्कूलों के लिए अध्ययन सामग्री की आपूर्ति की गई।	ओएनजीसी विदेश के बोर्ड में 2 महिला निदेशक

पर्यावरण	सामाजिक	अभिशासन
एमईसीएल, कोलंबिया में प्रौद्योगिकी के माध्यम से जीव–जंतुओं और वनस्पतियों की निगरानी। हमारे प्रचालन क्षेत्रों के निकट वन्यजीवों की विविधताओं पर नजर रखी गई और वर्ष 2023 के प्राप्त परिणाम उत्साहजनक हैं। पिछले कुछ वर्षों में पक्षियों की प्रजातियों की उपस्थिति में वृद्धि हुई है।	पीओएसएच समिति उपलब्ध है। कर्मचारियों को पीओएसएच के बारे में जागरूक करने के लिए कार्यशालाएं आयोजित की गईं।	
कोलंबिया के सीपीओ–5 में कछुओं की स्थानीय प्रजातियों के बारे में जागरूकता फैलाने के लिए कार्यक्रम प्रचालित किया जा रहा है।	मानव अधिकार नीति तैयार की गई और सार्वजनिक डोमेन पर प्रकाशित की गई।	
	सुरक्षा संस्कृति को बढ़ाने के लिए कॉर्पोरेट सुरक्षा प्रबंधन प्रणाली लागू की गई है	एचएसई गतिविधियों की निगरानी के लिए बोर्ड स्तरीय समिति
	5,041 प्रशिक्षण मानव घंटे तथा प्रति कर्मचारी 20.01 औसत प्रशिक्षण मानव घंटे प्रदान किए गए	







संवेदनशील पेट्रोलियम उत्पादों संबंधी मूल्य निर्धारण नीति

11 संवेदनशील पेट्रोलियम उत्पादों संबंधी मूल्य निर्धारण नीति

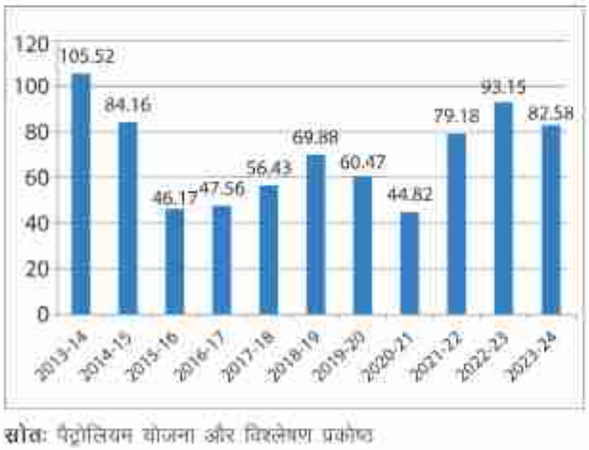
पृष्ठभूमि

11.1. पेट्रोलियम उत्पादों के मूल्य निर्धारण को जुलाई, 1975 से प्रभावी प्रशासित मूल्य तंत्र (एपीएम) के अंतर्गत लाया गया था जब पेट्रोलियम उत्पादों के मूल्य निर्धारण को आयात समता सिद्धांतों से लागत संबंधी सिद्धांतों में स्थानांतरित कर दिया गया था। एपीएम (1975 से 2002) के तहत विभिन्न तेल पूल खातों को इस उद्देश्य से बनाए रखा गया था कि (i) बिक्री मूल्य में स्थिरता सुनिश्चित किया जा सके; (ii) उपभोक्ताओं को अंतर्राष्ट्रीय मूल्यों में उतार-चढ़ाव से बचाया जा सके;और (iii) पेट्रोल, विमानन टर्बाइन ईंधन (एटीएफ) आदि जैसे अन्य उत्पादों से क्रॉस राजसहायता द्वारा सार्वजनिक वितरण के लिए मिट्टी तेल और घरेलू एलपीजी जैसे कतिपय उत्पादों के उपभोक्ता मूल्य में राजसहायता दी जा सके।

11.2. दिनांक 01.04.2002 से एपीएम को समाप्त कर दिया गया और सरकार ने विनिर्दिष्ट फ्लैट दरों पर पीडीएस मिट्टी तेल और घरेलू एलपीजी की बिक्री पर राजसहायता प्रदान करने का निर्णय लिया। इन बजटीय राजसहायता को प्रशासित करने के लिए सरकार ने 'पीडीएस मिट्टी तेल और घरेलू एलपीजी, राजसहायता स्कीम 2002' तैयार किया। इस योजना के तहत, यह निर्णय लिया गया था कि इन राजसहायता को 3–5 वर्षों में समाप्त कर दिया जाएगा।

वर्ष 2013–14 से 2023–24 तक कच्चे तेल की भारतीय रुझान बास्केट की प्रवृत्ति नीचे दी गई है:

कच्चे तेल का रुझान: भारतीय बास्केट $/बीबीएल



स्रोत: पेट्रोलियम योजना और विश्लेषण प्रकोष्ठ

कच्चे तेल का मूल्य निर्धारण

कच्चे तेल का भारतीय बास्केट पिछले वर्ष के तत्काल पूर्व मीठे कच्चे तेल और सोर कच्चे तेल के वास्तविक प्रसंस्करण के अनुपात में भारतीय रिफाइनरियों द्वारा संसाधित कच्चे तेल के औसत दर्शाता है। मीठे कच्चे तेल की कीमत के लिए, बेंचमार्क कच्चे तेल "ब्रेंट" के लिए दैनिक प्लैट्स आकलन पर विचार किया जाता है। सोर कच्चे तेल के लिए बेंचमार्क कच्चे तेल "दुबई" और "ओमान" हेतु औसत प्लेट मूल्यांकन पर विचार किया जाता है। वर्ष 2020–21 के दौरान भारतीय रिफाइनरियों ने 75.62 प्रतिशत सोर कच्चे तेल और 24.38 प्रतिशत मीठे कच्चे तेल का प्रसंस्करण किया।इसलिए, 2021–22 के लिए, कच्चे तेल की भारतीय बास्केट ने प्लैट्स द्वारा "दुबई" और "ओमान" (सोर कच्चा तेल) और "ब्रेंट" (मीठा कच्चा तेल) के बेंचमार्क अंतर्गत औसत के लिए 75:62:24:38 के अनुपात में दैनिक मूल्य दर्शाया।

घरेलू कच्चे तेल उत्पादक कंपनियों को अंतरराष्ट्रीय कच्चे तेल की कीमतों की भी पेशकश की जाती है जो अंतरराष्ट्रीय कच्चे तेल के लिए बेंचमार्क हैं जो उनके कच्चे तेल की कसौटी से मेल खाती हैं। कच्चे तेल का आयात अंतर्राष्ट्रीय मूल्यों पर होता है।

प्राकृतिक गैस

सरकार ने ओएनजीसी/ओआईएल के नामित क्षेत्रों, नई अन्वेषण लाइसेंसिंग नीति (एनईएलपी) ब्लॉकों और पूर्व-एनईएलपी ब्लॉकों, जहां उत्पादन साझाकरण संविदा (पीएससी) में कीमतों के लिए सरकार की मंजूरी का प्रावधान है, से उत्पादित गैस के लिए दिनांक 07.04.2023 की राजपत्र अधिसूचना के माध्यम से संशोधित घरेलू प्राकृतिक गैस मूल्य निर्धारण दिशानिर्देशों को भी मंजूरी दी है। ऐसी प्राकृतिक गैस की कीमत भारतीय क्रूड बास्केट के मासिक औसत का 10% होगी और इसे मासिक आधार पर अधिसूचित किया जाएगा। ओएनजीसी और ओआईएल द्वारा अपने नामांकन ब्लॉकों से उत्पादित गैस के लिए, प्रशासित मूल्य तंत्र (एपीएम) मूल्य क्रमश: $4.0/एमएमबीटीयू और $6.5/एमएमबीटीयू की न्यूनतम और अधिकतम सीमा के अध्यधीन होगा। सुधारों के कारण घरों के लिए पाइप्ड नेचुरल गैस (पीएनजी) और परिवहन के लिए संपीडित प्राकृतिक गैस (सीएनजी) की कीमतों में उल्लेखनीय कमी आई है।

नए मूल्य निर्धारण दिशानिर्देश घरेलू उत्पादन को प्रोत्साहित करने की आवश्यकता के साथ उपभोक्ता हितों को संतुलित करने के सरकार के आशय को दर्शाते हैं और वर्ष 2030 तक भारत के ऊर्जा मिश्रण में प्राकृतिक गैस की हिस्सेदारी को 15% तक बढ़ाने की व्यापक कार्यनीति का हिस्सा हैं।

पेट्रोल और डीजल

1. पेट्रोल और डीजल के मूल्य क्रमश 26 जून, 2010 और 19 अक्टूबर, 2014 से बाजार निर्धारित किए गए और तब से उनके मूल्यों का निर्धारण सरकारी क्षेत्र की तेल विपणन

कंपनियों (ओएमसीज़) नामतः इंडियन आयल कार्पोरेशन लिमिटेड, हिन्दुस्तान पेट्रोलियम कार्पोरेशन लिमिटेड और भारत पेट्रोलियम कार्पोरेशन लिमिटेड द्वारा अंतर्राष्ट्रीय बाजार मूल्यों और अन्य बाजार दशाओं में परिवर्तन के अनुरूप किया जा रहा है।

2. सरकारी क्षेत्र की तेल विपणन कंपनियों (ओएमसीज) ने 16 जून, 2017 से पूरे देश में पेट्रोल और डीज़ल के खुदरा बिक्री मूल्य में दैनिक संशोधन लागू किया। पेट्रोल और डीज़ल के दैनिक मूल्य संशोधन खुदरा कीमतों को वर्तमान बाजार स्थितियों के प्रति अधिक प्रतिबिंबित करते हैं, जिससे पेट्रोल और डीज़ल के खुदरा बिक्री मूल्य में अस्थिरता कम हो जाती है। इसके अलावा, इससे प्रणाली में पारदर्शिता बढ़ती है और रिफाइनरी/डिपो से खुदरा दुकानों तक उत्पादों के सुचारू प्रवाह को सक्षम बनाता है।

वर्ष 2013–14 से दिल्ली में पेट्रोल और डीज़ल के वार्षिक औसत खुदरा बिक्री मूल्य के रुझान निम्नानुसार हैं:



स्रोतः पेट्रोलियम योजना और विश्लेषण प्रकोष्ठ

घरेलू एलपीजी

1. अंतर्राष्ट्रीय तेल मूल्यों में वृद्धि के प्रभाव से आम आदमी को बचाने के लिए सरकार घरेलू एलपीजी के उपभोक्ताओं के लिए प्रभावी मूल्य (प्रत्येक परिवार के लिए प्रति वर्ष 12 सिलेंडरों की सीमा तक) को घटाना जारी रखे हुए है। तथापि, गैर–राजसहायता प्राप्त घरेलू एलपीजी के मूल्यों का निर्धारण ओएमसीज द्वारा अंतर्राष्ट्रीय बाजारों में परिवर्तनों के अनुरूप किया जाता है।

2. 1 जनवरी, 2015 से "पहल (डीबीटीएल) योजना 2014" पूरे देश में लागू की गई है, जिसमें घरेलू एलपीजी पर राजसहायता पात्र उपभोक्ताओं को सीधे उनके बैंक खातों में हस्तांतरित की जा रही है।

   सरकार प्रधानमंत्री उज्ज्वला योजना (पीएमयूवाई) के लाभार्थियों को प्रति वर्ष 12 रिफिल तक 14.2 किलोग्राम एलपीजी सिलेंडर पर ₹300 की लक्षित राजसहायता भी प्रदान कर रही है। दिनांक 31.03.2024 तक, लक्षित राजसहायता के बाद, पीएमयूवाई उपभोक्ताओं के लिए घरेलू एलपीजी की प्रभावी लागत ₹503 प्रति 14.2 किलोग्राम एलपीजी सिलेंडर (दिल्ली में) है।

पीडीएस कैरोसीन

1 मार्च, 2020 से प्रभावी पीडीएस कैरोसीन का खुदरा बिक्री मूल्य अखिल भारतीय आधार पर शून्य अंडर–रिकवरी स्तर पर बनाए रखा जा रहा है।

राज सहायता

वर्ष 2017–18 से पेट्रोलियम उत्पादों और प्राकृतिक गैस पर कुल राजसहायता/अंडर रिकवरी निम्नानुसार है:

(₹ करोड़ में)

विवरण	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24 (पी)
कैरोसीन							
पीडीएस कैरोसीन पर कुल अंडर–रिकवरी	4,672	5,950	1,833	-	-	-	-
एलपीजी							
एलपीजी (डीबीएलटी) राजसहायता के लिए प्रत्यक्ष लाभ अंतरण (क)	20,905	31,539	22,726	3,658	242	855	1,227
प्रधान मंत्री उज्ज्वला योजना (पीएमयूवाई) राजसहायता* (ख)	2,559	5,670	1,446	76	1,569	6,110	10,217
प्रधान मंत्री गरीब कल्याण पैकेज (पीएमजीकेपी) राजसहायता (ग)	-	-	-	8,162	-	-	-
घरेलू एलपीजी पर कुल राजसहायता (क+ख+ग)	**23,464**	**37,209**	**24,172**	**11,896**	**1,811**	**6,965**	**11,444**

*लक्षित राजसहायता शामिल है

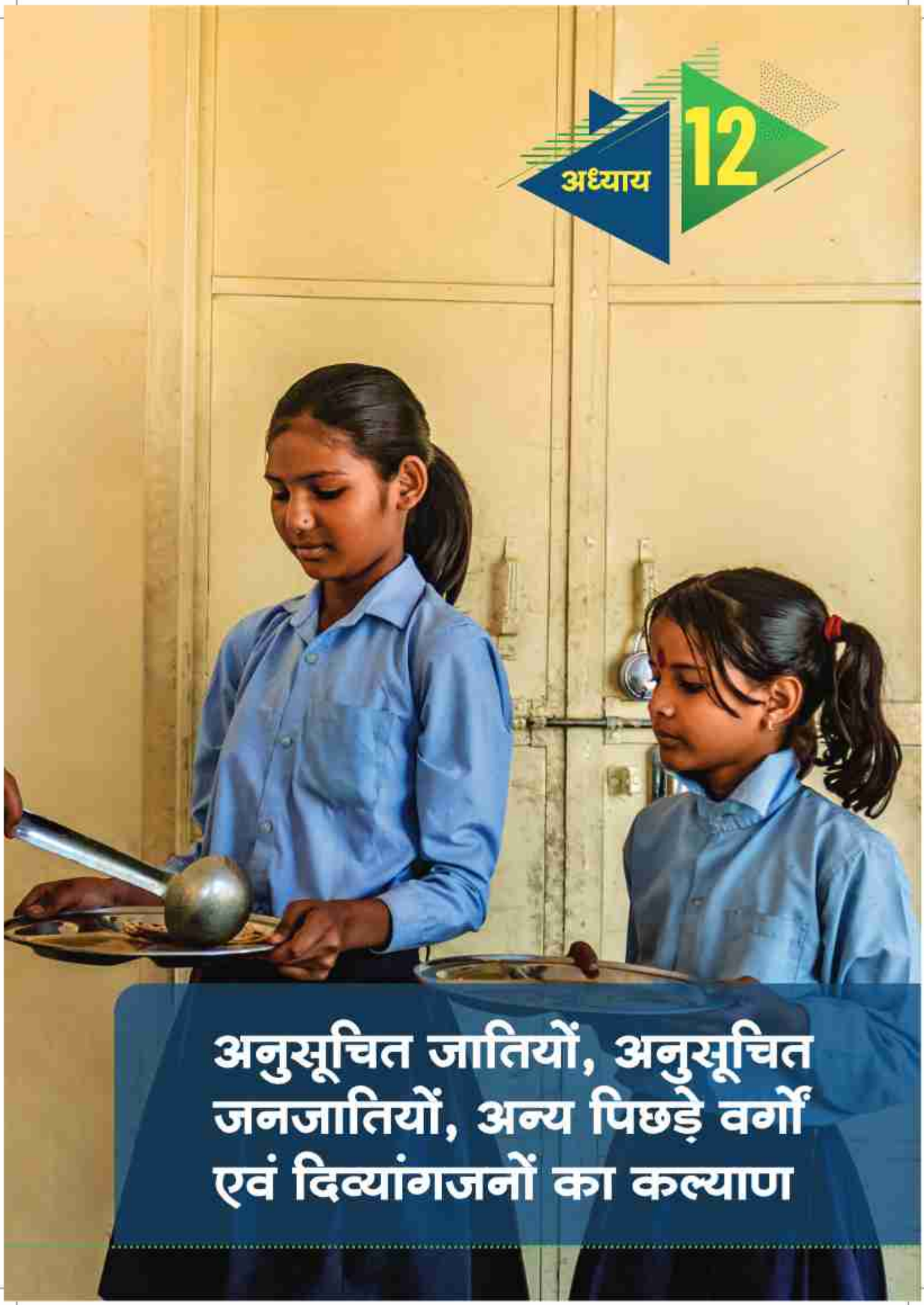
स्रोतः पेट्रोलियम योजना एवं विश्लेषण प्रकोष्ठ

(पी): अनंतिम

गैर–राजसहायता वाले घरेलू एलपीजी की कीमतें अंतर्राष्ट्रीय बाजारों में होने वाले परिवर्तनों के अनुरूप तेल विपणन कंपनियों द्वारा स्वयं निर्धारित की जाती हैं।


AKSHAYA
PATRA
IndianOil

अध्याय 12



अनुसूचित जातियों, अनुसूचित जनजातियों, अन्य पिछड़े वर्गों एवं दिव्यांगजनों का कल्याण

12 अनुसूचित जातियों, अनुसूचित जनजातियों, अन्य पिछड़े वर्गों एवं दिव्यांगजनों का कल्याण

12.1. कार्मिक एवं प्रशिक्षण विभाग, लोक उद्यम विभाग, सामाजिक न्याय और अधिकारिता मंत्रालय तथा जनजातीय कार्य मंत्रालय द्वारा समय-समय पर अनुसूचित जातियों, अनुसूचित जनजातियों, अन्य पिछड़े वर्गों और दिव्यांगजनों के लिए आरक्षण के संबंध में जारी दिशा-निर्देश पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय और इस मंत्रालय के प्रशासनिक नियंत्रणाधीन सार्वजनिक क्षेत्र के उपक्रमों (पीएसयू) में कार्यान्वित किए जा रहे हैं। इस मंत्रालय का एससीटी प्रकोष्ठ मंत्रालय के साथ-साथ इस मंत्रालय के प्रशासनिक क्षेत्राधिकार के अंतर्गत आने वाले सार्वजनिक क्षेत्र के उपक्रमों और अन्य संगठनों में आरक्षण नीतियों के कार्यान्वयन की निगरानी करता है। सार्वजनिक क्षेत्र के उपक्रमों ने अनुसूचित जातियों, अनुसूचित जनजातियों, अन्य पिछड़े वर्गों, ईडब्ल्यूएस, ईएसएम और दिव्यांगजनों (पीडब्ल्यूडी) कर्मचारियों के हितों की रक्षा करने और उनकी शिकायतों का निवारण करने के लिए अपने मुख्य संपर्क अधिकारियों की देखरेख में कार्यान्वयन प्रकोष्ठों का भी गठन किया है। सार्वजनिक क्षेत्र के उपक्रमों के संपर्क अधिकारी राष्ट्रपति के निर्देशों के कार्यान्वयन के साथ-साथ इस विषय पर समय-समय पर जारी भारत सरकार के विभिन्न आदेशों के कार्यान्वयन को सुनिश्चित करने के लिए उत्तरदायी हैं। संसद सदस्यों, राष्ट्रीय अनुसूचित जातियों और अनुसूचित जनजातियों के आयोग तथा राष्ट्रीय अन्य पिछड़े वर्ग आयोग के माध्यम से प्राप्त सार्वजनिक क्षेत्र के उपक्रमों के अनुसूचित जातियों, अनुसूचित जनजातियों, अन्य पिछड़े वर्गों, ईडब्ल्यूएस, ईएसएम और दिव्यांग कर्मचारियों की शिकायतों पर उपचारात्मक कार्रवाई की जाती है। मंत्रालय द्वारा अ. जा., अ.ज.जा., अपिव, ईडब्ल्यूएस और दिव्यांगजनों की नियुक्ति की स्थिति की निगरानी पीएसयू द्वारा दी गई रिपोर्ट के माध्यम से की जाती है।

12.2. सेवारत अनुसूचित जातियों/अनुसूचित जनजातियों के लिए आरक्षण वाली कल्याण संबंधी संसदीय समिति की टिप्पणियों के अनुसरण में, इस मंत्रालय के मुख्य संपर्क अधिकारी के नेतृत्व में एक दल सार्वजनिक क्षेत्र के उपक्रमों की इकाइयों द्वारा रखे जाने वाले आरक्षण रोस्टरों का वार्षिक रूप से निरीक्षण करता है।

12.3. अनुसूचित जाति/अनुसूचित जनजाति/अन्य पिछड़ा वर्ग/पीडब्ल्यूडी कर्मचारियों पर विशेष ध्यान देते हुए मंत्रालय के अधीन तेल एवं गैस पीएसयू द्वारा विभिन्न कार्यकलाप शुरू किए गए हैं, सीएसआर पहल/योजनाओं में अनुसूचित जाति/अनुसूचित जनजाति/अन्य पिछड़ा वर्ग समुदाय को प्रभावी ढंग से ध्यान में रखा जा रहा है।

12.4. दिव्यांगजनों (पीडब्ल्यूडी) के लिए विशेष भर्ती अभियान।

माननीय उच्चतम न्यायालय ने दिनांक 28.04.2015 को नेशनल फेडरेशन ऑफ ब्लाइंड द्वारा सीए संख्या 9096/2013 में दायर अवमानना याचिका संख्या 499/2014 में दिव्यांगजनों के पदों को भरने का आदेश दिया। इस मामले की निगरानी डीओपीटी द्वारा की जा रही है। पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय और इस मंत्रालय के प्रशासनिक नियंत्रण के तहत पीएसयू में 359 पदों की पहचान की गई थी। 31.12.2024 तक दिव्यांगजनों के लिए रिक्तियों को भरने की स्थिति निम्नानुसार है:

क्र.सं.	चरण-वार ब्योरा	पद
1.	माननीय उच्चतम न्यायालय को सूचित मंत्रालय और तेल पीएसयू में पदों की संख्या	359
2.	पहले से भरे गए पदों की संख्या	326
3.	भरे जाने वाले शेष पद	33

31.12.2024 की स्थिति के अनुसार मंत्रालय के प्रशासनिक नियंत्रणाधीन तेल कंपनियों में अ.जा./अ.ज.जा./अपिव/दिव्यांग हेतु बैकलॉग

पीएसयू/ पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय	अ.जा., अ.ज.जा., अपिव और दिव्यांगजनों के संबंध में बैकलॉग रिक्तियों (सीधी भर्ती) की संख्या															
	समूह क				समूह ख				समूह ग*				समूह घ*			
	अ.जा.	अ.ज.जा.	अपिव	दिव्यांगजन	अ.जा.	अ.ज.जा.	अपिव	दिव्यांगजन	अ.जा.	अ.ज.जा.	अपिव	दिव्यांगजन	अ.जा.	अ.ज.जा.	अपिव	दिव्यांगजन
एमआरपीएल	इस मंत्रालय में इसका ब्यौरा नहीं रखा जाता है।				शून्य	शून्य	शून्य	शून्य	0	2	0	0	लागू नहीं			
एचपीसीएल	शून्य	शून्य	शून्य	शून्य	शून्य	1	शून्य	1	1	शून्य	2	8	शून्य	शून्य	शून्य	शून्य
आरजीआईपीटी	0	0	1***	0	0	0	0	0	0	1***	1***	0	लागू नहीं	लागू नहीं	लागू नहीं	लागू नहीं
एचपीसीएल	0	0	0	8	--	--	--	--	0	0	0	0	--	--	--	--
आईआईपी	वर्तमान में सीधी भर्ती के लिए आईआईपीई में कोई बैकलॉग रिक्तियां नहीं है।															
एमआरपीएल	7	4	11	5	*	*	*	*	-	-	1	3	*	*	*	*
ओएनजीसी	36	37	67	22	यह प्रवेश स्तर नहीं है				31	41	64	85	04	01	09	07
बीओआरएल	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य
बीपीसीएल	शून्य	5	30	23	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य	शून्य
एचआरएल	0	0	0	0	लागू नहीं	लागू नहीं	लागू नहीं	लागू नहीं	0	0	0	0	0	0	0	0
आईओसीएल	18	27	42	62	इस समूह में कोई भर्ती नहीं की गई				3	8	14	84	3	2	3	33
सीआईएसी	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ओआरएल	1	0	2	1	0	0	0	1	7	6	15	16	लागू नहीं	लागू नहीं	लागू नहीं	लागू नहीं
गेल	19	19	18	28	01	03	01	06	33	24	44	21	-	-	-	-
सीजीसीएल	02	0	12	16	0	0	0	0	0	0	0	0	0	0	0	0
ईआईएल	7	1	2	3	-	-	-	1	1	2	-	2	-	-	-	-

आरजीआईपीटी ***केवल प्रशासनिक कर्मचारी कैडर

एचपीसीएल *एचपीसीएल में समूह 'ख' और 'घ' के तहत वर्गीकृत कोई पद नहीं है क्योंकि गैर–प्रबंधन ग्रेड में प्रविष्टि को समूह 'ग' में पुनर्वर्गीकृत किया गया है।

एमआरपीएल *एमआरपीएल में समूह 'ख' और 'घ' में कोई सीधी भर्ती नहीं है।

टिप्पणी: उपरोक्त बैकलॉग रिक्तियां प्रवेश स्तर पर हैं जहां आम तौर पर भर्तियां की जाती हैं।

समूह 'क' – अ.जा. में 7 रिक्तियों में से 6 रिक्तियों को पहले ही वर्ष 2024 में फिर से विज्ञापित किया जा चुका है और भर्ती प्रगति पर है। सभी 4 अ.ज.जा. रिक्तियों को पहले ही वर्ष 2024 में फिर से विज्ञापित किया जा चुका है और भर्ती प्रगति पर है।

अ.पि.व. में 11 रिक्तियों में से 9 रिक्तियों को पहले ही वर्ष 2024 में फिर से विज्ञापित किया जा चुका है और भर्ती प्रगति पर है। पीडब्ल्यूबीडी में 5 रिक्तियों में से 3 रिक्तियों को पहले ही वर्ष 2024 में फिर से विज्ञापित किया जा चुका है और भर्ती प्रगति पर है।

अ.पि.व. में **समूह 'ग'**–1 की रिक्ति वर्ष 2023 में पहले ही फिर से विज्ञापित की जा चुकी है और भर्ती प्रक्रिया जारी है।

पीडब्ल्यूबीडी में 2 रिक्तियों को वर्ष 2023 में पहले ही फिर से विज्ञापित किया जा चुका है और भर्ती प्रक्रिया जारी है।

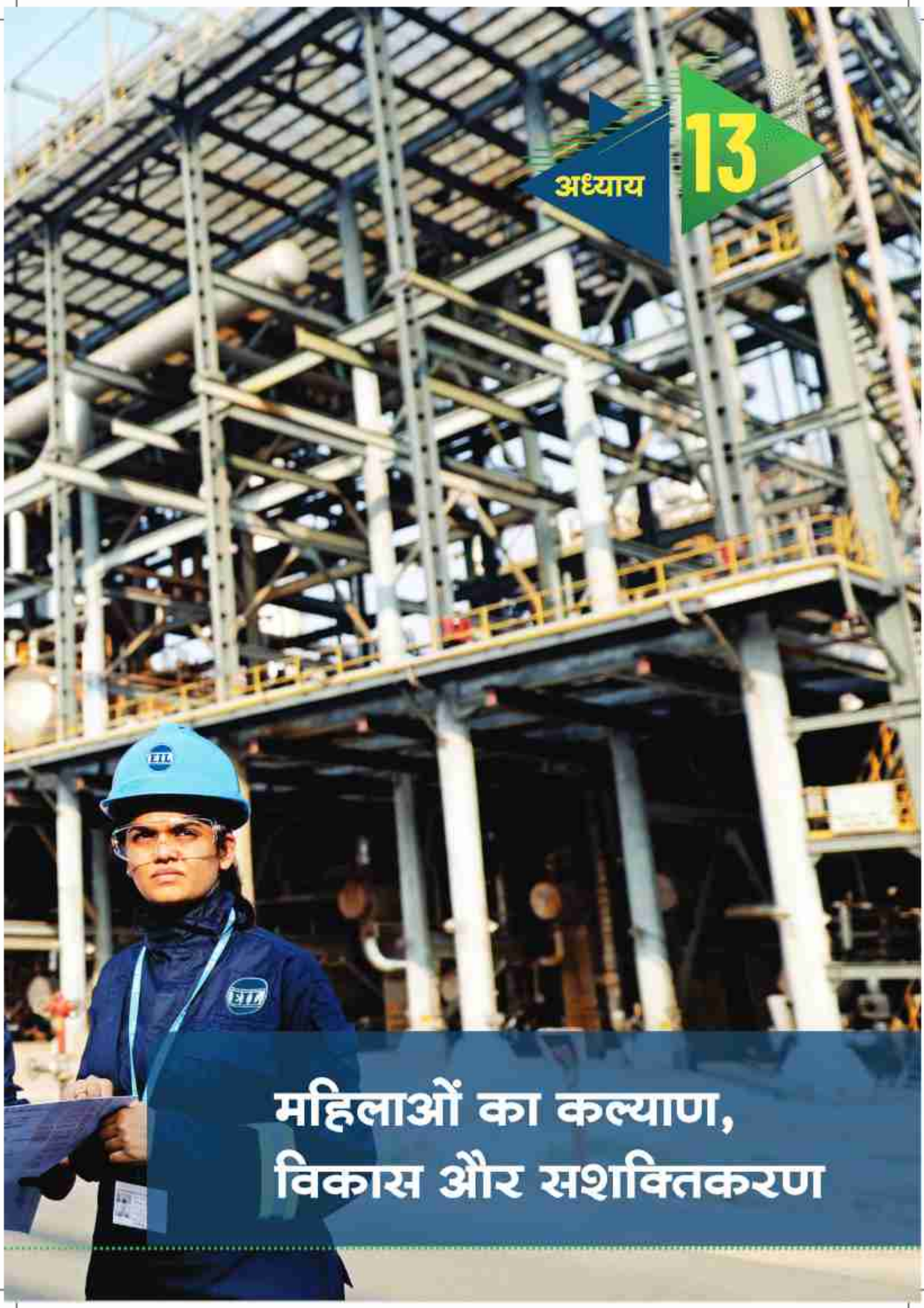
ओएनजीसी ***टिप्पणी:**

(1) ओएनजीसी में इस तरह की कोई बैकलॉग रिक्तियां नहीं है। हालांकि, पिछली भर्ती प्रक्रिया में खाली रह गई रिक्तियों को बाद की भर्ती प्रक्रिया में अग्रेणीत किया जाता है।

समूह 'ग' की 63 रिक्तियां और समूह 'घ' की 11 रिक्तियां आंध्र प्रदेश की है, जो वर्ष 2014–15 से न्यायालयी मामले के कारण रुकी हुई है।

एनआरएल ***एनआरएल** में आरक्षित रिक्तियों की कमी है, लेकिन कोई बैकलॉग नहीं है। एनआरएल आगामी भर्ती प्रक्रिया में इन कमियों को दूर करने का पूरा प्रयास कर रहा है।





अध्याय 13

महिलाओं का कल्याण, विकास और सशक्तिकरण

13 महिलाओं का कल्याण, विकास और सशक्तिकरण

13.1. पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय तथा इस मंत्रालय के प्रशासनिक नियंत्रणाधीन सार्वजनिक क्षेत्र के उपक्रम/संगठन महिला कर्मचारियों के कल्याण और सशक्तिकरण की दिशा में कई पहल कर रहे हैं। स्त्री–पुरुष संवेदनशीलता से निपटने और महिला सशक्तिकरण को बढ़ावा देने की दृष्टि से, उनके व्यावसायिक विकास और कल्याण गतिविधियों पर ध्यान केंद्रित करते हुए विशेष कार्यक्रम आयोजित किए जाते हैं। इनमें बाह्य और आंतरिक प्रशिक्षण, महिला स्वास्थ्य संबंधी कार्यक्रम, सार्वजनिक क्षेत्र में महिलाओं के मंच की राष्ट्रीय बैठक में भाग लेने के लिए उन्हें प्रायोजित करना आदि शामिल है।

महिला कर्मचारियों के हितों को देखने के लिए पीएसयू में महिला मंच का गठन किया गया है। राष्ट्रीय महिला आयोग द्वारा तैयार की गई 'क्या करें और क्या न करें' की सूची सभी कर्मचारियों के ध्यानार्थ प्रचालित की गई। कार्यस्थलों पर यौन उत्पीड़न की शिकायतों के निवारण के लिए समितियों का गठन किया गया है।

अनुलग्नक-II

तेल पीएसयू में 31.12.2024 की स्थिति के अनुसार कुल कर्मचारियों की संख्या की तुलना में महिला कर्मचारियों की संख्या:

क्र.सं.	पीएसयू का नाम/एमओपीएनजी	कर्मचारियों की कुल संख्या	महिला कर्मचारियों की कुल संख्या
1.	पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय	231	56
2.	सीपीसीएल	1422	75
3.	आरजीआईपीटी	107	15
4.	एचपीसीएल	8154	847
5.	आईआईपीई	47	5
6.	एमआरपीएल	2548	229
7.	ओएनजीसी	25847	2043
8.	बीएलएल	863	97
9.	बीपीसीएल	8508	674
10.	एनआरएल	1063	82
11.	आईओसीएल	30349	2731
12.	ओआईडीबी	12	4
13.	ओआईएल	6492	496
14.	गेल	5038	344
15.	बीसीपीएल	625	53
16.	ईआईएल	2646	307

13.2. विशाखा बनाम राजस्थान राज्य के मामले में माननीय उच्चतम न्यायालय द्वारा निर्धारित दिशा–निर्देशों और कार्मिक एवं प्रशिक्षण विभाग/महिला एवं बाल विकास मंत्रालय द्वारा जारी आदेशों के अनुरूप कामकाजी महिलाओं के यौन उत्पीड़न की शिकायतों की रोकथाम और निवारण के लिए मंत्रालय में एक आंतरिक शिकायत समिति (महिला प्रकोष्ठ) का गठन किया गया है। वर्तमान में श्रीमती सुजाता शर्मा, संयुक्त सचिव, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय इस समिति की अध्यक्ष हैं, जिसमें एनजीओ के एक सदस्य सहित चार अन्य सदस्य हैं। समिति नियमित अंतराल पर अपनी बैठकें आयोजित करती है।

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IndianOil Stree Shakti

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असम ऑयल कॉलेज ऑफ नर्सिंग & असम ऑयल स्कूल ऑफ

Assam Oil College of Nursing & Assam Oil School

Digboi, Assam - 786171

Established in 1986

B.Sc. (N) Course affiliated to Srimanta Sankardeva University of Health Sciences, Guwahati. I Recognised by A





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A Navratna Company

अध्याय 14

उपक्रम/संगठन

14 उपक्रम/संगठन

14.1. महारत्न कंपनी

14.1.1. इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल)



इंडियन ऑयल भारत की एक ऐसी ऊर्जा है जो तेल, गैस, पेट्रो रसायन और वैकल्पिक ऊर्जा स्रोतों की लगभग सभी धाराओं को समाहित करने वाली विविधीकृत, एकीकृत ऊर्जा प्रमुख है। ब्रांड इंडियनऑयल उच्च क्षमता वाले लोगों और अत्याधुनिक तकनीकों का लाभ उठाता है ताकि सभी प्रकार की ऊर्जा का जिम्मेदारी से दोहन किया जा सके और उन्हें उपभोक्ताओं तक किफायती दरों पर पहुँचाया जा सके। यह फॉर्च्यून ग्लोबल 500–2023 सूची (रैंक 94) में भारत का सर्वोच्च रैंक वाला ऊर्जा पीएसयू है।

इंडियन ऑयल के व्यावसायिक रूचि में रिफाइनिंग से लेकर संपूर्ण हाइड्रोकार्बन मूल्य श्रृंखला, कच्चे तेल और गैस की खोज और उत्पादन के लिए पाइपलाइन परिवहन और विपणन, पेट्रोरसायन, गैस विपणन, वैकल्पिक ऊर्जा स्रोतों और अनुप्रवाह संचालन के वैश्वीकरण शामिल है। इस ब्रांड की वैश्विक आकांक्षाओं को श्रीलंका, मॉरीशस, संयुक्त अरब अमीरात और अन्य देशों में इंडियन ऑयल के व्यापारिक प्रयासों के माध्यम से पूरा किया जाता है।

14.1.1.1. वित्तीय निष्पादन:

इंडियन ऑयल का कारोबार (प्रचालन से राजस्व) अप्रैल 2022–मार्च 2023 में ₹ 9,34,953 करोड़ की तुलना में अप्रैल 2023–मार्च 2024 में 7% (₹ 68,608 करोड़) घटकर ₹ 8,66,345 करोड़ हो गया। अप्रैल 2023–मार्च 2024 के दौरान, इंडियन ऑयल को ₹ 39,619 करोड़ का निवल लाभ हुआ, जबकि अप्रैल 2022–मार्च 2023 के दौरान यह ₹ 8,242 करोड़ था और इसका मुख्य कारण वर्तमान अवधि के उच्च विपणन मार्जिन है। जीआरएम अप्रैल 2022–मार्च 2023 के दौरान 19.52 अमेरिकी डॉलर प्रति बैरल की तुलना में अप्रैल 2023–मार्च 2024 के दौरान 12.05 अमेरिकी डॉलर प्रति बैरल रहा।

14.1.1.2. राजकोष में योगदान:

पिछले कुछ वर्षों में इंडियन ऑयल शुल्कों, करों और लाभांश के रूप में सरकारी खजाने में सबसे बड़ा योगदानकर्ता रहा है। अप्रैल 2023–मार्च 2024 के दौरान सरकारी खजाने में ₹ 2,41,629 करोड़ का भुगतान किया गया, जबकि अप्रैल 2022–मार्च 2023 के दौरान ₹ 2,40,185 करोड़ का भुगतान किया गया था। 23 अप्रैल–मार्च 2024 के दौरान केंद्रीय राजकोष को ₹ 1,21,171 करोड़ और राज्यों के राजकोष को ₹ 1,20,458 करोड़ का भुगतान किया गया, जबकि अप्रैल 2022–मार्च 2023 के दौरान क्रमशः ₹ 1,16,271 करोड़ और ₹ 1,23,914 करोड़ का भुगतान किया गया था।

14.1.1.3. रिफाइनरी संबंधी निष्पादन:

आईओसीएल के रिफाइनरियों ने वित्त वर्ष 2023–24 में अब तक का सबसे अधिक 73.3 एमएमटी कच्चा तेल और अब तक का सबसे अधिक 3.1 एमएमटी नैफ्था संसाधित किया है, जबकि पिछले वित्त वर्ष 2022–23 में 72.4 एमएमटी कच्चा तेल और 2.1 एमएमटी नैफ्था संसाधित किया गया था। आईओसीएल रिफाइनरियों की डिस्टिलेट उपज भी वित्त वर्ष 2022–23 में 78.7% से बढ़कर वित्त वर्ष 2023–24 में 79.3% हो गई।

प्रचालन उपलब्धता (ओए) के संबंध में, आईओसीएल वित्त वर्ष 2023–24 में 97.3% पर है (पिछले वर्ष 98.1%) और विशिष्ट ऊर्जा खपत (एमबीएन) के संबंध में (कम एमबीएन उच्च ऊर्जा दक्षता को दर्शाता है), आईओसीएल रिफाइनरियों ने वित्त वर्ष 2022–23 में 68.0 एमबीएन की तुलना में वित्त वर्ष 2023–24 में 68.9 एमबीएन हासिल किया है।

'आत्मनिर्भर भारत' पहल को प्रमुख उत्पादों की शुरूआत और संयंत्र की स्थापना द्वारा और भी बेहतर तरीके से दर्शाया गया है। उल्लेखनीय शुरूआत में वाहन परीक्षण और अंशांकन के लिए भारत का पहला रेफरेंस गैसोलीन (ई10, ई20) और डीजल ईंधन (बी7), गैर–एथेनॉल एक्सपी 100 और एशियाई रोड रेसिंग चैंपियनशिप के लिए स्टॉर्म–एफआईएम अनुरूप कैट 2 ईंधन शामिल हैं। इंडियन ऑयल रेफरेंस फ्यूल बनाने वाली दुनिया की 3 कंपनियों में से एक है।

14.1.1.4. पाइपलाइन संबंधी निष्पादन:

वित्त वर्ष 2023–24 के दौरान, कच्चे तेल की पाइपलाइनों ने वित्त वर्ष 2022–23 के दौरान 53.4 एमएमटी की तुलना में 51.8 एमएमटी का थ्रूपुट हासिल किया और उत्पाद पाइपलाइनों ने वित्त वर्ष

2023–24 में 44.0 एमएमटी का थ्रूपुट हासिल किया, जबकि वित्त वर्ष 2022–23 के दौरान यह 41.7 एमएमटी था। इसके अतिरिक्त, गैस पाइपलाइनों ने वित्त वर्ष 2023–24 में 3,717 एमएमएससीएम का थ्रूपुट हासिल किया, जबकि वर्ष 2022–23 के दौरान यह 3,077 एमएमएससीएम था।

वित्त वर्ष 2023–24 के दौरान अंतर– देश नेटवर्क में 2,180 किलोमीटर की वृद्धि करते हुए इंडियन ऑयल ने अपने पाइपलाइन नेटवर्क को विस्तार करना जारी रखा और कच्चे तेल और उत्पाद पाइपलाइनों के लिए प्रति वर्ष 124.4 मिलियन टन संसाधन और गैस पाइपलाइनों के लिए 48.73 एमएमएससीएमडी की संयुक्त थ्रूपुट क्षमता सहित 19,744 किलोमीटर का महत्वपूर्ण उपलब्धि प्राप्त कर ली हैं।

14.1.1.5. विपणन निष्पादन:

वर्ष 2023–24 के दौरान 87.32 एमएमटी की घरेलू पीओएल बिक्री (सीएनजी और एलएनजी को छोड़कर और स्वयं के उपयोग सहित) हुई है, जबकि पिछले वर्ष 2022–23 की इसी अवधि में 87.16 एमएमटी घरेलू पीओएल बिक्री हुई थी।

इंडियन ऑयल ने अपने खुदरा दुकानों के माध्यम से प्रतिदिन लगभग 2.85 करोड़ ग्राहकों को सेवा प्रदान की और वित्त वर्ष 2023–24 के दौरान प्रतिदिन 22 लाख से अधिक घरेलू एलपीजी सिलेंडर वितरित किए, जिससे भारत की ऊर्जा आवश्यकता पूरी हुई। वित्त वर्ष 2023–24 के दौरान, इंडियन ऑयल ने 1,260 खुदरा दुकानों (आरओ) को शुरू किया, जो किसी भी ओएमसी में सबसे अधिक है। नए युग के ईंधन के चलन को बढ़ावा देने के लिए, इंडियन ऑयल ने वित्त वर्ष 2023–24 के दौरान डीजल के लिए 26 डोर–टू–डोर डिलीवरी मोबाइल डिस्पेंसर भी शुरू किए हैं, जिससे इसकी कुल संख्या 1,187 हो गई है।

31 मार्च 2024 तक, एक्स्ट्राग्रीन डीजल उत्पाद पूरे भारत में 6,948 आरओ के माध्यम से बेचा जा रहा है। भारत का पहला सुपर प्रीमियम पेट्रोल एक्सपी100, जिसका ऑक्टेन मूल्य 100 है, 98 नगरों में 201 आरओ के माध्यम से बेचा जा रहा है। साथ ही, एक्सपी95 (95 ऑक्टेन प्रीमियम पेट्रोल) पूरे भारत में 11,243 आरओ के माध्यम से बेचा जा रहा है।

वैकल्पिक ईंधन को बढ़ावा देने के लिए, इंडियन ऑयल ने वित्त वर्ष 2023–24 के दौरान 322 नए सीएनजी, 40 कम्प्रेस्ड बायोगैस (सीबीजी), 3,500 इलेक्ट्रिक वाहन (ईवी) चार्जिंग और 12 बैटरी स्वैपिंग स्टेशन शुरू की हैं।

इंडियन ऑयल वर्तमान में देश में 2,110 सीएनजी, 85 सीबीजी, 8,598 ईवी चार्जिंग और 87 बैटरी स्वैपिंग स्टेशन प्रचालित कर रहा है।

इंडियन ऑयल ने वित्त वर्ष 2023–24 के दौरान 14.1 एमएमटी की कुल एलपीजी बिक्री की है और उज्ज्वला 2.0 योजना के अंतर्गत लगभग 37.5 लाख सहित 54.0 लाख से अधिक नए एलपीजी कनेक्शन दिए हैं। सेवाओं में ग्राहकों की पहुँच और ग्राहकों की संतुष्टि में सुधार करने के लिए, इंडियन ऑयल ने 44 नए एलपीजी डिस्ट्रीब्यूटरशिप शुरू किए, जिससे दिनांक 31.03.2024 तक उनकी कुल संख्या 12,880 हो गई। वित्त वर्ष 2023–24 के दौरान 5 किग्रा निःशुल्क व्यापार एलपीजी (एफटीएल) सिलेंडर, 50 लाख से अधिक "छोटू" सिलेंडरों की बिक्री हुई है और इसमें 53.8% की वृद्धि हुई है। इसके अतिरिक्त, वित्त वर्ष 2023–24 के दौरान, 4.5 लाख से अधिक इंडेन कम्पोजिट सिलेंडर भी ग्राहकों को बेचे गए, जिन्हें 5 किलोग्राम और 10 किलोग्राम की इकाइयों में शुरू किया गया, ताकि ग्राहकों को नए जमाने का और हल्का एलपीजी सिलेंडर उपलब्ध कराया जा सके।

विमानन क्षेत्र में भी, इंडियन ऑयल ने वित्त वर्ष 2023–24 के दौरान 4.8 एमएमटी की ईंधन बिक्री करके 58% की बाजार हिस्सेदारी सहित अपनी अग्रणी स्थिति बनाए रखी। इंडियन ऑयल ने वर्ष के दौरान अयोध्या में एक नया एएफएस शुरू किया, जिससे दिनांक 31.03.2024 तक देश में इंडियन ऑयल द्वारा स्थापित एएफएस की कुल संख्या 129 हो गई।

14.1.1.6. अनुसंधान और विकास (आरएंडडी)

इंडियन ऑयल आरएंडडी घरेलू प्रौद्योगिकियों को विकसित करके, आयात निर्भरता को कम करके और भविष्य के संधारणीयता को आकार देकर आत्मनिर्भरता की ओर अग्रसर है। वित्त वर्ष 2023–24 में आरएंडडी की उपलब्धियों में पानीपत रिफाइनरी में उत्प्रेरक विनिर्माण संयंत्र शुरू करना और आयात के स्थान पर संदर्भ गैसोलीन और प्रीमियम रेसिंग ईंधन 'स्टॉर्म' जैसे विशिष्ट उत्पादों के लिए घरेलू उत्पादन को सक्षम करना शामिल है। आत्मनिर्भर भारत पर ध्यान केंद्रित करते हुए, पहली बार इन–हाउस विकसित निरीक्षण गेज का उपयोग करके 2,711 किलोमीटर तेल पाइपलाइनों का निरीक्षण किया गया। इसके अतिरिक्त, वर्ष के दौरान 125 से अधिक ल्यूब फॉर्मूलेशन जारी किए गए और 45 से अधिक ओईएम अनुमोदन प्राप्त की गईं। पर्यावरण के प्रति प्रतिबद्धता का निष्पादन करते हुए, इंडियन ऑयल आरएंडडी ने संबर्धित ऊर्जा दक्षता के लिए एंजाइम–सहायता प्राप्त सीओ2, कैप्चर प्रौद्योगिकी 'ईसीओ2 एसओआरबी' का सफलतापूर्वक परीक्षण किया। हरित संरक्षण का नेतृत्व करते हुए, आरएंडडी ने केंद्र द्वारा प्रचालित परियोजना के हिस्से के रूप में पहली हरित हाइड्रोजन ईंधन सेल बस का उद्घाटन किया गया। नवाचार को बढ़ावा देते हुए, इंडियन

ऑयल स्टार्टअप योजना, जो वर्तमान में 75 से अधिक आईपीआर प्रदान करने वाली 36 परियोजनाओं को विकसित कर रही है, को एक और मुक्त नवोन्मेष दौर के माध्यम से 6 और स्टार्टअप के चयन सहित आगे बढ़ाया गया है। दर्ज 1,736 और 1,636 प्रभावी पेटेंट को सुदृढ़ पेटेंट पोर्टफोलियो द्वारा सुदृढ़ करते हुए, इंडियन ऑयल आरएंडडी नैनोटेक्नोलॉजी, सौर, जैव ऊर्जा और हाइड्रोजन ईंधन सेल जैसे उभरते क्षेत्रों में काम करते हुए नवाचार और राष्ट्र प्रथम के मूल मूल्य को सुदृढ़ करते हुए आगे बढ़ रहा है, जिसमें मौजूदा अनुसंधान और नियोजन सुविधाएं शामिल हैं, और आने वाले नए ऊर्जा परिसर हेतु फरीदाबाद में भविष्य के संधारणीय के लिए एक परिसर की स्थापना की जा रही है।

14.1.1.7. पेट्रोरसायन निष्पादन:

इंडियन ऑयल देश की दूसरी सबसे बडी पेट्रोरसायन कंपनी है, जो पॉलिमर (पॉलीइथिलीन) और पॉलीप्रोपाइलीन), लीनियर अल्काइल बेंजीन (एलएबी), शुद्ध टेरेफथेलिक एसिड (पीटीए), ग्लाइकोल और ब्यूटाडीन प्रदान करती है। ब्रांड, प्रोपेल, भारतीय पेट्रोकेमिकल्स बाजार में अग्रणी ब्रांड है।

वर्ष 2023–24 के दौरान, निर्यात सहित पेट्रोरसायन की बिक्री 2.9 एमएमटी रही, जो भारतीय तेल द्वारा अब तक की सबसे अधिक बिक्री है, जबकि वर्ष 2022–23 में यह 2.1 एमएमटी थी।

पानीपत में दो नए आला पीपीसीपी ग्रेड 2,300 एमएक्स और 5,300 एमएन और पारादीप में एक रैंडम को–पॉलिमर 2,120 एमसी की शुरूआत सहित उत्पाद बास्केट का विस्तार किया गया। एक महत्वपूर्ण उपलब्धि के रूप में, पीई 100 ऑरेंज और ब्लैक कंपाउंड को प्रतिष्ठित और मान्यता प्राप्त अंतरराष्ट्रीय परीक्षण प्रयोगशाला–एलिमेंट, स्वीडन से अनिवार्य एमआरएस 10 रेटिंग के लिए अनुमोदन मिला है। इससे भारतीय तेल सीजीडी गैस परिवहन के लिए पीई ऑरेंज यौगिकों को प्रस्तुत किया जाएगा, जिससे आयात प्रतिस्थापन के लिए सामग्री प्रस्तुत करने वाला भारत का पहला घरेलू उत्पादक बन जाएगा।

14.1.1.8. प्राकृतिक गैस:

इंडियन ऑयल ने वर्ष 2023–24 में 6.5 एमएमटी की बिक्री (आंतरिक खपत सहित) की है, जबकि वर्ष 2022–23 में यह 4.4 एमएमटी थी। बिक्री में यह वृद्धि ग्राहक और रिफाइनरियों को एचपीएचटी गैस की अतिरिक्त आपूर्ति के कारण हुई है। इंडियन ऑयल ने दिनांक 31 मार्च 2024 तक 10 नए औद्योगिक ग्राहक अपने साथ जोडे हैं। इंडियन ऑयल 'एलएनजी एट डोरस्टेप' के माध्यम से बिक्री ने वित्त वर्ष 2023–24 के दौरान 66.8 टीएमटी की तुलना में वित्त वर्ष 2023–24 के दौरान 150.7 टीएमटी की अब तक की सबसे अधिक बिक्री दर्ज की है। वित्त वर्ष 2023–24 के दौरान, 33 एलएनजी कार्गो आयात किए गए, जिनमें से 18 स्पॉट कार्गो थे, जबकि 15 दीर्घकालिक संविदा के अंतर्गत थे।

14.1.1.9. नगरी गैस वितरण (सीजीडी)

गैस आधारित अर्थव्यवस्था की ओर बढ़ने में इंडियन ऑयल का महत्वपूर्ण योगदान है। जेवीसी सहित, इंडियन ऑयल में 114 जिलों के कुल 49 जीए का प्राधिकरण है। इंडियन ऑयल अपने आप को ओएमसी के बीच सबसे अधिक जीए के साथ देश की सबसे बड़ी सीजीडी कंपनी के रूप में स्थापित किया है।

14.1.1.10. अन्वेषण और उत्पादन:

इंडियन ऑयल भागीदारी हितों (पीआई), संयुक्त उद्यमों और अन्य गठबंधनों के माध्यम से ईएंडपी क्षेत्र में अवसरों का निरंतर पता लगाता रहता है। वर्तमान में, अपस्ट्रीम पोर्टफोलियो टैली 18 घरेलू और 11 विदेशी परिसंपत्तियों से संबंधित है, जिनमें से 8 परिसंपत्तियां उत्पादन कर रही हैं (1 घरेलू और 7 विदेशी)। उत्पादक परिसंपत्तियों के अतिरिक्त, 6 परिसंपत्तियाँ विकास के अधीन हैं, 4 परिसंपत्तियों में खोज की जा रही है, 1 परिसंपत्ति का मूल्यांकन किया जा रहा है और 10 परिसंपत्तियाँ अन्वेषण के अधीन हैं।

वित्त वर्ष 2023–24 के दौरान, इंडियन ऑयल की अपनी उत्पादक परिसंपत्तियों से उत्पादन में हिस्सेदारी 4.2 एमएमटी तेल समतुल्य (एमएमटीओई) रही है, जबकि वित्त वर्ष 2022–23 के दौरान यह 4.3 एमएमटीओई थी।

वित्त वर्ष 2023–24 के दौरान, नेशनल कंपनी लॉ ट्रिब्यूनल द्वारा प्रचालित कॉर्पोरेट दिवालियापन समाधान प्रक्रिया के माध्यम से मकैटर पेट्रोलियम लिमिटेड (एमपीएल) में 100% हिस्सेदारी हासिल करने में सफल होने पर इंडियन ऑयल के घरेलू एकड क्षेत्र को सुदृढ़ किया गया।

14.1.1.11. वैकल्पिक ऊर्जा:

इंडियन ऑयल हरित अर्थव्यवस्था के लिए कार्बन उत्सर्जन को कम करने के लिए नवीकरणीय ऊर्जा का उपयोग करने की दिशा में लगातार आगे बढ़ रहा है। दिनांक 31.03.2024 तक की स्थिति के अनुसार इंडियन ऑयल की स्थापित क्षमता 246.94 मेगावाट नवीकरणीय ऊर्जा की है, जिसमें 167.60 मेगावाट पवन ऊर्जा क्षमता और 79.34 मेगावाट सौर ऊर्जा क्षमता शामिल है। इंडियन ऑयल ने वित्त वर्ष 2023–24 के दौरान 401.5 मिलियन यूनिट का अब तक का सबसे अधिक नवीकरणीय ऊर्जा उत्पादन हासिल किया है, जिससे 368.98 हजार मीट्रिक टन कार्बन डाइऑक्साइड समतुल्य उत्सर्जन में कमी आई है।

दिनांक 31.03.2024 तक की स्थिति के अनुसार, इंडियन ऑयल ने 31,647 खुदरा दुकानों को सौर ऊर्जा से सुसज्जित किया है, जिसकी कुल सौर ऊर्जा स्थापित क्षमता 165.3 मेगावाट है। साथ ही, वित्त वर्ष 2023–24 में अब तक का सबसे अधिक खुदरा दुकानों का सौरीकरण अर्थात 10,655 दुकानों का किया गया है, जिसकी क्षमता लगभग 41.91 मेगावाट है। इससे वित्त वर्ष 2023–24 के दौरान लगभग 212.15 गीगावॉट घंटे बिजली उत्पादन हुआ, जिससे 194.97 हजार मीट्रिक टन कार्बन–डाइऑक्साइड समतुल्य (टीएमटीसीओ,ई) उत्सर्जन में कमी आई।

इंडियन ऑयल, एसएटीएटी (सस्ती परिवहन के लिए संधारणीय विकल्प) की प्रमुख कार्यान्वयन एजेंसी है। इंडियन ऑयल समय–समय पर संपीड़ित बायोगैस (सीबीजी) के उत्पादन और आपूर्ति के लिए आशय पत्र (एलओआई) जारी करता रहा है और दिनांक 31.03.2024 तक, इंडियन ऑयल में एसएटीएटी पहल के अंतर्गत 1,596 सक्रिय आशय पत्र (एलओआई) हैं। वित्त वर्ष 2023–24 के दौरान, 8 सीबीजी संयंत्र शुरू किए गए हैं, जिससे शुरू किए गए सीबीजी की संख्या 31 हो गई है। सीबीजी का विपणन 85 खुदरा दुकानों और 2 औद्योगिक उपभोक्ताओं के माध्यम से किया जा रहा है। उत्पादित सीबीजी को 'इंडीग्रीन' ब्रांड नाम से इंडियन ऑयल के खुदरा दुकानों के माध्यम से खुदरा बिक्री की जा रही है। वित्त वर्ष 2023–24 में, इंडियन ऑयल ने लगभग 7.8 हजार मीट्रिक टन (टीएमटी) सीबीजी की बिक्री की और इसके स्थापना (सितम्बर 2019) के बाद से संचयी बिक्री 18.8 टीएमटी को पार कर गई है।

गोरखपुर में प्रतिदिन 200 टन (टीपीडी) मिश्रित अपशिष्ट (धान का भूसा, प्रेस–मड और गोबर) आधारित सीबीजी संयंत्र स्थापित किया गया है, जो इंडियन ऑयल आरएंडडी केन्दर द्वारा विकसित इन–हाउस तकनीक का उपयोग करके धान के भूसे के निपटान के लिए पर्यावरण–अनुकूल समाधान प्रदान करता है। इस संयंत्र में सालाना 70 टीएमटी धान के भूसे और 3.5 टीएमटी गोबर को संसाधित करने की क्षमता है। इस संयंत्र का उद्घाटन उत्तर प्रदेश के माननीय मुख्यमंत्री और माननीय मंत्री पीएंडएनजी और एचएंडयूए द्वारा दिनांक 8 मार्च 2024 को किया गया था।

14.1.1.12. संधारणीय विकास:

वर्ष 2023 में, ब्लूमबर्ग ने अपनी एनईएफ वैश्विक मूल्य निर्धारण में इंडियन ऑयल को शीर्ष भारतीय कंपनी का दर्जा दिया है, जो संधारणीय भविष्य के प्रति अपनी प्रतिबद्धता को मान्यता देता है।

भारत में तेल और गैस क्षेत्र की कंपनियों के बीच वर्ष 2023 में डॉव जोन्स सस्टेनेबिलिटी इंडेक्स (डीजेएसआई) में इंडियन ऑयल को प्रथम स्थान दिया गया।

विश्व पर्यावरण दिवस 2023 के उपलक्ष्य में इंडियन ऑयल द्वारा साइक्लोथॉन कार्यक्रम का आयोजन किया गया। इस कार्यक्रम में मंत्रालय के अधिकारियों और विभिन्न तेल एवं गैस पीएसयू के सीएमडी/वरिष्ठ अधिकारियों ने भाग लिया था।

14.1.1.13. हरित ऊर्जा:

इंडियन ऑयल, मेसर्स लैंजाजेट इंक, यूएसए और मेसर्स प्राज इंडस्ट्रीज लिमिटेड, भारत जैसी प्रतिष्ठित वैश्विक प्रौद्योगिकी अग्रणियों के साथ कार्यनीतिक साझेदारी के लिए कार्य कर रही है, जिसका उद्देश्य भारत में संधारणीय विमानन ईंधन (एसएएफ) सुविधाएं स्थापित करना है। इंडियन ऑयल लैंजाजेट एटीजे प्रौद्योगिकी पर आधारित पानीपत में 86.8 टीएमटीपीए एसएएफ संयंत्र स्थापित कर रहा है। बीडीईपी का काम नवंबर 2023 में शुरू हो गया है और पीएमसी की स्थापना फरवरी 2024 में की जाएगी। इसके अतिरिक्त, इंडियन ऑयल ने दिनांक 06 जुलाई 2023 को प्राज इंडस्ट्रीज के साथ निबंधन और शर्तों संबंधी पत्रक पर हस्ताक्षर किए, जिसके अंतर्गत भारत में एसएएफ और एथेनॉल, सीबीजी, बायोडीजल, बायो–बिटुमेन आदि से युक्त अन्य जैव ईंधन संयंत्रों की स्थापना के लिए 50:50 संयुक्त उद्यम कंपनी (जेवीसी) का गठन किया जाएगा।

14.1.2. तेल और प्राकृतिक गैस निगम लिमिटेड (ओएनजीसी)



तेल और प्राकृतिक गैस निगम लिमिटेड (ओएनजीसी) की स्थापना दिनांक 23.06.1993 को इस उद्देश्य से की गई थी कि संसद के अधिनियम के माध्यम से तेल और प्राकृतिक गैस आयोग नामक संवैधानिक आयोग को सार्वजनिक क्षेत्र की कंपनी में परिवर्तित किया जाए और दिनांक 01.02.1994 से आयोग के व्यवसाय को अपने हाथ में लिया जाए। ओएनजीसी एक वैश्विक ऊर्जा कंपनी है जो संपूर्ण ऊर्जा मूल्य–श्रृंखला के लिए एकीकृत कंपनी है। ओएनजीसी पेट्रोलियम और प्राकृतिक गैस मंत्रालय के प्रशासनिक नियंत्रण के अंतर्गत ईएंडपी क्षेत्र में अनुसूची–'ए' सूचीबद्ध महारत्न सीपीएसई कंपनी है, जिसके पास इसकी 58.89% शेयरधारिता है।

14.1.2.1. वर्ष 2023–24 की प्रमुख विशेषताएँ/पहलें

- **केजी–डीएन–98/2 ब्लॉक से तेल उत्पादन की शुरूआत:** ओएनजीसी ने दो खोजों अर्थात एल. ई. केजी–डीएन–98/2–एम–1 (पद्मावती) और केजी–डीएन–98/2–एम–3 का मुद्रीकरण किया और दिनांक 7 जनवरी 2024 को बंगाल की खाड़ी के तट पर स्थित गहरे पानी के केजी–डीएन–98/2 ब्लॉक के 'एम' क्षेत्र से "पहला तेल" निकालने का सफलतापूर्वक शुरूआत किया।
- भारत के ऊर्जा क्षेत्र में ऐतिहासिक उपलब्धि को चिह्नित करते हुए, माननीय प्रधान मंत्री श्री नरेंद्र मोदी ने दिनांक 2 मार्च 2024 को ओएनजीसी के कृष्णा गोदावरी गहरे पानी के ब्लॉक से 'पहला कच्चा तेल' टैंकर 'स्वर्ण सिंधु' को हरी झंडी दिखाई। अपने सर्वाधिक उत्पादन से यह परियोजना भारत के तेल और गैस उत्पादन में 7 प्रतिशत की वृद्धि करेगी।
- माननीय प्रधान मंत्री ने दिनांक 6 फरवरी 2024 को भारत ऊर्जा सप्ताह (आईईडब्ल्य) 2024 के दौरान ओएनजीसी समुद्री जीवन रक्षा केंद्र को राष्ट्र को समर्पित किया। गोवा के आईपीएस एचईएम में ओएनजीसी उन्नत प्रशिक्षण संस्थान में स्थित यह केंद्र देश के समुद्री जीवन रक्षा प्रशिक्षण पारिस्थितिकी तंत्र को वैश्विक मानकों तक आगे बढ़ाने के उद्देश्य से अग्रणी संस्थान के रूप में उभर कर आया है।
- ओएनजीसी ने दिनांक 27 फरवरी 2024 को पूर्ण स्वामित्व वाली सहायक कंपनी ओएनजीसी ग्रीन को निगमित किया। भविष्य में, ओएनजीसी हरित ऊर्जा उद्योग मूल्य श्रृंखला के विभिन्न क्षेत्रों में प्रवेश करेगी। इसमें नवीकरणीय ऊर्जा स्रोत, जैव ईंधन और बायोगैस, साथ ही हरित हाइड्रोजन और इसके व्युत्पन्न जैसे ग्रीन अमोनिया और ग्रीन मेथनॉल और अन्य कम कार्बन ऊर्जा स्रोत शामिल होंगे।
- नवरत्न कंपनी ओएनजीसी विदेश लिमिटेड (ओवीएल) ने गुजरात के गिफ्ट सिटी में पूर्ण स्वामित्व वाली सहायक कंपनी ओवरसीज आईएफएससी लिमिटेड (ओओआईएल) को निगमित किया, जो ओवीएल और 15 देशों में विस्तृत इसकी 25 सहायक कंपनियों (स्टेप–डाउन सहायक कंपनियों सहित) की राजकोषीय कार्यकलापों को केंद्र में रखने के लिए वैश्विक राजकोषीय केंद्र के रूप में कार्य करेगी।
- ओएनजीसी ने वित्तीय वर्ष 2023–24 में रिकॉर्ड तोड़ 541 कुओं की ड्रिलिंग करके ऐतिहासिक उपलब्धि हासिल की है, जो पिछले तीन दशकों में हासिल की गई उपलब्धियों में सबसे अधिक संख्या है। ड्रिलिंग सर्विसेज ने 103 खोजपूर्ण कुओं और 438 विकास सह साइड ट्रैक कुओं की सफलतापूर्वक ड्रिलिंग की। वित्तीय वर्ष में अब तक की सबसे अधिक चक्रिय गति प्राप्त हुई, लगभग 1042एम/आरएम तक पहुँच प्राप्त हुई, जो इसके दक्षता और प्रचालन उत्कृष्टता को दर्शाती है।
- ओएनजीसी मुंबई हाई ने फरवरी 2024 में अपनी 50 वर्ष की सेवा सफलतापूर्वक पूरा करने के लिए वर्षगाठ मनाया।
- **राजमुंदरी की तातीपका रिफाइनरी से उत्पादित नेफ्था की बिक्री के लिए अब तक का सबसे अधिक प्रीमियम जुटाया गया:** नई बिक्री निविदा के समापन पर, एचपीसीएल को रियायती बिक्री की तुलना में नेफ्था की बिक्री के लिए प्रीमियम के संदर्भ में प्राप्ति 2.8 गुना सुधार हुआ है, जिससे तातीपका रिफाइनरी में कोई रोकथाम संबंधी समस्या नहीं आई।
- **ओएनजीसी, ब्रिटिश गैस और रिलायंस के बीच ऐतिहासिक समझौता:** ओएनजीसी और पन्ना मुक्ता तापी संयुक्त उद्यम भागीदारों अर्थात ब्रिटिश गैस एक्सप्लोरेशन एंड प्रोडक्शन इंडिया लिमिटेड (बीजीईपीआईएल) और रिलायंस इंडिया लिमिटेड (आरआईएल) के बीच दिनांक 17 अप्रैल 2023 को हस्ताक्षरित त्रिपक्षीय समझौता गैस परिवहन शुल्क से संबंधित लंबे समय से लंबित मुद्दे को हल करेगा।
- **पेट्रोरसायन में अनुप्रवाह संभावनाओं की खोज के लिए आईओसीएल के साथ समझौता ज्ञापन:** ओएनजीसी ने रिफाइनिंग और पेट्रोरसायन उपज के निर्यात से मूल्य सृजन को बढ़ाने के लिए वैश्विक संभावनाओं की संयुक्त रूप से खोज करने के लिए दिनांक 14 जून 2023 को नई दिल्ली में इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल) के साथ समझौता ज्ञापन पर हस्ताक्षर किए। दोनों कंपनियों का लक्ष्य ग्रीनफील्ड परियोजनाओं और अधिग्रहणों के माध्यम से तेल से लेकर रसायनों और/या आला परियोजनाओं के सहयोग की संभावनाओं का दोहन करना है।

- **पूर्वोत्तर क्षेत्र में गैस मुद्रीकरण के लिए आईजीजीएल के साथ हुक अप करार:** आईओसीएल, गेल, ओआईएल और एनआरएल के साथ संयुक्त उद्यम, अर्थात इंद्रधनुष गैस ग्रिड लिमिटेड (आईजीजीएल) के प्रवर्तक के रूप में ओएनजीसी ने दिनांक 11 जुलाई 2023 को आईजीजीएल के साथ तीन हुक अप करारों पर हस्ताक्षर किए, ताकि जोरहाट, सिलचर और त्रिपुरा परिसंपत्ति में पहचान किए गए 09 स्रोत बिंदुओं पर आईजीजीएल तक ओएनजीसी की गैस वितरण संबंधी सुविधा प्रदान करने के लिए ओएनजीसी क्षेत्रों को नॉर्थ ईस्ट गैस ग्रिड (एनईजीजी) से जोड़ा जा सके।
- भारत सरकार के पेट्रोलियम और प्राकृतिक गैस मंत्रालय के अंतर्गत बीपीसीएल, गेल, एचपीसीएल, आईओसी और ओएनजीसी सहित केंद्रीय सार्वजनिक क्षेत्र के उपक्रमों (पीएसयू) ने 19 जून 2023 को पेट्रोलियम और प्राकृतिक गैस मंत्रालय के अधिकारियों की उपस्थिति में पाइपलाइनों की क्रॉसिंग अनुमति के लिए ऐतिहासिक समझौता ज्ञापन (एमओयू) पर हस्ताक्षर किए।

14.1.2.2. अन्वेषण

- वर्ष 2023–24 के दौरान, ओएनजीसी ने 971.81 एनकेएम 2डीए 8,588 एसकेएम 3डी भूकंपीय डेटा प्राप्त किया और 103 अन्वेषण कुओं की खुदाई की, 11 नई हाइड्रोकार्बन की खोज (6 तेल और 5 गैस) की। साथ ही, 7 खोजों का मुद्रीकरण किया, जिसमें वित्त वर्ष 2023–24 की 3 खोजें शामिल हैं।
- वित्त वर्ष 2023–24 के दौरान, ओएनजीसी ने ओएएलपी बोली दौर–VIII के अंतर्गत 7 राजस्व साझाकरण संविदा (आरएससी) पर हस्ताक्षर किए। सात संविदाओं में से छह अपतटीय ओएएलपी ब्लॉक और एक ऑनलैंड ओएएलपी ब्लॉक (कैम्बे ऑनलैंड) के लिए हैं। ओएनजीसी ने ऑनलैंड और अपतटीय क्षेत्रों को शामिल करते हुए लगभग 2.17 लाख वर्ग किलोमीटर क्षेत्र के लिए आशय की अभिव्यक्ति (EOI) प्रस्तुत की। ईओआई प्रस्तुत करने के लिए लक्षित नए घाटियां–करेवा, प्राणहिता गोदावरी आदि हैं।
- महानदी ओएएलपी ब्लॉक में दौर–III (एमएन-डीडब्लूएचपी–2018/1) में दो महत्वपूर्ण गैस अर्थात "उत्कल" और "कोणार्क" खोजें गए हैं, जहाँ क्रमशः 3.0 लाख एमं/दिन और 4.5 लाख एमं/दिन से अधिक गैस प्रवाहित हुई। प्लियोसीन में इन खोजों ने महानदी अपतटीय क्षेत्र में नई उम्मीदें जगाई हैं।
- त्रिपुरा के तुलामुरा क्षेत्र में कुआं टीएलएम#3 में गैस की खोज की गई, जहाँ मध्य भुवन एफएम के सब–थ्रस्ट भाग से लगभग 85,000 एमक/दिन गैस प्रवाहित हुई, जिससे गलियारे में और उसके आसपास सब–थ्रस्ट अन्वेषण खुलने की संभावना है। इसके अतिरिक्त, असम शेल्फ के पूर्वी लखीबारी–6 में अन्वेषण ने गॉडोवाना प्ले के लिए और अधिक समन्वित अन्वेषण की उम्मीद जगाई है।
- ग्लोबल आउटरीच पहल के अंतर्गत, ओएनजीसी ने कई प्रतिष्ठित ईएंडपी मेजर जैसे शेवरॉन, टोटल एनर्जीज, एक्सोमोबिल आदि के साथ समझौता ज्ञापन पर हस्ताक्षर किए। इन वैश्विक प्रमुख कंपनियों द्वारा विभिन्न तलछटी बेसिन क्षेत्र के लिए समझौता ज्ञापन की शर्तों के अनुसार तकनीकी अध्ययन प्रगति पर हैं।

14.1.2.3. उत्पादन पहल:

- **बेसिन और सैटेलाइट (बीएंडएस) परिसंपत्ति ने रुझान को पलट दिया:** योजना–भिन्न कुओं से एनबीपी क्षेत्र तेल उत्पादन हाल के दिनों में अपने सर्वाधिक उत्पादन तक पहुंच गया। ड्रिलिंग और चार कुओं के पूरा होने के बाद तेल उत्पादन 18,000 बीओपीडी से बढ़कर 20,010 बीओपीडी हो गया। राजमुंदरी एसेट के मंडापेटा क्षेत्र ने दिनांक 05 अक्टूबर 2023 को 1.0 एमएमएससीएमडी गैस उत्पादन का आंकड़ा पार कर लिया, जो वर्ष 1994 में इस क्षेत्र की स्थापना के बाद से अब तक का सबसे अधिक आंकड़ा है। यह जलाशय के लक्षण और उचित कुओं की नियुक्ति, उच्च मात्रा में फ्रैकिंग और उत्पादन सुविधाओं के समय पर विस्तार के माध्यम से संभव हो पाया है।
- **कैम्बे परिसंपत्ति में पूरे 10 ट्रंक लाइन सेगमेंट के लिए सफल पिगिंग प्रचालन:** कैम्बे परिसंपत्ति में लगभग 65 किलोमीटर तक फैले पूरे 10–इंच ट्रंक लाइन सेगमेंट के लिए प्रारंभिक पिगिंग प्रचालन सफलतापूर्वक किया गया है। यह पाइपलाइन अखोलजुनी, कथाना और पादरा जीजीएस से उत्पादित कच्चे तेल को लक्ष्मीपुरा में टी–ऑफ संयंत्र में स्थानांतरित करने की सुविधा प्रदान करती है, ताकि इसे केटी रिफाइनरी में बाद में प्रसंस्करण किया जा सके।

- **नागयालंका चरण–II**

  पुनर्विकास: नागयालंका क्षेत्र के द्वितीय चरण के क्षेत्र विकास के पूरा होने के बाद राजमुंदरी परिसंपत्ति ने 245 मिलियन प्रति दिन का अब तक का सर्वाधिक तेल उत्पादन किया, जिसके बाद ड्रिलिंग के बाद तीन नए विकास स्थलों में बहु–स्तरीय उच्च टन भार हाइड्रो फ्रैक्चरिंग कार्य किए गए और उन्हें उत्पादन में लगाया गया।

14.1.2.4. ड्रिलिंग पहल:

- **साइड–ट्रैक, सब–सी वेल वाडा का पुन: निर्माण:** वाडा कुएं की साइड–ट्रैकिंग आईआरएस, आईओजीपीटी और डीडब्ल्यू मुंबई द्वारा संयुक्त रूप से तैयार की गई रिपोर्ट के आधार पर डीपी रिग के साथ की गई, जिससे बहुविध सहयोग, प्रौद्योगिकी प्रेरण और गहरे पानी में प्रचालन उत्कृष्टता की सफलता की कहानी बन गई।
- ड्रिलिंग उस क्षेत्र में शुरू की गई है जिसे पहले राष्ट्रीय सुरक्षा हितों के कारण 'नो–गो' क्षेत्र के रूप में वर्गीकृत किया गया था और महानदी ब्लॉक एमएन–डीडब्ल्यूएचपी–2018/1 में उत्कल और कोणार्क नामक दो खोजें क्रमशः 714 मीटर और 1,110 मीटर की पानी की गहराई में की गई थीं।
- ओएनजीसी ने वर्क ओवर जॉब्स (2110 जॉब्स) के माध्यम से एक वित्तीय वर्ष में अब तक के सबसे अधिक कुओं की सेवा करने की उपलब्धि हासिल की गई और साथ ही वित्त वर्ष 2023–24 के दौरान 28.30 का अब तक का सबसे अधिक वर्क ओवर सूचकांक प्राप्त हुआ।
- रिकॉर्ड संख्या में 13,276 कुआं उत्तेजन कार्य किए गए, जो कि स्थापना के बाद से अब तक के सबसे अधिक उत्तेजन कार्य है।
- कुआं सेवा ईओए ने कुआं हस्तक्षेप के माध्यम से केजी–डीएन–98/2 क्षेत्र के उप–समुद्री कुआं यू–1–बी से उत्पादन को सफलतापूर्वक पुनर्जीवित किया।

14.1.2.5. तकनीकी सेवा पहल:

- **ओएनजीसी ने उपकरण उपलब्धता में सुधार के लिए परिसंपत्ति विनिमय कार्यक्रम शुरू किया:** 9 जनवरी 2024 को बीएंडएस परिसंपत्ति के बीपीए–प्लेटफॉर्म पर बूस्टर कंप्रेसर–4 में परिसंपत्ति विनिमय नीति के अंतर्गत पहला गैस टरबाइन इंजन स्थापित किया गया।
- **कॉर्पोरेट विजुअलाइजेशन सेंटर 'दर्पण' का उद्घाटन:** माननीय पेट्रोलियम एवं प्राकृतिक गैस तथा आवासन एवं नगरी कार्य के मंत्री ने नई दिल्ली में अत्याधुनिक डिजिटल कॉर्पोरेट विजुअलाइजेशन सेंटर, ओएनजीसी दर्पण का उद्घाटन किया, जो वास्तविक समय के आधार पर तेल और गैस कुओं और ड्रिलिंग इकाइयों (अपतटीय सहित) की केंद्रीय निगरानी को सक्षम बनाता है।
- **ओएनजीसी ने बी2बी एकीकरण के लिए डिजिटल शक्ति का लाभ उठाया:** ई–शासन और व्यापारिक सुगमता की दिशा में बड़े कदम के रूप में, ओएनजीसी ने नेशनल ई–गवर्नेंस सर्विसेज लिमिटेड (एनईएसएल) के पहले लाभार्थी के रूप में इलेक्ट्रॉनिक बैंक गारंटी (ईबीजी) के लिए एनईएसएल के साथ बी2बी एकीकरण क्रियान्वित किया। ईबीजी प्रक्रिया में, एनईएसएल के डिजिटल दस्तावेज निष्पादन (डीडीई) प्लेटफॉर्म का उपयोग बैंक गारंटी जारी करने, इसे संशोधन करने और बैंक गारंटी के विभिन्न जीवन चक्र से संबंधित चरणों के लिए किया जाता है।
- **सौर ऊर्जा संयंत्र की शुरुआत:** ओएनजीसी ने कावेरी परिसंपत्ति के नरीमनम–जीजीएस में 200 किलोवाट के ग्राउंड–माउंटेड सौर ऊर्जा संयंत्र की पायलट परियोजना को सफलतापूर्वक शुरू किया। इसके अतिरिक्त, तमिलनाडु सरकार की नीति के नए प्रावधानों के अनुसार पावर व्हीलिंग को भी सक्षम बनाया गया।
- **कुआं #एलडब्ल्यूकेआई में पहली बार चक्रीय स्टीम प्रोत्साहन पूरी हुई:** ओएनजीसी मेहसाणा, सीमेंटिंग सर्विसेज, ने आईडीटी के सहयोग से एचजीएस–आधारित सीमेंट घोल का उपयोग करके चक्रीय स्टीम प्रोत्साहन (सीएसएस) परियोजना के प्रारंभिक कुएं के लिए सीमेंटेशन कार्य पूरा किया।
- **ओएनजीसी ने पन्ना प्रोसेस प्लेटफॉर्म को अपने विशाल सबसी पाइपलाइन नेटवर्क से जोड़ा:** इस कार्य में 37.50 किलोमीटर लंबी सबमरीन पाइपलाइन के 2 खंड को बिछाना और अन्य मदों के अतिरिक्त 3 एमओएल (मुख्य तेल लाइन) और 3 बूस्टर पंप लगाना शामिल था। पन्ना खंड के शुरू होने से टैंकर किराए पर लेने की लागत, टैंकर बदलने के दौरान उत्पादन में होने वाले नुकसान और खराब मौसम के दौरान टैंकर के विलंब के मामले में बचत हुई।

- **ओएनजीसी ने पश्चिमी अपतटीय कार्बोनेट जलाशयों के प्रोत्साहन के लिए अगली पीढ़ी के एसिडाइजिंग फॉर्मूलेशन 'एसपीआरएएस' का विकास किया:** कार्बोनेट जलाशयों में मैट्रिक्स प्रोत्साहन में हाइड्रोक्लोरिक एसिड (एचसीआई) का उपयोग करने में आने वाली चुनौतियों को दूर करने के लिए, आईपीईओटी ने नया सुत्रीकरण विकसित किया है, अर्थात सिंगल फेज रिटार्डेड एसिड सिस्टम (एसपीआरएएस) जो रिटार्डिंग सर्फेक्टेंट का उपयोग करके प्रतिक्रिया की दर को धीमा कर देता है और डीजल के उपयोग को पूरी तरह से समाप्त कर देता है।

- भारत में नवीकरणीय ऊर्जा, जल विद्युत और पंप भंडारण जल विद्युत परियोजना विकास योजना के क्षेत्रों में सहयोग के लिए एसजेवीएन ग्रीन एनर्जी लिमिटेड (एसजीईएल) के साथ समझौता ज्ञापन।

- ऊर्जा परिवर्तन की दिशा में नवीकरणीय ऊर्जा उद्देश्यों को साकार करने के लिए एनटीपीसी ग्रीन एनर्जी लिमिटेड (एनजीईएल) के साथ समझौता ज्ञापन, जिसका मुख्य उद्देश्य विभिन्न क्षेत्रों में नवीकरणीय ऊर्जा परियोजनाओं की स्थापना और व्यवहार्यता की खोज करना है।

- **एनटीपीसी ग्रीन के साथ संयुक्त उद्यम करार (जेवीए):** आईईडब्ल्यू वर्ष 2024 के दौरान, ओएनजीसी और एनजीईएल ने अपतटीय पवन पर ध्यान केंद्रित करते हुए नवीकरणीय ऊर्जा परियोजनाओं को विकसित करने के लिए संयुक्त उद्यम करार पर हस्ताक्षर किए।

- **मीथेन उत्सर्जन का पता लगाने और उसे मापने के लिए सहयोग करार:** भारत ऊर्जा सप्ताह 2024 के दौरान, ओएनजीसी ने मीथेन उत्सर्जन का पता लगाने और उसे मापने के अभियान चलाने के लिए टोटल एनर्जीज के साथ करार किया है।

- भारत में भूतापीय ऊर्जा की खोज और विकास के लिए 7 जून 2023 को नई दिल्ली में आइसलैंड जियो–सर्वे (आईएसओआर) के साथ समझौता ज्ञापन।

- एसआरपी–पीसीपी (सकर रॉड पंप– प्रोग्रेसिव कैविटी पंप) कुओं के लिए वास्तविक समय निगरानी प्रणाली लागू की गई जो वर्तमान में विद्युत और ऊर्जा मापदंडों को पहचानने में सक्षम है, जिससे एसआरपी–पीसीपी सतह इकाई असामान्यताओं की पहचान करने में मदद मिली है और साथ ही डाउन होल समस्याओं और ब्रेकडाउन के बाद सुधार के लिए प्रतिक्रिया समय को कम करने और प्रारंभिक समस्या निवारण में मदद मिली है, जिससे डाउनटाइम घंटे कम हो गए हैं।

- **सौर और पवन ऊर्जा पहल:** दिनांक 31 मार्च 2024 तक नवीकरणीय ऊर्जा की कुल स्थापित क्षमता लगभग 192.8 मेगावाट थी (सौर) 39.8 मेगावाट और पवन: 153 मेगावाट)

14.1.2.6. प्रमुख पुरस्कार और मान्यताएँ:

- फोर्ब्स 2000 सूची 2023: फोर्ब्स ने ओएनजीसी को भारत में 5वां स्थान दिया है और यह बिक्री, लाभ, परिसंपत्ति और बाजार मूल्य के आधार पर वैश्विक 2000 सूची में दुनिया भर में 226वां स्थान पर है।

- फॉर्च्यून ग्लोबल 500 सूची 2023 में ओएनजीसी को वैश्विक स्तर पर 158वां और भारत में चौथा स्थान मिला है।

- एसएंडपी ग्लोबल कमोडिटी इनसाइट्स टॉप 250 ग्लोबल एनर्जी कंपनी रैंकिंग 2022 में ओएनजीसी को 14वां स्थान मिला।

- भारत के माननीय उपराष्ट्रपति ने दिनांक 18 जनवरी 2024 को पर्यावरण उत्कृष्टता और संधारणीय विकास में सराहनीय उपलब्धियों के लिए ओएनजीसी को स्कॉप एमिनेंस अवार्ड्स 2019–20 प्रदान किए।

- ओएनजीसी को दिनांक 17 अक्टूबर 2023 को इंस्टीट्यूट ऑफ डायरेक्टर्स (आईओडी) द्वारा कॉर्पोरेट गवर्नेंस के लिए प्रतिष्ठित गोल्डन पीकॉक अवार्ड 2023 से सम्मानित किया गया।

- ओएनजीसी ने ऊर्जा क्षेत्र में अपने नेतृत्व को स्वीकार करते हुए उत्कृष्टता और नवाचार के प्रति अपनी अटूट प्रतिबद्धता के लिए डन एंड ब्रैडस्ट्रीट पीएसयू और गवर्नमेंट समिट 2023 में सर्वश्रेष्ठ महारत्न पुरस्कार और क्रूड ऑयल (केंद्रीय पीएसयू) पुरस्कार जीता।

- ओएनजीसी को दिनांक 13 जनवरी 2024 को इंस्टीट्यूट ऑफ चार्टर्ड अकाउंटेंट्स ऑफ इंडिया (आईसीएआई) द्वारा पीएसयू श्रेणी में वित्तीय वर्ष 2022–23 के लिए प्रतिष्ठित 'वित्तीय रिपोर्टिंग में उत्कृष्टता हेतु पुरस्कार' से सम्मानित किया गया है।

- दिनांक 16 फरवरी 2023 को, ओएनजीसी को राष्ट्र निर्माण में अपने योगदान के लिए गवर्नेंस नाउ 9वें पीएसयू पुरस्कार से सम्मानित किया गया और कॉर्पोरेट संचार टीम को अपने उत्कृष्ट संचार आउटरीच के लिए पुरस्कार मिला।
- दिनांक 25 मार्च 2023 को, ओएनजीसी को सीएनबीसी, नेटवर्क 18 समूह द्वारा जैव विविधता संरक्षण के लिए ग्रीन रिबन चैंपियंस पुरस्कार मिला, जो इसके प्रचालन क्षेत्रों के आसपास जैव विविधता की रक्षा में सराहनीय और निरंतर प्रयासों के प्रति इसकी प्रतिबद्धता को मान्यता देता है।
- ओएनजीसी को वित्त वर्ष 2022–23 के दौरान शासन संरचना में स्थापित जोखिम प्रबंधन प्रक्रिया की प्रभावशीलता को मान्यता देने के लिए दिनांक 03 अप्रैल 2023 को ग्रो केयर इंडिया द्वारा जोखिम प्रबंधन श्रेणी में स्वर्ण पुरस्कार मिला।
- दिनांक 6–7 मई 2023 के दौरान नई दिल्ली में अपने पहले अंतर्राष्ट्रीय एडीआर शिखर सम्मेलन में एशिया पैसिफिक सेंटर फॉर आर्बिट्रेशन एंड कॉन्सिलिएशन (एपीसीएएम) द्वारा एडीआर में अपने योगदान के लिए ओएनजीसी को 'अग्रणी वैकल्पिक विवाद समाधान (एडीआर) यूजर 2023' होने के लिए सम्मानित किया गया।
- ओएनजीसी के निदेशक (वित्त) सुश्री पोमिला जसपाल को दिनांक 12 सितंबर 2023 को उनके उत्कृष्ट नेतृत्व और वित्त में ओएनजीसी के शानदार निष्पादन के सम्मान में दलाल स्ट्रीट इन्वेस्टमेंट जर्नल द्वारा "सर्वश्रेष्ठ महिला सीएफओ 2023 (लार्ज कैप)" के रूप में सम्मानित किया गया।
- ओएनजीसी को दिनांक 17 नवंबर 2023 को एमएच परिसंपत्ति के क्लस्टर–7 और 8 क्षेत्र में इंस्टीट्यूट ऑफ प्रोडक्शन इंजीनियरिंग एंड ओशन टेक्नोलॉजी (आईपीईओटी) द्वारा किए गए अध्ययन के आधार पर असाधारण 'ऑफशोर इनिशिएटिव ऑफ द ईयर–इंडिया' के लिए प्रतिष्ठित अंतर्राष्ट्रीय एशियाई तेल और गैस पुरस्कार से सम्मानित किया गया।
- ड्रिलिंग प्रौद्योगिकी संस्थान (आईडीटी) को 24 नवंबर, 2023 को 23वें वार्षिक ग्रीनटेक पर्यावरण पुरस्कार 2023 में दो श्रेणियों अर्थात नवोन्मेष प्रौद्योगिकी अपनाने और पर्यावरण के अनुकूल उत्पादों में वार्षिक ग्रीनटेक पर्यावरण पुरस्कार 2023 से सम्मानित किया गया।



14.1.2.7. इंस्टीट्यूट ऑफ ड्रिलिंग टेक्नोलॉजी (आईडीटी) ने दिनांक 30 जनवरी 2024 को रीसाइकलिंग और अपशिष्ट प्रबंधन क्षेत्र में आईडीटी के उत्कृष्ट योगदान के लिए टीम ऑफ द ईयर श्रेणी में प्रतिष्ठित "बिजनेस वर्ल्ड रीसाइकलिंग फॉर ग्रीनर टुमॉरो अवार्ड्स 2024" जीता है।

वित्तीय निष्पादन (ओएनजीसी)

₹/करोड़ में

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
कुल आय	1,09,655	96,214	68,141	1,10,345	1,55,517	1,38,402
निवल लाभ / हानि	26,765	13,464	11,246	40,306	40,097*	40,526
योजना परिव्यय–वास्तविक	29,450	29,538	26,859	27,741	30,208	37,494
योजना लक्ष्य	32,077	32,921	32,502	29,800	29,950	30,125

14.1.3. गेल (इंडिया) लिमिटेड



गेल (इंडिया) लिमिटेड को अगस्त, 1984 में पेट्रोलियम और प्राकृतिक गैस मंत्रालय (एमओपीएंडएनजी) के अंतर्गत केंद्रीय सार्वजनिक क्षेत्र उपक्रम (पीएसयू) के रूप में निगमित किया गया था, जिसका मिशन "राष्ट्रीय अर्थव्यवस्था के लाभ के लिए प्राकृतिक गैस और उसके अंशों के प्रभावी और आर्थिक उपयोग को गति देना और अनुकूलित करना" था।

गेल 1997 में नवरत्न बन गया और अब यह तेरह महारत्न सार्वजनिक क्षेत्र उपक्रमों में से एक है, जो किसी भी पीएसयू को दिया जाने वाला सर्वोच्च दर्जा है। गेल के व्यवसायों में प्राकृतिक गैस का संचरण और विपणन शामिल है और गेल एलपीजी के संचरण, पेट्रोकेमिकल्स और लिक्विड हाइड्रोकार्बन के निर्माण में भी शामिल है। गेल ने अस्सी के दशक के अंत में गैस ट्रांसमिशन कंपनी के रूप में शुरुआत की और यह लगभग 16,240 किलोमीटर की प्राकृतिक गैस पाइपलाइनों का बड़ा नेटवर्क स्थापित करके स्वाभाविक रूप से विकसित हुआ है; लगभग 2040 किलोमीटर की दो एलपीजी पाइपलाइन प्रणाली; एलपीजी और अन्य तरल हाइड्रोकार्बन के उत्पादन के लिए पांच गैस प्रसंस्करण संयंत्र जिनकी संयुक्त उत्पादन क्षमता लगभग 1.4 एमएमटीपीए है और 810 केटीपीए पॉलिमर की क्षमता वाला गैस आधारित एकीकृत पेट्रोकेमिकल संयंत्र है। गेल दो अन्य पेट्रोकेमिकल परियोजनाओं का सह–प्रवर्तक है, जिसमें असम में 280 केटीपीए ब्रह्मपुत्र क्रैकर एंड पॉलिमर लिमिटेड (बीसीपीएल) कॉम्प्लेक्स और गुजरात में 1.4 एमएमटीपीए ओएनजीसी पेट्रो–एडिशंस लिमिटेड (ओपीएएल) परियोजना शामिल है। पेट्रोनेट एलएनजी (गेल का संयुक्त उद्यम) नगर गैस और कोच्चि में दो एलएनजी रीगैसिफिकेशन टर्मिनल प्रचालित करता है।

गेल कोंकण एलएनजी लिमिटेड का भी प्रवर्तक है जो 5 एमएमटीपीए की डिजाइन क्षमता सहित दाभोल में एलएनजी रीगैसिफिकेशन टर्मिनल प्रचालित करता है। इसके अतिरिक्त गेल के पास 2,200 एमटीपीडी अमोनिया और 3,850 एमटीपीडी यूरिया के उत्पादन के लिए एनएफएल, ईआईएल और एफसीआईएल के साथ मिलकर रामागुंडम फर्टिलाइजर एंड केमिकल्स लिमिटेड (आरएफसीएल) में 14.72% इक्विटी हिस्सेदारी है। गेल संयुक्त उद्यम अर्थात कोल इंडिया लिमिटेड (सीआईएल) के साथ गठित तालचेर फर्टिलाइजर लिमिटेड (टीएफएल), राष्ट्रीय केमिकल्स एंड फर्टिलाइजर्स लिमिटेड (आरसीएफ) जिनमें से प्रत्येक की 31.65% इक्विटी हिस्सेदारी है और फर्टिलाइजर कॉर्पोरेशन ऑफ इंडिया लिमिटेड (एफसीआई) की 4.45% इक्विटी है, के माध्यम से कोयला गैसीकरण आधारित उर्वरक संयंत्र की स्थापना की प्रक्रिया में भी कार्य कर रही है। गेल ने ओएनजीसी त्रिपुरा पावर कंपनी में 26% हिस्सेदारी और मेसर्स मित्सुई ओएसके लाइन्स जापान की मेसर्स एलएनजी जैपोनिका शिपिंग कॉर्पोरेशन लिमिटेड में 26% इक्विटी हिस्सेदारी भी हासिल कर ली है। इसके अतिरिक्त, गेल ने कॉरपोरेट दिवाला समाधान प्रक्रिया (सीआईआरपी) के माध्यम से 1.25 एमएमटीपीए निवल टेरेफ्थेलिक एसिड (पीटीए) की जेबीएफ पेट्रोकेमिकल्स लिमिटेड (जेबीएफपीएल) का अधिग्रहण किया है। जेबीएफपीएल का पुनः नामाकरण गेल मैंगलोर पेट्रोकेमिकल्स लिमिटेड (जीएमपीएल) के रूप में हुआ है और यह अब गेल की पूर्ण स्वामित्व वाली सहायक कंपनी बन गई है।

गेल, भारत में नगरी गैस वितरण व्यापार में अग्रणी है। 12वें सीजीडी बोली दौर के पूरा होने के बाद भारत भर में 72 भौगोलिक क्षेत्रों में इसकी पहुंच है। गेल के पास अपने सीजीडी व्यवसाय के लिए भारत में 8 संयुक्त उद्यम और तीन सहायक कंपनियां हैं। इसके अतिरिक्त, गेल की रूस, अमेरिका, सिंगापुर, म्यांमार, चीन और मिस्र में विदेशी पहुंच है। इसने सिंगापुर, यांगून, ह्यूस्टन और मॉस्को (भारत ऊर्जा कार्यालय) में कार्यालय खोले हैं। इसकी अमेरिका में पूर्ण स्वामित्व वाली सहायक कंपनी गेल ग्लोबल (यूएसए) इंक (जीजीयूआई) है। जीजीयूआई ने सहायक कंपनी गेल ग्लोबल (यूएसए) एलएनजी एलएलसी (जीजीयूएलएल) बनाई है, जिसने कोव प्वाइंट एलएनजी द्रवीकरण परियोजना में 2.3 एमएमटीपीए क्षमता बुक की है। गेल के पास एलएनजी में व्यापार करने और विदेशी निवेश करने के लिए एक और पूर्ण स्वामित्व वाली सहायक कंपनी गेल ग्लोबल (सिंगापुर) प्राइवेट लिमिटेड है। गेल का कुल एलएनजी सोर्सिंग पोर्टफोलियो लगभग 15.5 एमएमपीटीए है।

गेल की 13 अन्वेषण एवं उत्पादन (ईएंडपी) ब्लॉकों में भागीदारी है, जिनमें से 10 ब्लॉक भारत में, 2 म्यांमार में और ईगल फोर्ड बेसिन, टेक्सास, यूएसए में 1 शेल गैस संयुक्त उद्यम है। इसके अतिरिक्त, गेल की साउथ ईस्ट एशिया गैस पाइपलाइन कंपनी (एसईएजीपी) में 4.17% इक्विटी भागीदारी है, जो म्यांमार से चीन तक गैस पहुंचा रही है। गेल ने मिस्र और चीन में डाउनस्ट्रीम व्यवसाय में तीन कंपनियों में निवेश किया है।

गेल के पास ~134.72 मेगावाट का नवीकरणीय पोर्टफोलियो है, जिसमें लगभग ~118 मेगावाट पवन और लगभग ~16.72 मेगावाट सौर ऊर्जा शामिल है। इसके अतिरिक्त, गेल जैविक अपशिष्ट से संपीड़ित जैव गैस (सीबीजी) के उत्पादन और विपणन में विभिन्न व्यावसायिक संभावनाओं का खोज कर रहा है। नए व्यावसायिक संभावनाओं के लिए एथेनॉल, हाइड्रोजन, कोयला गैसीकरण, लघु पैमाने की एलएनजी इकाई आदि सहित उभरते क्षेत्रों की भी खोज की जा रही है। गेल ने वर्ष 2040 तक कार्यक्षेत्र 1 और कार्यक्षेत्र 2 उत्सर्जन में 100% कमी और कार्यक्षेत्र 3 उत्सर्जन में 35% की कमी के लिए जीएचजी उत्सर्जन के लिए अपना निवल शून्य कार्यनीति लक्ष्य विकसित किया है। गेल रांची में सीबीजी संयंत्र स्थापित कर रहा है जो विजयपुर इकाई में इलेक्ट्रोलाइजर संयंत्र है और जिसकी क्षमता 10 मेगावाट है और जो प्रतिदिन 4.3 टन/1.4 किलो टन प्रति वर्ष ग्रीन हाइड्रोजन उत्पादन करेगा और जो विजयपुर में लघु पैमाने की एलएनजी इकाई है।

दिनांक 31 दिसंबर, 2023 तक की स्थिति के अनुसार गेल की कार्यबल की संख्या लगभग ~5,038 थी।

14.1.3.1 वास्तविक और वित्तीय निष्पादन: –

भौतिक

मापदंड	इकाई	वर्ष 2022–23 में निष्पादन	वर्ष 2023–24 में निष्पादन
गैस परिवहन	एमएमएससीएमडी	107	120
गैस विपणन	एमएमएससीएमडी	95	98
तरल हाइड्रोकार्बन उत्पादन	टीएमटी	933	995
पेट्रोरसायन उत्पाद	टीएमटी	442	777
एलपीजी परिवहन टीएमटी		4335	4396

वित्तीय

₹ करोड़ में

विवरण	वर्ष 2022–23 में निष्पादन	वर्ष 2023–24 में निष्पादन
प्रचालन से राजस्व	1,44,302	1,30,638
सकल मार्जन (ईबीडीआईटीए)	9,384	15,563
कर से पहले लाभ	6,584	11,555
कर पश्चात लाभ	5,302	8,836

14.1.3.2. गेल द्वारा कार्यान्वित की जा रही प्रमुख परियोजनाएँ/पाइपलाइनें:

क. जगदीशपुर हल्दिया और बोकारो–धामरा पाइपलाइन (जेएचबीडीपीएल)

पूर्वी भारत में किफायती मूल्य पर स्वच्छ और गुणवत्तापूर्ण ऊर्जा सुनिश्चित करने के उद्देश्य से गेल जगदीशपुर–हल्दिया और बोकारो–धामरा प्राकृतिक गैस पाइपलाइन (जेएचबीडीपीएल) परियोजना (2,563 किमी) का क्रियान्वयन कर रहा है, जिसे पूर्वी भारत की प्रधानमंत्री ऊर्जा गंगा के नाम से जाना जाता है। इसके अतिरिक्त, पाइपलाइन को बरौनी से गुवाहाटी (सिलीगुड़ी और बोंगाईगांव के माध्यम से) (726 किमी) तक भी विस्तारित किया जा रहा है, जो जेएचबीडीपीएल का अभिन्न अंग है, ताकि उत्तर पूर्व क्षेत्र (एनईआर) को राष्ट्रीय गैस ग्रिड से जोड़ा जा सके। जेएचबीडीपीएल की कुल एकीकृत लंबाई 3,289 किमी है। बीजीपीएल सहित संपूर्ण जेएचबीडीपीएल का निर्माण ₹ 17,405 करोड़ के निवेश से किया जा रहा है। यह उत्तर प्रदेश (335 किमी), बिहार (719 किमी), झारखंड (500 किमी), पश्चिम बंगाल (696 किमी), ओडिशा (785 किमी) और असम (254 किमी) से होकर गुजरेगा। जेएचबीडीपीएल ने एचयूआरएल गोरखपुर, एचयूआरएल सिंदरी, एचयूआरएल बरौनी के उर्वरक संयंत्रों को पुनर्जीवित किया है और दुर्गापुर में मेसर्स मैटिक्स फर्टिलाइजर्स की मांगों को भी पूरा कर रहा है। इसके अतिरिक्त, यह नेटवर्क पाइपलाइन के रास्ते भारत के पूर्वी हिस्से में घरेलू और औद्योगिक ग्राहकों के लिए स्वच्छ ईंधन की आपूर्ति को सक्षम बनाएगा।

दुर्गापुर हल्दिया पाइपलाइन (~294 किमी) को छोड़कर एकीकृत जगदीशपुर-हल्दिया और बोकारो-धामरा प्राकृतिक गैस पाइपलाइन (जेएचबीडीपीएल) के सभी खंड (2,986 किमी) शुरू हो चुके हैं।

जेएचबीडीपीएल द्वारा प्राप्त की गई प्रमुख उपलब्धियां:

- फूलपुर से वाराणसी (110 किमी) की शुरूआत की गई। **दिनांक 14.07.2018 को माननीय प्रधान मंत्री द्वारा राष्ट्र को समर्पित किया गया।**
- दिनांक 31.03.2019 को वाराणसी से डोभी और पटना से बरौनी (474 किमी) की शुरूआत की गई।
- दिनांक 30.06.2019 को गोरखपुर से कनेक्टिविटी (166 किमी) की शुरूआत की गई।
- डोभी से दुर्गापुर (350 किमी) जिसमें मैटिक्स फर्टिलाइजर तक कनेक्टिविटी भी शामिल है। **माननीय भारत के प्रधान मंत्री द्वारा दिनांक 07.02.21 को आयोजित कार्यक्रम में राष्ट्र को समर्पित।**
- दिनांक 02.06.2021 को स्पर लाइन से एचयूआरएल सिंदरी (9.2 किमी) तक की शुरूआत।
- बोकारो अंगुल मेनलाइन (533 किमी) **दिनांक 12.07.2022 को माननीय प्रधानमंत्री द्वारा राष्ट्र को समर्पित।**
- दिनांक 12.09.2022 को जमशेदपुर स्पर लाइन का 123.2 किमी और सीजीएस रांची स्परलाइन का 4.6 किमी हिस्सा शुरू किया गया।
- धर्मा–अंगुल मेनलाइन (206 किमी) **दिनांक 16.02.2023 को शुरू किया गया।**
- धामरा–अंगुल खंड की कटक–भुवनेश्वर स्परलाइन को दिनांक 31.03.2023 को शुरू किया गया।
- बरौनी–गुवाहाटी पाइपलाइन का बिहार खंड (282 किमी) दिनांक 31.03.2023 को शुरू किया गया।
- पारादीप स्परलाइन (~86 किमी): **दिनांक 30.06.2023 को शुरू किया गया।**
- बरौनी–गुवाहाटी पाइपलाइन (717 किमी) का **उद्घाटन माननीय प्रधान मंत्री द्वारा दिनांक 09.03.2024 को किया गया।**

ख. मुंबई नागपुर झारसुगुडा पाइपलाइन (एमएनजेपीएल)

मुंबई–नागपुर–झारसुगुडा पाइपलाइन 1,755 किलोमीटर लंबी पाइपलाइन है जो मुंबई से शुरू होकर झारसुगुड़ा में समाप्त होगी। साथ ही, इसकी स्परलाइन नागपुर (महाराष्ट्र) से जबलपुर (मध्य प्रदेश) तक विस्तारित होगी। यह राष्ट्रीय गैस ग्रिड (एनजीजी) का भी हिस्सा है और महाराष्ट्र के 25 जिलों (12 जिले), मध्य प्रदेश (3 जिले), छत्तीसगढ़ (19 जिले) और ओडिशा (1 जिला) से होकर गुजरेगी। यह ठाणे (महाराष्ट्र) से शुरू होगा और झारसुगुड़ा (ओडिशा) में जेएचबीडीपीएल से जुड़ेगा।

यह पाइपलाइन स्वच्छ ईंधन की उपलब्धता सुनिश्चित करेगी और सीजीडी उद्योगों और एंकर लोड ग्राहकों की मांग को पूरा करेगी। घरेलू गैस की उपलब्धता भविष्य में पाइपलाइन के मार्ग में विद्युत, उर्वरक और अन्य उद्योगों जैसे प्रमुख उद्योगों के विकास में मदद कर सकती है। पीएनजीआरबी ने 33 जिलों (महाराष्ट्र 21, मध्य प्रदेश: 15, छत्तीसगढ़, 17) को शामिल करते हुए लगभग 17 जीए को अधिकृत किया है, जहां निकट भविष्य में नगर गैस वितरण नेटवर्क विकसित किया जाएगा।

पाइपलाइन कई औद्योगिक क्षेत्रों से गुजर रही है जैसे महाराष्ट्र में म्हसकल, औरंगाबाद, वर्धा, अमरावती, जलगांव, नागपुर, गोंदिया; मध्य प्रदेश में जबलपुर और छिंदवाड़ा; छत्तीसगढ़ में रायपुर, दुर्ग, बिलासपुर, कोरबा और रायगढ़; ओडिशा में झारसुगुड़ा।

मुंबई–नागपुर और नागपुर–जबलपुर खंड के निर्माण कार्य जोरों पर है और नागपुर–जबलपुर खंड में आरओयू अधिग्रहण का काम चल रहा है। मार्च 2024 तक 1,174 किलोमीटर लोअरिंग संबंधी कार्य पूरी कर ली गई है।

ग. श्रीकाकुलम अंगुल पाइपलाइन (एसएपीएल):

ओडिशा और आंध्र प्रदेश में स्वच्छ और गुणवत्तापूर्ण ऊर्जा की आपूर्ति के उद्देश्य से, इस पाइपलाइन का राष्ट्रीय गैस ग्रिड के अंश के रूप में कार्यनीतिक महत्व है और यह अंगुल में गेल की जगदीशपुर हल्दिया बोकारो धामरा पाइपलाइन (जेएचबीडीपीएल) नेटवर्क और श्रीकाकुलम में आंध्र प्रदेश गैस वितरण निगम (एपीजीडीसी) कोंकाकोनाडा श्रीकाकुलम पाइपलाइन से जुड़ेगी। यह पाइपलाइन नगर गैस, एन्नोर, धामरा, गंगावरम (ए.पी.), गोपालपुरा एफएसआरयू आदि जैसे मौजूदा/भविष्य में एलएनजी टर्मिनलों से गैस के कुल खरीद के लिए महत्वपूर्ण अवसंरचना के रूप में कार्य करेगी।

श्रीकाकुलम अंगुल पाइपलाइन की कुल लंबाई 744 किमी (ओडिशा में 619 किमी और आंध्र प्रदेश में 125 किमी) है, जिसकी क्षमता 6.65 एमएमएससीएमडी है और यह ओडिशा के अंगुल, ढेंकनाल, कटक, खोरधा, नयागढ़, गजपति, गंजम, रायगढ़, कोरापुट और कालाहांडी जिलों और आंध्र प्रदेश के

श्रीकाकुलम और विजयनगरम जिलों से होकर गुजरती है।

निर्माण कार्य जोरों पर है और मार्च 2024 तक 613 किमी लोअरिंग संबंधी कार्य पूरी कर ली गई है।

घ. कोच्चि–कूट्टनद–बैंगलोर–मैंगलोर पाइपलाइन (केकेबीएमपीएल) परियोजना चरण–II (891 किमी):

कोच्चि–कूट्टनद–बैंगलोर–मैंगलोर पाइपलाइन (केकेबीएमपीएल) परियोजना की अवधारणा वर्ष 2007 में सरकार द्वारा की गई थी। भारत की महत्वाकांक्षी राष्ट्रीय गैस ग्रिड (एनजीजी) के अंश के रूप में और गेल को एमओपीएंडएनजी द्वारा केरल, कर्नाटक और तमिलनाडु राज्यों में इस गैस पाइपलाइन परियोजना को बिछाने के लिए अधिकृत किया गया था। 16 एमएमएससीएमडी की कुल क्षमता वाली इस 30"/24" पाइपलाइन की योजना कोच्चि एलएनजी टर्मिनल से पुनः गैसीफाइड एलएनजी (आरएलएनजी) को निकालने के लिए केरल, तमिलनाडु और कर्नाटक राज्य के विभिन्न उपभोक्ताओं तक परिवहन करने की योजना बनाई गई थी, जिससे इन तीन दक्षिणी राज्यों को राष्ट्रीय गैस ग्रिड से जोड़ा जा सके। यह पाइपलाइन घरेलू जरूरतों को पूरा करेगी अर्थात खाना पकाने के उद्देश्य के लिए पीएनजी (पाइप्ड नेचुरल गैस), होटल उद्योग, परिवहन क्षेत्र में वाहनों के लिए सीएनजी (सपीड़ित प्राकृतिक गैस), विद्युत संयंत्र, उर्वरक संयंत्र और कई अन्य उद्योग।

परियोजना को प्रगतिशील तरीके से कार्यान्वित और शुरू किया जा रहा है। इस परियोजना का कार्य नवंबर, 2024 तक समाप्त होने की संभावना है।

ङ. धामरा हल्दिया पाइपलाइन परियोजना :–

धामरा हल्दिया पाइपलाइन परियोजना को प्रधानमंत्री ऊर्जा गंगा (पीएमयूजी) पाइपलाइन परियोजना के विस्तार के रूप में क्रियान्वित किया जा रहा है, जिसका नाम जगदीशपुर–हल्दिया और बोकारो धामरा पाइपलाइन परियोजना (जेएचबीडीपीएल) है, जिसका उद्देश्य आईओसीएल हल्दिया की अतिरिक्त गैस मांग और ओडिशा और पश्चिम बंगाल में सीजीडी जीए की मांग को पूरा करना है। यह पाइपलाइन ओडिशा (154 किमी) के 03 जिलों और पश्चिम बंगाल (99 किमी) के 02 जिलों से होकर गुजर रही है। धामरा–हल्दिया पाइपलाइन का निर्माण ₹ 1,030 करोड के निवेश से किया जा रहा है और इसके जून 2024 तक पूरा होने की उम्मीद है। ओडिशा में इस पाइपलाइन का 154 किलोमीटर भाग पूरा हो चुका है। पश्चिम बंगाल में शेष 99 किलोमीटर का काम जारी है।

च. उत्तर–पूर्व प्राकृतिक गैस ग्रिड (इंद्रधनुष) गैसग्रिड लिमिटेड (आईजीजीएल)

इंद्रधनुष गैस ग्रिड लिमिटेड (आईजीजीएलआई) आईओसीएल (20% ओएनजीसी (20%), गेल (20%), ओआईएल (20%), और एनआरएल (20%) की संयुक्त उद्यम कंपनी है, जिसे भारत सरकार द्वारा प्रतिष्ठित उत्तर पूर्व गैस ग्रिड (एनईजीजी) परियोजना के कार्यान्वयन के लिए सौंपा गया है, जिसकी परिकल्पना उत्तर पूर्व भारत के लिए हाइड्रोकार्बन विजन 2030 के अनुरूप की गई है। एनईजीजी को सभी आठ उत्तर पूर्वी राज्यों अर्थात असम, अरुणाचल प्रदेश, मेघालय, त्रिपुरा, मिजोरम, नागालैंड, मणिपुर और सिक्किम को प्राकृतिक गैस की आपूर्ति करने के लिए कार्यान्वित किया जा रहा है, जिसकी अनुमानित लागत ₹ 9,265 करोड है। 4.75 एमएमएससीएमडी की क्षमता वाली 1,656 किलोमीटर लंबी प्राकृतिक गैस पाइपलाइन ग्रिड उत्तर पूर्व भारत के चुनौतीपूर्ण इलाकों से होकर गुजरेगी और गुवाहाटी को राजधानी/क्षेत्र के प्रमुख नगरों अर्थात ईटानगर, दीमापुर, कोहिमा इम्फाल, आइजोल, अगरतला, शिलांग, सिलचर, गंगटोक और नुमालीगढ़ से जुड़ेगा। चरणबद्ध तरीके से विभिन्न कार्यकलाप प्रक्रियाधीन हैं और इस परियोजना का मार्च, 2025 तक शुरू होने की संभावना है।

छ. कोयला गैसीकरण

गेल, कोल इंडिया लिमिटेड (सीआईएल), राष्ट्रीय केमिकल्स एंड फर्टिलाइजर्स लिमिटेड (आरसीएफ) के साथ गठित संयुक्त उद्यम–तालचेर फर्टिलाइजर्स लिमिटेड (टीएफएल) के माध्यम से कोयला गैसीकरण आधारित यूरिया परियोजना स्थापित करने जा रही है। कोल इंडिया लिमिटेड (सीआईएल), राष्ट्रीय केमिकल्स एंड फर्टिलाइजर्स लिमिटेड (आरसीएफ) दोनों की हिस्सेदारी 31.85% है और फर्टिलाइजर कॉरपोरेशन ऑफ इंडिया लिमिटेड (एफसीआईएल) का 4.45% इक्विटी है। लगभग ₹ 17,080 करोड की अनुमानित लागत वाली इस परियोजना से 2,200 एमटीपीडी अमोनिया और 3,850 एमटीपीडी यूरिया का उत्पादन करने की परिकल्पना की गई है।

ज. पेट्रोरसायन

गेल 500 केटीए पीडीएच–पीपी इकाई स्थापित कर रहा है जो महाराष्ट्र के ऊसर में पॉलीप्रोपाइलीन इकाई और ऑफसाइट इकाई

सहित एकीकृत भारत की पहली प्रोपेन डिहाइड्रोजनेशन इकाई है, साथ ही ऊसर–उरण प्रोपेन पाइपलाइन (नई लिक्विड हाइड्रोकार्बन पाइपलाइन) भी है। यह परियोजना महाराष्ट्र के रायगढ़ जिले में गेल–ऊसर के मौजूदा एलपीजी रिकवरी संयंत्र में स्थित है। प्रोपेन फीड मौजूदा बीपीसीएल उरण टर्मिनल से प्राप्त की जाएगी और इसे समर्पित लिक्विड प्रोपेन पाइपलाइन के माध्यम से गेल–ऊसर संयंत्र में पंप किया जाएगा। कुल परियोजना लागत ₹ 11,256 करोड़ है। सभी प्रमुख उपकरणों और अनुबंधों सहित, स्थल निर्माण कार्यकलाप पूरे जोरों पर प्रक्रियाधीन हैं और यह परियोजना अक्टूबर, 2025 तक पूरी हो जाएंगी।

गेल उत्तर प्रदेश के औरैया जिले के पाटा पेट्रोकेमिकल कॉम्प्लेक्स में लगभग ₹ 1,299 करोड़ की लागत से 60 केटीपीए पॉलीप्रोपाइलीन इकाई स्थापित कर रहा है। प्रस्तावित सुविधा पाटा पेट्रोकेमिकल कॉम्प्लेक्स में मौजूदा सुविधाओं के अंदर स्थापित की जा रही है और मौजूदा पाटा पेट्रोकेमिकल कॉम्प्लेक्स में उत्पादित पॉलिमर ग्रेड प्रोपलीन का उपयोग नए पॉलीप्रोपाइलीन (पीपी) संयंत्र के लिए फीड–स्टॉक के रूप में किया जाएगा। सभी उपकरण और कार्य संविदा प्रदान किए जा चुके हैं। मार्च, 2025 तक परियोजना के लक्षित पूरा होने के लिए निर्माण कार्यकलाप पूरे जोरों पर प्रक्रियाधीन हैं।

वित्त वर्ष 2023–24 की उपलब्धियां :–

- डीपीई ने गेल को वित्त वर्ष 2022–23 के लिए उत्कृष्ट समझौता ज्ञापन रेटिंग प्रदान की है।
- गेल ने 120.46 एमएमएससीएमडी की अब तक की सबसे अधिक वार्षिक गैस ट्रांसमिशन मात्रा प्राप्त की है।
- 4.395 एमएमटीपीए की अब तक की सबसे अधिक कुल वार्षिक एलपीजी ट्रांसमिशन मात्रा प्राप्त की है।
- गेल ने लगातार तीसरी बार वित्त वर्ष 2023–24 में 1000 किमी से अधिक की पाइपलाइन लौअरिंग संबंधी कार्य पूरा किया है, ~1,171 किमी पूरी की है।
- भारत के माननीय प्रधानमंत्री ने निम्नलिखित परियोजनाओं को राष्ट्र को समर्पित किया:
  - जेएचबीडीपीएल का धामरा अंगुल पाइपलाइन खंड (412 किमी)
  - बरौनी गुवाहाटी पाइपलाइन (बीजीपीएल), जेएचबीडीपीएल का एक भाग (717 किमी)
  - विजयपुर–औरैया पाइपलाइन (352 किमी)
- भारत के माननीय प्रधानमंत्री ने एमएनजेपीएल के नागपुर-झारसुगुड़ा खंड और केकेबीएमपीएल-II के कृष्णागिरि से कोयंबटूर खंड (294 किमी) की आधारशिला रखी।
- पीएनजीआरबी ने गेल को गुरदासपुर–जम्मू एनजीपीएल की 160 किमी प्राकृतिक गैस पाइपलाइन बिछाने, निर्माण, संचालन और विस्तार करने के लिए प्राधिकरण प्रदान किया।
- माननीय केंद्रीय पेट्रोलियम एवं प्राकृतिक गैस तथा आवासन एवं नगरी कार्य मंत्री ने देश भर में गेल और गेल समूह के 201 सीएनजी स्टेशनों, विजयपुर में भारत की पहली लघु स्तरीय एलएनजी इकाई और रविदास घाट, वाराणसी में दुनिया के पहले फ्लोटिंग सीएनजी एमआरयू का उद्घाटन किया।
- गेल ने वर्ष 2026 से शुरू होने वाले लगभग 1.53 एमएमटीपीए की कुल मात्रा के लिए मेसर्स विटोल एशिया प्राइवेट लिमिटेड और मेसर्स एडीएनओसी एलएनजी के साथ दीर्घकालिक एलएनजी करार किए हैं।
- गेल ने महाराष्ट्र के उसर में आगामी पेट्रोकेमिकल संयंत्र के लिए प्रोपेन की 15 वर्ष की आपूर्ति के लिए बीपीसीएल के साथ एक करार पर हस्ताक्षर किए हैं।
- कतर एनर्जी एलएनजी और पेट्रोनेट एलएनजी लिमिटेड ने फरवरी 2024 में 7.5 एमएमटीपीए के एलएनजी एसपीए पर हस्ताक्षर किए हैं, जिसमें गेल वर्ष 2028 से 20 वर्ष की अवधि के लिए 60% मात्रा का अधिग्रहण करेगा।
- गेल की परिसंपत्ति और बाजार पूंजीकरण 1 ट्रिलियन के आंकड़े को पार कर गया।
- वित्त वर्ष 2022–23 (लगातार 14 साल) के लेखों के लिए सीएजी से "शून्य" टिप्पणियां प्राप्त हुई।
- गेल ने कॉरपोरेट इनसॉल्वेंसी रेजोल्यूशन प्रोसेस (सीआईआरपी) के जरिए जेबीएफ पेट्रोकेमिकल्स लिमिटेड (जेबीएफपीएल) का 100% अधिग्रहण कर लिया है और इसका नाम बदलकर गेल मैंगलोर पेट्रोकेमिकल्स लिमिटेड (जीएमपीएल) कर दिया है।
- गेल को फिच रेटिंग द्वारा "बीबीबी" और आउटलुक स्टेबल द्वारा बीएए3 स्टेबल की पुष्टि की गई है, दोनों को सॉवरेन रेटिंग दिया गया है। केयर द्वारा गेल की मूल्य निर्धारण को "एएए" के रूप में फिर से पुष्टि की गई है।

वर्ष के दौरान प्राप्त प्रमुख सम्मान/पुरस्कार :–

- गेल को एफआईपीआई द्वारा प्रतिष्ठित पुरस्कार "वर्ष की सर्वश्रेष्ठ प्राकृतिक गैस परिवहन कंपनी" से सम्मानित किया गया
- गेल को एफआईपीआई से विजयपुर–औरई पाइपलाइन परियोजना (36352 किमी) के लिए वर्ष की सर्वश्रेष्ठ प्रबंधित परियोजना का पुरस्कार मिला
- गेल (इंडिया) लिमिटेड को वाराणसी में दुनिया का सबसे पहला फ्लोटिंग कंप्रेस्ड नेचुरल गैस (सीएनजी) स्टेशन की स्थापना के लिए "वर्ष की मिडस्ट्रीम परियोजना" श्रेणियों के अंतर्गत प्रतिष्ठित "इंटरनेशनल एशियन आयल एंड गैस पुरस्कार 2023" से सम्मानित किया गया और मलेशिया के कुआलालंपुर में आयोजित कार्यक्रम में एलएनजी के शिप–टू–शिप (एसटीएस) हस्तांतरण के माध्यम से एलएनजी शिपिंग लागत और उत्सर्जन में कमी के लिए "इनोवेशन अवार्ड" दिया गया।
- गेल को विक्रेता चालान प्रबंधन [वीआईएम] प्रणाली के लिए गेल में वित्त परिवर्तन के लिए प्रौद्योगिकी के लाभ उठाने को मान्यता देने के लिए "द डिसरप्टर–बेस्ट फाइनेंस ट्रांसफॉर्मेशन" श्रेणी के तहत प्रतिष्ठित एसएपी एसीई पुरस्कार–2023 से सम्मानित किया गया।
- गेल को सीआईडीसी से "नई दिल्ली में बरौनी–गुवाहाटी प्राकृतिक गैस पाइपलाइन परियोजना के लिए सर्वश्रेष्ठ निर्माण परियोजनाओं के लिए उपलब्धि पुरस्कार" श्रेणी में "15वां विश्वकर्मा पुरस्कार" 2023 प्राप्त हुआ।
- गेल ने "राजभाषा विभाग, गृह मंत्रालय की "राजभाषा कीर्ति पुरस्कार योजना" के तहत "प्रथम पुरस्कार" जीता।
- गेल ने पर्यावरण जागरूकता पर ब्रांडेड सामग्री के लिए "गोवाफेस्ट एबी वन शो साउथ एशिया अवार्ड 2023" में स्वर्ण पदक जीता
- गेल को एमएसएमई मंत्रालय द्वारा वित्त वर्ष 2022–23 के लिए ₹ 1,000 करोड़ से अधिक की कुल खरीद की उच्चतम श्रेणी में एससी/एसटी स्वामित्व वाले एमएसई से दूसरे उच्चतम प्रतिशत खरीद पुरस्कार से सम्मानित किया गया है।
- गेल, विजयपुर को विज्ञान भवन में आयोजित पुरस्कार समारोह में भारतीय लागत लेखाकार संस्थान (आईसीएमएआई) द्वारा लागत प्रबंधन में उत्कृष्टता के लिए 18वें राष्ट्रीय पुरस्कारों में विनिर्माण–सार्वजनिक क्षेत्र–मध्यम श्रेणी के तहत प्रथम स्थान प्रदान किया गया है।

14.1.4. भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड (बीपीसीएल)



बीपीसीएल जो एक फॉर्च्यून ग्लोबल 500 कंपनी है, भारत की दूसरी सबसे बड़ी तेल विपणन कंपनी और एकीकृत ऊर्जा कंपनियों में से एक है। यह कंपनी कच्चे तेल के शोधन और पेट्रोलियम उत्पादों के विपणन में कार्य कर रही है, जिसकी उपस्थिति तेल और गैस उद्योग के अपस्ट्रीम और डाउनस्ट्रीम क्षेत्रों में है। इसने प्रतिष्ठित महारत्न का दर्जा प्राप्त किया और अधिक प्रचालन और वित्तीय स्वायत्तता वाली कंपनियों के क्लब में शामिल हो गई है।

मुंबई, कोच्चि और बीना में भारत पेट्रोलियम की रिफाइनरियों की संयुक्त शोधन क्षमता लगभग 35.3 एमएमटीपीए है। इसके विपणन अवसंरचना में प्रतिष्ठानों, डिपो, ऊर्जा स्टेशनों, विमानन सेवा स्टेशनों, एलपीजी और ल्यूब वितरकों का नेटवर्क शामिल है।

भारत पेट्रोलियम संधारणीय मंच की ओर बढ़ने के लिए अपनी कार्यनीति, निवेश, पर्यावरण और सामाजिक महत्वाकांक्षाओं को एकीकृत कर रहा है। कंपनी ने लगभग 7000 ऊर्जा स्टेशनों पर इलेक्ट्रिक वाहन चार्जिंग स्टेशन पेश करने की योजना बनाई है।

संधारणीय समाधानों पर ध्यान केंद्रित करते हुए, कंपनी कार्यक्षेत्र 1 और कार्यक्षेत्र 2 उत्सर्जन में 2040 तक निवल शून्य ऊर्जा कंपनी बनने के लिए पारिस्थितिकी तंत्र और दिशा–निर्देश विकसित कर रही है। भारत पेट्रोलियम मुख्य रूप से शिक्षा, जल संरक्षण, कौशल विकास, स्वास्थ्य, सामुदायिक विकास, क्षमता निर्माण और कर्मचारी स्वयंसेवा के क्षेत्रों से जुड़ी कई पहलों का समर्थन करके समुदायों के साथ भागीदारी कर रहा है। अपने मुख्य उद्देश्य "एनरजाइजिंग लाइव्ज" सहित, भारत पेट्रोलियम

का विजन प्रतिभा, नवाचार और प्रौद्योगिकी का लाभ उठाते हुए प्रशंसित वैश्विक ऊर्जा कंपनी बनना है।

14.1.4.1. वित्तीय निष्पादन

वर्ष 2023–24 के दौरान बीपीसीएल का प्रचालन से राजस्व ₹ 5,06,911 करोड़ रहा। अनुकूल बाजार स्थितियों के साथ समर्थित सुदृढ़ प्रचालन दक्षताओं का निष्पादन करते हुए, बीपीसीएल ने वित्त वर्ष 2023–24 में ₹ 26,673.50 करोड़ का अपना अब तक का सबसे अधिक स्टैंडअलोन निवल लाभ प्राप्त किया, जो पिछले वर्ष के ₹ 1,870.10 करोड़ के निवल लाभ से उल्लेखनीय वृद्धि है। इस शानदार निष्पादन के मद्देनजर, बोर्ड ने 21 प्रति शेयर (प्री–बोनस) का अंतिम लाभांश दिया, जिससे अंतरिम भुगतान सहित वर्ष के लिए कुल लाभांश 42 प्रति शेयर हो गया और यही वित्त वर्ष 2022–23 की तुलना में 950% की भारी वृद्धि को दर्शाता है। अपनी कामयाबी को आगे साझा करते हुए, बीपीसीएल ने अपने शेयरधारकों के निरंतर समर्थन को स्वीकार करते हुए 1:1 के अनुपात में बोनस शेयर जारी किए।

14.1.4.2. राजकोष में योगदान

पिछले कुछ वर्षों में, बीपीसीएल ने शुल्क, कर और लाभांश के रूप में सरकारी खजाने में योगदान दिया है। अप्रैल–मार्च 2024 की अवधि के दौरान, राजकोष को ₹ 1,48,566 करोड़ का भुगतान किया गया। अप्रैल–मार्च 2024 के दौरान केंद्रीय राजकोष को ₹ 77,907 करोड़ और राज्यिक राजकोष को ₹ 70,659 करोड़ का भुगतान किया गया।

14.1.4.3. रिफ़ाइनरी संबंधी निष्पादन

मुंबई रिफ़ाइनरी

मुंबई रिफ़ाइनरी की वर्तमान स्थापित क्षमता 12.00 एमएमटीपीए है। मुंबई रिफ़ाइनरी ने वित्त वर्ष 2023–24 (अप्रैल 2023–मार्च 2024) के दौरान 125.43% की क्षमता उपयोग सहित 15.05 एमएमटी का क्रूड थ्रुपुट प्राप्त किया। वित्त वर्ष 2022–23 के लिए, 121.25% की क्षमता उपयोग सहित 14.55 एमएमटी का क्रूड थ्रुपुट प्राप्त किया गया।

कोच्चि रिफ़ाइनरी

कोच्चि रिफ़ाइनरी की वर्तमान स्थापित क्रूड प्रसंस्करण क्षमता 15.5 एमएमटीपीए है।

कोच्चि रिफ़ाइनरी ने वित्त वर्ष 2023–24 में 17.31 एमएमटी क्रूड प्रसंस्करण किया, जिसकी क्षमता का उपयोग 112% रहा, जबकि वित्त वर्ष 2022–23 में 16.02 एमएमटी की क्षमता का उपयोग 103% रहा।

बीना रिफ़ाइनरी

बीना रिफ़ाइनरी की वर्तमान स्थापित क्षमता 7.8 एमएमटीपीए है। बीना रिफ़ाइनरी ने वर्ष 2023–24 के दौरान 7.13 एमएमटी क्रूड थ्रुपुट प्राप्त किया। अनुरक्षण और निरीक्षण (एमबी) के लिए रिफ़ाइनरी का कारोबार वर्ष 2023 के मद्देनजर वर्ष के दौरान क्षमता उपयोग 91.4% रहा। वित्त वर्ष 2022–23 के लिए, 7.84 एमएमटी का क्रूड थ्रुपुट प्राप्त किया गया, जिसमें क्रूड रिफ़ाइनिंग क्षमता का 100.5% उपयोग किया गया।

14.1.4.4. पाइपलाइन निष्पादन

बीपीसीएल में 3,537 किमी का मल्टीप्रोडक्ट और क्रूड पाइपलाइन का नेटवर्क है, जिसकी डिज़ाइन क्षमता 29 एमएमटीपीए है।

वित्त वर्ष 2023–24 के दौरान, पाइपलाइन थ्रुपुट 25.72 एमएमटी था। भारत पेट्रोलियम ने पाइपलाइनों को कुशल और सुरक्षित तरीके से प्रवालित करना जारी रखा और उनके पाइपलाइन नेटवर्क में कोई चोरी की घटना नहीं घटी, बीपीसीएल ने अपनी सभी प्रमुख उत्पाद पाइपलाइनों को पाइपलाइन घुसपैठ पहचान प्रणाली (पीआईडीएस) के साथ शामिल किया है जो पाइपलाइन नेटवर्क पर तीसरे पक्ष की कार्यप्रणाली की वास्तविक समय की निगरानी में मदद करेगा।

14.1.4.5. विपणन अवसंरचना और निष्पादन

बीपीसीएल के पास सुदृढ़ वितरण नेटवर्क है जिसमें 21,800 से अधिक ऊर्जा केन्द्र, 6,200 से अधिक एलपीजी डिस्ट्रीब्यूटरशिप, 525 ल्यूब डिस्ट्रीब्यूटरशिप, 121 पीओएल भंडारण केन्द्र, 53 एलपीजी बॉटलिंग संयंत्र, 63 विमानन सेवा केन्द्र, 4 ल्यूब ब्लेंडिंग संयंत्र और 4 क्रॉस–कंट्री पाइपलाइन शामिल हैं, जिसमें 3,537 किमी मल्टीप्रोडक्ट और क्रूड पाइपलाइन का नेटवर्क है, जिसकी डिज़ाइन क्षमता 29 एमएमटीपीए है।

वित्त वर्ष 2023–24 में बीपीसीएल की बाजार बिक्री 51.04 एमएमटी थी जबकि वित्त वर्ष 2022–23 में यह 48.92 एमएमटी थी। पीएसयू तेल कंपनियों के बीच 27.57% की बाजार हिस्सेदारी सहित बिक्री में 4.33% की वृद्धि हुई है।

बीपीसीएल के खुदरा व्यापार खंड ने 1.1% की वृद्धि प्राप्त की, जो 32.69 एमएमटी की मात्रा और पिछले 10 वर्षों में पीएसयू के बीच उच्चतम पूर्ण बाजार हिस्सेदारी है (वित्त वर्ष 2023–24 के दौरान: एमएस में 29.68% और एचएसडी में 29.83%)।

बीपीसीएल ने देश भर में 25 से अधिक शहरों में 120 से अधिक खुदरा दुकानों पर बाक और श्रवण

(एसएचआई) दिव्यांगजनों को रोजगार प्रदान करने के लिए रुसाइलेंटवॉयस शुरू किया।

बीपीसीएल 6,252 वितरकों के सुदृढ़ नेटवर्क सहित 9.35 करोड़ से अधिक एलपीजी ग्राहकों को सेवा प्रदान कर रहा है। वर्ष के दौरान उज्ज्वला 2.0 के तहत 18.54 लाख नए ग्राहकों को नामांकित किया गया और 9.26 लाख ग्राहकों को डबल बॉटलिंग कनेक्शन में अपग्रेड किया गया। एलपीजी सिलेंडरों से संबंधित चोरी और अन्य मुद्दों का समाधान करने के लिए छेड़छाड़ रहित सील और क्यूआर कोड सहित "प्योर फॉर श्योर" पहल संबंधी योजना शुरू की गई।

स्नेहक व्यवसाय खंड में, 16% की वृद्धि सहित 446 टीएमटी की अब तक की सबसे अधिक बिक्री की गई। एमएके ने अफ्रीका में अपनी व्यावसाय को स्थापित किया, केन्या, युगांडा और तंजानिया में अपना स्थान पक्का किया और स्नेहक के लिए श्रीलंका में नए चैनल पार्टनर को नियुक्त किया।

विमानन टर्बाइन ईंधन (एटीएफ) की बिक्री 1,901 टीएमटी रही, जिसमें 9.40% की वृद्धि हुई है और ओएमसी पीएसयू के बीच 25.20% की बाजार हिस्सेदारी प्राप्त की।

14.1.4.6. अनुसंधान और विकास

आरएंडडी व्यवसाय विकास और संधारणीयता के लिए महत्वपूर्ण है, आरएंडडी से बौद्धिक संपदा अधिकार बाजार में अंतर प्रदान करते हैं और 'आत्मनिर्भर भारत' के लिए स्वदेशी प्रौद्योगिकियों को बढ़ावा देते हैं। बीपीसीएल का कॉर्पोरेट अनुसंधान और विकास केंद्र (सीआरडीसी) विशिष्ट पेट्रोकेमिकल्स, जैव ईंधन, वैकल्पिक ऊर्जा, ग्रीन हाइड्रोजन और कार्बन डाइऑक्साइड शमन पर ध्यान केंद्रित करता है।

वर्ष 2023–24 के दौरान, सीआरडीसी ने ग्रीन हाइड्रोजन में महत्वपूर्ण उपलब्धियाँ प्राप्त कीं। भारत ऊर्जा सप्ताह में, सीआरडीसी ने ग्रीन हाइड्रोजन उत्पादन के लिए भाभा परमाणु अनुसंधान केंद्र (बीएआरसी) के साथ संयुक्त रूप से विकसित स्वदेशी क्षारीय इलेक्ट्रोलाइज़र का निष्पादन और प्रदर्शन किया। कोचीन अंतर्राष्ट्रीय हवाई अड्डे (सीआईएएल) पर बसों के लिए ग्रीन हाइड्रोजन ईंधन भरने वाला स्टेशन स्थापित किया जा रहा है। सहयोग की इसी भावना को बढ़ावा देने के लिए, एच–सीएनजी और एच2–आईसीई आधारित जेनसेट के संयुक्त विकास के लिए मेसर्स किर्लोस्कर ऑयल इंजन लिमिटेड के साथ समझौता ज्ञापन पर हस्ताक्षर किए गए।

वर्ष 2023–24 के दौरान विभिन्न प्रतिष्ठित मंचों पर बीपीसीएल के अनुसंधान एवं विकास प्रयासों को मान्यता दी गई। फेडरेशन ऑफ इंडियन पेट्रोलियम इंडस्ट्री (एफआईपीआई) द्वारा भारत एच2सेप टेक्नोलॉजी को इनोवेटर ऑफ द ईयर नामित किया गया। ऊर्जा दक्षता नवाचार के लिए भारत हाईजी डीऐरेशन टेक्नोलॉजी ने एनईईआईए–2023 में दूसरा पुरस्कार जीता। के मॉडल® / को एशियन ऑयल एंड गैस अवार्ड्स से न्यू प्रोडक्ट ऑफ द ईयर का पुरस्कार मिला। बीपीसीएल और एस्पेन टेक्नोलॉजी के सहयोग को डिजिटल परिवर्तन और परिचालन उत्कृष्टता के लिए कई पुरस्कार मिले। भारत हाई–स्टार ने विज्ञान और प्रौद्योगिकी में अनुसंधान एवं विकास प्रयासों के लिए पीआरएसआई राष्ट्रीय पुरस्कार जीता। वर्ष 2023–24 के दौरान ध्यान–केंद्रित अनुसंधान एवं विकास प्रयासों के परिणामस्वरूप सात पेटेंट दिए गए। इसके अतिरिक्त, वर्ष के दौरान छह नए पेटेंट आवेदन दर्ज किए गए।

14.1.4.7. पेट्रोरसायन संबंधी निष्पादन

स्वदेशी उत्पादन और आयात निर्भरता में कमी के साथ भारत सरकार के "आत्मनिर्भर भारत" के दृष्टिकोण का समर्थन करने के लिए, सितंबर 2021 में कोच्चि रिफाइनरी में प्रोपलीन डेरिवेटिव पेट्रोकेमिकल प्रोजेक्ट (पीडीपीपी) शुरू किया गया, जिसमें ऐक्रेलिक एसिड, ऑक्सो अल्कोहल और एक्रिलेट्स जैसे विशिष्ट पेट्रोकेमिकल्स का उत्पादन किया गया, जिन्हें अब तक आयात किया जा रहा था। संयंत्र की क्षमता उपयोगिता पिछले कुछ वर्षों में पहले वर्ष (वित्त वर्ष 2021–22) में 28% से बढ़कर वित्त वर्ष 2023–24 में 233 केटी उत्पादन सहित 71% हो गई है। इसके अतिरिक्त, कोच्चि रिफाइनरी में ₹ 4,460 करोड़ की लागत से 400 केटीपीए पॉलीप्रोपाइलीन परियोजना स्थापित की जा रही है।

बीपीसीएल रिफाइनरी और पेट्रोकेमिकल परिचालनों के एकीकरण की सहक्रियाशीलता का लाभ उठाने और उत्पाद पोर्टफोलियो में पेट्रोकेमिकल्स की हिस्सेदारी बढ़ाने के लिए ₹ 43,367 करोड़ की लागत से बीना रिफाइनरी में आधुनिक पेट्रोकेमिकल कॉम्प्लेक्स भी स्थापित कर रही है। बीना रिफाइनरी की क्षमता को वर्तमान के 7.8 एमएमपीटीए से बढ़ाकर 11 एमएमटीपीए किया जाएगा, जो लगभग 2.2 एमएमटीपीए पेट्रोकेमिकल उत्पादों का उत्पादन करेगी।

14.1.4.8. प्राकृतिक गैस

बीपीसीएल ने वर्ष 2023–24 में अपने प्राकृतिक गैस कारोबार का विस्तार जारी रखा और वर्ष 2002–21 में 1.48 एमएमटी की तुलना में 1.69 एमएमटी की आंतरिक खपत सहित बिक्री दर्ज की है। बीपीसीएल

के पास अब 65 संरक्षकों का ग्राहक आधार है, जिसमें वर्ष के दौरान 6 नए ग्राहक जुड़े हैं, इसके अतिरिक्त मुंबई (महाराष्ट्र) और कोच्चि (केरल) में अपनी स्वयं की रिफाइनरियों को आपूर्ति भी शामिल है।

14.1.4.9. नगर गैस वितरण

बीपीसीएल को पेट्रोलियम और प्राकृतिक गैस विनियामक बोर्ड (पीएनजीआरबी) द्वारा 81 जिलों वाले 26 भौगोलिक क्षेत्रों के लिए नगर गैस वितरण (सीजीडी) नेटवर्क के विकास के लिए प्राधिकरण प्राप्त हुआ है। प्राकृतिक गैस की जल्द से जल्द आपूर्ति सुनिश्चित करने के लिए सीजीडी परियोजनाएं पूरे जोरों पर चल रही हैं। इसमें मार्च 2024 तक 671 सीएनजी स्टेशन स्थापित किए जा चुके हैं, 3.31 लाख पीएनजी ग्राहक जुड़े हुए हैं, 1,287 किमी स्टील पाइपलाइन और 3,387 किमी एमडीपीई पाइपलाइन सहित सीजीडी नेटवर्क बिछाया गया है।

14.1.4.10. अन्वेषण और उत्पादन

भारत पेट्रो रिसोर्सेज लिमिटेड (बीपीआरएल) को अपस्ट्रीम कार्यकलापों को समाप्त करने के लिए बीपीसीएल की पूर्ण स्वामित्व वाली सहायक कंपनी के रूप में अक्टूबर 2006 में स्थापित किया गया। इसके पोर्टफोलियो में अन्वेषण, मूल्यांकन, विकास और उत्पादन के विभिन्न चरणों में ब्लॉक शामिल हैं। लगभग 19,824 वर्ग किमी को शामिल करते हुए, बीपीआरएल और इसकी सहायक कंपनियों के स्वामित्व वाले लगभग 46% एकड़ जमीन अपतटीय क्षेत्र में विस्तारित है।

बीपीआरएल के पास 15 ब्लॉकों में भागीदारी हित (पीआई) है, जिनमें से 8 भारत में और 7 विदेश में स्थित हैं। इसके अतिरिक्त, बीपीआरएल के पास दो रूसी संस्थाओं में इक्विटी हिस्सेदारी है, जिनके पास रूस में चार उत्पादक ब्लॉकों के लिए लाइसेंस हैं। जबकि बीपीआरएल के पास घरेलू ब्लॉकों में सीधे तौर पर पीआई है, ब्राज़ील, मोज़ाम्बिक, इंडोनेशिया, यूएई में ब्लॉकों के संबंध में इसकी हिस्सेदारी और रूसी संस्थाओं में इक्विटी हिस्सेदारी नीदरलैंड और सिंगापुर में स्थित पूर्ण स्वामित्व वाली सहायक कंपनियों की स्टेप-डाउन पूर्ण स्वामित्व वाली सहायक कंपनियों या संयुक्त उद्यमों के माध्यम के रूप में है। भारत में आठ ब्लॉकों में से पाँच को नई अन्वेषण लाइसेंसिंग नीति (एनईएलपी) के विभिन्न दौरों के तहत अधिग्रहित किया गया था, एक ब्लॉक को खोजे गए छोटे क्षेत्रों (डीएसएफ) बोली दौर 1 के तहत और दो ब्लॉकों को ओपन एकरेज लाइसेंसिंग नीति (ओएएलपी) बोली दौर 1 के तहत सम्मानित किया गया था।

वित्त वर्ष 2023-24 में, तेल और गैस उत्पादन में बीपीआरएल समूह की हिस्सेदारी 2.64 एमएमटीओई थी।

14.1.4.11. वैकल्पिक ऊर्जा

वर्ष 2023 में बीपीसीएल की कुल स्थापित नवीकरणीय ऊर्जा क्षमता 78 मेगावाट है। कुल स्थापित सौर क्षमता 66 मेगावाट है और पवन क्षमता 12 मेगावाट है। कोच्चि और बीना में कुल 31 मेगावाट क्षमता के नए सौर संयंत्र स्थापित और शुरू किए गए हैं। वर्तमान में 176 मेगावाट की संचयी क्षमता वाली चार नवीककरणीय ऊर्जा परियोजनाएँ कार्यान्वयन के विभिन्न चरणों में हैं।

बीपीसीएल मध्य प्रदेश में अपनी बीना रिफाइनरी में 5 मेगावाट का हरित हाइड्रोजन संयंत्र स्थापित कर रही है और सीआईएएल के साथ कोच्चि में एक एकीकृत हरित हाइड्रोजन संयंत्र और हाइड्रोजन ईंधन भरने वाला स्टेशन स्थापित कर रही है।

बीपीसीएल को एसईसीआई मोड-1 ट्रैक-1 एसआईजीएचटी योजना संविदा के तहत मार्ग आधारित बायोमास के माध्यम से हरित हाइड्रोजन उत्पादन की 2000 मीट्रिक टन प्रति वर्ष क्षमता प्रदान की गई है। इन सभी परियोजनाओं में नियोजित कार्यक्रम का अनुपालन करते हुए कार्य सुचारू रूप से चल रही है।

बीपीसीएल ने भाभा परमाणु अनुसंधान केंद्र (बीएआरसी) के साथ साझेदारी की है ताकि हरित हाइड्रोजन उत्पादन के लिए क्षारीय इलेक्ट्रोलाइज़र तकनीक को बढ़ाया जा सके। यह नवीकरणीय ऊर्जा लक्ष्यों को प्राप्त करने और ग्रीनहाउस गैस उत्सर्जन को कम करने के लिए भारत की प्रतिबद्धता का समर्थन करने के लिए अपनी तरह की पहली पहल है। इलेक्ट्रोलाइज़र संयंत्र वर्तमान में आयात किए जाते हैं, और सहयोग का उद्देश्य "हरित हाइड्रोजन उत्पादन के लिए क्षारीय इलेक्ट्रोलाइज़र तकनीक को बढ़ाना" है।

जैव–ईंधन

सरकार के इथेनॉल मिश्रित पेट्रोल (ईबीपी) कार्यक्रम के अनुरूप, बीपीसीएल ने इस वर्ष 11.7% (166.4 करोड़ लीटर इथेनॉल की खपत) का उच्चतम इथेनॉल मिश्रण प्रतिशत हासिल किया, जो पिछले वर्ष के 10.6% से अधिक है और इसका लक्ष्य 2024–25 में 14% से अधिक होना है। बीपीसीएल ने अपने आरओ में ई20 (20% इथेनॉल मिश्रण के साथ एमएस) भी स्थापित किया है और अब तक 4,279 आरओ तक पहुँच गया है।

कंपनी पूरे भारत में अपने सभी स्थानों पर पेट्रोल में गुड़, गन्ना, क्षतिग्रस्त खाद्यान्न और अधिशेष चावल से उत्पादित 1जी इथेनॉल का मिश्रण कर रही है। इसने अपने आपूर्ति स्थानों पर इथेनॉल भंडारण क्षमता को भी पिछले वित्तीय वर्ष में 112 टीकेएल से बढ़ाकर 135 टीकेएल कर दिया है। बीपीसीएल ने ईबीएमएस के साथ–साथ रेल द्वारा इथेनॉल की कमी वाले स्थानों तक आवाजाही करके पूरे देश में इथेनॉल की उपलब्धता सुनिश्चित की है।

बीपीसीएल इथेनॉल खरीद के लिए उद्योग समन्वयक है और कई स्रोतों से 1जी इथेनॉल खरीद कर ईबीपी कार्यक्रम का नेतृत्व कर रहा है। कंपनी की ओडिशा के बरगढ़ में एकीकृत 1जी/2जी बायो–इथेनॉल रिफाइनरी, जिसकी संयुक्त उत्पादन क्षमता 200 किलोलीटर प्रतिदिन है, निर्माणाधीन है और वित्त वर्ष 2024–25 में शुरू होने की उम्मीद है।

कंपनी का बायोडीजल पर ध्यान वर्ष 2023–24 में 102.6 टीकेएल (पिछले वित्त वर्ष में 8.21 टीकेएल) बायोडीजल की खरीद और 1,390 टीकेएल बायोडीजल–मिश्रित डीजल (पिछले वर्ष 116 टीकेएल बेचा गया) की बिक्री के साथ गति पकड़ चुका है, जिससे 0.36% (पिछले वर्ष 0.03%) का मिश्रण प्राप्त हुआ है।

बीपीसीएल ने कृषि अवशेषों, गन्ना प्रेस मड नगरपालिका ठोस अपशिष्ट इत्यादि जैसे बायोमास अपशिष्ट/बायोमास स्रोतों से संपीड़ित जैव–गैस (सीबीजी) के उत्पादन के क्षेत्र में भी पहल की है और सीबीजी की लगभग 7 लाख टन प्रति वर्ष (टीपीए) की कुल अनुमानित उत्पादन क्षमता के लिए 382 आशय पत्र (एलओआई) जारी किए हैं। वर्ष के दौरान, बीपीसीएल एलओआई धारकों द्वारा छह सीबीजी संयंत्र शुरू किए गए। कंपनी ने सीबीजी खुदरा बिक्री के लिए नौ और आरओएस जोड़े, जिससे आउटलेट्स की संख्या 50 हो गई और संचयी बिक्री 6.5 टीएमटी हो गई। बीपीसीएल ने अपने स्वयं के सीबीजी संयंत्रों की स्थापना शुरू कर दी है और अलग किए गए नगरपालिका ठोस अपशिष्ट पर आधारित कोच्चि में 150 टीपीडी सीबीजी संयंत्र स्थापित करने के लिए केरल सरकार से सैद्धांतिक अनुमोदन प्राप्त कर लिया है।

14.1.4.12. संधारणीय विकास

एक जिम्मेदार व्यवसाय के रूप में, बीपीसीएल ने ऊर्जा संरक्षण, ऊर्जा दक्षता, नवीकरणीय ऊर्जा, कार्बन पृथक्करण, अपशिष्ट उपचार के माध्यम से जल प्रबंधन, वर्षा जल संचयन, जल संतुलन अध्ययन और अपशिष्ट प्रबंधन आदि से संबंधित अपने स्थानों पर किफायती परिवहन के लिए दीर्घकालिक विकल्प विकास के लिए कई पहल की हैं, जो तीन उपाय अर्थात कम करें, पुन: उपयोग करें और पुनर्चक्रण करें की विचारधारा का पालन करते हैं। वर्षा जल संचयन के जलग्रहण क्षेत्र में 13% की वृद्धि हुई है, जो बीपीसीएल में कुल 13.5 लाख वर्गमीटर आरडब्लूएच क्षेत्र बनाएगी। मार्च 2024 तक कुल जल संचयन लगभग 639 टीकेएल है, जो बीपीसीएल द्वारा पिछले वर्ष की तुलना में 5.28% की वृद्धि हुई है। मुंबई रिफाइनरी ने वर्षा जल संचयन को बढ़ाने के लिए पर्याप्तता और क्षमता का अध्ययन किया है। 29 नए स्थानों/स्थानों के समूहों का चयन किया गया, जिनका कुल जलग्रहण क्षेत्र 63,010 वर्ग मीटर है और अनुमानित वार्षिक आरडब्ल्यूएच क्षमता 1,64,439 केएल (दैनिक आधार पर एमआर के ताजे पानी का लगभग 10%) है। मुंबई, कोच्चि और बिनल रिफाइनरियों ने भी जल संतुलन अध्ययन किया है और अब पानी की खपत को कम करने के लिए सुझाए गए विभिन्न पहलों को लागू कर रहे हैं। सभी खुदरा विपणन स्थानों और एलपीजी संयंत्रों में जल संतुलन अध्ययन भी प्रक्रियाधीन है और पानी बचाने और स्थान को जल तटस्थ बनाने के लिए पहल लागू की जा रही है।

बीपीसीएल ने कार्यक्षेत्र 1 और कार्यक्षेत्र 2 जीएचजी उत्सर्जन के लिए 2040 तक निवल शून्य बनने की घोषणा की है और इसके लिए दिशा–निर्देश बनाया है। सौर, पवन, जल और हरित हाइड्रोजन के उपयोग को बढ़ाने और ऊर्जा परिवर्तन के लिए जैव–ईंधन, जैव–सीएनजी, जैव–डीजल के उपयोग के लिए विभिन्न परियोजनाएं शुरू की जा रही हैं।

बीपीसीएल ई–मोबिलिटी बढ़ाने के लिए खुदरा दुकानों पर चार्जिंग केन्द्र और बैटरी स्वैपिंग पहल स्थापित कर रहा है।

वर्ष 23–24 के दौरान ऊर्जा कुशल प्रकाश (ईईएल) क्षमता 63.52 मेगावाट से बढ़ाकर 71.05 मेगावाट कर दी गई। सभी खुदरा परिचालन स्थान, मुंबई रिफाइनरी, पाइपलाइन, एलपीजी, विमानन पहले ही 100% ईईएल में परिवर्तित हो चुके हैं।

सीड बॉलिंग: बीपीसीएल ने महाराष्ट्र क्षेत्र में 5 लाख बीज बम लगाए हैं, जिसमें खुदरा स्थान, एलपीजी संयंत्र और एमएमबीपीएल पाइपलाइन शामिल हैं।

मियावाकी तकनीक: विभिन्न विपणन स्थानों पर हरित आच्छादन बढ़ाने के लिए मियावाकी तकनीक का भी उपयोग किया गया।

बीपीसीएल की सभी व्यावसायिक इकाइयों में लगाए गए पेड़ों की कुल संख्या लगभग 1.6 लाख थी और कुल वृक्षारोपण 10.3 लाख से अधिक हो गया। इस वर्ष वृक्षारोपण अभियान के माध्यम से कुल कार्बन पृथककरण लगभग 23,600 मीट्रिक टन हुआ है। मध्य प्रदेश राज्य के बीना रिफाइनरी और वन विभाग ने 18.05.2023 को कंजिया रेंज, खुरई, वनमंडल उत्तर सागर, मध्य प्रदेश में 90 हेक्टेयर वन भूमि पर ग्रीनबेल्ट विकसित करने के लिए अपनी साझेदारी के लिए एक समझौता ज्ञापन पर हस्ताक्षर किए, जिसमें 5 वर्ष की परियोजना अवधि में कुल 1.96 करोड़ का निवेश किया जाएगा। यह सुनिश्चित करने के लिए कि प्रचालन स्थानों में संचालन मिट्टी को खराब न करे, बीपीसीएल ने अपनी सभी रिफाइनरियों और विपणन स्थानों में शून्य अपशिष्ट से भूमि भरना (जेडडब्लूएल) का प्रमाणन लेने के लिए अभियान शुरू किया है। मुंबई रिफाइनरी, बीना रिफाइनरी, खुदरा और एलपीजी प्रचालन स्थान, स्नेहक, विमानन, पाइपलाइन पहले से ही जेडडब्लूएल के लिए प्रमाणित हैं। ब्रांड मालिक के रूप में बीपीसीएल स्नेहक विभाग ने वर्ष 2023–24 में ब्रांड मालिक के रूप में लगभग 4,891 टन अपशिष्ट प्लास्टिक का निपटान किया है। बीपीसीएल के कॉर्पोरेट आर एंड डी ने सड़क बनाने में अपशिष्ट प्लास्टिक का उपयोग करने की एक नई तकनीक तैयार की है और अब तक लगभग 1,000 टन अपशिष्ट प्लास्टिक का उपयोग किया है। 250 टन अपशिष्ट प्लास्टिक से 750 एमटीसीओ2ई ग्रीनहाउस गैस उत्सर्जन में कमी आएगी।

14.1.4.13.कॉर्पोरेट सामाजिक उत्तरदायित्व:

निगम का दृष्टिकोण "एनरजाइजिंग लाइव्ज" है और सीएसआर पहलों के अंतर्निहित दर्शन को साथ में लेकर चलना है अर्थात स्थानीय समुदायों का सशक्तिकरण और समावेशी, न्यायसंगत और संधारणीय मार्ग प्रशस्त करना। निगम अपने सीएसआर हस्तक्षेपों को मुख्य रूप से पाँच मुख्य क्षेत्रों में वर्गीकृत करता है अर्थात कंपनी अधिनियम 2013 की अनुसूची VII में सूचीबद्ध अन्य मदों के साथ–साथ स्वास्थ्य और स्वच्छता, शिक्षा, कौशल विकास, सामुदायिक विकास और पर्यावरणीय स्थिरता।

- निगम की सीएसआर संबंधी कार्यकलाप मुख्य रूप से वित्त वर्ष 2023–2024 के लिए सार्वजनिक उद्यम विभाग (डीपीई) के विषय–वस्तु के अनुरूप स्वास्थ्य और पोषण पर ध्यान–केंद्रित है।
- राष्ट्रीय पोषण कार्यनीति के प्रति नीति आयोग के प्रयासों को पूरक बनाने के लिए बीपीसीएल ने पोषण केंद्रित शारीरिक परीक्षा (एनएफपीई) के परिणामों के आधार पर 13,700 से अधिक कुपोषित बच्चों और माताओं का समर्थन करते हुए "कुपोषण मुक्त भारत" कार्यक्रम शुरू किया है। इस कार्यक्रम का उद्देश्य पोषण को राष्ट्रीय विकास एजेंडे के केंद्र में लाना है, साथ ही भारत की पोषण संबंधी आवश्यकताओं को पूरा करने के लिए लक्षित कार्रवाई का दिशा–निर्देश तैयार करना है। बीपीसीएल मध्य प्रदेश के झाबुआ जिले के 7 सरकारी स्कूलों में कुपोषण और बौनेपन के बारे में जागरूकता की आवश्यकता संबंधी समस्या का समाधान कर रहा है।
- कैंसर के क्षेत्र में, बीपीसीएल ने कैंसर के माध्यम से निवारक देखभाल को बढ़ावा देने के लिए कैंसर देखभाल कार्यक्रम शुरू किया है। मौखिक, स्तन और गर्भाशय ग्रीवा के कैंसर की जांच के साथ–साथ 10 सरकारी/धर्मार्थ अस्पतालों में वंचित जनसंख्या को मुफ्त में गुणवत्तापूर्ण कैंसर उपचार प्रदान कर रहा है और साथ ही कैंसर से बचे लोगों के पुनर्वास हेतु सहायता प्रदान की जा रही है। इस अखिल भारतीय कार्यक्रम से अब तक 1.5 लाख से अधिक लोगों की मदद मिली है।

- तकनीकी प्रगति की शक्ति का उपयोग करके, बीपीसीएल ने दूरदराज के ग्रामीण क्षेत्रों में स्वास्थ्य देखभाल चुनौतियों का समाधान करने के लिए हमारे सीएसआर प्रयासों को नया रूप देने, सहयोग करने और बढ़ाने की पहल की है। आईआईटी, रोपड़ के सहयोग से उत्तर प्रदेश के आकांक्षी जिले सोनभद्र में भविष्य की स्वास्थ्य सेवा वितरण प्रणाली शुरू की गई है। यह जिले भर में प्राथमिक स्वास्थ्य सेवा प्रणालियों को सुदृढ़ और डिजिटल बनाने की सरकारी नीति के अनुसार है। यह गैर–संचारी रोगों के लिए, सभी आयु समूहों और ग्रामीण क्षेत्रों में न्यूनतम मानवीय हस्तक्षेप के साथ व्यापक समाधान के रूप में कार्य करता है। और विशेषज्ञों के साथ मौके पर ही निःशुल्क टेलीकंसल्टेशन के माध्यम से इंटरफेस करता है। प्रमुख आईआईटी द्वारा विकसित एआई तंत्र का उपयोग करके दृष्टिबाधित लाभार्थियों को स्मार्ट विजन सहायक पहनने योग्य उपकरण प्रदान किया गया है। यह उपकरण वस्तुओं का पता लगाने, पढ़ने, वस्तुओं की पहचान आदि में मदद करता है।
- बीपीसीएल ने भारत भर में विभिन्न स्थानों पर संजीवनी अस्पतालों में अत्याधुनिक अवसंरचना प्रदान करके जन्मजात हृदय रोग से पीड़ित जरूरतमंद बच्चों के लिए पूरी तरह से मुफ्त बाल हृदय शल्य चिकित्सा को सक्षम किया है। कुल मिलाकर, बीपीसीएल ने 30,000 से अधिक बाल चिकित्सा हृदय शल्यचिकित्सा सफलतापूर्वक की हैं।
- पहुंच से वंचित लोगों तक पहुंचना बीपीसीएल सीएसआर का मुख्य उद्देश्य है, इसलिए हमारी पहल उत्तराखंड के सबसे कठिन स्थानों तक विस्तारित की गई है जहां समुदाय अक्सर भौगोलिक और मौसमी चुनौतियों के कारण पर्याप्त चिकित्सा सेवाओं तक पहुंचने के लिए संघर्ष करते हैं। स्थानीय क्षेत्रों के वंचित वर्गों की स्वास्थ्य देखभाल आवश्यकताओं को पूरा करने के लिए अत्याधुनिक, 50 बिस्तरों वाला अस्पताल स्थापित किया जा रहा है।
- लाइफ–लाइन एक्सप्रेस (ट्रेन पर अस्पताल) जिसने आंतरिक भौगोलिक क्षेत्रों तक हमारी पहुँच बढ़ाई है जो बीपीसीएल द्वारा समर्थित प्रमुख कार्यक्रमों में से अन्यतम है। इसका उद्देश्य ग्रामीण भारत में समुदायों में स्क्रीनिंग और प्रारंभिक पहचान तथा चिकित्सा और शल्य चिकित्सा हस्तक्षेप के माध्यम से परिहार्य दिव्यांगता के बोझ को कम करना है। कार्यक्रम के माध्यम से अब तक लगभग 2 लाख लाभार्थियों तक पहुँचा जा चुका है।
- समावेशन और विविधता की दिशा में एक कदम के रूप में हमने भारत के विभिन्न स्थानों में दिव्यांगजनों को सहायक उपकरण और सहायताएँ प्रदान की हैं। इस पहल के माध्यम से 1500 से अधिक लाभार्थियों को सहायता प्रदान की गई है। क्लबफुट विकलांगता वाले बच्चों के उपचार के लिए एक हस्तक्षेप को वित्तीय सहायता के माध्यम से बीपीसीएल द्वारा समर्थित किया गया है।
- क्लबफुट एक सामान्य प्रकार का जन्म दोष है जो पैरों की मांसपेशियों और हड्डियों को प्रभावित करता है
- बीपीसीएल विभिन्न सरकारी जिला अस्पतालों, सार्वजनिक स्वास्थ्य केंद्रों और सामुदायिक स्वास्थ्य केंद्रों में बुनियादी ढाँचे को उन्नत करने में बड़े पैमाने पर योगदान दे रहा है। रोगी मॉनिटर–वेंटिलेटर, पूर्ण स्वचालित बायोकेमिस्ट्री एनालाइजर, ऑपरेटिंग माइक्रो कार्यक्षेत्र, बायोमेट्री मशीन, एमआरआई सीटी स्कैन मशीन जैसे महत्वपूर्ण जीवन रक्षक उपकरणों को प्रमुख सीएसआर हस्तक्षेपों के तहत समर्थन दिया गया है।
- बीपीसीएल स्थानीय समुदायों की जरूरतों को पूरा करने के लिए कोच्चि और बीना रिफाइनरियों में पूरी तरह कार्यात्मक अस्पताल चला रहा है। अस्पताल आयुर्वेद, होम्योपैथी, योग चिकित्सा और स्थानीय/स्वदेशी चिकित्सा प्रणाली जैसी वैकल्पिक चिकित्सा प्रणाली के साथ–साथ एलोपैथी की सामान्य सुविधाएं प्रदान करता है।
- भारत के शीर्ष 20 एनआईटी के जरूरतमंद विद्वानों के लिए "मेधावी", "बीपीसीएल रत्न" जैसे शैक्षणिक उत्कृष्टता छात्रवृत्ति कार्यक्रम आयोजित किए गए हैं। ये छात्रवृत्तियाँ निम्न आय वाले परिवार और योग्यता मानदंडों के आधार पर प्रदान की गई है। इन कार्यक्रमों के

माध्यम से 1000 से अधिक विद्वानों को सहायता दी गई है। हमारी शिक्षा पहलों को पूरा करने के लिए बीपीसीएल ने उत्तर प्रदेश और बिहार में सरकारी स्कूली बच्चों को 50,000 से अधिक शैक्षिक डेस्क और स्कूल बैग दिए हैं।

- शिक्षा संबंधी पहलों को बढ़ावा देने के लिए बीपीसीएल ने रिफाइनरी परिसर में समुदाय के लिए स्कूल प्रचालित करने के लिए डीएवी स्कूलों के साथ भागीदारी की है।
- समुदायों के उत्थान के लिए, बीपीसीएल ने जिला अधिकारियों के सहयोग से देश के विभिन्न हिस्सों में सौर लाइट, ओपन जिम, पीने के पानी की सुविधाओं सहित आरओ/ट्यूबवेल की व्यवस्था का समर्थन किया है।
- कौशल विकास संस्थान पेट्रोलियम और प्राकृतिक गैस मंत्रालय के निर्देशों के तहत प्रमुख पहलों में से एक है। बीपीसीएल युवाओं के एक बड़े वर्ग को व्यावसायिक प्रशिक्षण प्रदान करने और तेल और गैस उद्योगों और अन्य क्षेत्रों में उनकी रोजगार क्षमता बढ़ाने के मुख्य उद्देश्य से कोच्चि, भुवनेश्वर, विशाखापत्तनम, रायबरेली, अहमदाबाद, गुवाहाटी में विभिन्न कौशल विकास संस्थानों (एसडीआई) का समर्थन कर रहा है। हम अपनी कौशल पहलों के माध्यम से आजीविका कार्यक्रमों का भी समर्थन कर रहे हैं। राजस्थान और फरीदाबाद के करौली जिले की महिलाओं को कढ़ाई, ज़री शिल्प, लाख चूड़ी बनाने आदि में कौशल प्रशिक्षण प्रदान किया गया है, जिससे उन्हें स्वरोजगार मिल रहा है।
- 1–15 जुलाई, 2023 तक आयोजित स्वच्छता पखवाड़ा कार्यक्रम में कंपनी ने विभिन्न क्षेत्रों के लाभार्थियों को शामिल किया था। जीवन के हर क्षेत्र में स्वच्छता के संदेशों को कई परियोजनाओं और पहलों के माध्यम से प्रतिध्वनित किया, प्लास्टिक के एक बार उपयोग के खतरों के बारे में जागरूकता फैलाने और लोगों को अधिक संधारणीय विकल्पों की ओर बढ़ने के लिए प्रेरित करने पर ध्यान केंद्रित किया। इन पहलों में 25,000 से अधिक कार्यकलाप शामिल किए गए थे, जिनका प्रत्यक्ष या अप्रत्यक्ष रूप से एक लाख से अधिक लोगों पर स्थायी प्रभाव पड़ेगा। पर्यावरणीय संधारणीयता की ओर कदम बढ़ाते हुए, बीपीसीएल ने उत्तर प्रदेश के आकांक्षी जिले के श्रावस्ती सरकारी स्कूलों में पुनर्चक्रित प्लास्टिक से बनी 1,400 बेंच दिए थे।
- स्वच्छता ही सेवा और स्वच्छता 3.0 अभियान जैसे अन्य अभियान भी शुरू किए गए हैं, जिनमें कुल स्क्रैप निपटान लगभग 1,500 मीट्रिक टन था।
- अपने पर्यावरण का पोषण करना और संधारणीय भविष्य सुनिश्चित करने के बुनियादी जिम्मेदारी के रूप में हमने मुंबई की सेंट्रल लाइन रेलवे ट्रैक पर लगभग 65,000 पौधे लगाए हैं। इस पहल के साथ 1 लाख से अधिक पौधे लगाने का लक्ष्य है। हमारा मानना है कि पौधे लगाने का कार्य पारिस्थितिकी संतुलन, जैव विविधता और जलवायु परिवर्तन को कम करने में महत्वपूर्ण योगदान देता है।
- वित्त वर्ष 2023–24 में मार्च तक बीपीसीएल द्वारा सीएसआर व्यय ₹ 158.18 करोड़ है।

परिशिष्ट-IX

कर से पहले लाभ (पीबीटी) और कर पश्चात लाभ (पीएटी) में भिन्नता–बीपीसीएल

विवरण	2023-24	2022-23
कर से पहले लाभ/(हानि)	35,548	2,217
कर पश्चात लाभ/(हानि)	26,674	1,870

मुख्य रूप से विपणन मार्जिन में वृद्धि के कारण वित्त वर्ष 2022–23 की तुलना में वित्त वर्ष 2023–24 में पीबीटी और पीएटी में वृद्धि हुई है, जो पिछले वर्ष में कम थी, विदेशी मुद्रा घाटे में कमी, कम वित्त लागत आदि लाभ किए गए अत्यधिक कर से पूरा किया जाता है।

14.1.5. हिंदुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड (एचपीसीएल)



हिंदुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड (एचपीसीएल) एक महारत्न सार्वजनिक क्षेत्र उद्यम (सीपीएसई) है, जिसकी वित्त वर्ष 2023–24 के दौरान वार्षिक सकल बिक्री ₹ 4,59,815 करोड़ रुपये है। 31 मार्च 2024 तक पीएसयू श्रेणी में लगभग 20% बाजार हिस्सेदारी सहित एचपीसीएल की भारत में रिफाइनिंग और मार्केटिंग में सुदृढ़ स्थान है।

मार्च 2024 तक, एचपीसीएल मुंबई और विशाखापत्तनम में क्रमशः 9.5 एमएमटीपीए और 13.7 एमएमटीपीए की क्षमताओं सहित रिफाइनरियों का स्वामित्व और संचालन करता है। एचपीसीएल मुंबई में 428 टीएमटीपीए (स्थापित क्षमता) की क्षमता सहित ल्यूब ऑयल बेस स्टॉक के उत्पादन के लिए देश की सबसे बड़ी ल्यूब रिफाइनरी का भी मालिक है।

इसके अतिरिक्त, एचपीसीएल के पास जेवी कंपनी, एचपीसीएल–मित्तल एनर्जी लिमिटेड (एचएमईएल) में 48.99% इक्विटी हिस्सेदारी है, जो पंजाब राज्य के बठिंडा में 11.3 एमएमटीपीए क्षमता वाली रिफाइनरी प्रचालित करती है और मैंगलोर रिफाइनरी एंड पेट्रोकेमिकल्स लिमिटेड (एमआरपीएल) में भी 16.96% इक्विटी हिस्सेदारी है, जो कर्नाटक राज्य के मैंगलोर में 15 एमएमटीपीए क्षमता वाली रिफाइनरी प्रचालित करती है।

भारत में पेट्रोलियम उत्पाद पाइपलाइनों का दूसरा सबसे बड़ा नेटवर्क जिसकी लंबाई लगभग 5,134 किमी है। एचपीसीएल के पास विशाल विपणन नेटवर्क है जिसमें प्रमुख नगरों में 19 जोनल ऑफिस और 145 क्षेत्रीय कार्यालय हैं, जिसे 44 टर्मिनल/इंस्टॉलेशन/टैप ऑफ पॉइंट, 55 एविएशन सेवा सुविधाएं, 56 एलपीजी बॉटलिंग संयंत्र, 5 ल्यूब ब्लेंडिंग संयंत्र से युक्त आपूर्ति और वितरण अवसंरचना और ल्यूब डिपो सहित 73 डिपो द्वारा सहायता प्रदान की जाती है। ग्राहक टच प्वाइंट्स में 22,022 रिटेल आउटलेट, 1,638 एसकेओ/एलडीओ डीलर, 333 ल्यूब वितरक, 141 औद्योगिक ल्यूब वितरक, रिटेल आउटलेट पर 1,690 सीएनजी सुविधाएं, 817 डोर–टू–डोर डिलीवरी डिस्पेंसर और 3,603 ईवी चार्जिंग केन्द्र और मार्च 2024 तक 9.63 करोड़ से अधिक एलपीजी उपभोक्ताओं के लिए 6,349 एलपीजी वितरण केन्द्र हैं।

एचपीसीएल का अपना अनुसंधान एवं विकास केंद्र है, जिसका नाम एचपी ग्रीन आरएंडडी केन्द्र है, जो बेंगलुरु में स्थित है। यह केंद्र परिचालन सुधार, नई तकनीकों को आत्मसात करने, नवीन और अग्रणी तकनीकों को विकसित करने, तकनीकों को लाइसेंस देने और सूचना केंद्र बनने के लिए रिफाइनरियों और विपणन एसबीयू को उन्नत तकनीकी सहायता प्रदान करता है। एचपीसीएल तेल और गैस मूल्य श्रृंखला में परिचालन करने वाली 20 सहायक उद्यम और सहायक कंपनियों के माध्यम से भी कारोबार करता है।

14.1.5.1. वित्त निष्पादन

अप्रैल 2023–मार्च 2024 की अवधि में एचपीसीएल की सकल बिक्री ₹ 4,59,815 करोड़ थी, जबकि अप्रैल 2022–मार्च 2023 की अवधि में यह ₹ 4,64,684 करोड़ थी। अप्रैल 2023–मार्च 2024 की अवधि के दौरान एचपीसीएल ने ₹ 14,694 करोड़ का कर पश्चात लाभ (पीएटी) अर्जित किया है, जबकि अप्रैल 2022–मार्च 2023 की अवधि में निवल घाटा (पीएटी) ₹ 8,974 करोड़ था। अप्रैल 2023–मार्च 2024 की अवधि के लिए एचपीसीएल के लिए रिफाइनिंग मार्जिन (निर्यात शुल्क का सकल) औसतन 9.08 अमेरिकी डॉलर प्रति बैरल रहा, जबकि अप्रैल 2022–मार्च 2023 की अवधि के लिए यह 12.09 अमेरिकी डॉलर प्रति बैरल था।

14.1.5.2. राजकोष में योगदान

अप्रैल 2023–मार्च 2024 की अवधि के दौरान, एचपीसीएल ने राजकोष में ₹ 97,305.05 करोड़ का योगदान दिया है, जिसमें केंद्रीय राजकोष को 34,963.72 और राज्य राजकोष को ₹ 62,341.33 करोड़ शामिल है।

14.1.5.3. रिफाइनरी संबंधी निष्पादन

अप्रैल 2023–मार्च 2024 की अवधि के दौरान, एचपीसीएल रिफाइनरियों ने 22.33 मिलियन मीट्रिक टन (एमएमटी) का रिफाइनिंग थ्रुपुट दर्ज करते हुए उत्कृष्ट निष्पादन किया है, जो अब तक का सबसे अधिक वार्षिक थ्रुपुट था।

अप्रैल 2023–मार्च 2024 के दौरान मुंबई रिफाइनरी ने 9.64 एमएमटी का क्रूड थ्रुपुट और विशाख रिफाइनरी ने 12.69 एमएमटी का क्रूड थ्रुपुट देखी गई।

वित्त वर्ष 2023–24 के दौरान विशाख रिफाइनरी का 12.69 एमएमटी का क्रूड थ्रुपुट अब तक का सबसे अधिक वार्षिक थ्रुपुट है।

एचपीसीएल की तीसरी विशाख रिफाइनरी आधुनिकीकरण परियोजना (वीआरएमपी) की क्षमता 8.3 एमएमटी से बढ़ाकर 15.0 एमएमटी करने की परियोजना मार्च 2024 में भारत के माननीय प्रधान मंत्री द्वारा राष्ट्र को समर्पित की गई।

वीआरएमपी के हिस्से के रूप में, अप्रैल 2023– मार्च 2024 की अवधि के दौरान निम्नलिखित सुविधाएं शुरू की गईं।

- 3.05 एमएमटी एफसीएचसीयू (उच्चतम रूपांतरण वाला भारत का सबसे बड़ा वीजीओ हाइड्रोक्रैकर)
- हाइड्रोजन उत्पादन इकाइयाँ (सबसे बड़ी एकल ट्रेन क्षमता)
- सल्फर वसूली इकाई (ऑक्सीजन संवर्धन के साथ), सल्फर फॉर्मिंग यूनिट
- ईंधन गैस–पीएसए (प्रेशर स्विंग एडसोर्प्शन)
- एकीकृत अपशिष्ट उपचार संयंत्र
- नया एचआरएसजी (हीट रिकवरी स्टीम जेनरेटर)
- संबद्ध उपयोगिताएँ और ऑफसाइट (22 भंडारण टैंक और 1 सर्ज शमन टैंक सहित)।

एचपीसीएल राजस्थान रिफाइनरी लिमिटेड (एचआरआरएल) ने बाड़मेर, राजस्थान में अपनी 9 एमएमटीपीए एकीकृत ग्रास रूट रिफाइनरी सह पेट्रोकेमिकल परियोजना के लिए वित्तीय समापन प्राप्त कर लिया है। राजस्थान रिफाइनरी और पेट्रोकेमिकल परिसर निर्माण के उन्नत चरण में है।

14.1.5.4. पाइपलाइन संबंधी निष्पादन

एचपीसीएल वर्तमान में 35.2 एमएमटीपीए की मुख्य लाइन क्षमता सहित 5,134 किलोमीटर का पेट्रोलियम उत्पाद पाइपलाइन नेटवर्क प्रचालित कर रहा है, जिसमें 23 एमएमटीपीए की शाखा लाइन क्षमता शामिल है। अप्रैल 2023–मार्च 2024 की अवधि के दौरान, 25.8 एमएमटी की कुल पाइपलाइन थ्रुपुट देखी गई।

₹ 776 करोड़ की लागत वाली बाड़मेर–पालनपुर पाइपलाइन परियोजना यांत्रिक रूप से पूरी हो गई है। बाड़मेर–पालनपुर पाइपलाइन परियोजना के चालू होने पर एचपीसीएल का परिचालन पाइपलाइन नेटवर्क बढ़कर 5,350 किलोमीटर हो जाएगा।पाइपलाइन नेटवर्क और क्षमताओं को और बढ़ाने के लिए लॉजिस्टिक दक्षता और संबंधित पर्यावरणीय लाभों को बढ़ाने के लिए बठिंडा संगरूर पाइपलाइन परियोजना और हल्दिया पानागढ़ एलपीजी पाइपलाइन परियोजना लगभग ₹ 1,377 करोड़ के अनुमानित निवेश के साथ क्रियान्वयन में है। इन पाइपलाइन परियोजनाओं से प्रमुख बाजारों में एचपीसीएलवाई की स्थिति सुदृढ़ होने की उम्मीद है। एचपीसीएल ने संयुक्त उद्यम मार्ग के माध्यम से कांडला से गोरखपुर (2,805 किमी) तक भारत की सबसे लंबी एलपीजी पाइपलाइन के विकास में आईओसीएल और बीपीसीएल के साथ मिलकर काम किया है।

14.1.5.5. विपणन संबंधी निष्पादन

अप्रैल 2023–मार्च 2024 की अवधि के दौरान, एचपीसीएल ने निर्यात और पेट्रोकेमिकल बिक्री सहित 46.8 एमएमटी की बिक्री की है।

घरेलू बिक्री खंड में, एचपीसीएल ने 44.6 एमएमटी (पेट्रोकेमिकल बिक्री सहित) की बिक्री मात्रा दर्ज की है और सार्वजनिक क्षेत्र की तेल विपणन कंपनियों (ओएमसी) के बीच लगभग 22.09% की बाजार हिस्सेदारी हासिल की है।

मोटर–ईंधन खंड में, एचपीसीएल ने अप्रैल 2023–मार्च 2024 की अवधि में 27.89 एमएमटी की बिक्री मात्रा हासिल की, जिसमें कुल मोटर ईंधन के आधार पर (पीएसयू के बीच) 26.21% की बाजार हिस्सेदारी थी। अप्रैल 2023–मार्च 2024 की अवधि में 836 नए रिटेल आउटलेट (कुल रिटेल आउटलेट की संख्या 22,022 तक) और 303 रिटेल आउटलेट (कुल 1,690 आउटलेट) पर सीएनजी सुविधाओं की शुरुआत की गई। मार्च 2024 तक, 817 डोर–टू–डोर मोबाइल डिस्पेंसर और 3,603 ईवी चार्जिंग शुरू किया गया। अप्रैल 2023–मार्च 2024 के दौरान, 7,143 आउटलेट पर सोलराइजेशन किया गया, जिससे कुल आउटलेटों की संख्या 17,618 हो गए।

अप्रैल 2023–मार्च 2024 के दौरान, एचपीसीएल के एलपीजी व्यवसाय वर्टिकल ने पिछले वर्ष की तुलना में 5.5% की वृद्धि सहित 8.56 एमएमटी की बिक्री दर्ज की और 27.55% की बाजार हिस्सेदारी हासिल की, एचपीसीएल ने लगातार 8वें वर्ष घरेलू एलपीजी में बाजार हिस्सेदारी हासिल की। अप्रैल 2023–मार्च

2024 के दौरान, एचपीसीएल ने 26.83 लाख नए ग्राहकों को नामित किया और 66 नए नियमित एलपीजी वितरकों को शुरू किया (वितरक की कुल संख्या 6,349 हो गई)। अप्रैल 2023–मार्च 2024 के दौरान, एचपीसीएल ने 18.3 लाख पूएमयूवाई ग्राहकों को नामित किया, जिससे कुल पूएमयूवाई ग्राहकों की संख्या 273 लाख हो गई। मार्च 2024 तक, एचपीसीएल के पास 9.63 करोड़ एलपीजी उपभोक्ता। एचपीसीएल ने वित्त वर्ष 2023–24 के दौरान 120 टीएमटीपीए की क्षमता वाले अबू रोड और वाराणसी में एलपीजी संयत्र चालू किए हैं, जिससे कुल एलपीजी संयत्र की संख्या 56 हो गई है, जिनकी कुल क्षमता 6,590 टीएमटीपीए है।

एचपीसीएल अप्रैल 2023–मार्च 2024 की अवधि के दौरान 4.19 टीएमटी के निर्यात के साथ 652 टीएमटी ('000 मीट्रिक टन) की बिक्री मात्रा के साथ देश में एक अग्रणी ल्यूब विपणक बना हुआ है।

औद्योगिक और उपभोक्ता (आईएंडसी) व्यवसाय लाइन में, एचपीसीएल ने लगभग 5.39 एमएमटी की कुल बिक्री मात्रा दर्ज हुई है।

विमानन व्यवसाय में, एचपीसीएल ने विमानन टर्बाइन ईंधन की 878 टीएमटी की बिक्री मात्रा हासिल की। अयोध्या एएसएफ को चालू करके विमानन सेवा सुविधा (एएसएफ) नेटवर्क को बढ़ाया गया, जिससे एएसएफ की कुल संख्या 55 हो गई।

जैव ईंधन और नवीकरणीय ऊर्जा में, एचपीसीएल ने 18.45 करोड़ किलोवाट घंटे की नवीकरणीय ऊर्जा उत्पन्न की है। अप्रैल 2023–मार्च 2024 में आंध्र प्रदेश के माननीय मुख्यमंत्री द्वारा गलीवेदु में स्थित 100 मेगावाट क्षमता की एचपीसीएल की पहली मेगा सौर परियोजना की आधारशिला रखी गई। उत्तर प्रदेश में आठ अलग–अलग एचपीसीएल सुविधाओं की नवीकरणीय ऊर्जा जरूरतों को पूरा करने के लिए उत्तर प्रदेश के झांसी में 6 मेगावाट (एसी) / 6.5 मेगावाट (डीसी) सौर ऊर्जा परियोजना का निर्माण भी शुरू किया गया।

एचपीसीएल के आपूर्ति, परिचालन और वितरण विभाग ने अप्रैल 2023–मार्च 2024 की अवधि के दौरान 59.38 एमएमटी का थ्रूपुट हासिल किया और रिफाइनरियों से लेकर अंतिम ग्राहकों तक पूरी आपूर्ति श्रृंखला में पेट्रोलियम उत्पादों की निर्बाध आपूर्ति बनाए रखी। एचपीसीएल ने इस अवधि के दौरान सितारगंज डिपो (उत्तराखंड) में हेक्सेन सुविधा शुरू की है।

14.1.5.6. अनुसंधान एवं विकास (आरएंडडी)

हिंदुस्तान पेट्रोलियम ग्रीन रिसर्च एंड डेवलपमेंट सेंटर (एचपीजीआरडीसी) की स्थापना विपणन एसबीयूएस और रिफाइनरियों को उन्नत तकनीकी सहायता प्रदान करने के उद्देश्य से की गई है, ताकि परिचालन उत्कृष्टता प्रदान की जा सके, अभिनव, पथप्रदर्शक प्रौद्योगिकियों को विकसित और अपनाया जा सके और सूचना केंद्र बन सके। अनुसंधान केंद्र को अत्याधुनिक अवसंरचना सुविधाएँ प्रदान की गई हैं, जिसमें 6 लाख वर्ग फीट के निर्मित क्षेत्र के साथ ऊर्जा कुशल हरित भवन शामिल हैं। आरएंडडी केंद्र के चरण-I में एफसीसी / आरएफसीसी, हाइड्रो–प्रोसेसिंग, कैटेलिसिस, ब्लो प्रोसेस, क्रूड इवैल्यूएशन और ईंधन अनुसंधान, मानक परीक्षण, विश्लेषणात्मक, प्रक्रिया मॉडलिंग और सिमुलेशन और नैनो प्रौद्योगिकी के क्षेत्रों में नौ प्रयोगशालाएँ हैं, चरण-II में पेट्रोकेमिकल्स और पॉलिमर, सेंटर ऑफ एक्सीलेंस ल्यूब, जंग अध्ययन, नवीन पृथक्करण, अवशेष उन्नयन, इंजन और बैटरी अनुसंधान, डिजिटल जल अनुसंधान, दहन अनुसंधान और सेंटर ऑफ एक्सीलेंस–बिटुमेन और फुटपाथ अनुसंधान के क्षेत्रों में ग्यारह प्रयोगशालाएँ हैं।

वित्त वर्ष 2023–24 के दौरान, 17 उत्पाद / प्रौद्योगिकियाँ विकसित और शुरू की गई। इन रिफाइनरी उत्पादों / प्रौद्योगिकियों के अतिरिक्त, इस अवधि के दौरान, 26 नए ल्यूब–आधारित फॉर्मूलेशन लॉन्च और व्यावसायीकरण किए गए हैं।

वित्त वर्ष 2023–24 के दौरान, 104 पेटेंट दाखिल किए गए, जिससे संचयी भारतीय और अंतर्राष्ट्रीय पेटेंट आवेदनों की संख्या 547 हो गई और 51 पेटेंट प्रदान किए गए, जिससे 31 मार्च, 2024 तक संचयी पेटेंट अनुदान की संख्या 210 हो गई।

अप्रैल 2023–मार्च 2024 की अवधि के दौरान, 2 प्रकाशन किए गए, जिससे विभिन्न अंतर्राष्ट्रीय पत्रिकाओं में संचयी प्रकाशन संख्या 65 हो गई

14.1.5.7. प्राकृतिक गैस

एचपीसीएल की प्राकृतिक गैस व्यवसाय की संपूर्ण मूल्य श्रृंखला में भागीदारी है।

एचपीसीएल जोकि एक सहायक कंपनी है, एचपीसीएल एलएनजी लिमिटेड (एचपीएलएनजी) के माध्यम से गुजरात में छारा बंदरगाह (गिर सोमनाथ जिला) पर एस एमएमटीपीए एलएनजी रीगैसिफिकेशन टर्मिनल का निर्माण कर रही है। टर्मिनल के वित्त वर्ष 2024–25 में शुरू होने की उम्मीद है।

एचपीसीएल संयुक्त उद्यम कंपनियों अर्थात जीएसपीएल इंडिया गैसनेट लिमिटेड (जीआईजीएल) और जीएसपीएल इंडिया ट्रांसको लिमिटेड (जीआईटीएल) के माध्यम से तीन क्रॉस– कंट्री प्राकृतिक गैस पाइपलाइनों (मेहसाणा से बठिंडा, बठिंडा से श्रीनगर और मल्लावरम से भीलवाड़ा) के विकास में भी भाग ले रही है।

एचपीसीएल ने गुजरात के साबरकांठा जिले के ओरान में एचपीसीएल रिटेल आउटलेट में अपना पहला एलएनजी डिस्पेंसिंग केन्द्र सफलतापूर्वक शुरू कर दिया है और इस केन्द्र से बिक्री शुरू हो गई है। अजमेर, सतारा और प्रयागराज में 3 और एलएनजी डिस्पेंसिंग स्टेशनों के लिए यांत्रिक निर्माण पूरा हो चुका है

14.1.5.8. नगर गैस वितरण

नगर गैस डिस्ट्रीब्यूशन (सीजीडी) में एचपीसीएल की उपस्थिति बढ़ाने के लिए, एचपीसीएल हरियाणा, उत्तर प्रदेश, उत्तराखंड, पश्चिम बंगाल, राजस्थान, बिहार और झारखंड राज्यों में 13 भौगोलिक क्षेत्रों में स्टैंडअलोन आधार पर सीजीडी नेटवर्क स्थापित कर रही है।

पीएनजीआरबी बोली के 12वें दौर के दौरान, एचपीसीएल ने सिक्किम भौगोलिक क्षेत्र को सफलतापूर्वक सुरक्षित कर लिया है।

एचपीसीएल अहमदाबाद में सीएनजी नेटवर्क का संचालन भी कर रही है।

इसके अतिरिक्त, एचपीसीएल संयुक्त उद्यम कंपनी एचपीओआर गैस प्राइवेट लिमिटेड (एचओजीपीएल) के माध्यम से अंबाला–कुरुक्षेत्र (हरियाणा) और कोल्हापुर (महाराष्ट्र) जिलों के भौगोलिक क्षेत्रों में सीजीडी नेटवर्क स्थापित कर रही है। पीएनजीआरबी बोली के 12वें दौर के दौरान, एचपीओआईएल, गैस प्राइवेट लिमिटेड ने नागालैंड भौगोलिक क्षेत्र को सफलतापूर्वक सुरक्षित कर लिया है।

एचपीसीएल संयुक्त उद्यम कंपनियों आवंतिका गैस लिमिटेड (एजीएल), भाग्यनगर गैस लिमिटेड (बीजीएल) और गोदावरी गैस प्राइवेट लिमिटेड (जीजीपीएल) के माध्यम से आंध्र प्रदेश, तेलंगाना और मध्य प्रदेश राज्यों में 7 भौगोलिक क्षेत्रों (जीएएस) में नगर गैस वितरण (सीजीडी) नेटवर्क का संचालन भी कर रही है।

14.1.5.9. अन्वेषण और उत्पादन

एचपीसीएल अपनी पूर्ण स्वामित्व वाली सहायक कंपनी प्राइज पेट्रोलियम कंपनी लिमिटेड (पीपीसीएल) के माध्यम से हाइड्रोकार्बन का अन्वेषण और उत्पादन (ईएसपी) करता है। एचपीसीएल के पास भारत के गुजरात में सीबी–ओएनएन–2002/3 नामक एक उत्पादन क्षेत्र में 15% भागीदारी हित (पीआई) है और अप्रैल 2023–मार्च 2024 की अवधि के दौरान उत्पादन में एचपीसीएल का हिस्सा 3861 बीबीएलएस है।

पीपीसीएल की सिंगापुर में निगमित प्राइज पेट्रोलियम इंटरनेशनल पीटीई लिमिटेड (पीपीआईपीएल) नामक एक पूर्ण स्वामित्व वाली सहायक कंपनी है, पीपीआईपीएल के पास ऑस्ट्रेलिया में दो ईएंडपी ब्लॉक टी/एल1 और 1/18पी में क्रमशः 11.25% और 9.75% भागीदारी हित है। ऑस्ट्रेलिया में योला उत्पादक क्षेत्र (टी/ए1) से उत्पादन में पीपीआईपीएलएस की हिस्सेदारी का उत्पादन विवरण अप्रैल 2023–मार्च 2024 की अवधि के दौरान 95,108 बीओई है।

14.1.5.10. वैकल्पिक ऊर्जा

नवीकरणीय ऊर्जा

एचपीसीएल मूल्य श्रृंखला में कार्बन की छाप और विद्युत की लागत को कम करने के लिए नवीकरणीय ऊर्जा स्रोतों का लाभ उठा रहा है और लगातार पवन और सौर ऊर्जा उत्पादन क्षमताओं का विस्तार कर रहा है।

मार्च 2024 तक, एचपीसीएल के पास कुल सौर स्थापित बिजली संयंत्र क्षमता लगभग 107.1 मेगावाट है। ये सौर संयंत्र देश भर में फैले कंपनी के विभिन्न विपणन/संचालन स्थानों पर स्थापित हैं।

ग्रीनिंग इनिशिएटिव के अंश के रूप में एचपीसीएल हरियाणा और उत्तर प्रदेश में एचपीसीएल सुविधाओं की आरई जरूरतों को पूरा करने के लिए पानीपत में 6 मेगावाट (एसी) और झांसी में 5 मेगावाट (एसी)/6.5 मेगावाट पी (डीसी) क्षमता के सौर ऊर्जा संयंत्रों का निर्माण कार्य लगभग पूरा हो गया है।

एचपीसीएल ने आंध्र प्रदेश के गैलीवेडु में 100 मेगावाट की अपनी पहली मेगा स्केल यूटिलिटी सोलर परियोजना पर काम शुरू कर दिया है।

इसके अतिरिक्त, एचपीसीएल के पास महाराष्ट्र और राजस्थान में 100.90 मेगावाट पवन ऊर्जा संयंत्र भी हैं। ये पवन ऊर्जा परियोजनाएं राजस्थान के डिस्कॉम को उत्पादित विद्युत बेचती हैं और राजस्थान में एमबीपीएल और एलपीजी स्थानों और महाराष्ट्र में एमपीएसपीएल स्थानों के लिए कैप्टिव

स्थानों में भी विद्युत बेचती है। अप्रैल 2023–मार्च 2024 के लिए इन पवन संयंत्रों से विद्युत उत्पादन 18.45 करोड़ केडब्लूएच था, जिसके परिणामस्वरूप 151.3 हजार मीट्रिक टन कार्बन डाइऑक्साइड समकक्ष का उत्सर्जन कम हो पाया है।

जैव ईंधन

अप्रैल 2023–मार्च 2024 की अवधि के दौरान, एचपीसीएल ने मोटर स्पिरिट (एमएस) में 156 करोड़ लीटर ऐथेनॉल मिलाकर 12% ऐथेनॉल मिश्रण प्राप्त किया है।

एचपीसीएल की पहली 2जी ऐथेनॉल बायो रिफाइनरी परियोजना बठिंडा में निर्माणाधीन है, जिसमें बायोमास से 100 केएलपीडी की ऐथेनॉल उत्पादन क्षमता है।

उत्तर प्रदेश के बदायूं में 14.2 टीपीडी क्षमता के अपने पहले बायोमास–आधारित सीबीजी संयंत्र की वाणिज्यिक बिक्री की शुरूआत की गई है।

परिवहन क्षेत्र में वैकल्पिक ईंधन में अपनी उपस्थिति दर्ज कराने के लिए, एचपीसीएल संपीड़ित बायो गैस (सीबीजी) को बढ़ावा देने के लिए भारत सरकार की किफायती परिवहन के लिए दीर्घकालिक विकल्प (सस्ती परिवहन के लिए संधारणीय विकल्प) पहल में सक्रिय रूप से भाग ले रही है। किफायती परिवहन के लिए दीर्घकालिक विकल्प योजना के तहत, 2023–24 में 26.1 टीपीडी सीबीजी की कुल क्षमता वाले 05 सीबीजी संयंत्र शुरू किए गए और संचयी रूप से 54.65 टीपीडी की कुल क्षमता वाले 9 संयंत्र शुरू किए गए हैं। वर्ष 2023–24 में 112.5 टीपीडी की सीबीजी उत्पादन क्षमता वाले सीबीजी संयंत्र के लिए 20 नए एलओआई जारी किए गए, जिससे कुल सक्रिय एलओएल की संख्या 107 हो गई और कुल क्षमता 606.6 टीपीडी हो गई।

2023–24 के दौरान एचपीसीएल और एचपीसीएल एसएटीएटी एलओएल धारकों के प्लांटों द्वारा आपूर्ति किए गए एचपीसीएल के समर्पित सीबीजी रिटेल आउटलेट्स के माध्यम से 338.6 मीट्रिक टन सीबीजी की बिक्री की गई, जबकि ऐतिहासिक सीबीजी बिक्री 77.3 मीट्रिक टन रही, जो 338% की वृद्धि को दर्शाती है।

हितधारकों के बीच किफायती परिवहन के लिए दीर्घकालिक विकल्प योजना को संवेदनशील बनाने और बढ़ावा देने के लिए बैंकरों के लिए 29.02.2024 को लखनऊ में एमओपीएनजी के तत्वावधान में सीबीजी पर कार्यशाला आयोजित की गई जहां एलओआई धारकों और सीबीजी संयंत्र मालिकों के साथ एक बैठक हुई, जिसमें पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय, पेयजल एवं स्वच्छता विभाग (जलशक्ति मंत्रालय), वित्तीय सेवा विभाग (वित्त मंत्रालय), उर्वरक विभाग (रसायन एवं उर्वरक मंत्रालय), यूपीनेडा, भारतीय बायोगैस संघ (आईबीए), विश्व बैंक और प्रौद्योगिकी प्रदाताओं के वरिष्ठ अधिकारी शामिल हुए थे।

"ग्रामीण भारत में अपशिष्ट से ऊर्जा–गोबरधन" के लिए भारत सरकार के दृष्टिकोण के अनुरूप, एचपीसीएल ने सीएसआर रूट के माध्यम से पथमेड़ा, सांचौर राजस्थान में 1.6 टीपीडी सीबीजी क्षमता का गोबर आधारित सीबीजी संयंत्र स्थापित किया है।

14.1.5.11. संधारणीय विकास

एचपीसीएल अपनी भावी कार्यनीतियों और व्यावसायिक संचालन में ईएसजी कारकों को एकीकृत कर रहा है, ताकि निवेशकों को आकर्षित करने, समुत्थानशील व्यावसायिक मॉडल बनाने और अधिक संधारणीय और समावेशी वैश्विक अर्थव्यवस्था में योगदान देने के लिए प्रतिस्पर्धात्मक लाभ बढ़ाया जा सके। एचपीसीएल अपने संचालन और गतिविधियों में सर्वोत्तम प्रथाओं को लागू करके अपने ईएसजी उद्देश्यों को प्राप्त करने के लिए प्रतिबद्ध है। ईएसजी निष्पादन को लगातार राष्ट्रीय और अंतरराष्ट्रीय समकक्षों के साथ बेंचमार्किंग किया जाता है।

एचपीसीएल ने संगठन स्तर पर अपने एसबीयू के एचएसई कार्यों में एकीकृत प्रबंधन प्रणाली (आईएमएस) (आईएसओ 9001, 14001 और 45001) को लागू किया है। एचपीसीएल, रिफाइनरियों और प्रमुख विपणन स्थानों ने आईएसओ–14001 मानकों के आधार पर अंतर्राष्ट्रीय स्तर पर स्वीकृत पर्यावरण प्रबंधन प्रणाली को लागू किया है।

उद्योग की सर्वोत्तम कार्यप्रणाली के अनुरूप विभिन्न स्थानों पर खतरनाक अपशिष्ट उपचार और निपटान प्रणालियाँ उपलब्ध हैं। पर्यावरण की सुरक्षा सुनिश्चित करने के लिए प्रमुख स्थानों पर अपशिष्ट जल के उपचार और पुनर्चक्रण के लिए अत्याधुनिक अपशिष्ट उपचार संयंत्र उपलब्ध हैं।

प्रमुख प्रतिष्ठानों पर फ्यूजीटिव इमिशन्स की निगरानी और नियंत्रण के लिए स्टीमशील कार्बनिक यौगिक (वीओसी) निगरानी और रिसाव का पता लगाने और मरम्मत (एलडीएआर) कार्यक्रम जैसी सर्वश्रेष्ठ श्रेणी की तकनीकों को अपनाया गया है। विभिन्न आपूर्ति स्थानों और खुदरा दुकानों पर स्टीम

रिकवरी सिस्टम (वीआरएस) स्थापित किए गए हैं। प्रमुख स्थानों पर नियामक एजेंसियों को वास्तविक समय डेटा हस्तांतरण सहित नवीनतम तकनीकों के उपयोग से पर्यावरण और परिवेशी वायु गुणवत्ता में गैसीय उत्सर्जन की निरंतर निगरानी की जाती है।

उत्सर्जन और वायु गुणवत्ता की ऑनलाइन निगरानी में विचलन की निगरानी और सुधार के लिए चेतावनी की व्यवस्था है। संचालन स्थलों पर वर्षा जल संचयन प्रणालियाँ लागू की गई हैं।

एचपीसीएल ने विश्व प्रसिद्ध सलाहकार की मदद से अपनी पर्यावरण कार्यनीति पूरी कर ली है। इसने कार्यक्षेत्र–1 और कार्यक्षेत्र–2 उत्सर्जन के लिए 2040 के अपने नेट–जीरो लक्ष्य के अनुरूप अपने संचालन के डी–कार्बोनाइजेशन के लिए दिशा–निर्देश तैयार किया है। इस दिशा–निर्देश में बहु–ऊर्जा हरित और कम कार्बन निगम की ओर परिवर्तन पर विशेष ध्यान दिया गया है। एचपीसीएल अपने ग्राहक–उन्मुख दृष्टिकोण के माध्यम से अपने ग्राहकों को सुलभ और सस्ती स्वच्छ ऊर्जा प्रदान करने के लिए भी प्रतिबद्ध है। निवल शून्य लक्ष्यों को पूरा करने के लिए अपेक्षित पूंजीगत व्यय लगभग ₹ 60,000 करोड़ होगा।

एचपीसीएल ने निवल शून्य हासिल करने के लिए प्रमुख उत्तोलक की पहचान की है, जैसे कि अपने स्वयं के संचालन में ऊर्जा दक्षता बढ़ाना, रिफाइनरियों में नवीकरणीय ऊर्जा का उपयोग करना, हाइड्रोजन की आवश्यकताओं को ग्रीन हाइड्रोजन से बदलना, फ्लेयर गैस उत्सर्जन को कम करना आदि। उत्सर्जन तीव्रता में कमी लाने की दिशा में, निगम नवीकरणीय ऊर्जा और भंडारण, बायोगैस, जैव ईंधन, पेट्रोकेमिकल्स और ग्रीन हाइड्रोजन जैसे विभिन्न व्यावसायिक क्षेत्रों की खोज कर रहा है।

अपनी ऊर्जा परिवर्तन यात्रा में तेजी लाने के लिए, एचपीसीएल ने एक नया ऊर्जा परिवर्तन प्रकोष्ठ स्थापित किया है, जो निगम के निवल शून्य लक्ष्यों को प्राप्त करने के लिए समर्पित है। एचपीसीएल को अपने नवीकरणीय और हरित ऊर्जा पोर्टफोलियो के लिए पूर्ण स्वामित्व वाली सहायक कंपनी की स्थापना के लिए विनियामक अनुमोदन प्राप्त हुआ है और उसने एचपीसीएल रिन्यूएबल्स एंड ग्रीन एनर्जी लिमिटेड को निगमित किया है। एचपीसीएल की महत्वाकांक्षी योजना है कि वह वर्ष 2030 तक अपने नवीकरणीय पोर्टफोलियो को 10 गीगावाट तक बढ़ाए और नए 1जी, 2जी और सीबीजी संयंत्रों के माध्यम से जैव–ईंधन पोर्टफोलियो को बढ़ाए।

एचपीसीएल उन्नत/वैकल्पिक ईंधन में पदचिह्नों का विस्तार करके हरित और उभरते अवसरों का लाभ उठा रहा है। जैव ईंधन में पदचिह्नों का विस्तार करने के लिए, एचपीसीएल द्वारा अपने दम पर और साथ ही उद्यमियों की भागीदारी के साथ विभिन्न जैव ईंधन परियोजनाओं का क्रियान्वयन किया जा रहा है। खुदरा दुकानों के सौरीकरण, रिफाइनरियों की परिचालन आवश्यकताओं को पूरा करने के लिए नवीकरणीय ऊर्जा के उपयोग में वृद्धि, दोनों रिफाइनरियों में विद्युत आयात के लिए अवसंरचना की स्थापना आदि के माध्यम से नवीकरणीय ऊर्जा में विस्तार किया जा रहा है।

एचपीसीएल के हरित अनुसंधान एवं विकास केंद्र (एचपीजीआरडीसी) ने इथेनॉल, सीबीजी, संधारणीय विमानन ईंधन और कार्बन कैप्चर के उत्पादन के लिए आंतरिक प्रौद्योगिकियां विकसित की हैं, जो प्रमुख परियोजना और वाणिज्यिक कार्यान्वयन के विभिन्न चरणों में हैं, जिनका विवरण नीचे दिया गया है।

- एचपीसीएल ने एच–सीएनजी के उत्पादन के लिए कार्बन–मुक्त और जल–मुक्त प्रक्रिया विकसित की है। वर्तमान में, एक प्रमुख परियोजना स्थापित किया गया है, जो मूल्यवान उप–उत्पाद के रूप में कार्बन नैनो ट्यूब (सीएनटी) का भी उत्पादन करता है।
- एचपीसीएल ने ब्लू हाइड्रोजन तकनीक विकसित की है जिसमें रोटेटिंग पैकड बेड सिस्टम (एचपी–एचआईजीएएस टेक्नोलॉजी) का उपयोग करके विभिन्न धाराओं से सीओ2 को कैप्चर किया जाएगा। इस तकनीक का मुख्य लाभ यह है कि लंबे अवशोषण स्तंभों का आकार 10 गुना कम हो जाता है। एचपीसीएल–विशाख रिफाइनरी में 24 केटीपीए सीओ2 कैप्चर क्षमता वाला निष्पादन संयंत्र स्थापित किया जा रहा है
- लिग्नोसेल्यूलोसिक बायोमास से 2जी–इथेनॉल के उत्पादन के लिए एचपी–एएसएपी प्रौद्योगिकी (सहायक एकल चरण एसिड पूर्वशोधन)।
- लिग्नोसेल्यूलोसिक बायोमास से बायोगैस युक्त मीथेन के उत्पादन के लिए एचपी–रैम्प (मीथेन उत्पादन के लिए तीव्र अम्लीकरण) नामक प्रौद्योगिकी।
- प्रयुक्त खाना पकाने के तेल (यूसीओ) से ग्रीन डीज़ल और बायो–एटीएफ के उत्पादन के लिए एचपी–ट्राईजेट नामक प्रौद्योगिकी।

- सीएसपी (ध्यान–केंद्रित सौर ऊर्जा संयंत्र) में उपयोग के लिए थर्मिक तरल पदार्थ।
- एचपीजीआरडीसी नवीकरणीय ऊर्जा भंडारण के लिए समाधान के लिए काम कर रहा है, जिसमें सोडियम आयन बैटरी का विकास, वैनेडियम रेडॉक्स फ्लो बैटरी और सुपर कैपेसिटर का विकास, ग्रीन हाइड्रोजन उत्पादन के लिए सामग्री और प्रौद्योगिकियों का विकास शामिल है, जिसमे एल्कलाइन और एसओईसी आधारित इलेक्ट्रोलाइजर शामिल हैं।
- एचपीसीएल की विशाख रिफाइनरी में कच्चे तेल से लेकर रसायन तक के उत्पादन के लिए एचपीकोट तकनीक का विकास और 80 केटीपीए से संबंधित संयंत्र स्थापित किया जा रहा है।
- एचपीजीआरडीसी ने ग्रीन हाइड्रोजन, बैटरी प्रौद्योगिकी, जैव ईंधन, कार्बन कैप्चर और सीक्वेस्ट्रेशन, और प्रक्रिया मॉडलिंग आदि के क्षेत्रों में सहयोगात्मक अनुसंधान के लिए ऑयल इंडिया लिमिटेड (ओएलएल) के साथ समझौता ज्ञापन पर हस्ताक्षर किए हैं।

एचपीसीएल ने इलेक्ट्रिक 2–व्हीलर बैटरी स्वैपिंग सेक्टर में वैश्विक अग्रणी मेसर्स गोगोरो इंक के साथ एक समझौता ज्ञापन पर हस्ताक्षर किए हैं। गोगोरो, अपने अभिनव बैटरी–स्वैपिंग व्यवसाय रूपरेखा के साथ सीमित धारणा, तेजी से ईंधन भरने, सुरक्षा और सामर्थ्य से संबंधित चुनौतियों का समाधान करने में अग्रणी है।

एचपीसीएल 2014 में सीआईआई ग्रीन कंपनी (ग्रीनको) रेटिंग के लिए स्वेच्छा से चुनने वाली पीएसयू में पहली कंपनी है। यह प्रणाली किसी प्रचालन इकाई के निष्पादन का मूल्यांकन करती है अर्थात प्रबंधन प्रणाली, ऊर्जा दक्षता, जल संरक्षण, नवीकरणीय ऊर्जा, ग्रीनहाउस गैस उत्सर्जन, अपशिष्ट प्रबंधन, सामग्री संरक्षण, पुनर्चक्रण और पुनर्चक्रण, हरित आपूर्ति श्रृंखला, उत्पाद प्रबंधन, पर्यावरण के लिए नवाचार, हरित अवसंरचना और पारिस्थितिकी के मापदंड। 8 वर्षों की अवधि में कुल 20 स्थानों को प्रमाणित किया गया है। वर्तमान वर्ष के दौरान एचपीसीएल ने 35 स्थानों के लिए 3 ग्रीनको रेटिंग संस्करण लिया है, जिसमें से 29 स्थानों को ग्रीनको रेटेड स्थान घोषित किया गया है। एचपीसीएल को ग्रीनको मुवमेंट को अपनाकर पर्यावरणीय स्थिरता में अपने योगदान के लिए 2023 के लिए ग्रीनको चैंपियन पुरस्कार मिला है।

एचपीसीएल ने वैश्विक जलवायु कार्रवाई वृत्तांत में व्यक्तिगत व्यवहार को सबसे आगे लाने, गति को अधिक व्यापक पहुंच प्रदान करने और देश के संधारणीय विकास संबंधी कार्यसूची के उद्देश्यों को पूरा करने के लिए ₹मिशन लाइफ़श आंदोलन में सक्रिय रूप से भाग लिया। एचपीसीएल ने 1,250 खुदरा दुकानों पर मिशन लाइफ क्रिएटिव निष्पादित किए हैं, 5,000 से अधिक प्रो–प्लैनेट लोगों को मिशन लाइफ प्रतिज्ञाओं के साथ जोड़ा, 1,000 मीट्रिक टन से अधिक अपशिष्ट प्लास्टिक एकत्र किया, 1,500 से अधिक पेड़ लगाए, 74% से अधिक दक्षता वाले 9,000 से अधिक उच्च दक्षता वाले थर्मल एलपीजी स्टोव बेचे और नुक्कड़ नाटक (स्ट्रीट प्ले), स्कूल प्रतियोगिताओं आदि जैसी कई जागरूकता सत्र आयोजित किए।

एचपीसीएल ने संयुक्त राष्ट्र वैश्विक करार (यूएनजीसी) पर हस्ताक्षर करना जारी रखा। वर्ष के दौरान, एचपीसीएल मानवाधिकार नीति जारी की गई। संधारणीयता के प्रति जागरूकता बढ़ाने के लिए प्रशिक्षण कार्यक्रम, जागरूकता सत्र, संधारणीयता प्रश्नोत्तरी, समाचार पत्र और तकनीकी बुलेटिन जैसी संधारणीयता की दिशा में क्षमता निर्माण पहल निरंतर आधार पर आयोजित की गई। एचपीसीएल संधारणीयता की सर्वोत्तम कार्यप्रणाली के आदान–प्रदान के माध्यम से आपूर्ति श्रृंखला में ईएसजी कार्यप्रणाली को आत्मसात करने के लिए प्रमुख औद्योगिक ग्राहकों के साथ भी सहयोग कर रहा है।

एचपीसीएल ने अपने परिचालनों और अपने ग्राहकों के लिए सुरक्षा सुनिश्चित करने पर ध्यान केंद्रित करना जारी रखा। इस उद्देश्य से, जॉब सेफ्टी एनालिसिस (जेएसए) के साथ एकीकृत कार्य अनुमति प्रणाली, एसएपी में घटना प्रबंधन प्रणाली, अधिकारियों के लिए सजीव अग्निशमन व्यवस्था , लाइफसेविंग कार्डिनल नियमों का कार्यान्वयन, अधिकारियों के लिए एनईबीओएसएच प्रक्रिया सुरक्षा प्रबंधन पाठ्यक्रम प्रमाणन, स्थानीय भाषाओं में एनिमेटेड एसओपी वीडियो, क्षेत्रीय, एसबीयू, स्तर और कॉर्पोरेट स्तर पर सुरक्षा समितियां, पीपीई और एसओपी पालन सुनिश्चित करने के लिए वीडियो एनालिटिक्स, अधिकारियों के लिए लैपटॉप पर दैनिक सुरक्षा क्षण, सुरक्षा जागरूकता प्रकाशन, अनुबंध कर्मियों के साथ एक–एक करके प्रबंधन बातचीत, खतरे को पहचानें और विचलन अभियान से आगे न चलें, सुरक्षा भेद्यता सूचकांक जैसी असंख्य पहल की गई।

सार्वजनिक क्षेत्र के उपक्रमों में पहली बार, एचपीसीएल ने भारतीय राष्ट्रीय सुरक्षा परिषद के सहयोग से राष्ट्रीय सुरक्षा योग्यता परीक्षा (एनएसएटी परीक्षा) के माध्यम से मूल्यांकन के लिए अनिवार्य एचएसई फाउंडेशन और योग्यता आश्वासन कार्यक्रम शुरू किया और अपने क्षेत्रीय अधिकारियों के लिए सुरक्षा, पर्यावरण और स्थायित्व के क्षेत्रों में व्यापक मॉड्यूल विकसित किए।

14.1.5.13. परियोजनाएं

एचपीसीएल अपने संयुक्त उद्यम के साथ रिफाइनरियों और विपणन अवसंरचना के सुदृढ़ीकरण और विस्तार की दिशा में विभिन्न परियोजनाओं को क्रियान्वित कर रहा है।

पूर्ण परियोजनाएं

बेंगलुरु स्थित एचपीसीएलएस ग्रीन आरएंडडी केन्द्र (ओएचपीजीआरडीसी) ने आरएंडडी क्षमताओं का लाभ उठाने के लिए अतिरिक्त और नई प्रयोगशालाएं जोड़कर अपनी क्षमताओं का और विस्तार किया है, जिससे मार्च 2024 तक कुल 20 प्रयोगशालाएं हो जाएंगी।

पेट्रोलियम उत्पादों की बढ़ती मांग को पूरा करने के लिए इंदौर, मध्य प्रदेश में मौजूदा एचपीसीएल डिपो का पुनरुद्धार किया गया।

देश में एलपीजी की बढ़ती मांग को पूरा करने के लिए, एचपीसीएल ने राजस्थान राज्य के आबू रोड में नए 120 टीएमटीपीए एलपीजी संयंत्र और उत्तर प्रदेश राज्य के वाराणसी में 120 टीएमटीपीए एलपीजी संयंत्र की स्थापना के साथ अपने एलपीजी आपूर्ति अवसंरचना को सुदृढ़ किया है।

जीवाश्म ईंधन पर देश की निर्भरता कम करने की दिशा में आगे बढ़ते हुए, एचपीसीएल ने उत्तर प्रदेश के बदायूं में पहला बायोमास आधारित संपीड़ित बायोगैस संयंत्र चालू किया।

जारी परियोजनाएं

रिफाइनरी संबंधी परियोजनाएं

विशाख रिफाइनरी आधुनिकीकरण परियोजना (वीआरएमपी) में रिफाइनिंग क्षमता को 8.3 एमएमटी से बढ़ाकर 15.0 एमएमटी करने का काम पूरा होने के अंतिम चरण में है। एक बार चालू हो जाने पर, अतिरिक्त क्षमता एचपीसीएल रिफाइनिंग और विपणन पोर्टफोलियो को और अधिक संरेखित करेगी। वीआरएमपी के हिस्से के रूप में अवशेष उन्नयन सुविधाओं (आरयूएफ) का निष्पादन भी अच्छी तरह से प्रगति कर रहा है।

इसके अतिरिक्त, एचपीसीएल एक संयुक्त उद्यम कंपनी, एचपीसीएल राजस्थान रिफाइनरी लिमिटेड (एचआरआरएल) के माध्यम से राजस्थान के बाड़मेर जिले में 9 एमएमटीपीए क्षमता की नई ग्रीनफील्ड रिफाइनरी–सह–पेट्रोकेमिकल कॉम्प्लेक्स स्थापित कर रही है, जो अच्छी प्रगति कर रही है।

एचपीसीएल अपनी संयुक्त उद्यम कंपनी, रत्नागिरी रिफाइनरी एंड पेट्रोकेमिकल्स लिमिटेड (आरएपीसीएल) के माध्यम से महाराष्ट्र के रत्नागिरी जिले में एकीकृत ग्रीनफील्ड रिफाइनरी–सह–पेट्रोकेमिकल कॉम्प्लेक्स की स्थापना में भाग ले रही है।

विपणन परियोजनाएँ

देश में पेट्रोलियम उत्पादों की बढ़ती मांग को लागत प्रभावी और पर्यावरण अनुकूल तरीके से पूरा करने के लिए, एचपीसीएल ने कई पाइपलाइन परियोजनाएं शुरू की हैं। एचपीसीएल की प्रमुख किफायती परिवहन के लिए दीर्घकालिक विकल्प पाइपलाइन अवसंरचना परियोजनाओं में निम्नलिखित शामिल हैं

(i) बठिंडा संगरूर पाइपलाइन

(ii) हल्दिया पानागढ़ एलपीजी पाइपलाइन

देश में एलपीजी की बढ़ती ज़रूरत को पूरा करने और आयात क्षमता बढ़ाने के लिए मैंगलोर में 80 टीएमटी एलपीजी कैवर्न का निर्माण कार्य प्रगति पर है। इसके अतिरिक्त, कमरदंगा (असम) में नई एलपीजी सुविधाओं का निर्माण कार्य प्रगति पर है। मदुरै एलपीजी संयंत्र (तमिलनाडु) में टैंक वैगन और रेलवे साइडिंग सुविधा का निर्माण कार्य प्रगति पर है। रायपुर (छत्तीसगढ़), वाशी (महाराष्ट्र) में पीओएल डिपो/टर्मिनल का पुनरुद्धार/संवर्धन, कमरदंगा (असम) में नई रेल से चलने वाली पीओएल सुविधा का निर्माण कार्य भी प्रगति पर है। पश्चिम बंगाल, यूपी/यूके, जींद और सोनीपत में सीजीडी परियोजनाएं भी प्रगति पर हैं। एचपीसीएल बाड़मेर (राजस्थान) में अपना पहला पेट्रोकेमिकल इवैक्यूएशन मार्केटिंग टर्मिनल भी बना रहा है, जो मार्केटिंग इंफ्रास्ट्रक्चर को और सुदृढ़ बनाने में महत्वपूर्ण योगदान देगा।

14.1.5.14. प्रमुख पुरस्कार एवं सम्मान

अप्रैल 2023 से मार्च 2024 की अवधि के दौरान, एचपीसीएल को विभिन्न मंचों पर कई पुरस्कार और मान्यताएँ प्रदान की गईं। एचपीसीएल द्वारा प्राप्त कुछ पुरस्कारों की सूची निम्नानुसार है:

1. सार्वजनिक उद्यमों के स्थायी सम्मेलन (कार्यक्षेत्र) द्वारा निम्नलिखित श्रेणियों के अंतर्गत स्कोप पुरस्कार प्रदान किए गए:

i. मानव संसाधन प्रबंधन और डिजिटल परिवर्तन के लिए स्कोप एमिनेंस पुरस्कार

ii. आरटीआई अधिनियम के प्रभावी कार्यान्वयन के लिए स्कोप मेरिटोरियस अवार्ड

2. वर्ष 2022–23 के लिए पेट्रोलियम और प्राकृतिक गैस मंत्रालय से निम्नलिखित श्रेणियों के अंतर्गत नवाचार पुरस्कार प्राप्त हुआ:

i. स्वदेशी पीएसए पीएलसी प्रौद्योगिकी के विकास और व्यावसायीकरण के लिए सर्वश्रेष्ठ स्वदेशी रूप से विकसित प्रौद्योगिकी।

ii. एचपी–एचसीएनजी प्रौद्योगिकी (हाइड्रोजन समृद्ध सीएनजी के कार्बन–नकारात्मक उत्पादन के लिए प्रौद्योगिकी) के लिए 'अनुसंधान और विकास संस्थान में सर्वश्रेष्ठ नवाचार'

3. गृह मंत्रालय, भारत सरकार द्वारा "राजभाषा कार्यान्वयन वर्ष 2022–23" के लिए "राजभाषा कीर्ति पुरस्कार" (द्वितीय पुरस्कार)।

4. विद्युत मंत्रालय, भारत सरकार द्वारा मुंबई रिफाइनरी को "राष्ट्रीय ऊर्जा संरक्षण पुरस्कार 2023" (द्वितीय स्थान)।

5. रसायन एवं उर्वरक मंत्रालय, रसायन एवं पेट्रोकेमिकल्स विभाग (डीसीपीसी) और फेडरेशन ऑफ इंडियन चैंबर्स ऑफ कॉमर्स एंड इंडस्ट्री (फिक्की) पुरस्कार 2023 द्वारा "रासायनिक श्रेणी" में एचपी ग्रीन आरएंडडी सेंटर टीम के लिए एफसीसी उत्प्रेरक योजक (एचपी–बॉटम क्रैकिंग एडिटिव) के विकास के लिए "वर्ष 2023 का उत्पाद नवप्रवर्तक"।

6. चौथे वार्षिक डिजिटल परिवर्तन शिखर सम्मेलन और पुरस्कार, 2023 में ड्राइवट्रैक प्लस कार्यक्रम के लिए "वफादारी कार्यक्रम में प्रौद्योगिकी का सर्वश्रेष्ठ उपयोग" पुरस्कार।

7. भारतीय चेंबर ऑफ कॉमर्स (आईसीसी) द्वारा 13वी पीएसई कॉन्क्लेव और उत्कृष्टता पुरस्कार 2023 में "कॉर्पोरेट प्रशासन" और "सीएसआर और संधारणीय" पुरस्कार।

8. भारतीय उद्योग परिसंघ (सीआईआई) द्वारा निम्नलिखित श्रेणियों के तहत सीआईआई डिजिटल परिवर्तन (डीएक्स) पुरस्कार 2023

i. "सबसे नवीन सर्वोत्तम कार्यप्रणाली" "स्मार्ट एलपीजी सिलेंडर डिलीवरी सिस्टम" और "इन–सर्विस टैंक सिस्टम का रोबोटिक निरीक्षण"

ii. "एचपीसीएल के डिजिटल एक्सपीरियंस सेंटर" और "ऑगमेंटेड एंड वर्चुअल रियलिटी–बेस्ड ट्रेनिंग सिमुलेशन" में "नवीनतम सर्वोत्तम कार्यप्रणाली"

9. "10वें पीएसयू पुरस्कार" श्रेणियों के अंतर्गत (i) स्टार्ट–अप में निवेश और (ii) गवर्नेंस नाउ द्वारा एचआर उत्कृष्टता (समग्र)

10. "ग्लोबल मार्केटिंग एक्सीलेंस अवार्ड्स" श्रेणियों के अंतर्गत वर्ल्ड मार्केटिंग कांग्रेस द्वारा:

(i) पावर95 के लिए "इमर्जिंग ब्रांड ऑफ द ईयर" और

(ii) कंज्यूमर आउटरीच प्रोग्राम (सीओपी) के लिए "बेस्ट एक्सपीरियंसल मार्केटिंग कैंपेन"

14.1.6 ऑयल इंडिया लिमिटेड (ओआईएल)

14.1.6.1. प्रस्तावना

ओआईएल, भारत सरकार का उद्यम तथा एमओपीएंडएनजी के प्रशासनिक कार्यढांचे के अंतर्गत महारत्न कंपनी है। यह देश में तथा विदेशों में कच्चे तेल और प्राकृतिक गैस की खोज, उत्पादन तथा परिवहन के व्यवसाय संबंधी कार्य करती है। ओआईएल की अधिकृत पूंजी ₹ 2,000 करोड़ है तथा चुकता पूंजी ₹ 1,084.41 करोड़ है। 31.12.2024 तक, भारत सरकार की शेयरधारिता ओआईएल की चुकता इक्विटी शेयर पूंजी का 56.66% है।

14.1.6.2. घरेलू पोर्टफोलियो

कंपनी के घरेलू प्रचालन असम, अरुणाचल प्रदेश तथा राजस्थान राज्यों में ऑनशोर पीईएल तथा पीएमएल के अंतर्गत आने वाले क्षेत्रों में फैले हुए हैं। ओआईएल के घरेलू क्षेत्रफल में 1 (एक) पीईएल शामिल है, जिसका क्षेत्रफल लगभग 23.3 वर्ग किलोमीटर है जोकि नामांकन के आधार पर अनुमोदित है और 25 (पच्चीस) पीएमएल लगभग 4,829 वर्ग किलोमीटर क्षेत्र में फैले हैं, जो असम (21 नग), अरुणाचल प्रदेश (2 नग) और राजस्थान (2 नग) राज्यों में स्थित हैं।

ओआईएल के पास गैर–प्रचालन के रूप में असम और अरुणाचल प्रदेश में प्री–एनईएलपी संयुक्त उद्यम के तहत 85.88 वर्ग किलोमीटर का 2 (दो) ब्लॉक हैं। कंपनी के पास प्रचालन के रूप में एनईएलपी के तहत 2 (दो) ऑनशोर ब्लॉक हैं, जिसमें असम और मिजोरम में 3,609 वर्ग किलोमीटर शामिल है। ओआईएल के पास गैर–ऑपरेटर के रूप में एनईएलपी के तहत 2 (दो) ब्लॉक हैं, जिसमें गुजरात–कच्छ (उथला अपतटीय), पश्चिम बंगाल (ऑनशोर) में 5,301 वर्ग किलोमीटर है। कंपनी के

पास डीएसएफ–I बोली दौर के तहत दिए गए एए/ओएनडीएसएफ/खेरेम/2016 में गैर–प्रचालन भागीदारी हित (40%) भी है।

कंपनी के पास असम, अरुणाचल प्रदेश, त्रिपुरा, नागालैंड, ओडिशा, राजस्थान और अंडमान तथा केरल–कोंकण के उथले अपतटीय भागों में 49,895 वर्ग किलोमीटर क्षेत्रफल वाले 27 (सत्ताईस) ओएएलपी ब्लॉक हैं। प्रचलक के रूप में, कंपनी के पास त्रिपुरा, कृष्णा–गोदावरी अपतटीय और राजस्थान में 208 वर्ग किलोमीटर क्षेत्रफल वाले 3 डीएसएफ ब्लॉक हैं। गैर–प्रचालक के रूप में, कंपनी के पास 1 डीएसएफ ब्लॉक है।

14.1.6.3. अन्वेषण संबंधी कार्यकलाप

ओआईएल वर्तमान में असम, अरुणाचल प्रदेश, त्रिपुरा, ओडिशा और राजस्थान के तटवर्ती क्षेत्रों में 27 (सत्ताईस) ओएएलपी ब्लॉकों में और अंडमान और केरल–कोंकण घाटी में उथले अपतटीय क्षेत्रों में अन्वेषण संबंधी कार्यकलाप में जुटा हुआ है। वर्ष 2023–24 के दौरान, ओआईएल ने 378.72 एलकेएम 2डी, 248.73 एसकेएम 3डी भूकंपीय आंकड़े प्राप्त की और 17 अन्वेषण कुओं की खुदाई की।

डीजीएच के राष्ट्रीय भूकंपीय कार्यक्रम (एनएसपी) अभियान के तहत 2डी भूकंपीय आंकड़ों के अधिग्रहण, प्रसंस्करण और व्याख्या (एपीआई) के लिए ओआईएल को संशोधित कुल 6,032 एलकेएम (5,162 एलकेएम भूकंपीय आंकड़े और 870 एलकेएम एयरबोर्न जियोफिजिकल सर्वेक्षण (एजीएस) आवंटित किया गया था। ओआईएल ने मई 2022 तक 5,245.80 एलकेएम (5,162 एलकेएम के संशोधित लक्ष्य का 101.62%) का भूकंपीय एपीआई पूरा कर लिया है।

उन क्षेत्रों को शामिल करने के लिए जहां दुर्गम भूभाग और प्रतिकूल वातावरण के कारण राष्ट्रीय भूकंपीय कार्यक्रम (एनएसपी) के तहत भूकंपीय आंकड़े प्राप्त नहीं किए जा सके उनके लिए 49,795 फ्लाइट एलकेएम ग्रेविटी ग्रैडियोमेट्री) और ग्रेविटी–मैग्नेटिक डेटा प्राप्त करने के लिए एयरबोर्न जियोफिजिकल सर्वे की योजना बनाई गई थी। तदनुसार, 49,795 फ्लाइट एलकेएम के लक्ष्य के स्थान पर कुल 42,943.09 फ्लाइट एलकेएम (86.24%) आंकड़े दर्ज किए गए। इसका प्रसंस्करण और व्याख्या दिनांक 31.03.2024 को पूरी हुई।

14.1.6.4. वास्तविक निष्पादन

मापदंड	इकाई	2022-23 (वास्तविक)	2023-24	
			लक्ष्य	वास्तविक (अनंतिम)
भूकंपनीय सर्वेक्षण				
2डी	जीएलकेएम	1333.3	354	378.72
3डी	एसक्यूकेएम	680.05	735	248.73
ड्रिलिंग				
खोजपूर्ण	'000 मीटर	59.890	105.255	64.788
	कुएं	16	33	17
विकास	'000 मीटर	86.330	123.258	105.654
	कुएं	29	44	44
कुल (खोजपूर्ण+विकास)	'000 मीटर	146.22	228.513	170.442
	कुएं	45	77	61
कच्चे तेल का उत्पादन				
असम	एमएमटी	3.114	3.705	3.287
अरुणाचल प्रदेश		0.024	0.037	0.032
राजस्थान (सकल तेल)		0.017	0.04	0.025
कुल ओआईएल		**3.155**	**3.782**	**3.344**

ओआईएल+ओआईएल का संयुक्त उद्यम में हिस्सा		**3.176**	**3.811**	**3.36**
प्राकृतिक गैस उत्पादन				
असम	एमएमएससीएम	2812	3353	2886
अरूणाचल प्रदेश		48	48.55	34
राजस्थान		181	240	171
कुल ओआईएल		**3,041**	**3,641**	**3,091**
ओआईएल+ओआईएल का संयुक्त उद्यम में हिस्सा		**3,180**	**3,816**	**3,182**
एलपीजी उत्पादन	'000T	**32.100**	**29.00**	**31.550**

उन क्षेत्रों को शामिल करने के लिए जहां दुर्गम भूभाग और प्रतिकूल वातावरण के कारण राष्ट्रीय भूकंपीय कार्यक्रम (एनएसपी) के तहत भूकंपीय आंकड़े प्राप्त नहीं किए जा सके उनके लिए 49,795 फ्लाइट एलकेएम ग्रेविटी ग्रैडियोमेट्री और ग्रेविटी–मैग्नेटिक डेटा प्राप्त करने के लिए एयरबोर्न जियोफिजिकल सर्वे की योजना बनाई गई थी। तदनुसार, 49,795 फ्लाइट एलकेएम के लक्ष्य के स्थान पर कुल 42,943.09 फ्लाइट एलकेएम (86.24%) आंकड़े दर्ज किए गए। इसका प्रसंस्करण और व्याख्या दिनांक 31.03.2024 को पूरी हुई।

14.1.6.5. दिनांक 01.04.2023 तक प्रारक्षित स्थिति (2पी)

निरंतर अन्वेषण और विकास कार्यकलापों के परिणामस्वरूप, ओआईएल ने 31.03.2024 तक घरेलू क्षेत्र में 804.0802 एमएमटी (तेल) और 417. 5161 बीसीएम (गैस) (1,166.4709 एमएमटीओई ओ+ओईजी) की कुल मात्रा (बीई) स्थापित की है। कंपनी की 2पी / बीई शेष उत्पादित तेल और गैस मात्रा क्रमशः 69.6531 एमएमटी और 139.2098 बीसीएम (190.3455 एमएमटीओई ओ+ओईजी) है।

14.1.6.6. कच्चे तेल का परिवहन

ओआईएल कुल 1,243 किमी कच्चे तेल पाइपलाइन का नेटवर्क प्रचालित करता है जो असम, पश्चिम बंगाल और बिहार राज्यों से होकर गुजरती है।

ओआईएल की कच्चे तेल की पाइपलाइन की कुल क्षमता 9.0 एमएमटीपीए (एफ+ आर) है। वित्त वर्ष 2023–24 के दौरान पाइपलाइन का कुल थ्रुपुट 6.72 एमएमटी था। ओआईएल नुमालीगढ़ रिफाइनरी (एनआरएल) से पश्चिम बंगाल में सिलीगुड़ी टर्मिनल तक कुल 1.72 एमएमटीपीए उत्पादों की निकासी के लिए 654.3 किलोमीटर लंबी पाइपलाइन भी प्रचालित करता है। वित्त वर्ष 2023–24 के दौरान, ओआईएल ने नुमालीगढ़–सिलीगुड़ी उत्पाद पाइपलाइन (एनएसपीएल) के माध्यम से 1.16 एमएमटी एमएमटी तैयार पेट्रोलियम उत्पादों का परिवहन किया।

बीवीएफसीएल, बीसीपीएल, एजीसीएल एपीजीसीएल, नीपको, आईओसी (एओडी), और एपीएल और आसपास के चाय बागान जैसे विभिन्न ग्राहकों को असम में उत्पादित प्राकृतिक गैस बेची जाती है। मार्च, 2011 से ओआईएल नुमालीगढ़ रिफाइनरी को गैस की आपूर्ति कर रहा है। राजस्थान में ओआईएल द्वारा उत्पादित गैर–संबद्ध गैस राजस्थान राज्य विद्युत उत्पादन निगम लिमिटेड (आरआरवीयूएनएल) को बेची जाती है। ओआईएल असम के दुलियाजान स्थित अपने संयंत्र में तरलीकृत पेट्रोलियम गैस (एलपीजी) का भी उत्पादन करता है।

14.1.6.7. वैकल्पिक ऊर्जा

ओआईएल ने वैकल्पिक ऊर्जा क्षेत्र में कार्यनीतिक रूप से विविधता लाई है, जिसमें पवन ऊर्जा, सौर ऊर्जा, हरित हाइड्रोजन और सीबीजी खंडों पर विशेष ध्यान दिया गया है। ओआईएल ने कुल 188. 10 मेगावाट की वाणिज्यिक नवीकरणीय ऊर्जा परियोजनाएँ सफलतापूर्वक स्थापित की हैं, जिसमें 174.10 मेगावाट पवन ऊर्जा परियोजनाएँ और 14 मेगावाट सौर ऊर्जा परियोजनाएँ शामिल हैं। इसके अतिरिक्त, असम सरकार के उद्यम असम पावर जनरेशन कॉरपोरेशन लिमिटेड (एपीजीसीएल) के साथ नवगठित संयुक्त उद्यम के माध्यम से असम में 650 मेगावाट की अनुमानित क्षमता वाले सौर नवीकरणीय संयंत्र स्थापित करने की योजनाएँ चल रही हैं। इस संयुक्त उद्यम के तहत पहला संयंत्र असम के नामरूप में स्थित 25 मेगावाट का सौर ऊर्जा संयंत्र होगा।

इसके अतिरिक्त, ओआईएल ने असम के जोरहाट में 100 किलोवाट क्षमता वाला देश का पहला एनियन एक्सचेंज मेम्ब्रेन (एईएम) तकनीक आधारित ग्रीन हाइड्रोजन (जीएचजेड) संयंत्र शुरू किया है। यह संयंत्र वर्तमान में प्रतिदिन 10 किलोग्राम जीएच2 का उत्पादन कर रहा है, जिसे बढ़ाकर 30 किलोग्राम प्रतिदिन किया जा सकता है। ओआईएल ने नगर गैस डिस्ट्रीब्यूशन (सीजीडी) में प्राकृतिक गैस के साथ 2% जीएच2 को मिश्रित करने के लिए पेट्रोलियम और प्राकृतिक गैस विनियामक बोर्ड (पीएनजीआरबी) से अनुमोदन प्राप्त किया है।

इन प्रयासों के अतिरिक्त, ओआईएल ने अपने स्टार्टअप कार्यक्रम "एसएनईएच" के माध्यम से हाइड्रोजन फ्यूल सेल ई–बस विकसित की है। 60 किलोवाट के प्रोटॉन एक्सचेंज मेम्ब्रेन (पीईएम) फ्यूल सेल इंजन द्वारा प्रचालित यह बस की 6 फरवरी 2023 को बेंगलुरु में भारत ऊर्जा सप्ताह (आईईडब्ल्यू) में माननीय प्रधान मंत्री श्री नरेंद्र मोदी द्वारा उद्घाटन किया गया। इसके अतिरिक्त, ओआईएल को असम के जोरहाट में हाइड्रोजन ईंधन सेल ई–बस के ट्रायल रन आयोजित करने के लिए सड़क परिवहन और राजमार्ग मंत्रालय (एमओआरटीएच) से अनुमोदन मिला है, जिसकी शुरुआत दिनांक 10.08.2023 को हुई थी।

ओआईएल लिक्विड ऑर्गेनिक हाइड्रोजन कैरियर (एलओएचसी) तकनीक के विकास का समर्थन करने में भी सक्रिय रूप से शामिल है, जिसका उद्देश्य 500 किलोमीटर की सीमा में परिवेशी दबाव और तापमान की स्थिति में हाइड्रोजन के परिवहन को सक्षम बनाना है। यह पहल ओआईएल के स्टार्टअप कार्यक्रम "एसएनईएच" के माध्यम से मेसर्स ओम क्लीनटेक प्राइवेट लिमिटेड, पुणे के सहयोग से की जा रही है।

गोवरधन योजना के अनुरूप, ओआईएल ने 25 संपीड़ित जैव–गैस (सीबीजी) संयंत्र स्थापित किए हैं। सात सीबीजी परियोजनाओं की स्थापना में प्रगति हुई है, जिनकी विस्तृत परियोजना रिपोर्ट (डीपीआर) वर्तमान में तैयार की जा रही है।

14.1.6.8. विविधीकरण

ओआईएल ने मुख्य रूप से डाउनस्ट्रीम व्यवसाय में हिस्सेदारी हासिल करके अपने पोर्टफोलियो का चुनिंदा विविधीकरण किया है। ओआईएल के पास नुमालीगढ़ रिफाइनरी लिमिटेड में 69.63% हिस्सेदारी, ब्रह्मपुत्र क्रैकर एंड पॉलीमर लिमिटेड में 10% हिस्सेदारी और दुलियाजान नुमालीगढ़ पाइपलाइन लिमिटेड (डीएनपीएल) में 23% हिस्सेदारी है। ओआईएल ने असम पेट्रोकेमिकल लिमिटेड की 500 टीपीडी मेथनॉल और 200 टीपीडी फॉर्मैल्डिहाइड परियोजना में 49% इक्विटी हिस्सेदारी हासिल की है।

ओआईएल की संयुक्त उद्यम कंपनी (जेवीसी), जिसका नाम एचपीओआईएल गैस प्राइवेट लिमिटेड (एचओजीपीएल) है, ने 11 सीएनजी केन्द्र (कोल्हापुर: 4, अंबाला और कुरुक्षेत्र: 7) शुरू किए हैं, जिससे इसकी कुल संख्या 51 (कोल्हापुर: 26, अंबाला और कुरुक्षेत्र: 25) और 3 बायो सीएनजी आउटलेट (कोल्हापुर: 1, अंबाला और कुरुक्षेत्र: 2) हो गई है। अंबाला–कुरुक्षेत्र जीए में 1,028 इंच–किलोमीटर के लक्ष्य के स्थान पर 1682 इंच किलोमीटर और कोल्हापुर जीए में 1,620 इंच–किलोमीटर के लक्ष्य के स्थान पर 1735 इंच–किलोमीटर की स्टील पाइपलाइन पूरी हो गई है। अंबाला–कुरुक्षेत्र जीए और कोल्हापुर जीए में क्रमशः 15,465 और 25,211 नग डीपीएनजी कनेक्शन दिए गए हैं।

ओआईएल की संयुक्त उद्यम कंपनी, अर्थात् पूर्व भारती गैस प्राइवेट लिमिटेड (पीबीजीपीएल) ने 113 इंच किलोमीटर स्टील पाइपलाइन, 231 किलोमीटर एमडीपीई, 1,221 आरएफसी बिछाने का काम पूरा कर लिया है और 3 सीएनजी स्टेशन पूरे कर लिए हैं। पाइप्ड गैस की आपूर्ति के लिए 2 वाणिज्यिक कनेक्शन भी पूरे कर लिए गए हैं। कामरूप जॉर्जिया में, पीबीजीपीएल ने 144 इंच किलोमीटर स्टील पाइपलाइन, 299 किमी एमडीपीई, 1,400 डीपीएनजी कनेक्शन बिछाने का काम पूरा कर लिया है और 9 सीएनजी स्टेशन पूरे कर लिए हैं। 06 और सीएनजी केन्द्र पूरा होने के अंतिम चरण में हैं। पीबीजीपीएल ने कामरूप जॉर्जिया के उलुबारी में कोको स्टेशन सहित 4 सीएनजी स्टेशन शुरू किए हैं। सीजीएस–I (ओएनजीसी सीजीएस) को कछार जॉर्जिया में शुरू कर दिया गया है पीबीजीपीएल ने राष्ट्रीय पीएनजी अभियान में सक्रिय भागीदारी के तहत कामरूप जीए और कछार जीए में 28,000 और 12,000 डीपीएनजी उपभोक्ताओं को पंजीकृत किया है। पीबीजीपीएल ने कामरूप जीए में 8,69,668 किलोग्राम सीएनजी बेची है, जबकि जीए में गैस स्रोत की कमी है और निकटतम प्रमुख केन्द्र की दूरी 500 किलोमीटर है, पीबीजीपीएल असम सरकार द्वारा खरीदे गए 100 सीएनजी बसों को सीएनजी से चलाने के लिए कैस्केड के माध्यम से गैस का परिवहन कर रहा है।

बोली के 11वें दौर में, ऑयल जेवीसी, नॉर्थ ईस्ट गैस डिस्ट्रीब्यूशन कंपनी लिमिटेड (एनईजीडीसीएल) ने तीन जीए (असम–1 नग, त्रिपुरा–2 नग) जीते हैं। एनईजीडीसीएल ने अपने 3 जीए उत्तरी असम, उत्तरी त्रिपुरा और दक्षिण त्रिपुरा के लिए पहले पाच वर्षों के निर्माण लागत ₹ 2081.39 करोड़ के "अस–बिल्ट" परियोजना लागत को वित्तपोषित करने का प्रस्ताव दिया।

ऑयल ने एचपीसीएल (एचओजीपीएल: नागालैंड जीए) और बीपीसीएल के साथ अपने संयुक्त उपक्रमों के माध्यम से 12वां सीजीडी बोली दौर में 2 जीए भी जीते। (अरुणाचल प्रदेश जीए को निगमित किया जाना है)

14.1.6.9. विदेशी पोर्टफोलियो

दिनांक 31.03.2024 तक कंपनी का विदेशी ईएंडपी पोर्टफोलियो रूस, वेनेजुएला, मोजाम्बिक नाइजीरिया, बांग्लादेश, लीबिया और गैबॉन को शामिल करते हुए 07 देशों में फैला हुआ है। पोर्टफोलियो में निम्नलिखित शामिल हैं:

i. चार (4) उत्पादक परिसंपत्तियाँ (रूस–3 और वेनेजुला–11)

ii. दो (2) खोजी गई और विकास परिसंपत्तियाँ (मोजाम्बिक–1 और नाइजीरिया–1)

iii. चार (4) अन्वेषणात्मक परिसंपत्तियाँ (लीबिया–1, गैबॉन–1, और बांग्लादेश–2)

दिनांक 31.03.2024 तक 2पी तेल और गैस भंडार की स्थिति, 4 विदेशी उत्पादक और खोजी गई परिसंपत्तियों में ऑयल की हिस्सेदारी के अनुरूप है, अर्थात, वैंकोमेफ्ट और तास रूस में युरयाख, वेनेजुएला में कारबोबो और मोजाम्बिक में रोवुमा एरिया 1 में 43.95 एमएमटीओआईआरीई रहा। वर्तमान वित्त वर्ष 2023–24 के दौरान, विदेशी परिसंपत्तियों से संचयी उत्पादन में ओआईएल का हिस्सा 2.119 एमएमटीओई रहा। इस ब्लॉकों में प्रमुख विकास की स्थिति निम्नानुसार है:

14.1.6.9.1. उत्पादक परिसंपत्तियाँ (4)

i. जेएससी वैंकोरनेफ्ट, रूस (रोसनेफ्ट: 50.1%, ओआईएल/आईओसीएल/ बीपीआरएल: 23.9% (ओवीएल: 26%)

कंपनी ने आईओसीएल और बीपीआरएल के साथ मिलकर 5 अक्टूबर 2016 से जेएससी वैंकोरनेफ्ट, रूस में 23.9% हिस्सेदारी प्राप्त की। परिसंपत्ति एसपीवी वैंकोर इंडिया प्राइवेट लिमिटेड(वीआईपीएल) के माध्यम से रखी गई है, जिसे कंपनी की पूर्ण स्वामित्व वाली सहायक कंपनियों, ऑयल इंडिया, आईओसीएल और सिंगापुर में बीपीआरएल द्वारा संयुक्त रूप से निगमित किया गया है। दिनांक 31.03.2024 तक, इस परिसंपत्ति में कंपनी की भागीदारी हित के अनुरूप 2पी रिजर्व स्थिति 11.94 एमएमटी तेल और 4.56 एमएमटीओई प्राकृतिक गैस होने का अनुमान लगाया गया है। वर्ष 2023–24 के दौरान, परिसंपत्ति में कंपनी का उत्पादन हिस्सा 1.076 एमएमटीओई रहा। दिनांक 31.03.2024 तक संचयी रूप से, परियोजना में ओआईटी की हिस्सेदारी के अनुरूप वीआईपीएल स्तर पर 444.7 मिलियन अमरीकी डॉलर के बराबर राशि लाभांश के रूप में प्राप्त हुई है।

ii एलएलसी तास–युर्याख नेफ्टेगाज़ोडोबचा (टीवीएनजीडी): रूस (रोसनेफ्ट) 50.1%, ऑयल/आईओसीएल/बीपीआरएल: 29.9%, ब्रिटिश पेट्रोलियम: 20%)

कंपनी ने आईओसीएल और बीपीआरएल के साथ मिलकर एलएलसी तास–युर्याख नेफ्टेगाज़ोडोबचा (टीवाईएनजीडी), रूस में 5 अक्टूबर 2016 से 29.9% हिस्सेदारी हासिल की। यह परिसंपत्ति एरापीवी तास इंडिया प्राइवेट लिमिटेड (टीआईपीएल) के माध्यम से रखी गई है, जिसे सिंगापुर में कंपनी, ऑयल, आईओसीएल और बीपीआरएल की पूर्ण स्वामित्व वाली सहायक कंपनियों द्वारा संयुक्त रूप से निगमित किया गया है।

दिनांक 31.03.2024 तक, इस परिसंपत्ति में कंपनी की भागीदारी हित के अनुरूप 2पी रिजर्व स्थिति 10.66 एमएमटी तेल होने का अनुमान लगाया गया है। वर्ष 2023–24 के दौरान, परिसंपत्ति में कंपनी का उत्पादन हिस्सा 1.025 एमएमटीओई रहा। दिनांक 31.03.2023 तक संचयी रूप से, परियोजना में ओआईएल की हिस्सेदारी के अनुरूप लाभांश और अधिशेष पूंजी पुनर्भुगतान के रूप में टीआईपीएल स्तर पर 398 मिलियन अमेरिकी डॉलर के बराबर राशि प्राप्त हुई है।

iii. रूस: लाइसेंस 61 (ओआईएल–50% और पेट्रोनेफ्ट रिसोर्सेज लिमिटेड–50% (ऑपरेटर),

ओआईएल ने 3 जुलाई 2014 को पेट्रोनेफ्ट रिसोर्सेज पिक (पीआर) से अपने डब्ल्यूओएस ऑयल इंडिया इंटरनेशनल बीवी (ओआईआईबीवी)

के माध्यम से वर्ल्डऐस इन्वेस्टमेंट लिमिटेड (डब्लूआईएल) में 50% हिस्सेदारी प्राप्त की। डब्लूआईएल का शेष 50% हिस्सा पेट्रोनेफ्ट रिसोर्सेज पीएलसी (पीआर) के स्वामित्व में है। डब्लूआईएल की रूस में एलएलसी स्टीमुल–टी नामक पूर्ण रूप से स्वामित्व वाली सहायक कंपनी है, जिसके पास ब्लॉक लाइसेंस–61 (L-61) का लाइसेंस है। आज तक, लाइनिनोये, वेस्ट लाइनिनोये, आर्कुजोल्कोये और तुंगोलस्कॉय क्षेत्रों का विकास किया गया है।

अगस्त 2022 से, नॉर्ड इंपीरियल पाइपलाइन के बंद होने के कारण परिसंपत्ति कच्चे तेल का उत्पादन नहीं कर रहा है। स्टिमुल–टी ने प्रतिकूल प्रचालन और वित्तीय परिस्थितियों के कारण दिनांक 10.05.2023 को दिवालियापन घोषित किया है।

iv. वेनेजुएला: परियोजना कैराबोबो [कॉर्पोरेशन वेनेजुएला डेल पेट्रोल (सीवीपी)–71%, इंडोइल नीदरलैंड बीवी 7% (आईओसीएल–3.5%, ओआईएल–3.5%)] ओवीएल–11% रेपसोल वाईपीएफ (स्पेन)–11%)]

रेप्सोल (11%) ओवीएल (11%) और इंडोइल (7%) (आईओसीएल–3.5% ओआईएल 3.5%) (सामूहिक रूप से अल्पसंख्यक शेयरधारक (एमएसएच) कहा जाता है) और इस संघ के पास 29% शेयर हैं, और सीवीपी (पीडीवीएसए की सहायक कंपनी) के पास शेष 71% शेयर हैं, जो मेसर्स पेट्रोकाराबोबो एसए (पीसीबी) नामक मिश्रित कंपनी में है, जो प्रचालक है। ओआईएल और आईओसीएल ने परियोजना में निवेश करने के लिए नीदरलैंड में इंडोइल नीदरलैंड बीवी (इंडोइल) नामक 50:50 संयुक्त उद्यम कंपनी बनाई है। मिश्रित कंपनी संबंधी संविदा पर दिनांक 12 मई 2010 को 25 वर्ष की अवधि के लिए हस्ताक्षर किए गए थे।

यह परियोजना 30 केबीडी क्रूड शोधन संयत्र का स्वामित्व और संचालन करती है। वर्तमान में, वेनेजुएला में आर्थिक और राजनीतिक संकट के कारण परियोजना संबंधी कार्यकलापों में विलम्ब हो रही है।

दिनांक 31.03.2024 तक, परियोजना कैराबोबो में कंपनी की भागीदारी हित के अनुरूप 2पी प्रारक्षित स्थिति का अनुमान 0.12 एमएमटी लगाया गया है। वर्ष 2023–24 के दौरान, परिसंपत्ति में कंपनी का उत्पादन हिस्सा 0.018 एमएमटीओई रहा।

14.1.6.9.2. विकास संबंधी परिसंपत्तियाँ (2)

i. मोजाम्बिक: रोवुमे क्षेत्र 1 (कुल (प्रचालन–26.5%) मित्सुई–20%, ईएनएच 15% (वहन किया), बीपीआरएल–10%, बीआरईएमएल 10%, ओवीएल–10%, पीटीटीईपी–8.5%)

कंपनी ने वीडियोकॉन मोजाम्बिक रोवुमा 1 लिमिटेड (जिसे बाद में ब्यास रोवुमा एनर्जी मोजाम्बिक लिमिटेड (बीआरईएमएल)–ओवीएल 60%, ओआईएल–40%) में 100% शेयरों के अधिग्रहण के माध्यम से ओवीएल के साथ मिलकर 7 जनवरी 2014 को क्षेत्र–1 मोजाम्बिक में 10% भागीदारी हित प्राप्त किया।

मोजाम्बिक के काबो डेलगाडो प्रांत में सुरक्षा स्थिति के बिगड़ने के कारण, ऑपरेटर ने 22 अप्रैल 2021 को फोर्स मैज्योर घोषित किया। परियोजना वर्तमान में फोर्स मैज्योर के तहत है और क्षेत्र में सामान्य स्थिति बहाल करने के लिए ऑपरेटर और मोजाम्बिक सरकार के बीच चर्चा जारी है।

दिनांक 31.03.2024 तक, रोवुमा, एरियल में कंपनी की भागीदारी हित के अनुरूप क्षेत्र 1 के गोलिकन्हो–एटम क्षेत्र की 2पी प्रारक्षित स्थिति का अनुमान 16.21 एमएमटीओई प्राकृतिक गैस और 0.456 एमएमटी कंडेनसेट है।

ii. नाइजीरिया: ब्लॉक ओएमएल 142 (पूर्व में ओपीएल 205) [संयुक्त उद्यम सनटेरा नाइजीरिया 205 में ओआईएल–17.5%, आईओसीएल–17.5%, और सनटेरा रिसोर्सेज–35% (ब्लॉक में 70% हित)] समिट पेट्रोलियम–30% (प्रचालन)

नाइजीरिया में निगमित एक कंपनी सनटेरा नाइजीरिया 205 लिमिटेड (एसएन–205) ने मई 2006 में समिट ऑयल इंटरनेशनल से 30% का आर्थिक हित (ईआई) ने 40% भागीदारी हित (पीआई) अधिग्रहण किया। इसके पश्चात, ओआईएल ने आईओसीएल के साथ मिलकर सनटेरा नाइजीरिया 205 लिमिटेड (एसएन–205) की 25% (प्रत्येक) शेयरधारिता हासिल कर ली, जिसमें सनटेरा रिसोर्सेज लिमिटेड के पास शेष 50% हिस्सेदारी है, ब्लॉक में हाइड्रोकार्बन खोज (गैस और कंडेनसेट) वर्ष 1991–92 (ओटियन #1 कुआं) से शुरू हुई थी। खोज कुएं ओटियन #1 में पुनः प्रवेश के बाद, एकल क्षेत्र (क्षेत्र #8) से विस्तारित कुआं परीक्षण

(ईडब्ल्यूटी) उत्पादन और ओटियन #1 कुएं का पुनः वर्कओवर संचालन पूरा हो गया।

ओटियन क्षेत्र के करीब एक ऊर्जा पार्क बन रहा है जो इस क्षेत्र से उत्पादित गैस के मुद्रीकरण में मदद करेगा।

14.1.6.9.3. अन्वेषणात्मक परिसंपत्तियाँ (4)

I. बांग्लादेश: ब्लॉक एसएस–04 और एसएस–09 [ओआईएल–45%: ओवीएल–45%: (प्रचालक)–45% (बेपेक्स: 10% (वहन)]

उथले अपतटीय ब्लॉक बांग्लादेश बोली दौर–2012 में प्रदान किये गए थे। दोनों ब्लॉकों के लिए उत्पादन साझाकरण संविदा 17 फरवरी, 2014 को ढाका, बांग्लादेश में पाँच (05) वर्षों की प्रारंभिक अन्वेषण अवधि के लिए हस्ताक्षरित किए गए थे, जो 16.02.2025 तक वैध है। संघ ने अनिवार्य भूकंपीय सर्वेक्षण और 1 (एक) तटवर्ती कुएँ (ब्लॉक एसएस–04 में) की ड्रिलिंग पूरी कर ली है। ब्लॉक एसएस–04 और एसएस–09 में 1 (एक) अपतटीय कुएँ की ड्रिलिंग के लिए ड्रिलिंग कार्यनीति की योजना बनाई जा रही है।

ii. लीबिया: क्षेत्र 95/96 ब्लॉक [सीपेक्स (प्रचालक)–50%, आईओसीएल–25%, ओआईएल–25%]

संघ ने 08 (आठ) कुओं की ड्रिलिंग की प्रतिबद्धता के एमडब्लूपी के लिए पाँच कुओं की ड्रिलिंग पूरी कर ली है। सभी ड्रिल किए गए कुओं में तेल और गैस पाई गई है। जब से अशांति शुरू हुई, तब से छठे कुएँ की ड्रिलिंग चल रही थी और मई 2014 से क्षेत्र–95/96 में सभी प्रचालन निलंबित कर दिए गए थे। अशांति के कारण, मई 2014 से ब्लॉक अप्रत्याशित घटना के अधीन था, तथापि, लीबिया में कानून और व्यवस्था की स्थिति में सुधार को देखते हुए, अप्रत्याशित घटना को 07.11.2023 से हटा दिया गया है। एनओसी, लीबिया ने 07.11.2023 से 06.05.2026 तक 30 महीने के लिए अन्वेषण अवधि का विस्तार देने पर सहमति व्यक्त की है।

iii. गैबॉन: ब्लॉक शक्ति–II [ओआईएल (प्रचालक)–50%, आईओसीएल–50%)

पुराने पीएससी (जी4–220) के दौरान ब्लॉक में तीसरे कुएं (लासा–1) में तेल की खोज की गई थी। नए पीएससी (जी4–245) के चरण–I के एमडब्लूपी के अनुसार दो मूल्यांकन कुएं (लासा–2 और 3) भी ड्रिल किए गए और चरण–I में 1,213.04 एलकेएम का 2डी भूकंपीय एपीआई पूरा किया गया। एकीकृत व्याख्या और संभावना मूल्यांकन के आधार पर, संघ ने ब्लॉक ने चरण–II अन्वेषण अवधि में प्रवेश किया है, जिसे संवैधानिक विलंब और कोविड–19 महामारी आदि के कारण 15.04.2025 तक बढ़ा दिया गया था। वर्तमान में, ड्रिलिंग की तैयारी संबंधी कार्यकलाप किया जा रहा है।

14.1.6.9.4. पाइपलाइन

सूडान: उत्पाद पाइपलाइन [ओआईएल–10% पीआई एवं ओवीएल–90% पीआई]

इस परियोजना में अल–राबयान से पोर्ट सूडान तक 12" x 741 किलोमीटर लंबी क्रॉस कंट्री मल्टी प्रोडक्ट पाइपलाइन का निर्माण शामिल है। पाइपलाइन का निर्माण निर्माण कार्य, परिचालन, पट्टा और हस्तांतरण के आधार पर किया गया है। कंसोर्टियम ने परियोजना के लिए ईपीसी संविदाकार के रूप में मेसर्स डोडसल प्राइवेट लिमिटेड को नियुक्त किया। इस परियोजना को 15 महीने के रिकॉर्ड समय में पूरी कर ली गई (लक्ष्य 16 महीने का था)। इस पाइपलाइन की शुरूआत वर्ष 2005 में की गई है।

14.1.6.10 वित्तीय प्रदर्शन

₹/करोड

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
कुल आय	15,170.00	13,648.71	10,561.45	16,427.65	24,757.85	24,514.28
निवल लाभ / हानि	2,590.14	2,584.06	1,741.59	3,887.31	6,810.40	5,551.85
योजना परिव्यय–वास्तविक	3,180.81	4,247.21	13,331.93*	4,366.52	5,534.42	5906.92
योजना संबंधी लक्ष्य	4,299.99	4,105.20	3,877.00	4,108.00	4,302.00	4,896.00

नोट*: इसमें एनआरएल ₹8,677.27 करोड़ में कार्यनीतिक निवेश शामिल है

14.1.6.11. कॉर्पोरेट सामाजिक उत्तरदायित्व (सीएसआर)

ओआईएल जिम्मेदार कॉर्पोरेट नागरिक है जो अपने प्रचालन क्षेत्रों और समग्र रूप से समाज के समावेशी और समग्र विकास के लिए सीएसआर के सिद्धांतों के प्रति पूर्ण प्रतिबद्ध है।

जैसा कि कंपनी अधिनियम 2013 की अनुसूची VII के तहत विनिर्दिष्ट किया गया है, कंपनी ने निम्नलिखित प्रमुख क्षेत्रों के अंतर्गत विभिन्न सीएसआर परियोजनाएं शुरू की हैं:

क) स्वास्थ्य देखभाल और पोषण:

ओआईएल आरोग्य, ओआईएल स्पर्श जैसी परियोजनाएं और स्वास्थ्य सेवा के अवसंरचना को संवर्धित करना, आम जनता को स्वास्थ्य सुविधाएं प्रदान करने और शिशुओं, बच्चों और गर्भवती एवं स्तनपान कराने वाली माताओं आदि की पोषण संबंधी आवश्यकताओं को पूरा करने के लिए विभिन्न परियोजनाएं।

ख) स्वच्छ भारत अभियान (पेयजल एवं स्वच्छता):

ओआईएल स्कूलों में शौचालयों, सामुदायिक शौचालयों और व्यक्तिगत घरेलू शौचालयों के निर्माण, ग्रामीण क्षेत्रों में स्वच्छ पेयजल की आपूर्ति, एकीकृत ठोस अपशिष्ट प्रबंधन परियोजनाओं और अपने प्रचालन क्षेत्रों में ओआईएल के कर्मचारियों द्वारा संगोष्ठी, वॉकथॉन, प्रतियोगिताओं और श्रमदान के आयोजन जैसे कार्यकलापों के लिए प्रतिबद्ध है।

ग) शिक्षा:

ओआईएल सुपर 30 परियोजना जेईई और एनईईटी के लिए 11 महीने की निःशुल्क आवासीय कोचिंग प्रदान करती है। इसके अतिरिक्त दिव्यांगजनों के लिए साक्षरता और पुनर्वास को बढ़ावा देने के लिए ओआईएल दीक्ष्या, सक्षम जैसी परियोजनाएं भी चलाई जा रही हैं।

घ) संधारणीय आजीविका सृजन:

संधारणीय आय सृजन के लिए रूपान्तर, जीविका और कृषि परियोजना जैसी परियोजनाएं।

ङ) कौशल/क्षमता निर्माण:

कौशल/क्षमता निर्माण परियोजना के लिए ओआईएल स्वावलंबन परियोजना। इसके अतिरिक्त ओआईएल ने पूर्वोत्तर क्षेत्र के युवाओं की कौशल आवश्यकताओं को पूरा करने के लिए गुवाहाटी में कौशल विकास संस्थान की स्थापना की है।

च) महिला सशक्तिकरण के लिए परियोजनाएँ:

महिलाओं को प्रशिक्षण देने के लिए हथकरघा, हस्तशिल्प और उद्यमिता के लिए उत्कृष्टता केंद्र; ऑयल नर्सिंग स्कूल का जनरल नर्सिंग और मिड वाइनरी (जीएनएम) में तीन वर्षीय पाठ्यक्रम

छ) पर्यावरण और संधारणीता:

असम के डिगबोई में बड़े पैमाने पर वृक्षारोपण और बांस के बागान की स्थापना, तालाबों/झीलों की सफाई और जीर्णोद्धार, वृक्षारोपण और जैव विविधता संरक्षण जैसी अन्य परियोजनाएँ

ज) कला, संस्कृति और विरासत का संवर्धन:

धार्मिक और सांस्कृतिक हितों के विभिन्न स्थानों पर इस के संबंध में व्यवस्था की गई।

झ) खेलों का विकास:

क्षमता निर्माण के लिए कोचिंग कार्यक्रम और खेल प्रशिक्षण और पुनर्वास केंद्र का निर्माण

ज) ग्रामीण अवसंरचना का विस्तार:

सड़कों, पुलों, सामुदायिक हॉल, प्रतीक्षा शेड और अन्य अवसंरचना का निर्माण।

14.2. नवरत्न पीएसयू

14.2.1. इंजीनियर्स इंडिया लिमिटेड (ईआईएल)

14.2.1.1. प्रस्तावना

इंजीनियर्स इंडिया लिमिटेड (ईआईएल) की स्थापना सन 1965 में नई दिल्ली में अपने मुख्यालय सहित पेट्रोलियम रिफाइनरियों और संबंधित परियोजनाओं के लिए इंजीनियरिंग और संबंधित तकनीकी सेवाएं प्रदान करने के लिए की गई थी। पिछले कुछ वर्षों में, इसने अपनी सेवाओं के कार्यक्षेत्र को बढ़ाया है और विभिन्न क्षेत्रों में उत्कृष्टता हासिल की है और निम्न क्षेत्रों में अग्रणी परियोजना, डिजाइन, इंजीनियरिंग और टर्नकी संविदा कंपनी के रूप में उभरी है।

- पेट्रोलियम रिफाइनिंग
- पेट्रोरसायन, रसायन और उर्वरक
- कच्चा तेल, पेट्रोलियम उत्पाद और गैस पाइपलाइन

- ऑफशोर / ऑनशोर तेल और गैस
- टर्मिनल और भंडारण
- उप सतह कार्यनीतिक भंडारण
- खनन एवं धातुकर्म
- अवसंरचना एवं नगरी विकास

अवसंरचना क्षेत्र में अपने प्रवेश के बाद से, ईआईएल ने अंतर्राष्ट्रीय हवाई अड्डों के आधुनिकीकरण / विकास, खुफिया भवनों और जल प्रबंधन से संबंधित कई उल्लेखनीय और महत्वपूर्ण कार्य प्राप्त किए हैं। ईआईएल परामर्शी और टर्नकी के दो प्रमुख खंडों के तहत परियोजनाओं को निष्पादित करता है।

ईआईएल आईएसओ 9001:2015 प्रमाणित कंपनी है और चेन्नई, वडोदरा और कोलकाता में इसके क्षेत्रीय कार्यालय हैं, मुंबई में शाखा कार्यालय, अबू धाबी में विदेशी इंजीनियरिंग / विपणन कार्यालय है, जो मध्य पूर्व में कंपनी का कार्यकलाप संबंधी केंद्र है। पूरे भारत में और लंदन, मिलान और शंघाई में विभिन्न स्थानों पर निरीक्षण / खरीद के लिए कार्यालय हैं, साथ ही भारत और विदेश दोनों में विभिन्न परियोजना स्थलों पर निर्माण कार्यालय हैं। इसके अतिरिक्त, ईआईएल के पास प्रमाणन और निरीक्षण सेवाएं प्रदान करने के लिए पूर्ण स्वामित्व वाली सहायक कंपनी, सर्टिफिकेशन इंजीनियर्स इंटरनेशनल लिमिटेड है। ईआईएल की संयुक्त उद्यम कंपनी–रामागुंडम फर्टिलाइजर्स एंड केमिकल्स लिमिटेड (आरएफसीएल) है, जिसमें नेशनल फर्टिलाइजर लिमिटेड (एनएफएल) और फर्टिलाइजर कॉरपोरेशन ऑफ इंडिया (एफसीआईएल) की 26% हिस्सेदारी है। आरएफसीएल संयंत्र का वाणिज्यिक संचालन दिनांक 22 मार्च, 202 को पूरा हो गया है। ईआईएल के पास नुमालीगढ़ रिफाइनरी लिमिटेड में 4.37% हिस्सेदारी भी है।

ईआईएल परियोजना से संबंधित प्रौद्योगिकी और इंजीनियरिंग सेवाओं की व्यापक श्रृंखला प्रदान करता है, जो परियोजना की अवधारणा से लेकर परियोजना की शुरूआत तक विस्तृत है, जिसमें संयंत्रों का पुनरुद्धार, क्षमता विस्तार और आधुनिकीकरण शामिल है। कंपनी द्वारा दी जाने वाली सेवाओं के पोर्टफोलियो में निम्नलिखित शामिल हैंरू

परियोजना–पूर्व सेवाएँ जैसे व्यवहार्यता अध्ययन, पर्यावरण प्रभाव आकलन प्रौद्योगिकी और प्रक्रिया लाइसेंसकर्ता चयन और लागत अनुमान।

परियोजना प्रबंधन सेवाओं में पूरी श्रृंखला अवधारणा से लेकर कमीशनिंग तक जिसमें प्रक्रिया देवगढ़ इंजीनियरिंग, बुनियादी और विस्तृत इंजीनियरिंग खरीद और तृतीय–पक्ष प्रमाणन निर्माण प्रबंधन, कमीशनिंग और पूर्ण स्टार्ट–अप सहायता शामिल है।

ईआईएल शायद उन कतिपय परामर्शदात्री संगठनों में से एक है जो हीट और माउ ट्रांसफर उपकरण डिजाइन, निवेश इंजीनियरिंग, सूचना प्रौद्योगिकी, विशेषज्ञ सामग्री और रखरखाव, संयंत्र संचालन और सुरक्षा सहित एचएजेडओपीएस और जोखिम विश्लेषण, जंग संरक्षण, संयंत्र अखंडता और अवशिष्ट जीवन मूल्यांकन, रिफाइनरी अनुकूलन अध्ययन और, उपज और ऊर्जा अनुकूलन अध्ययन आदि के क्षेत्र में विशेषज्ञ सेवाएं प्रदान करता है।

ईआईएल के पास बहु–विषयक इंजीनियरिंग कार्यबल है और 31.03.2024 तक मुख्यालय और विदेशी कार्यालयों सहित क्षेत्रीय कार्यालयों में कंपनी की स्वीकृत कार्यबल 2,649 थी। इंजीनियरिंग में उत्कृष्टता हासिल करने के अतिरिक्त, ई.आई.एल. एक जिम्मेदार कॉर्पोरेट नागरिक है और अच्छे कॉर्पोरेट प्रशासन संबंधी कार्यप्रणाली के लिए प्रतिबद्ध है। सूचना का अधिकार अधिनियम, 2005 को कंपनी में लागू किया गया है और अधिनियम संबंधित समस्याओं का समाधान करने के लिए सार्वजनिक सूचना अधिकारी और अपीलीय प्राधिकरण नामित किया गया है। अधिनियम के प्रावधान के अनुसार सूचना कंपनी की वेबसाइट www.engineersindia.com पर प्रदर्शित की जाती है। इसके अतिरिक्त, जनता, संविदाकारों, विक्रेताओं, आपूर्तिकर्ताओं आदि से प्राप्त अभियोगों / शिकायतों का निष्पादन करने के लिए वेब–आधारित शिकायत प्रबंधन प्रणाली लागू की गई है। इसके अतिरिक्त, कंपनी के महिला फोरम में यौन उत्पीड़न से संबंधित शिकायतों का निवारण करने के लिए निर्धारित समिति है।

14.2.1.2. वर्ष 2023-24 से संबंधित निष्पादन की मुख्य विशेषताएं

व्यावसायिक निष्पादन

वित्त वर्ष 2023–24 के दौरान, ईआईएल ने ₹ 4,747.66 करोड़ का नया व्यवसाय किया है, जिसमें परामर्शी भाग में ₹ 1,725.44 करोड़ का व्यवसाय (घरेलू ग्राहकों से ₹ 1,226.97 करोड़ और विदेशी ग्राहकों से ₹ 498.47 करोड़) और एलएसटीके भाग ₹ 3,022.22 करोड़ का व्यवसाय शामिल है।

कंपनी द्वारा अपने व्यावसायिक परिचालन के घरेलू खंड में प्राप्त प्रमुख कार्यों में ओएनजीसी के लिए आवासीय मकान के नवीकरण और मुंबई हाई एसेट्स के लिए एचवीएसी के पुनरुद्धार के लिए परियोजना प्रबंधन परामर्श (पीएमसी), आईओसीएल के लिए पीआरपीसी में कोक ड्रम प्रतिस्थापन, आस्थना ब्यूरो के लिए एकीकृत कार्यालय–सह–आंकड़ा केन्द्र परिसर के लिए बहु–मंजिला भवन का निर्माण, नोएडा विशेष आर्थिक क्षेत्र प्राधिकरण और कई अन्य के लिए डिपॉजिटरी आधार पर एनएसईजेड नोएडा में अवसंरचना विकास और उन्नयन के लिए व्यापक डिजाइन इंजीनियरिंग और परियोजना प्रबंधन परामर्श शामिल है।

ईएलएल विभिन्न ग्राहकों को अपनी इंजीनियरिंग, खरीद और निर्माण प्रबंधन (ईपीसीएम) सेवाएं भी प्रदान करता है और वित्त वर्ष 2023–24 के दौरान मुंबई रिफाइनरी, माहुल से बीपीसीएल के रसायनी परिसर तक प्रस्तावित पाइपलाइन, गेल इंडिया लिमिटेड के लिए उसर में 50 केटीए आईएसओ–प्रोपाइल अल्कोहल (आईपीए) संयत्र, आईओसीएल, बरौनी रिफाइनरी (चरण–II) में बिटुरॉक्स इकाई, एनआरएल में डिपॉजिटरी आधार पर नुमालीगढ़ रिफाइनरी में जलीय अमोनिया इकाई की स्थापना, बीना में बीपीसीएल के लिए बीना पेट्रोकेमिकल और रिफाइनरी विस्तार परियोजना के लिए स्थल आधारित सक्षम कार्य सहित कई अन्य सेवाएं प्रदान करने के प्रमुख कार्य हासिल किए हैं।

ईआईएल को अपने ग्राहकों के लिए विभिन्न पूर्व–व्यवहार्यता और विस्तृत व्यवहार्यता रिपोर्ट (डीएफआर) तैयार करने का काम भी सौंपा गया है। वर्ष के दौरान इस श्रेणी के अंतर्गत प्राप्त कतिपय प्रमुख कार्यों में एआरयू, एसडब्ल्यूएस, यूटिलिटीज और ऑफसाइट पैकेज के लिए बीईडीपी प्रस्तुतिकरण, एचपीसीएल मुंबई रिफाइनरी में एकीकृत हाइड्रोक्रैकर कैटेलिटिक डी–वैक्सिंग और एसडीए इकाई के लिए एकीकृत डीएफआर, एचपीसीएल के लिए जवाहरद्वीप द्वीप पर कच्चे तेल टर्मिनल और उत्पाद टैंकों के लिए डीएफआर और ईआईए/आरआरए अध्ययन, एनआरएल के लिए मेथनॉल से मिथाइलमाइन उत्पादन के लिए पूर्व–व्यवहार्यता रिपोर्ट, एमआरपीएल के लिए नई पेट्रोकेमिकल परियोजना हेतु व्यवहार्यता रिपोर्ट, नयारा एनर्जी लिमिटेड के लिए एल्काइलेशन इकाई का व्यवहार्यता अध्ययन, गेल पाटा में सी2–सी3 प्राप्त करने के लिए पाटा में अतिरिक्त सुविधाओं की व्यवहार्यता सहित कई अन्य कार्य शामिल हैं। वर्ष के दौरान विभिन्न निष्पादन विधियों के तहत प्राप्त अन्य प्रमुख कार्यों में जीसीपीएल नगर गैस में पाइपलाइनों को हटाना, तटवर्ती भंडारण टैंक फार्म और संबंधित सुविधाओं के लिए एफईईडी इंजीनियरिंग सेवाओं के लिए परामर्श सेवाएं, भारी उद्योग मंत्रालय के उन्नत रसायन प्रकोष्ठ के लिए पीएलआई योजना के लिए स्वतंत्र इंजीनियर सेवाएं, भोगपुरम, विजयनगरम में ग्रीनफील्ड अंतर्राष्ट्रीय हवाई अड्डे के विकास, निर्माण और संचालन के लिए स्वतंत्र अभियांत्रिक, गोवा में पेट्रोलियम सुरक्षा, स्वास्थ्य और पर्यावरण प्रबंधन संस्थान (आईपीएसएचईएम) को ओएनजीसी के लिए लागत प्रतिपूर्ति के आधार पर विश्व स्तरीय सुविधा में उन्नत करना आदि शामिल हैं।





आईपीएसएचईएम परिसर, गोवा और आईईडब्ल्यू–2024 से संबंधित अवसंरचना के अवसंरचनागत कार्य को पूरा करना

आईपीएसएचईएम परिसर, गोवा और आईईडब्ल्यू–2024 से संबंधित अवसंरचना के अवसंरचनागत कार्य को पूरा करना वर्ष के दौरान **अंतर्राष्ट्रीय क्षेत्रों** में कंपनी द्वारा प्राप्त प्रमुख कार्य में विभिन्न अन्य सेवाओं में सोनाट्रैक, अल्जीरिया के लिए नई

एनएचटी/सीसीआर–रिफॉर्मिंग इकाई हेतु एफईईडी और पीएमसी सेवाएं, नाइजीरिया पदाह एलएनजी के लिए एलएनजी टर्मिनल के ईपीसी–1 (एलएनजी स्टोरेज) और ईपीसी–3 (यूटिलिटीज और बीओपी) पैकेज के लिए पीएमसी सेवाएं, लोअर जकूम सुविधाएं हैजॉप/इंजीनियरिंग पैकेज और सी5934–मैसर्स एडनोक ऑफशोर के लिए डीआवाईओबी मूल्यांकन कुआं जेडवो–420 (डब्ल्यूएचटी जेडके–374) को उत्पादन पर रखने के लिए अध्ययन आवश्यकताएं, केएनपीसी, कुवैत से एमएए रिफाइनरी में एजीआरपी पुनरुद्धार के लिए एफईईडी शामिल हैं।

वर्ष के दौरान, ईआईएल ने नाइजीरिया में स्टैंच फर्टिलाइजर एफजेडई के लिए ग्रीन–फील्ड 4,000 टीपीडी यूरिया और 2,300 टीपीडी अमोनिया कॉम्प्लेक्स (परिवर्तन आदेश) के लिए अपनी ईपीसीएम सेवाएँ प्रदान करने का प्रमुख कार्य प्राप्त किया।

अंतर्राष्ट्रीय क्षेत्रों में अन्य प्रमुख कार्यों में कुवैत नेशनल पेट्रोलियम कंपनी (केएनसीपी) के लिए एमएए रिफाइनरी में एसिड गैस रिमूवल प्रोजेक्ट (एजीआरपी) के पुनरुद्धार के लिए एफईईडी, एडीएनओसी ऑफशोर के लिए यूएई में एसएआरबी उत्पादित जल शोधन मूल्य के लिए एफईईडी और एडीएनओसी के लिए हेलोन प्रतिस्थापन कार्य के लिए एफईईडी शामिल हैं।

परियोजना संबंधी निष्पादन

परियोजना प्रबंधन में मुख्य योग्यता सहित ईआईएल गुणवत्ता, समय, लागत और अन्य प्रमुख निष्पादन सूचकांकों पर उच्च स्तर के निष्पादन से अपने ग्राहकों को परियोजनाओं को निष्पादित करने और वितरित करने का प्रयास करता है। इनमें से कई परियोजनाओं ने नए उद्योग मानक भी बनाए हैं।

वर्ष के दौरान पूरी की गई कुछ प्रमुख परियोजनाओं में सीपीसीएल रिफाइनरी की बीवी–VI ऑटो ईंधन परियोजना में एसआरबी की शुरुआत, छारा एलएनजी टर्मिनल परियोजना का यांत्रिक समापन, कोच्चि–पलक्कड़ एलपीजी पाइपलाइनों का यांत्रिक समापन, कॉकण एलएनजी लिमिटेड में एलएनजी ट्रक लदान सुविधा (टीएलएफ) का यांत्रिक समापन, जीजीएसपीएपी, एचएमईएल भटिंडा की एलएलडीपीई/एचडीपीई (स्विंग) इकाई का समापन, आईओसीएल ऐश्वर्या परियोजना की सोर वाटर स्ट्रिपर इकाई और अमाइन पुनर्जनन इकाई का निष्पादन गारंटी परीक्षण, धोबी–दुर्गापुर हल्दिया पाइपलाइन परियोजना के तहत जमशेदपुर स्परलाइन की शुरुआत, ओएनजीसी, उरण में स्लग कैचर


छारा एलएनजी परियोजना


कॉकण एलएनजी लिमिटेड में एलएनजी ट्रक लदान सुविधा


ओएनजीसी की स्लग कैचर परियोजना

परियोजना (चरण–1) को शुरू करना और पीजीटीआर, आईईडब्लू 2024 के लिए अवसंरचना कार्य को पूरा करना और आईपीएसएचईएम परिसर, गोवा में प्रमुख सुविधाएं, असम में पीएनसीपीएल परियोजना के लिए इंटरसेक्शन तकनीक सहित दुनिया की सबसे लम्बी एचडीडी क्रॉसिंग (28" आकार) को पूरा करना, राजस्थान रिफाइनरी परियोजना में 6500 एमड/घंटे क्षमता वाले प्राकृतिक जल शोधन संयंत्र (आरडब्लूटीपी) का यांत्रिक कार्य पूरा करना और आईओसीएल–बरौनीइंडजेटो इकाई के पीजीटीआर को पूरा करना।

ईएल के लिए यह गर्व की बात है कि स्वदेशी तकनीक इंडजेट, जिसका व्यवसायीकरण किया जा रहा है, को ईआईएल के अनुसंधान और विकास और आईओसीएलके अनुसंधान और विकास ने एटीएफ के उत्पादन के लिए संयुक्त रूप से विकसित किया है और यह प्रक्रिया पाइपलाइन संगत केरोसिन (पीसीके) का उत्पादन करने में भी सक्षम है।



आईओसीएल बरौनी रिफाइनरी में इंडजेट परियोजना



(जीजीएसपीएपी), एचएमईएल में स्थित इकाई) एलएलडीपीई हॉप



पीएनसीपीएल परियोजना के लिए दुनिया की सबसे लंबी एमडीपी कॉलिंग

14.2.1.3. वित्तीय निष्पादन

वित्त वर्ष 2023–24 के दौरान, ईआईएल ने क्रमशः ₹ 3,232.16 करोड़ और ₹ 470.41 करोड़ का कारोबार और कर से पहले लाभ प्राप्त किया।

14.2.1.4. मानव संसाधन संबंधी पहल

ईएलएल मानव संसाधन आधारित संगठन है और अपने मुख्यालय और निर्माण स्थलों, गुरुग्राम कार्यालय सहित विदेशी कार्यालयों में बहु–विषयक इंजीनियरिंग कार्यबल के माध्यम से काम करता है। 31 मार्च 2024 तक ईआईएल की स्वीकृत कार्यबल 2649 थी। वर्ष के दौरान मानव संसाधन फ्रंट पर कई पहल की गई, जिसमें मार्च 2023–मार्च 2024 की अवधि के लिए "ग्रेट प्लेस टू वर्क" के रूप में प्रमाणन, ई–साइन आधारित दावा प्रस्तुतियाँ और लेन–देन की शुरूआत सहित सहज एकीकरण और मानव संसाधन सेवा वितरण के लिए मानव संसाधन सॉफ्टवेयर का उन्नयन, बेहतर कर्मचारी जुड़ाव लाने के लिए मानव संसाधन नीतियों की समीक्षा और समीक्षा जिसमें "सहयोग ऋण योजना" की शुरूआत के माध्यम से कर्मचारी लाभ में वृद्धि शामिल है जो सरल और चुस्त–दुरुस्त आवेदन प्रक्रिया के माध्यम से कर्मचारियों की व्यक्तिगत आवश्यकताओं को पूरा करती है, आरोग्यम के माध्यम से शारीरिक स्वास्थ्य पर ध्यान केंद्रित करता है: कर्मचारियों और उनके परिवारों के लिए दैनिक ऑनलाइन योग सत्र का आयोजन करता है।



आरोग्यम–दैनिक ऑनलाइन योग सत्र

ईआईएल ने टीम लीडर्स और समूह प्रमुख के लिए 11 दिवसीय प्रबंधन विकास कार्यक्रम "दक्ष", वरिष्ठ अधिकारियों के लिए 12–सप्ताह का अग्रिम नेतृत्व विकास कार्यक्रम "शिखर" और नेतृत्व विकास कार्यक्रम–आरोहण जैसे दीर्घकालिक शिक्षण कार्यक्रम भी शुरू किए हैं। ईआईएल ने विदेश मंत्रालय (एमईए) के अंतर्राष्ट्रीय तकनीकी और आर्थिक सहयोग (आईटीईसी) मंच के साथ सहयोग करके वैश्विक शिक्षण भागीदार के रूप में भी उभर रहा है और मंगोल रिफाइनरी के अधिकारियों के लिए 10 सप्ताह का तकनीकी प्रशिक्षण आयोजित किया है। वर्ष के दौरान विभिन्न कर्मचारी सहभागिता कार्यकलापों का भी आयोजन किया जाता है, जिनमें "ऊर्जालेख"–जो कि उद्योग–व्यापी तकनीकी पेपर लेखन प्रतियोगिता

है, "दर्पण"–एक इन–हाउस फोटोग्राफी प्रतियोगिता और विशेषज्ञ व्याख्यान श्रृंखला–"इसमें सुविधा व्याख्यान श्रृंखला" शामिल है. इसके अतिरिक्त, सभी कर्मचारियों के लिए ईआईएल– गुरुग्राम कार्यालय परिसर में इन–हाउस क्रेच सुविधा भी स्थापित की गई है।



सिक्योर–वरिष्ठ अधिकारियों के लिए उन्नत नेतृत्व कार्यक्रम



गुरुग्राम परिसर में ईआईएल क्रेच

14.2.1.5. प्रौद्योगिकी विकास और व्यावसायीकरण

ईआईएल आंतरिक और विभिन्न हितधारकों के साथ सहयोगात्मक विकास के माध्यम से प्रौद्योगिकी विकास में सबसे आगे है। वर्ष के दौरान कई प्रौद्योगिकी विकास परियोजनाएं शुरू की गईं, जिनमें एसओ, की रोकथाम के लिए प्रक्रिया का विकास, टीजीटीयू क्वेंच कॉलम में फिसलन, बेहतर संचालन और ऊर्जा अनुकूलन के लिए नए सीडीयू–वीडीयू, विन्यास का डिजाइन, मल्टी–डाउनकमर ट्रे के लिए डिजाइन क्षमताओं का विकास, ग्रीन हाइड्रोजन शुद्धिकरण के लिए डी–ऑक्सो रिएक्टर प्रौद्योगिकी का विकास, कोयले के लंबे परिवहन के लिए स्लरी पाइपलाइन के लिए डिजाइन पद्धति का विकास, मॉडल बायोमास तेल से ग्रीन हाइड्रोजन संश्लेषण के लिए बहु–कार्यात्मक अनुरूप विषम उत्प्रेरक विकास और प्राकृतिक गैस से दुर्लभ गैस की वसूली के लिए प्रक्रिया का विकास शामिल है।

वर्ष के दौरान ईआईएल द्वारा विकसित कई प्रौद्योगिकियों का व्यावसायीकरण भी किया गया, जिसमें नुमालीगढ़ रिफाइनरी में जलीय अमोनिया इकाई की स्थापना, ईएलएल द्वारा लाइसेंस प्राप्त एनआरएल एसआरयू और टीजीटीयू की कमीशनिंग और पीजीटीआर गतिविधियां, नयारा एनर्जी लिमिटेड में सीडीयू–2 पुनरुद्धार के तहत इंजीएचओजी के लिए बेसिक इंजीनियरिंग डिजाइन पैकेज (बीईडीपी) की आपूर्ति, एचपीसीएल–वीआर में एलपीजी उपचार प्रौद्योगिकी के लिए मालिकाना संपर्ककर्ता का नवीनीकरण और कोच्चि रिफाइनरी में सुपर एब्जॉर्बेंट पॉलीमर (एसएपी) उत्पादन संयंत्र के लिए बीईडीपी शामिल है।

ईआईएल स्वदेशी प्रौद्योगिकियों के विकास के अपने मिशन को आगे बढ़ाने के लिए समझौता ज्ञापनों और एमओए करने के विभिन्न हितधारकों के साथ सहयोग भी करता है। इनमें से कुछ सहयोगी साझेदारी समझौतों और प्रौद्योगिकी गठजोड़ में भारत और विदेशों में विभिन्न औद्योगिक क्षेत्रों में नवीकरणीय ऊर्जा को एकीकृत करके सौर सीएसपी डोमेन में समाधान और सेवाओं की पूरी श्रृंखला प्रदान करने के लिए सनराइज सीएसपी ग्रुप के साथ समझौता ज्ञापन शामिल है। वैज्ञानिक जानकारी का आदान–प्रदान, संयुक्त अनुसंधान, हाइड्रोकार्बन, पेट्रोकेमिकल्स, ऊर्जा प्रौद्योगिकी के क्षेत्र में प्रदर्शन को प्रोत्साहित करने और एचपीसीएल द्वारा विकसित प्रौद्योगिकियों/संयुक्त रूप से विकसित प्रौद्योगिकियों के व्यावसायीकरण के लिए एचपीसीएल के साथ समझौता ज्ञापन पर हस्ताक्षर किए गए। बीपीसीएल द्वारा उत्पन्न तकनीक पर बीएफडब्ल्यू के लिए हाईजी डीएरेशन प्रौद्योगिकी के लिए संयुक्त प्रौद्योगिकी के विकास के लिए बीपीसीएल के साथ और एक महत्वपूर्ण समझौता ज्ञापन पर हस्ताक्षर किए गए। ईआईएल ने सीओ, को मूल्यवान रसायनों में बदलने, सीओ, के उत्प्रेरक रूपांतरण और लिग्नोसेल्यूलोसिक बायोमास को रसायनों में बदलने के लिए उत्प्रेरक प्रक्रिया के विकास जैसे पारस्परिक हित के क्षेत्रों में अनुसंधान हेतु सहयोगी कार्यकलापों के लिए आईआईटी रुड़की के साथ सहयोगी साझेदारी भी की है।

ईआईएल प्रोसेस साईस टेक्नोलॉजी सेंटर (पीएसटीसी) की सदस्यता भी रखता है, जो कि टेक्सास विश्वविद्यालय, यूएसए द्वारा शुरू किया गया एक उद्योग–अकादमिक सहयोगात्मक अनुसंधान कार्यक्रम है, फ्रैक्शनेशन रिसर्च इनकॉर्पोरेटेड (एफआरआई), ओक्लाहोमा, यूएसए स्थित एक गैर–लाभकारी सहकारी अनुसंधान संगठन और प्रोसेस इंटीग्रेशन रिसर्च कंसोर्टियम (पीआईआरसी), मैनचेस्टर विश्वविद्यालय, यूके।



ईआईएल का सनराइज सीएसपी ग्रुप के साथ समझौता ज्ञापन

14.2.1.6. स्टार्टअप पहल– इंग्सुई

ईआईएल के अनुसंधान और विकास ने भारत में स्टार्टअप पारिस्थितिकी तंत्र को बढ़ावा देने के लिए भारत सरकार के प्रमुख कार्यक्रम के लिए भी पूरी तरह प्रतिबद्ध है। इसके लिए ईआईएल की स्टार्टअप पहल "इंग्सुई" को आगे बढ़ाया जा रहा है। इंग्सुई के तहत, ईआईएल स्टार्टअप को बौद्धिक, ढांचागत और वित्तीय सहायता प्रदान कर रहा है। ईएलएल हाइड्रोकार्बन, आईटी और आईआईओटी, नवीकरणीय ऊर्जा और भंडारण, नैनो–सामग्री, अपशिष्ट से ऊर्जा, स्वास्थ्य सुरक्षा और पर्यावरण के क्षेत्र में काम करने वाली स्टार्टअप परियोजनाओं को वित्तपोषित करता है। 9 आईआईटी और 4 एनआईटी ने ईआईएल की स्टार्टअप इंडिया पहल के साथ पंजीकरण कराया है। अब तक 6 दौर में कुल 27 परियोजनाओं को वित्तपोषित किया गया है। हाल ही में, सातवें दौर का प्रस्ताव स्क्रीनिंग प्रक्रियाधीन है।

पेटेंट पोर्टफोलियो

पेटेंट दर्ज करना और अनुदान प्रदान करना ईआईएल के लिए महत्वपूर्ण कार्यकलाप है जिसके माध्यम से यह अपनी बौद्धिक संपदा की रक्षा करता है। इस प्रयास में वर्ष 2023–24 के दौरान ईआईएल ने 13 पेटेंट दाखिल किए जिनमें निम्नलिखित शामिल हैं:

- एच25 समृद्ध हाइड्रोकार्बन प्रणाली से उत्पन्न व्ययित कास्टिक धारा के शोधन के लिए विधि और प्रणाली
- कोश के लिए अस्तर प्रणाली
- निलंबित माइक्रो–लिग्निन समस्या निवारण हेतु द्वितीय पीढ़ी (2जी) इथेनॉल जैव–रिफाइनरियों के लिए नवीन अनुरूपित आसवन टॉवर इंजीनियरिंग डिजाइन
- कम ईंधन खपत सहित कच्चे तेल के प्रसंस्करण के लिए सौर ऊर्जा आधारित प्रक्रिया और उपकरण
- परिवेशीय परिस्थितियों में कच्चे तेल के भूमिगत भंडारण के लिए विधि, जो पर्याप्त सुरक्षा स्तर प्रदान करते हुए सभी तरफ से संरक्षित होती है
- वैक्यूम आसवन इकाई में निम्न ग्रेड गर्मी का उपयोग
- एबुलेटेड बेड अवशेष हाइड्रोक्रैकर से कुल अपरिवर्तित तेल को संसाधित करने के लिए विलंबित कोकर इकाई का पुनः प्रयोजन करना
- जीएचजी उत्सर्जन का अनुमान लगाने की विधि और प्रणाली
- औद्योगिक हीटर लगाने की प्रणाली
- हैंगिंग डाउनकमर्स के साथ आसवन स्तंभ
- बाहरी रूप से दुर्गम दीवार ट्यूब हैंगर समर्थन को समायोजित करने के लिए प्रणाली
- कुशल ताप हस्तांतरण के लिए नवीन आर्क–गुंबददार टू काउंटर करंट प्लेट एयर प्रीहीटर
- फायर्ड हीटर

इसके अतिरिक्त, वित्त वर्ष 2023–24 के दौरान 16 पेटेंट प्रदान किए गए, जिनमें निम्नलिखित शामिल हैं;

- डिगैसिंग सहित जमीन के ऊपर तरल सल्फर सील के लिए विधि और उपकरण
- प्री–फ्लैश ड्रम में डी–फोमिंग साइक्लोनिक उपकरण
- उच्च राख वाले कोयले को संभालने वाले द्रवित बिस्तर गैसीफायर के लिए फ्लैट प्लेट प्रकार का वितरक
- डिसाल्टर पात्र
- कोकरंट डाउनफ्लो ट्रिकल बेड रिएक्टर के लिए नवीन गैस–तरल इनलेट डिफ्यूजर
- पानी के डीऑक्सीजनेशन के लिए उपकरण और कैम के लिए प्रक्रिया

- कम दबाव वाले द्रव को पुनः प्राप्त करने और अलग करने के लिए उपकरण
- प्रणाली का उपयोग करके कैम में ऊर्जा के अनुकूलन की विधि
- सीओ, समृद्ध धारा का उपयोग करके क्षारीय अपशिष्ट जल के निष्प्रभावीकरण के लिए उपकरण और प्रक्रिया
- उच्च दबाव, तापमान और नमी सामग्री संश्लेषण गैस नमूनाकरण के लिए प्रणाली और प्रक्रिया
- उच्च शुद्धता सीओ, की वसूली सहित मेथनॉल उत्पादन के लिए उच्च राख भारतीय कोयले से सिंथेटिक गैस के शुद्धिकरण के लिए प्रणाली और प्रक्रिया
- ईंधन को कम करके गर्मी की वसूली और दक्षता में सुधार के लिए आत्मनिर्भर प्रक्रिया और प्रणाली
- थर्मोडायनामिक चक्र का उपयोग करके मौजूदा गैस टरबाइन से बिजली उत्पादन को अधिकतम करना
- चुंबकीय क्षेत्र की उपस्थिति में हाइड्रोडायनामिक कैविटेशन के आधार पर जल कंडीशनिंग उपकरण और विधि
- फायर हीटर सिस्टम के लिए वायु वितरण वाहिनी प्रणाली
- फायर हीटर के लिए स्पष्ट रूप से रिसाव–रोधी विस्फोट द्वार की व्यवस्था

14.2.1.7. सीएसआर संबंधी कार्यकलाप :

ईआईएल समाज में कंपनी के समग्र योगदान को बढ़ाने के लिए आर्थिक, सामाजिक और पर्यावरणीय रूप से जिम्मेदार तरीके से काम करने के लिए प्रतिबद्ध है। कंपनी की सीएसआर नीति का उद्देश्य समावेशी विकास को बढ़ावा देकर सामाजिक उत्थान की प्रक्रिया के माध्यम से लोगों के जीवन को समृद्ध बनाना और संधारणीय प्रक्रिया के माध्यम से पर्यावरण को रिचार्ज करना है।

सीएसआर कार्यकलाप कंपनी अधिनियम की अनुसूची VII और भारत सरकार के विभिन्न मंत्रालयों/विभागों द्वारा जारी परिपत्रों/संशोधनों/दिशानिर्देशों/निदेशों/नियमों और अधिसूचनाओं के अनुपालन में की जाती है। ईआईएल के सीएसआर के प्रमुख ध्यान–केन्द्रित क्षेत्र स्वास्थ्य सेवा और पोषण, शिक्षा/कौशल विकास, पेयजल/स्वच्छता, ग्रामीण विकास, पर्यावरण संरक्षण/स्थायित्व, वंचितों का उत्थान, महिला सशक्तिकरण और विशिष्ट सरकारी कार्यक्रमों/योजनाओं को पूरक बनाना है।

सीएसआर कार्यकलापों का उद्देश्य स्थानीय, राज्य या केंद्र सरकार की चल रही और नियोजित पहलों को पूरक/समर्थित करना है, जिसमें हमारे परियोजना स्थलों/कार्यालयों और मुख्यालय सहित देश भर में विभिन्न स्थानों पर पिछड़े क्षेत्रों और वंचितों पर ध्यान केंद्रित किया गया है। किए गए कार्यकलापों के दोहराव से बचने के लिए राज्य सरकारों, जिला प्रशासन, स्थानीय प्रशासन के साथ–साथ केंद्र सरकार के विभागों/एजेंसियों, स्वयं सहायता समूहों आदि के साथ सामंजस्य करता है और परामर्श भी लेता है।

कंपनी अधिनियम, 2013 के अनुसार, पिछले तीन वित्तीय वर्षों के दौरान किए गए औसत निवल लाभ का कम से कम 2% का बजटीय आवंटन वित्तीय वर्ष 2023–24 में सीएसआर कार्यकलापों के लिए किया गया है।

वित्तीय वर्ष 2023–24 (31 मार्च, 2024 तक) में परियोजनाओं/कार्यकलापों के प्रकार पर संक्षिप्त विवरण के साथ हमारी सीएसआर गतिविधियों के विभिन्न प्रमुख क्षेत्र नीचे दिए गए हैं:

स्वास्थ्य सेवा और पोषण (संजीवनी)–

इस प्रमुख क्षेत्र के अंतर्गत पूर्ण की गई परियोजनाओं में असम के आकांक्षी जिले धुबरी में 140 मॉडल आंगनवाड़ी केंद्रों की स्थापना; इंदिरा गांधी मेडिकल कॉलेज और अनुसंधान संस्थान, पुडुचेरी में एनेस्थिसियोलॉजी, कान नाक गला, रेडियो डायग्नोसिस और यूरोलॉजी विभाग के लिए चिकित्सा उपकरणों की खरीद; उत्तराखंड के आकांक्षी जिले हरिद्वार में 600 मोतियाबिंद सर्जरी और चश्मे और दवाओं के वितरण सहित नेत्र जांच शिविरों के लिए सहायता; असम के चार आकांक्षी जिलों बक्सा, उदलगिरी, बारपेटा और हैलाकांडी में नेत्र और स्वास्थ्य जांच शिविर आयोजित किए गए; पश्चिम बंगाल के पुरुलिया में टीएलएम पुरुलिया कुष्ठ रोग गृह और अस्पताल को चिकित्सा उपकरण प्रदान किए गए; असम के 4 जिलों में

चिकित्सा शिविरों और जीवन रक्षक उपचार के लिए एडवांस लाइफ एम्बुलेंस, गरीब और जरूरतमंद दिव्यांगजनों को सहायक उपकरण वितरित करने के लिए विभिन्न स्थानों पर चार शिविर आयोजित किए, महाराष्ट्र के आकांक्षी जिले नंदुरबार में डेस्क के साथ अभिनव स्कूल बैग वितरित करके बच्चों की रीढ़ और नेत्र स्वास्थ्य सुधार पर कार्यक्रम के लिए वित्तीय सहायता प्रदान की और प्राथमिक स्वास्थ्य सेवाओं के लिए राजस्थान के बाड़मेर जिले के आसपास के क्षेत्रों में चिकित्सा वैन के लिए सहायता की।

इस क्षेत्र के अंतर्गत कार्यान्वयन के तहत परियोजनाओं में राजीव गांधी कैंसर संस्थान और अनुसंधान केंद्र, नई दिल्ली में 8 वंचित कैंसर रोगियों के उपचार में सहायता करना और गाजियाबाद, उत्तर प्रदेश की मलिन बस्तियों में जन आरोग्यम सामुदायिक स्वास्थ्य क्लिनिक के लिए सहायता प्रदान करना शामिल है।



संपूर्ण भारत में 4 स्थानों पर दिव्यांगजनों को सहायक उपकरण और सहायता सामग्री वितरित की गई



नंदुरबार, महाराष्ट्र में बच्चों को डेस्क सहित अभिनव स्कूल बैग वितरित किए गए



पुथरी, असम में मॉडल आंगनवाड़ी केंद्र



बाड़मेर जिले, राजस्थान में ग्रामीणों की सेवा करने वाली चिकित्सा वैन

शिक्षा (प्रज्ञाता)/कौशल विकास (प्रवीण)– इस क्षेत्र के अंतर्गत पूर्ण की गई परियोजनाओं में कर्नाटक के धारवाड़ के कबेनूर में सरकारी स्कूल भवन का निर्माण; अहमदाबाद (गुजरात) में कौशल विकास संस्थानों के संचालन के लिए निधि में योगदान; पुडुचेरी के कराईकल जिले के 2 सरकारी स्कूलों और असम के दरंग जिले के 21 सरकारी स्कूलों में अतिरिक्त कक्षाओं का निर्माण; स्वच्छ विद्यालय अभियान के तहत असम, तमिलनाडु और ओडिशा में ईआईएल द्वारा निर्मित स्कूल शौचालयों का अनुरक्षण शामिल हैं।



एसडीआई–अहमदाबाद में अभ्यर्थियों के लिए कौशल विकास प्रशिक्षण



धारवाड़, कर्नाटक में स्कूल भवन का निर्माण

महिला सशक्तिकरण (शक्ति)– इस क्षेत्र के अंतर्गत पूर्ण की गई परियोजना में झारखंड के गिरिडीह जिले के आकांक्षी जिले में ग्रामीण लड़कियों/महिलाओं के लिए स्वास्थ्य और रिन्नयों का मासिक धर्म संबंधी स्वच्छता जागरूकता शिविरों के लिए सहायता शामिल हैं।



गुरुग्राम, हरियाणा में मियावाकी वन का विकास



डरंग, असम में सरकारी स्कूलों कक्षाओं का निर्माण किया गया



डरंग, असम में सरकारी स्कूलों कक्षाओं का निर्माण किया गया

पर्यावरण संरक्षण (प्रकृति)– इस महत्वपूर्ण क्षेत्र के अंतर्गत पूर्ण की गई परियोजना में पश्चिम बंगाल में दिव्यांगजनों के लिए आरोग्य संधान आवासीय देखभाल गृह में 40 किलोवाट की छत पर सौर ग्रिड की स्थापना शामिल है।

इस महत्वपूर्ण क्षेत्र के अंतर्गत कार्यान्वित की जा रही परियोजना में हरियाणा के गुरुग्राम में मियावाकी वन का विकास शामिल है, ताकि इस क्षेत्र में और उसके आसपास की आम जनता के लाभ के लिए परिवेशी वायु गुणवत्ता, जल संरक्षण, वनस्पति और जीव–जंतु तथा समग्र पर्यावरण और पारिस्थितिकी तंत्र में सुधार लाया जा सके।



पश्चिम बंगाल में दिव्यांगजनों के लिए आवासीय देखभाल गृह में छत पर सौर पैनल की स्थापना

14.2.2. ओएनजीसी विदेश लिमिटेड

ओएनजीसी विदेश लिमिटेड (ओवीएल) ऑयल एंड नेचुरल गैस कॉरपोरेशन लिमिटेड (ओएनजीसी) की पूर्ण स्वामित्व वाली सहायक कंपनी और विदेशी शाखा है। इसे सन 1965 में हाइड्रोकार्बन इंडिया लिमिटेड के रूप में निगमित किया गया था और सन 1989 में इसका नाम बदलकर ओएनजीसी विदेश लिमिटेड कर दिया गया। ओवीएल पेट्रोलियम और प्राकृतिक गैस मंत्रालय के प्रशासनिक नियंत्रण के तहत अनुसूची 'क' केंद्रीय सार्वजनिक क्षेत्र उद्यम (सीपीएसई) 'नवरत्न' कंपनी है। ओवीएल का प्राथमिक व्यवसाय भारत के बाहर तेल और गैस के क्षेत्रों की संभावना तलाशना है, जिसमें तेल और गैस की खोज, विकास और उत्पादन शामिल है। भंडार और उत्पादन के मामले में, ओवीएल भारत की दूसरी सबसे बड़ी पेट्रोलियम कंपनी है, जो अपनी मूल कंपनी ओएनजीसी से दूसरे स्थान पर है।

कंपनी ने 15 देशों में 32 परियोजनाओं में सीधे या अपनी पूर्ण स्वामित्व वाली सहायक कंपनियों/संयुक्त उद्यम कंपनियों के माध्यम से भागीदारी की है, जिनमें से 16 प्रचालित/संयुक्त रूप से प्रचालित हैं और 16 गैर-प्रचालित (भागीदारी हित के माध्यम से प्रबंधित) हैं। 15 देशों में परियोजनाएं, अर्थात मोज़ाम्बिक, इराक और यूएई में 1-1 परियोजना, अजरबैजान, बांग्लादेश, ब्राजील, दक्षिण सूडान, वियतनाम और वेनेजुएला में 2-2 परियोजनाएं, रूस में 3 परियोजनाएं, कोलंबिया में 4 परियोजनाएं, म्यांमार में 6 परियोजनाएं और 3 देशों में 4 बंद परियोजनाएं।

ओवीएल संतुलित पोर्टफोलियो दृष्टिकोण अपनाता है और उत्पादन, खोज, अन्वेषण और पाइपलाइन परिसंपत्तियों का संयोजन बनाए रखता है। वर्तमान में, ओवीएल के पास 14 परिसंपत्तियों से तेल और गैस का उत्पादन है, 4 परिसंपत्तियां जहां हाइड्रोकार्बन की खोज की गई है और विकास के विभिन्न चरणों में हैं, 11 परिसंपत्तियां अन्वेषण के विभिन्न चरणों में हैं और 3 पाइपलाइन परियोजनाएं हैं।

ओवीएल भारत की ऊर्जा सुरक्षा में महत्वपूर्ण योगदानकर्ता है। वर्ष 2022-23 में, ओवीएल ने 10.171 मिलियन मीट्रिक टन तेल समकक्ष (एमएमटीओई) तेल और गैस का उत्पादन किया, जो भारत के घरेलू तेल और गैस उत्पादन का लगभग 16% है। वित्त वर्ष 2023-24 के दौरान, ओएनजीसी विदेश ने लगभग 10.518 मिलियन मीट्रिक टन तेल और गैस के समकक्ष (एमएमटीओई) तेल का उत्पादन किया है।

ओवीएल अच्छी तरह से प्रबंधित और व्यावसायिक रूप से प्रचालित कंपनी है। अंतर्राष्ट्रीय तेल और गैस उद्योग में इसकी सफलता का सुदृढ़ कार्य निष्पादन रिकॉर्ड है। ओवीएल भारत को विश्वसनीय और सस्ती ऊर्जा प्रदान करने और देश की आर्थिक वृद्धि में योगदान देने के लिए प्रतिबद्ध है।

14.3. मिनीरत्न पीएसयू

14.3.1. बामर लॉरी एंड कंपनी लिमिटेड (बीएल)

बामर लॉरी एंड कंपनी लिमिटेड (बीएल) बहु-प्रौद्योगिकी, बहु-स्थानीय कंपनी है जिसका मुख्यालय कोलकाता में है और इसका संचालन पूरे भारत में विस्तारित है। कंपनी के पास दुबई और इंडोनेशिया में संयुक्त उद्यमों के साथ महत्वपूर्ण अंतर्राष्ट्रीय व्यावसायिक हित हैं। कंपनी की भारत में एक सहायक कंपनी और कई संयुक्त उद्यम भी हैं। कंपनी का व्यावसायिक हित विनिर्माण और सेवा दोनों में फैला हुआ है। 31 मार्च, 2024 तक कंपनी की अधिकृत और चुकता पूंजी क्रमशः ₹ 300 करोड़ और ₹ 171 करोड़ थी। बामर लॉरी इन्वेस्टमेंट्स लिमिटेड जो एक सरकारी कंपनी है, कंपनी के ₹ 10 प्रति शेयर के रूप में 10,56,79,350 इक्विटी शेयर (कुल चुकता इक्विटी पूंजी का लगभग 61.80%) है। कंपनी ने 2023-24 के दौरान ₹ 2,404.16 करोड़ का निवल कारोबार किया है, जबकि 2022-23 के दौरान यह ₹ 2,383.09 करोड़ था, जो पिछले वर्ष की तुलना में लगभग 0.88% की वृद्धि दर्ज करता है। वर्ष 2023-24 में कर से पहले लाभ ₹ 278.65 करोड़ रहा, जबकि 2022-23 में यह ₹ 211.30 करोड़ था, जो पिछले वर्ष की तुलना में लगभग 32% की वृद्धि है। यह वृद्धि सभी विनिर्माण व्यवसायों के साथ-साथ ट्रैवल वर्टिकल के उल्लेखनीय निष्पादन के कारण है।

कंपनी का प्रारक्षित और अधिशेष 31 मार्च 2023 में ₹ 1,185.24 करोड़ की तुलना में 31 मार्च 2024 को ₹ 1,256.21 करोड़ बढ़ गया।

14.3.2. चेन्नै पेट्रोलियम कॉर्पोरेशन लिमिटेड

i. चेन्नै पेट्रोलियम कॉर्पोरेशन लिमिटेड (सीपीसीएल), जिसे पहले मद्रास रिफाइनरीज लिमिटेड (एमआरएल) के नाम से जाना जाता था, का गठन सन 1965 में भारत सरकार, एएमओसीओ और नेशनल इरानी ऑयल कंपनी (एनआओसी) के बीच संयुक्त उद्यम के रूप में किया गया था। एएमओसीओ ने सन 1985 में भारत सरकार के पक्ष में सीपीसीएल की इक्विटी का विनिवेश किया। बाद में भारत सरकार ने अपनी इक्विटी आईओसीएल को हस्तांतरित कर दी और सीपीसेल वर्ष 2001 में आईओसीएल की सहायक कंपनी बन गई। मनाली रिफाइनरी की वर्तमान क्षमता 10.5 एमएमटीपीए है।

सीपीसीएल मनाली रिफाइनरी भारत की सबसे जटिल रिफाइनरियों में से एक है, जिसमें ईंधन, स्नेहक, मोम और पेट्रोकेमिकल फीडस्टॉक उत्पादन की सुविधाएँ है। इसकी रिफाइनरी की पानी की जरूरतों को पूरा करने के लिए 5.8 एमजीडी समुद्री जल विलवणीकरण परियोजना उद्योग में अपनी तरह की पहली परियोजना थी।

सीपीसीएल में वैक्स संयत्र की उत्पादन क्षमता प्रति वर्ष 30,000 मीट्रिक टन (एमटी) है, जो मोमबत्ती मोम, जलरोधी फॉर्मूलेशन और माचिस मोम के निर्माण के लिए पैराफिन मोम का उत्पादन करता है। पड़ोसी डाउनस्ट्रीम उद्योगों को पेट्रोकेमिकल फीडस्टॉक की आपूर्ति करने के लिए सन 1988 में 17,000 मीट्रिक टन प्रति वर्ष की प्रारंभिक क्षमता सहित प्रोपलीन संयत्र शुरू किया गया था। वर्ष 2004 में प्रोपलीन उत्पादन क्षमता को बढ़ाकर 30,000 मीट्रिक टन प्रति वर्ष करने के लिए इकाई का जीर्णोद्धार किया गया। कंपनी के मुख्य उत्पाद एलपीजी, मोटर स्पिरिट, सुपीरियर केरोसिन, एविएशन टर्बाइन फ्यूल, हाई स्पीड डीजल, नेफ्था, बिटुमेन, ल्यूब बेस स्टॉक, पैराफिन वैक्स, फ्यूल ऑयल, हेक्सेन, पेट्रोकेमिकल फीड स्टॉक और पेट्रोलियम कोक आदि हैं। सीपीसीएल लीनियर अल्काइल बेंजीन के निर्माण के लिए डाउनस्ट्रीम इकाई को लीनियर अल्काइल बेंजीन फीडस्टॉक (एलएबीएफएस) की भी आपूर्ति करता है।

नागपट्टिनम में स्थित सीपीसीएल की दूसरी रिफाइनरी सन 1993 में शुरू की गई थी। यह कावेरी बेसिन रिफाइनरी (सीबीआर) एक छोटी पेल–हेड रिफाइनरी थी जो पास के ओएनजीसी फील्ड, रावा क्रूड और कंजी–डी6 क्रूड से कच्चे तेल का प्रसंस्करण करती थी। मौजूदा कॉन्फिगरेशन सहित उत्पाद विनिर्देशों को पूरा करने में उत्पन्न हुई कठिनाईयों के कारण सीबीआर को दिनांक 01.04.2019 से बंद कर दिया गया है। पेट्रोकेमिकल सुविधा सहित 9.0 एमएमटीपीए क्षमता की नई रिफाइनरी का निर्माण आईओसीएल (आईओसीएल–75% और सीपीसीएल–25%) के साथ संयुक्त उद्यम मोड में की जा रही है।

वर्ष 2023–24 में सीपीसीएल ने कुल 76.2% आसवन का लक्ष्य पूरा कर लिया है।

मापदंड	2022-23	2023-24
क्रूड थ्रुपुट (एमएमटी)	11.316	11.642
आसवन उपज (%)	76.0	76.2

ii. वित्तीय निष्पादन

वित्त वर्ष 2022–23 के दौरान सीपीसीएल में ₹ 90,801 करोड का कारोबार हुआ है। वर्तमान वित्त वर्ष 2023–24 में ₹ 97,207 करोड का कारोबार हुआ है। वित्त निष्पादन का ब्यौरा निम्नानुसार है:

(₹ करोड़ में)

मापदंड	वित्त वर्ष 2022–23 वास्तविक	वित्त वर्ष 2023–24
कारोबार	90,801	79,207
कर से पहले लाभ	4,809	3,660
कर पश्चात लाभ	3,534	2,711

iii. परियोजनाएं

क. पूरी की गई प्रमुख परियोजनाएँ

न्यू सल्फर रिकवरी ब्लॉक:

संबंधित आवश्यक ऑफसाइट सहित एसडब्लूएस (सोर वाटर स्ट्रिपर की क्षमता–30 एम³ / घंटे), एआरयू (अमीन पुनर्जनन इकाई की क्षमता–300 एम³ / घंटे) और एसआरयू (सल्फर रिकवरी इकाई की क्षमता 2x100 टीपीडी) से युक्त नया सल्फर रिकवरी ब्लॉक अप्रैल 2023 में शुरू किया गया।

परियोजना की लागत लगभग ₹ 600 करोड़ है।

ख. कार्यान्वयनाधीन प्रमुख परियोजनाएँ

नई विलवणीकरण और आरओ अस्वीकरण पानी के लिए पाइपलाइन बिछाना:

सीपीसीएल मनाली रिफाइनरी और एन्नोर में सीपीसीएल विलवणीकरण संयंत्र के बीच 22 किलोमीटर लंबी नई 28" विलवणीकरण पानी (जीआरपी–ग्लास प्रबलित प्लास्टिक) पाइपलाइन और नई 10" आरओ अस्वीकरण पानी (जीआरपी) पाइपलाइन संबंधी कार्य पूरा किया गया।

परियोजना की अनुमानित लागत ₹ 205 करोड़ है। ±10% (जीएसटी सहित) रुपये है और सितंबर 2025 इसके पूरा होने की संभावना है।

सीबीआर में रिफाइनरी का विस्तार:

क) सीपीसीएल, इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल) के साथ मिलकर ₹ 31,580 करोड़ की अनुमानित लागत से नागपट्टिनम में 9.0 एमएमटीपीए की कावेरी बेसिन रिफाइनरी और पेट्रोकेमिकल्स परियोजना (सीबीआरपीएल) को शुरू कर रहा है।

ख) रिफाइनरी परिसर बीएस–VI विनिर्देशों को पूरा करने वाले एलपीजी, पेट्रोल, डीजल और एटीएफ और मूल्य वर्धित उत्पाद के रूप में पॉलीप्रोपाइलीन का उत्पादन करेगा। यह परियोजना देश के आत्मनिर्भर भारत के दृष्टिकोण के अनुरूप इंडमैक्स, ऑक्टामैक्स आदि जैसी कई स्वदेशी तकनीकों का उपयोग कर रही है।

ग) नई रिफाइनरी लगभग 1300 एकड़ भूमि में स्थापित की जाएगी। तमिलनाडु की सरकार द्वारा भूमि अधिग्रहण पूरा कर लिया गया है और इसके लिए भूमि 31 अक्टूबर 2023 को सीपीसीएल को सौंप दी गई थी।

घ) मौजूदा रिफाइनरी को हटाने का काम पूरा हो गया है और निर्माण संबंधी विद्युत, निर्माण जल, साइट ग्रेडिंग, स्थलाकृतिक और भू–तकनीकी सर्वेक्षण, सीमा दीवार और सड़क और नाली संबंधी सक्षम कार्यकलाप निर्माणाधीन हैं।

ङ) परियोजना की आधारशिला 17 फरवरी 2021 को माननीय प्रधान मंत्री द्वारा रखी गई थी। यह परियोजना न केवल भारत की ऊर्जा सुरक्षा में बढ़ोत्तरी करेगी, बल्कि रोजगार के अवसर भी सृजन करेगी (परियोजना निर्माण चरण के दौरान 25,000 से अधिक सहित 12,000 / दिन जनशक्ति, 600 प्रत्यक्ष रोजगार और परियोजना के संचालन चरण के दौरान 2000 अप्रत्यक्ष रोजगार) और क्षेत्र के आर्थिक विकास को बढ़ावा देगी।

च) इंजीनियरिंग, खरीद, निर्माण और प्रबंधन (ईपीसीएम) सलाहकार (इंजीनियर्स इंडिया लिमिटेड, मैकडरमोट और टाटा कंसल्टिंग इंजीनियर्स) को संरेखित किया गया है और विस्तृत इंजीनियरिंग की गई है। निविदा और खरीद संबंधी कार्यकलाप प्रगति पर हैं।

छ) सभी प्रमुख उपकरणों, कार्य संविदा (एलएसटीके और बीओओ सहित), पैकेजों के लिए पूछताछ शुरू कर दी गई है और वे निविदा, मूल्यांकन और प्रदान किए जाने के विभिन्न चरणों में है।

ज) कॉर्पोरेट कार्य मंत्रालय से संयुक्त उद्यम कंपनी (जेवीसी) के निगमन का प्रमाण पत्र प्राप्त हुआ है।

झ) जेवीसी में आईओसीएल और सीपीसीएल द्वारा इक्विटी के निवेश के लिए संवैधानिक अनुमोदन के अनुसार परियोजना को 39 महीनों में पूरा किया जाना है

ग. भावी परियोजनाएँ

सीपीसीएल बेहतर एलओबीएस उत्पादन के लिए ग्रुप II ल्यूब ऑयल बेस स्टॉक के उत्पादन के लिए परियोजना लागू करने की योजना बना रही है। सीपीसीएल / आईओसीएल बोर्ड से पहले चरण का अनुमोदन मिल गया है और बीडीईपी की तैयारी और डीएफआर की तैयारी जैसी परियोजना–पूर्व कार्य पूरी हो गया हैं। जनवरी 2024 में पर्यावरणीय अनुमोदन प्राप्त हुआ है।

iv. कॉर्पोरेट सामाजिक उत्तरदायित्व और संधारणीय विकास:

कंपनी अधिनियम, 2013 की धारा 135 के तहत और कॉर्पोरेट कार्य मंत्रालय द्वारा जारी सीएसआर नियमों और डीपीई द्वारा जारी सीएसआर और संधारणीयता पर

लागू दिशानिर्देशों के अनुरूप सीपीसीएल की सीएसआर और संधारणीयता नीति तैयार की गई है।

कंपनी की सीएसआर नीति का उद्देश्य उन समुदायों की आर्थिक और सामाजिक स्थितियों पर सकारात्मक प्रभाव डालना है जिनमें यह काम करती है और समावेशी विकास को बढ़ावा देकर सामाजिक उत्थान की प्रक्रिया के माध्यम से लोगों के जीवन को समृद्ध बनाना और संधारणीय प्रक्रिया के माध्यम से पर्यावरण को पुनर्जीवित करना है।

सीपीसीएल के सीएसआर के मुख्य ध्यान–केन्द्रित क्षेत्र निम्नानुसार हैं:

- शिक्षा / कौशल प्रशिक्षण
- स्वास्थ्य
- पेयजल एवं स्वच्छता
- सामुदायिक विकास
- पर्यावरण संधारणीयता विकास
- दिव्यांगजनों का सशक्तिकरण
- महिला सशक्तिकरण
- सामाजिक एवं आर्थिक रूप से पिछड़े लोगों का सशक्तिकरण

सीपीसीएल द्वारा की गई कतिपय सीएसआर कार्यकलाप निम्नानुसार हैं:

- वॉकहार्ट फाउंडेशन के माध्यम से रिफाइनरी के आसपास के लोगों को नेत्र विज्ञान, दंत चिकित्सा, फिजियोथेरेपी और रक्त विज्ञान से संबंधित मुफ्त स्वास्थ्य देखभाल सेवाएं प्रदान करने के लिए सामुदायिक स्वास्थ्य केंद्र का संचालन करना।
- हेल्पेज इंडिया के माध्यम से तमिलनाडु में चेन्नै के निकट मनाली, नागापट्टिनम और रामनाथपुरम (आकांक्षी जिला) में मोबाइल मेडिकल हेल्थ केयर यूनिट का संचालन और अनुरक्षण, जिससे लगभग 30 गावों को सामान्य स्वास्थ्य देखभाल सेवाएं प्रदान की जा सकें।
- चेन्नै स्थित मेडिकल रिसर्च फाउंडेशन की इकाई शंकर नेत्रालय के माध्यम से नागपट्टिनम में मेगा नेत्र देखभाल शिविर का आयोजन किया गया, जिसमें 800 से अधिक लाभार्थियों की दृष्टि सुधार के लिए सहायता प्रदान की गई; तथा 122 मोतियाबिंद शल्यचिकित्सा के साथ–साथ शल्यक्रिया उपरांत समीक्षा भी की गई।
- तमिलनाडु के चेन्नै और तिरुवल्लूर जिलों में विभिन्न स्थानों पर अनेक शिविरों का आयोजन करके एलिम्को लिमिटेड के माध्यम से बहु–दिव्यांगजनों को सहायक उपकरणों के वितरण के लिए प्रायोजन करना।
- दृष्टिबाधित छात्रों के लिए कृत्रिम बुद्धिमत्ता वाले स्मार्ट विजन ग्लास और सहायक उपकरण का वितरण।
- चेन्नै के अरिग्नार अन्ना प्राणी उद्यान में हाथियों को गोद लेना और उनका कल्याण करना।
- क्योर इंटरनेशनल इंडिया ट्रस्ट, चेन्नै के माध्यम से क्लबफुट की समस्या के साथ जन्मे शिशुओं / बच्चों को पोन्सेटी विधि (गैर–शल्य चिकित्सा) के माध्यम से क्लबफुट के कारण होने वाली विकलांगता के उपचार हेतु योगदान।
- आईआईटी मद्रास इनक्यूबेशन सेल के माध्यम से चेन्नै मेट्रोपॉलिटन वाटर सप्लाई एंड सीवरेज बोर्ड (सीएमएसएसडब्ल्यूबी), चेन्नै के लिए रोबोटिक स्कैवेंजिंग मशीन की खरीद में योगदान, ताकि मैनुअल स्कैवेंजिंग को कम किया जा सके और समाप्त किया जा सके तथा पहले मैनुअल स्कैवेंजिंग कार्यकलाप से जुड़े लोगों के स्वास्थ्य को बेहतर किया जा सके।
- मनाली रिफाइनरी के आसपास के गरीब और जरूरतमंद लोगों को तकनीकी शिक्षा प्रदान करने के लिए सीपीसीएल शिक्षा ट्रस्ट के माध्यम से पॉलिटेक्निक कॉलेज का संचालन।
- गरीब और वंचित छात्रों के लिए सीआईपीईटी, चेन्नै के माध्यम से मशीन ऑपरेटर प्लास्टिक प्रसंस्करण पाठ्यक्रम पर छह महीने के पूर्णकालिक आवासीय रोजगार उन्मुख कौशल विकास प्रशिक्षण कार्यक्रम का प्रायोजन।
- विभिन्न सरकारी अस्पतालों के लिए महत्वपूर्ण चिकित्सा उपकरणों की खरीद और सहायता।
- जेईई / नीट कोचिंग क्लास के छात्रों के लिए प्रायोजन।
- श्री अरबिंदो सोसाइटी, पुदुचेरी द्वारा शिक्षा और व्यावसायिक प्रशिक्षण के माध्यम से महिला सशक्तिकरण
- मानसून में भारी वर्षा के दौरान नदी के पानी का मुक्त प्रवाह सुनिश्चित करने और इस प्रकार निचले इलाकों में बाढ़ की घटनाओं को रोकने के लिए नागपट्टिनम में वेन्नार उप बेसिन में नदी, चैनलों और नालों से जलकुंभी को हटाना
- हरित तमिलनाडु मिशन के माध्यम से भूजल संरक्षण, मृदा क्षरण की रोकथाम और पर्यावरणीय संधारणीयता के लिए नागपट्टिनम जिले के 14 तटीय क्षेत्रों में एक करोड़ पाल्मीरा के बीज बोए जाएंगे।

- चेन्नै में रिफाइनरी के आसपास सरकारी स्कूलों और कॉलेजों के अवसंरचना और सुव्यवस्थित स्कूली कक्षा का विकास, सामुदायिक हॉल, आंगनवाड़ी, अतिरिक्त कक्षों का निर्माण, भोजन और बहुउद्देश्यीय हॉल, विश्राम कक्ष का निर्माण, सरकारी स्कूलों में प्रौद्योगिकी आधारित शिक्षा का विस्तार आदि के लिए प्रायोजन और वित्तपोषण।
- सीपीसीएल ने वर्ष के दौरान 1040 किलोवाट के छत पर सौर पैनल शुरू किए हैं। इसके साथ ही कुल स्थापित छत पर सौर पैनल की क्षमता 2255 किलोवाट हो गई है।

14.3.3. मैंगलोर रिफाइनरी और पेट्रोकेमिकल्स लिमिटेड (एमआरपीएल)

14.3.3.1. कंपनी का संक्षिप्त विवरण:

मैंगलोर रिफाइनरी और पेट्रोकेमिकल्स लिमिटेड (एमआरपीएल) श्रेणी 1 मिनीरत्न, "अनुसूची–क" सीपीएसई और ऑयल एंड नेचुरल गैस कॉर्पोरेशन लिमिटेड (ओएनजीसी) की सहायक कंपनी है।

रिफाइनरी में 24 से 46 एपीआई ग्रेविटी सहित कच्चे तेल को संसाधित करने के लिए उच्च समुत्थानशील सहित एक बहुमुखी रूपरेखा है और यह एक उच्च स्तरीय स्वचालन रिफाइनरी है।

रिफाइनरी की वर्तमान क्षमता 15 एमएमटीपीए है। एमआरपीएल ने वर्ष 2022–23 के दौरान 17.116 एमएमटी का अब तक का सबसे अधिक क्रूड थ्रुपुट प्राप्त किया है जबकि पिछले वर्ष 2021–22 के दौरान यह 15.04 एमएमटी था, जिसमें 114% की उपयोग क्षमता देखी गई है। यह किसी एक स्थान के पीएसयू द्वारा किया गया सबसे अधिक थ्रुपुट था। एमआरपीएल ने वित्तीय वर्ष 2022–23 के दौरान ₹ 2,638 करोड़ का कर पश्चात लाभ (पीएटी) अर्जित किया, जबकि पिछले वर्ष वित्तीय वर्ष 2021–22 के दौरान इसमें ₹ 2,955 करोड़ का लाभ हुआ था।

14.3.3.2. परियोजनाएँ

30 एमएलडी से 40 एमएलडी तक विलवणीकरण संयंत्र का विस्तार

एमआरपीएल ने गर्मियों / कमजोर मानसून के दौरान रिफाइनरी के निरंतर संचालन को सुनिश्चित करने के लिए न्यू मैंगलोर पोर्ट अथॉरिटी की भूमि पर थन्नीरबावी में 30 एमएलडी क्षमता का विलवणीकरण संयंत्र स्थापित किया है, ताकि नेत्रावली नदी के ताजे पानी का एकमात्र स्रोत होने के जोखिम को समाप्त किया जा सके। विलवणीकरण संयंत्र की क्षमता को 30 एमएलडी से बढ़ाकर 40 एमएलडी करने का काम शुरू किया गया। यह परियोजना फरवरी 2024 में शुरू हो जाएगी।

देवांगोथी में विपणन टर्मिनल

मुख्य रूप से कर्नाटक राज्य में पेट्रोलियम उत्पादों की आवश्यकताओं को पूरा करने के लिए ₹ 304 करोड़ की स्वीकृत लागत से देवांगोथी, बेंगलुरु में विपणन टर्मिनल स्थापित किया जा रहा है। टर्मिनल को एमआरपीएल से मौजूदा पीएमएचबीएल पाइपलाइन के माध्यम से तैयार पेट्रोलियम उत्पाद (एमएस, एचएसडी और एटीएफ) प्राप्त होंगे। खुदरा दुकानों / ग्राहकों / विमानन केन्द्रों को पेट्रोलियम उत्पादों की आपूर्ति सड़क टैंकरों के माध्यम से की जाएगी। मैसर्स नौबता इंजीनियरिंग प्राइवेट लिमिटेड इस परियोजना के लिए सलाहकार है। टर्मिनल के निर्माण संबंधी कार्यकलाप अंतिम चरण में हैं और वित्त वर्ष 2024–25 की पहली तिमाही तक पूरा होने की उम्मीद है।

सीसीआर–1 का पुनरुद्धार

सीसीआर–1 भारी नेफ्था फीडस्टॉक को गैसोलीन मिश्रण के लिए उच्च ऑक्टेन रिफॉर्मेट में परिवर्तित करता है और हाइड्रो–ट्रीटिंग / हाइड्रोक्रैकिंग के लिए हाइड्रोजन का उत्पादन करता है। सीसीआर–1 के रीजेनरेटर भाग का पुनरुद्धार रीजेनरेटर कोक बर्न क्षमता को बढ़ाने के लिए किया गया था, जिसके परिणामस्वरूप कुल क्षमता 75 एमं / घंटे से बढ़कर 80 एमं / घंटे हो गई। यह परियोजना पूरी हो गई है और मई 2023 में इसकी शुरूआत की गई है।

विद्युत प्रणाली उन्नयन परियोजना

इस परियोजना में ग्रिड कनेक्टिविटी और रिफाइनरी प्रणाली उन्नयन को बढ़ाने की परिकल्पना की गई है, जिसमें रिफाइनरी के लिए 220 / 33 केवी स्तर पर ग्रिड कनेक्टिविटी का कार्यान्वयन और एरोमैटिक्स के लिए 110 / 33 केवी पर ग्रिड कनेक्टिविटी शामिल है। रिफाइनरी विद्युत प्रणाली उन्नयन, एसटीजी और कूलिंग वॉटर सिस्टम संशोधन के साथ–साथ अन्य सक्षम कार्यकलाप इस परियोजना के कार्यक्षेत्र का अंश हैं। मेसर्स ट्रैक्टबेल इंजीनियरिंग प्राइवेट लिमिटेड इस परियोजना का प्रबंधन सलाहकार है। परियोजना का यांत्रिक कार्य वित्त वर्ष 2025–26 की तीसरी तिमाही में पूरा होना निर्धारित है।

पीएफसीसी रीजेनरेटर स्टैक वेट स्क्रबर सिस्टम

इस परियोजना की परिकल्पना प्रदूषण नियंत्रण उपाय के रूप में पीएफसीसी की फ्लू गैस में एसपीएम उत्सर्जन को कम करने के लिए की गई है। पेट्रोकेमिकल फ्लूइडाइज्ड कैटेलिटिक क्रैकिंग (पीएफसीसी) इकाई हाइड्रोक्रैकर इकाइयों, सीधे चलने वाले कम सल्फर वैक्यूम गैस तेल और हाइड्रो शोधित भारी कोकर गैस तेल से अपरिवर्तित तेल को संसाधित करती है और प्रोपलीन, एलपीजी और गैसोलीन जैसे मूल्य वर्धित उत्पादों में परिवर्तित करती है। रीजेनरेटर स्टैक वेट स्क्रबर सिस्टम प्रतिकूल परिस्थितियों में भी उत्सर्जन मानदंडों को पूरा करना सुनिश्चित करता है। मेसर्स थिसेनक्रुप इंडस्ट्रियल सॉल्यूशंस (इंडिया) प्राइवेट लिमिटेड परियोजना प्रबंधन सलाहकार है और मेसर्स कल्पतरु प्रोजेक्ट इंटरनेशनल लिमिटेड परियोजना के लिए एलएसटीके संविदाकार है। परियोजना का यांत्रिक कार्य वित्त वर्ष 2024–25 की पहली तिमाही में पूरा होना अपेक्षित है।

पीएफसीसी एलपीजी+प्रोपलीन अमीन स्क्रबर

पेट्रोकेमिकल फ्लुइडाइज्ड कैटेलिटिक क्रैकिंग (पीएफसीसी) में उच्च सल्फर सामग्री वाले फीड को प्रोसेस करते समय, एलपीजी और प्रोपलीन स्ट्रीम में उच्च हाइड्रोजन सल्फाइड (एच,एस) की अपेक्षा की जाती है। एलपीजी और प्रोपलीन उत्पाद में एच,एस को पूरा करने के लिए वर्तमान प्रणाली कास्टिक वॉश है। अमीन स्क्रबर सिस्टम काफी हद तक कास्टिक वॉश पर निर्भरता को कम करता है। यह प्रणाली और प्रोपलीन स्ट्रीम में एच,एस को समाप्त करता है और मौजूदा कास्टिक शोधन प्रणाली में व्यय किए गए कास्टिक उत्पादन को कम करता है। परियोजना का यांत्रिक कार्य दिसंबर 2023 में पूर्ण होने की संभावना है।

मौजूदा बिटुमेन ब्लोइंग इकाई के विस्तार के भाग के रूप में नई बिटुमेन ब्लोइंग ट्रेन

इस परियोजना में मौजूदा बिटुमेन ब्लोइंग यूनिट के विस्तार के अंश के रूप में 144 केटीपीए की क्षमता वाली अतिरिक्त बिटुमेन ब्लोइंग ट्रेन की स्थापना की परिकल्पना की गई है, ताकि बाजार की मांग का लाभ उठाने के लिए बिटुमेन के वीजी–30 और वीजी–40 ग्रेड की मांग को पूरा किया जा सके। मेसर्स इंजीनियर्स इंडिया लिमिटेड इस परियोजना के लिए इंजीनियरिंग, खरीद और निर्माण प्रबंधन सलाहकार है। परियोजना का यांत्रिक कार्य वित्त वर्ष 2024–25 की पहली तिमाही में पूरा होना अपेक्षित है।

आईएसओ ब्यूटाइल बेंजीन (आईबीबी) पायलट सह डेमो संयंत्र

यह एमआरपीएल की आरएंडडी परियोजना है। आईएसओ ब्यूटाइल बेंजीन (आईबीबी) एक सक्रिय फार्मास्युटिकल इंटरमीडिएट (एपी) है और दर्द निवारक दवाओं के लिए महत्वपूर्ण इनपुट है और इसका उपयोग इत्र उद्योग में भी किया जाता है. एमआरपीएल ने आईबीबी प्रक्रिया प्रौद्योगिकी विकसित करने के लिए सीएसआईआर–राष्ट्रीय रासायनिक प्रयोगशाला (सीएसआईआर–एनसीएल) के साथ सहयोग किया है, एमआरपीएल को इस प्रक्रिया प्रौद्योगिकी के लिए पेटेंट भी मिला है। 200 टीपीए क्षमता का पायलट सह डेमो संयंत्र स्थापित करने की योजना है। यह उत्पाद, आईबीबी एमआरपीएल मैकेनिकल के भीतर उपलब्ध कैप्टिव फीडस्टॉक के साथ निर्मित होने जा रहा है। परियोजना के वित्त वर्ष 2025–26 की पहली तिमाही में पूरा होने की उम्मीद है।

हरित हाइड्रोजन

एमआरपीएल रिफाइनरी के अंदर वाटर इलेक्ट्रोलिसिस पाथवे पर आधारित 500 टीपीए ग्रीन हाइड्रोजन संयंत्र स्थापित करेगी। संयंत्र को वित्त वर्ष 2026–27 की दूसरी तिमाही में पूरा करने की योजना है।

बायो–एटीएफ

एमआरपीएल स्वदेशी तकनीक (ईआईएल/सीएसआईआर–आईआईपी) पर आधारित 20 केएलपीडी क्षमता का बायो–एटीएफ संयंत्र स्थापित करेगा। यह संयंत्र मैंगलोर में मौजूदा रिफाइनरी के साथ एकीकृत किया जाएगा। संयंत्र का आकार फीड स्टॉक की उपलब्धता के आधार पर तय किया गया है। संयंत्र का मैकेनिकल निर्माण वित्त वर्ष 2025–26 के अंत तक पूरा होने की उम्मीद है।

मानव संसाधन

इसमें कुल स्वीकृत कार्यबल 2,550 थी जिसमें 226 महिला कर्मचारी, 332 अनुसूचित जाति/अनुसूचित जनजाति कर्मचारी और 41 शारीरिक रूप से दिव्यांग कर्मचारी शामिल थे। कुल 2,550 कर्मचारियों में से 1,107 कर्मचारी प्रबंधन संवर्ग से संबंधित हैं और 1,443 कर्मचारी गैर–प्रबंधन संवर्ग से संबंधित हैं।

14.3.3.4. ऊर्जा संरक्षण:

वित्त वर्ष 2022–23 के दौरान कार्यान्वित किए जाने वाले प्रमुख ऊर्जा संरक्षण उपाय:

क्र. सं.	योजना संबंधी विवरण
1	स्टीम रिसाव में कमी लाने के लिए स्टीम ट्रैप प्रबंधन प्रणाली की स्थापना
2	सीपीपी–1/2 एसटीजी के संचालन का अनुकूलन
3	एरोमैटिक परिसर में 2 नग. ज़ाइलीन हीटर/1 नग. टोल्यूनि हीटर में एपीएच प्रतिस्थापन
4	टर्नअराउंड के बाद डीसीयू स्टीम की खपत में कमी
5	एरोमैटिक परिसर प्लेटफॉर्मर में रीसाइकिल गैस अनुपात में कमी
6	एरोमैटिक परिसर में ज़ाइलीन कॉलम अनुकूलन
7	संयंत्र क्षेत्र में एच.पी.एम.वी. एवं एच.पी.एस.वी. लाइटों को ऊर्जा कुशल फिक्स्चरों से प्रतिस्थापित करना (7,000 नग)
8	एमसीएन एचडीएस बाईपासिंग और एमसीएन एचडीएस प्रीहीटर एक्सचेंजर खएफजीटीयू) लगभग 700 किलोग्राम/घंटा एचपी स्टीम की बचत
9	अतिरिक्त परिचालन पंप को रोकने के लिए सीएचटीयू वाश वाटर पंप की क्षमता में वृद्धि
10	सीपीपी–3 गैस बूस्टर कंप्रेसर के निष्पादन में सुधार
11	बॉयलर–4 में एपीएच निष्पादन में सुधार
12	डीसीयू एफडी पंखों में वीएसडी की व्यवस्था करना

14.3.3.5. सुरक्षा संबंधी निष्पादन:

- एमआरपीएल रिफाइनरी में 1003 दिनों तक और एरोमेटिक्स में 2711 दिनों तक चोट लगने की कोई सूचना (आरएलटीआई) नहीं मिली है।
- एरोमेटिक्स कॉम्प्लेक्स के लिए ओआईएसडी द्वारा बाह्य सुरक्षा लेखा–परीक्षा की गयी।
- कर्नाटक राज्यिक आपदा प्रबंधन प्राधिकरण और राष्ट्रीय आपदा प्रबंधन प्राधिकरण के सहयोग और उपस्थिति में दिनांक 29 जुलाई 2022 को एमआरपीएल में राज्य स्तरीय ऑफसाइट मॉक अभ्यास का आयोजन किया गया।
- माननीय केंद्रीय पेट्रोलियम एवं प्राकृतिक गैस तथा श्रम एवं रोजगार राज्य मंत्री द्वारा अग्निशमन एवं सुरक्षा विभाग के सात कर्मचारियों को आपसी सहायता करार के अंतर्गत एमएसईजेड में निकटवर्ती कंपनी में लगी आग पर बहादुरी से काबू पाने के लिए सम्मानित किया गया।
- एमआरपीएल एरोमैटिक्स कॉम्प्लेक्स को कर्नाटक सरकार के फैक्ट्रीज बॉयलर औद्योगिक सुरक्षा और स्वास्थ्य विभाग द्वारा पेट्रोकेमिकल उद्योग श्रेणी में "कर्नाटक राज्य स्तरीय सुरक्षा पुरस्कार 2023" में प्रथम स्थान मिला।
- एमआरपीएल एरोमैटिक्स कॉम्प्लेक्स ने अप्रैल 2022 में मेसर्स ब्रिटिश सेफ्टी काउंसिल से 4 स्टार रेटिंग और ओएसएच में बेहतर निष्पादन के लिए राष्ट्रीय सुरक्षा परिषद से जून 2022 के महीने में "प्रशंसा पत्र" पुरस्कार भी प्राप्त किया।
- एमआरपीएल रिफाइनरी कॉम्प्लेक्स को औद्योगिक जोखिम आपदा प्रबंधन में उत्कृष्टता के लिए (फेडरेशन ऑफ इंडिया चैम्बर्स ऑफ कॉमर्स एंड इंडस्ट्रीज) फिक्की–जीआईजेड द्वारा प्रतिष्ठित स्वर्ण पुरस्कार से सम्मानित किया गया।
- रासायनिक आपदा निवारण दिवस–2022 के मद्देनजर, एमआरपीएल ने 15.12.2022 को "आपदा प्रबंधन कार्यनीतियां–संभावित चुनौतियां और हस्तक्षेप" पर एक दिवसीय कार्यशाला का आयोजन किया।

14.3.3.6. पर्यावरण संबंधी प्रबंधन:

- एमओईएफएंडसीसी द्वारा रिफाइनरी की परिचालन क्षमता को मौजूदा विन्यास के 16.6 एमएमटीपीए से बढ़ाकर 18.2 एमएमटीपीए करने के लिए एमआरपीएल को पर्यावरण से अनुमोदन प्राप्त हुआ।
- इसके बाद, मौजूदा विन्यास (संचालन दिनों की संख्या बढ़ाकर) के 16.6 एमएमटीपीए से 18.2 एमएमटीपीए तक क्षमता विस्तार के लिए

केएसपीसीबी द्वारा संचालन के लिए सहमति (सीएफओ) दी गई।

- दावणगेरे में प्रस्तावित 2जी–इथेनॉल परियोजना के लिए राज्य पर्यावरण प्रभाव आकलन प्राधिकरण (एसईआईएए), जीओके द्वारा पर्यावरण से अनुमोदन प्राप्त हुआ।
- एसपीसीबी द्वारा अधिकृत सीमेंट उद्योगों में 1273.01 मीट्रिक टन तैलीय कीचड़ और 1428.44 मीट्रिक टन पीएफसीसी व्यय उत्प्रेरक का सह–प्रसंस्करण किया गया।
- प्लैटिनम, कोबाल्ट मोलिब्डेनम, निकेल आदि परिवर्तन धातुओं वाले 367.65 मीट्रिक टन व्ययित उत्प्रेरकों का निपटान एसपीसीबी अधिकृत रिसाइकिलर्स / पुनःप्रसंस्करण के माध्यम से किया गया।
- 14.89 मीट्रिक टन अपशिष्ट सफेद तेल का निपटान एसपीसीबी अधिकृत भस्मीकरण सुविधा में किया गया।
- 292.4 मीट्रिक टन गैर–पुनर्चक्रणीय / गैर–पुनः प्रयोगीय खतरनाक अपशिष्ट को सुरक्षित लैंडफिल (टीएसडीएफ) को सौंप दिया गया।
- मैंगलोर नगर में 61,09,555 एम3 (औसतन 3.68 एमजीडी) तृतीयक शोधन नगरपालिका जलमल का उपयोग किया गया।
- एमआरपीएल में 21,92,386 एम3 (औसतन 1.32 एमजीडी) अलवणीकृत जल का उपयोग किया गया।
- एमआरपीएल ने प्रतिष्ठित ईईएफ (ऊर्जा और पर्यावरण फाउंडेशन) ग्लोबल वाटर मैनेजमेंट एंड कंजर्वेशन कंपनी ऑफ द ईयर 2022 पुरस्कार जीता।
- एमआरपीएल ने ईएचएस में सर्वोत्तम कार्यप्रणाली के लिए ग्रीनटेक इंटरनेशनल ईएचएस पुरस्कार 2023 जीता।

14.3.3.7. कॉर्पोरेट सामाजिक उत्तरदायित्व पहल:

- कंपनी की सीएसआर उद्देश्य कंपनी अधिनियम, 2013 की अनुसूची VII और डीपीई दिशानिर्देशों के अनुरूप है और इसे संरक्षण के नाम से बढ़ावा दिया जाता है। यह संरक्षण, संरक्षण और संवर्धन की भावना और प्रतिबद्धता को दर्शाता है। हमारे व्यवसाय के क्षेत्र में और उसके आस–पास की सामाजिक, सांस्कृतिक और पर्यावरणीय विरासत और संपदा को संरक्षित करना और संधारणीय विकास की प्रतिबद्धता को दर्शाता है।
- **सीएसआर पहल:** पुनर्वास कॉलोनी में प्राथमिक स्वास्थ्य केंद्र, ओवरहेड पानी की टंकियों का निर्माण, ऑडिटोरियम, सामुदायिक हॉल, सार्वजनिक पार्क का विकास, आंगनवाड़ियों का निर्माण, सरकारी स्कूलों में कक्षाओं का निर्माण, महिला विश्राम कक्ष, समुद्र तट का विकास, सरकारी स्कूलों में प्रौद्योगिकी सक्षम शिक्षा का विस्तार, मैंगलोर में कृत्रिम अंग शिविर का आयोजन, संरक्षण कार्यकलाप के रूप में प्रधानमंत्री के स्वच्छ भारत अभियान के अनुसार सरकारी स्कूलों में शौचालयों का निर्माण, सरकारी आयुष अस्पताल–मैंगलुरु को चिकित्सा उपकरण, एंडोसल्फान पीड़ितों को वित्तीय सहायता, परिचालन क्षेत्रों में सरकारी स्कूलों को मध्याह्न भोजन। दिव्यांगजनों को ट्राइसाइकिल का दान, सरकारी अस्पताल को आईसीयू बेड, सुरथकल पुलिस स्टेशन को सीसीटीवी, अल्पसंख्यक छात्रावासों को बुनियादी सुविधाएं, सरकारी सहायता प्राप्त स्कूल को स्कूली वैन की सहायता, महिला सशक्तिकरण के लिए कर्नाटक दर्जी संघ को सिलाई मशीनों का वितरण, एचआईवी से पीड़ित लोगों को बाजरा वितरण।

14.3.3.8. पुरस्कार और मान्यता:

वर्ष के दौरान, कंपनी को निम्नलिखित पुरस्कार और मान्यताएँ प्रदान की गई हैं:

- एमआरपीएल ने ऊर्जा प्रौद्योगिकी सम्मेलन के दौरान आयोजित समारोह में "रिफाइनरी में सर्वश्रेष्ठ नवाचार" के लिए वित्त वर्ष 2022–23 के लिए पुरस्कार जीता।
- एमआरपीएल को देश में सभी क्षेत्रों में सर्वश्रेष्ठ मिनीरत्न सीपीएसई होने के लिए डन एंड ब्रैडस्ट्रीट पीएसयू पुरस्कार से सम्मानित किया गया।
- एमआरपीएल ने क्रेटा–विक्रेता गौरव सम्मान समारोह 2023 में "जीईएम स्टार बायर्स" श्रेणी में पुरस्कार जीता।
- एमआरपीएल ने ऊर्जा और पर्यावरण फाउंडेशन (ईईएफ) ग्लोबल वाटर मैनेजमेंट कंपनी ऑफ द ईयर पुरस्कार 2023 जीता।
- एमआरपीएल ने ग्रो केयर इंडिया से व्यावसायिक स्वास्थ्य और सुरक्षा प्लेटिनम पुरस्कार जीता।


Bureau Veritas Certification

MANGALORE REFINERY AND PETROCHEMICALS LIMITED

EN 9100:2018
AS 9100:D - JISQ 9100:2016

PRODUCTION, STORAGE, TESTING AND DISTRIBUTION OF AVIATION TURBINE FUEL


एमआरपीएल भारत की पहली एएस 9100: डी प्रमाणित रिफाइनरी बनी


ओएनजीसी के नए कच्चे तेल की वीजीडी-98/2 का पहला कार्गो एमआरपीएल में पहुंचा



कर्मा प्रौद्योगिकी सम्मेलन 2023 में एमआरपीएल को 'रिफाइनरी में सर्वश्रेष्ठ नवाचार' पुरस्कार मिला



एमआरपीएल ने सभी क्षेत्रों में सर्वश्रेष्ठ मिनीरत्न का पुरस्कार जीता


विलवणीकरण संयंत्र की क्षमता 30 एमएलडी से बढ़ाकर 40 एमएलडी की जाएगी

14.3.3.9. वित्तीय निष्पादन संबंधी विशेषताएं

अवधि		वित्त 2018-19	वित्त 2019-20	वित्त 2020-21	वित्त 2021-22	वित्त 2022-23	वित्त 2023-24
थ्रुपुट	एमएमटी	16.43	14.14	11.50	15.04	11.116	16.59
कारोबार (सकल)	₹ करोड़	72,283	60,728	50,796	86,064	1,24,686	105,189.68
ईबीआईटीडीए	₹ करोड़	1,809	(2,430)	797	5,003	6,711	7,892.54
पीबीटी	₹ करोड़	581	(3,955)	(915)	2,708	4,239	5,521.41
पीएटी	₹ करोड़	332	(2,708)	(761)	2,955	2,638	3,59.93
जीआरएम	$/बैरल	4.06	(0.23)	3.90	8.73	9.88	10.36

14.3.4. नुमालीगढ़ रिफाइनरी लिमिटेड (एनआरएल)

14.3.4.1 प्रस्तावना

नुमालीगढ़ रिफाइनरी लिमिटेड (एनआरएल) की स्थापना 22 अप्रैल 1993 को हुई थी। एनआरएल की स्थापना 15 अगस्त 1985 को भारत सरकार द्वारा हस्ताक्षरित "असम समझौते" पर आधारित है। एनआरएल, ऑयल इंडिया लिमिटेड (ओआईएल) की एक सहायक कंपनी है और असम के गोलाघाट जिले के नुमालीगढ़ में पेट्रोलियम रिफाइनरी प्रचालित करती है। एनआरएल श्रेणी–I मिनीरत्न पीएसयू है। एनआरएल का वाणिज्यिक प्रचालन 1 अक्टूबर 2000 से शुरू हुआ था। 31.12.2023 तक, एनआरएल की शेयर धारिता पैटर्न ऑयल इंडिया लिमिटेड (ओआईएल)–69.63%, असम सरकार–26% और इंजीनियर्स इंडिया लिमिटेड (ईआईएल)–4.37% है।

एनआरएल के पास नुमालीगढ़ में एक एलपीजी बॉटलिंग प्लांट (क्षमता 42 टीएमटीपीए) है, इसके अतिरिक्त नुमालीगढ़ और सिलीगुड़ी में दो विपणन टर्मिनल हैं। व्हाइट ऑयल उत्पाद, जैसे एमएस, एसकेओ और एचएसडी को ऑयल इंडिया लिमिटेड की नुमालीगढ़–सिलीगुड़ी उत्पाद पाइपलाइन (एनएसपीएल) के माध्यम से नुमालीगढ़ से सिलीगुड़ी तक पहुँचाया जाता है।

एनआरएल की रिफाइनरी में उन्नत माध्यमिक प्रसंस्करण प्रौद्योगिकियों के कारण उच्च जटिलता कारक है, जिसने उच्च आसवन उपज प्राप्त को सक्षम बनाया है। एनआरएल के उत्पाद में एलपीजी, नेफ्था, मोटर स्पिट, एविएशन टर्बाइन ईंधन हाई स्पीड डीजल, सुपीरियर केरोसिन ऑयल, पैराफिन वैक्स, कच्चा/कैल्सीनयुक्त पेट्रोलियम कोक और सल्फर आदि शामिल हैं। एनआरएल में वैक्स उत्पादन करने वाला देश की सबसे बड़ी इकाई मौजूद है।

एनआरएल को गुणवत्ता प्रबंधन के लिए आईएसओ 9001, पर्यावरण प्रबंधन के लिए आईएसओ 14001, व्यावसायिक स्वास्थ्य और सुरक्षा के लिए ओएचएसएएस 18001, सूचना सुरक्षा प्रबंधन प्रणाली के लिए आईएसओ 27001 और ऊर्जा प्रबंधन के लिए आईएसओ 50001 के अंतर्गत प्रमाणित किया गया है।

14.3.4.2. निष्पादन

एनआरएल प्रति वर्ष निरंतर लाभप्रदता के साथ काम कर रहा है। एनआरएल देश में सभी पीएसयू तेल रिफाइनरियों में सबसे अधिक डिस्टिलेट यील्ड हासिल करने में सफल रहा है। एनआरएल की विशिष्ट ऊर्जा खपत (एसईसी) और सकल रिफाइनिंग मार्जिन (जीआरएम) सर्वश्रेष्ठ उद्योगों में से एक है।

पिछले तीन वर्षों और वर्तमान वित्त वर्ष के अप्रैल–दिसंबर 2023 के दौरान एनआरएल के वास्तविक और वित्तीय निष्पादन सूचकांक निम्नानुसार हैं

वास्तविक निष्पादन

मापदंड	2020-21	2021-22	2022-23	2023-24
क्रूड प्राप्ति (टीएमटी)	2,612	2,661	2,934	2,457
क्रूड थ्रुपुट (टीएमटी)	2,707	2,624	3,091	2,510
क्षमता का उपयोग (%)	90.24	87.47	103.03	98.09
डिस्टिलेट उपज (%)	86.36	85.69	87.69	86.54
विनिर्दिष्ट ऊर्जा खपत (एमबीएन)	64.37	63.51	61.66	61.57
ऊर्जा तीव्रता सूचकांक (ईआईआई)	86.99	84.68	82.31	81.36

वित्तीय निष्पादन:

मापदंड	2020-21	2021-22	2022-23	2023-24
बिक्री संबंधी कारोबार (रुपये करोड़ में)	18,543	23,546	29,785	23,731
पीबीटी (रुपये करोड़ में)	4,083	4,848	4,953	2,912
पीएटी (रुपये करोड़ में)	3,036	3,562	3,703	2,610
जीआरएम ($ बीबीएल में)	4.09	14.33	19.86	13.17
कुल संपत्ति	5,596	8,388	11,427	13,926

14.3.4.3. परियोजनाएँ

कार्यान्वयनाधीन परियोजनाएँ

क) नुमालीगढ़ रिफ़ाइनरी विस्तार परियोजना (एनआरईपी):

विस्तार परियोजना के दो प्रमुख घटक हैं, अर्थात क) नुमालीगढ़ में 6.0 एमएमटीपीए रिफाइनरी और ख) पारादीप–नुमालीगढ़ क्रूड पाइपलाइन के साथ–साथ क्रूड ऑयल आयात टर्मिनल। परियोजना की स्वीकृत लागत ₹ 28,026 करोड़ है, जिसमें से परियोजना के लिए पूंजी राजसहायता के रूप में ₹ 1,020 करोड़ की राशि स्वीकृत की गई है

i. **एनआरईपी–6.0 एमएमटीपीए रिफाइनरी:** कुल स्वीकृत परियोजना लागत ₹ 28,026 करोड़ में से, 6.0 मिलियन रिफाइनरी के लिए निर्धारित राशि ₹ 18,968 करोड़ है। दिनांक 31.03.2024 तक, कुल वास्तविक प्रगति 55.2% और वित्तीय प्रगति 53.33% है।

ii. **एनआरईपी–पारादीप नुमालीगढ़ क्रूड ऑयल पाइपलाइन (पीएनसीपीएल) और क्रूड ऑयल इंपोर्ट टर्मिनल (सीओआईटी):** पीएनसीपीएल और सीओआईटी के लिए निर्धारित राशि ₹ 9,058 करोड़ है। पाइपलाइन की लंबाई 1,635 किलोमीटर और क्षमता 9 एमएमटीपीए है। 31.03.2024 तक, कुल वास्तविक प्रगति 69.0% और वित्तीय प्रगति 78.33% है।

ख) भारत–बांग्लादेश पाइपलाइन परियोजना:

भारत के माननीय प्रधान मंत्री और बांग्लादेश के माननीय प्रधान मंत्री ने दिनांक 18.03.2023 को भारत बांग्लादेश मैत्री पाइपलाइन का उद्घाटन किया।

ग) ग्रीन हाइड्रोजन संयंत्र–2.4 केटीपीए:

राष्ट्रीय ग्रीन हाइड्रोजन मिशन के अनुरूप और आने वाले वर्षों में जीएचसीओ (ग्रीन हाइड्रोजन उपभोग दायित्व) को पूरा करने के लिए, एनआरएल, ईपीसी के आधार पर नुमालीगढ़ में 300 किलोग्राम / घंटा (2.4 केटीपीए) क्षमता का ग्रीन हाइड्रोजन संयंत्र स्थापित करेगा। यह रिफाइनरी द्वारा उपयोग किए जा रहे वर्तमान की 5% के ग्रे हाइड्रोजन के स्थान पर प्रतिस्थापित किया जाएगा, जिससे प्रति वर्ष लगभग 24,000 टन कार्बन उत्सर्जन कम होगा। परियोजना की स्वीकृत लागत ₹ 170 करोड़ है।

घ) **डीसीयू का पुनरुद्धार:**

इस परियोजना के लिए स्वीकृत लागत ₹ 370 करोड़ है, जिसमें नई 6.0 एमएमटीपीए रिफाइनरी की रेजिड अपग्रेडेशन सुविधा में उत्पादित होने वाले अन कन्वर्टेड ऑयल (यूसीओ) के प्रसंस्करण की क्षमता को 306 केटीपीए से बढ़ाकर 560 केटीपीए करके मौजूदा डिलेड कोकर यूनिट (डीसीयू) का पुनरुद्धार शामिल है।

इस परियोजना में कोक चैंबर, हीटर और स्विच डेक सिस्टम जैसे महत्वपूर्ण और पुराने उपकरणों को प्रतिस्थापित करना भी शामिल है। 31.03.2024 तक, कुल वास्तविक प्रगति 28.4% और वित्तीय प्रगति 27.95% है।

ङ) **दाबीडुबी एलपीजी सुविधा:**

नुमालीगढ़ रिफाइनरी असम के गोलाघाट जिले के दाबीडुबी में स्थापित की जा रही अपनी एलपीजी सुविधाओं को जोड़ने के लिए 15 किलोमीटर लंबी भूमिगत एलपीजी पाइपलाइन स्थापित कर रही है। विस्तार परियोजना के शुरू होने के बाद नई एलपीजी सुविधा की क्षमता 700 केटीपीए होगी और जिसकी स्वीकृत परियोजना लागत ₹ 338 करोड़ है।

च) **पीएफसीसी इकाई में विद्युत वसूली टर्बाइन:**

ऊर्जा बचत पहल के रूप में पीएफसीसीयू के रिएक्टर–रीजेनरेटर सेक्शन के डाउनस्ट्रीम में फ्लू गैस सेक्शन में विद्युत वसूली टर्बाइन स्थापित किया जाएगा। यह इकाई की ऊर्जा दक्षता बढ़ाने के लिए रीजेनरेटर फ्लू गैस से विद्युत सृजन करेगा और इसके परिणामस्वरूप परिसर से सीओ$_2$ उत्सर्जन में कमी आएगी। परियोजना की स्वीकृत लागत ₹ 293.50 करोड़ है।

छ) **2जी बायो रिफाइनरी (संयुक्त उद्यम परियोजना):**

एनआरएल ने दो अन्य विदेशी निवेशकों के सहयोग से ज्वाइंट वेंचर कंपनी असम बायो–रिफाइनरी प्राइवेट लिमिटेड (एबीआरपीएल) का गठन किया है, जो गैर–खाद्य ग्रेड फीड स्टॉक बांस से ऐथेनॉल का उत्पादन करने के लिए असम के नुमालीगढ़ में दूसरी पीढ़ी की बायो रिफाइनरी स्थापित कर रही है। परियोजना की स्वीकृत लागत ₹ 4,200 करोड़ है। एबीआरपीएल को ₹ 150 करोड़ का वित्तीय अनुदान सीएचटी की उच्चाधिकार प्राप्त समिति द्वारा अनुशंसित किया गया है। 31.03.2024 तक, समग्र वास्तविक प्रगति 94.0% और वित्तीय प्रगति 80.0% है।

ज) **नॉर्थ ईस्ट गैस ग्रिड परियोजना (संयुक्त उद्यम परियोजना):**

एनआरएल संयुक्त उद्यम कंपनी इंद्रधनुष गैस ग्रिड लिमिटेड (आईजीजीएल) में 20% की हिस्सेदारी भागीदार है जो 4.75 एमएमएससीएमडी क्षमता की प्राकृतिक गैस पाइपलाइन बिछाने के लिए नॉर्थ ईस्ट गैस ग्रिड परियोजना को क्रियान्वित कर रही है। इस परियोजना को भारत सरकार द्वारा ₹ 9,265 करोड़ की लागत से कार्यान्वयन के लिए अनुमोदित किया गया है, जिसमें 60% की व्यवहार्यता अंतर निधियन शामिल है।

13.3.4.4. एससी/एसटी/ओबीसी/दिव्यांगों के लिए कल्याण योजना

31 मार्च 2024 तक एनआरएल की स्वीकृत कार्यबल 1,065 थी, जिसमें से 464 संघीकृत श्रेणी में और 601 कार्यकारी संवर्ग के थे। कुल कर्मचारियों में से 122 कर्मचारी अनुसूचित जाति (एससी), 114 अनुसूचित जनजाति (एसटी), 335 अन्य पिछड़ा वर्ग (ओबीसी) और 26 दिव्यांगजन हैं।

13.3.4.5. महिला कर्मचारी

दिनांक 31.03.2024 तक महिला कर्मचारियों की अद्यतन–वार ब्यौरा इस प्रकार है:

समूह	महिला कर्मचारियों की संख्या	कुल कर्मचारियों की संख्या	कुल कर्मचारी की तुलना में महिला कर्मचारियों का %
क	60	601	9.98%
ग	22	464	4.74%
घ	0	0	-
कुल	**82**	**1,065**	**7.70%**

टिप्पणी: एनआरएल में समूह ख से संबंधित कोई कर्मचारी नहीं है।

14.3.4.6. राजभाषा का कार्यान्वयन

राजभाषा विभाग, भारत सरकार, गृह मंत्रालय, नई दिल्ली के निर्देशानुसार एनआरएल ने "हिंदी" को राजभाषा के रूप में बढ़ावा देने और लागू करने की दिशा में अपना प्रयास ध्यान केंद्रित किया है। राजभाषा विभाग, नई दिल्ली द्वारा निर्धारित वार्षिक लक्ष्य को प्राप्त करने के लिए, हिंदी कार्यशाला और राजभाषा कार्यान्वयन समिति की ओएलआईसी बैठकें समय–समय पर आयोजित की जा रही हैं। कर्मचारियों के लिए "आज का शब्द" और "आज का सुविचार" के माध्यम से हिंदी सीखने को प्रतिदिन डिस्प्ले बोर्ड पर प्रदर्शित किया जा रहा है। दिनांक 16 से 29 सितंबर 2023 तक "हिंदी पखवाड़ा" मनाया गया जिसमें हिंदी में रुचि बढ़ाने और इसके प्रचार और कार्यान्वयन के उद्देश्य से कर्मचारियों, उनके परिवार के सदस्यों, स्कूली बच्चों और सीआईएसएफ कर्मियों को शामिल करते हुए विभिन्न प्रतियोगिताओं का आयोजन किया गया। इस बार हिंदी दिवस गृह मंत्रालय, भारत सरकार के दिशा–निर्देशों के अनुसार 14 सितंबर, 2023 को पुणे, महाराष्ट्र में राजभाषा विभाग के साथ संयुक्त रूप से मनाया गया। हिंदी पखवाड़े के उद्घाटन समारोह के दौरान 16 सितंबर, 2023 को श्री गोपाल सरमा, आरसीई द्वारा विशेष हिंदी ई–पत्रिका (5वां संस्करण) का विमोचन किया गया। एक वार्षिक हिंदी इन–हाउस पत्रिका "प्रयास" (13वां संस्करण) का विमोचन 19 दिसंबर, 2023 को 62वें टोलिक (पीएसयू) बैठक के दौरान अध्यक्ष, टोलिक (पीएसयू) एवं मंत्री, असम राष्ट्रभाषा प्रसार समिति श्री क्षीरोदा सैकिया द्वारा किया गया। नवंबर, 2023 में नुमालीगढ़ रिफाइनरी द्वारा विभिन्न सार्वजनिक क्षेत्र के उपक्रमों के लिए नगर राजभाषा कार्यकारिणी समिति (सार्वजनिक क्षेत्र के उपक्रम), गुवाहाटी के तत्वावधान में नगर राजभाषा कार्यकारिणी समिति स्तर पर "हिंदी के प्रचार–प्रसार में सूचना प्रौद्योगिकी की भूमिका" विषय पर निबंध प्रतियोगिता आयोजित की गई और प्रतियोगिताओं के पांच सर्वश्रेष्ठ विजेताओं को पुरस्कृत किया गया। हिंदी पत्राचार को बढ़ाने के उद्देश्य से, हिंदी प्रोत्साहन योजना के तहत वर्ष के दौरान नियमित आधार पर हर तिमाही में कर्मचारियों के बीच हिंदी ई–मेल प्रतियोगिता आयोजित की गई है। सरकारी प्रयोजनों के लिए हिंदी में प्रयुक्त होने वाली छोटी तकनीकी शब्दावलियों से संबंधित पुस्तिका मेज पर रखे जाने वाले कैलेंडर के रूप में प्रकाशित की गई और सभी कर्मचारियों को वितरित की गई। नुमालीगढ़ रिफाइनरी की इन–हाउस पत्रिका "प्रयास" (तेरहवां संस्करण) को नगर राजभाषा कार्यान्वयन समिति (पीएसयू) गुवाहाटी द्वारा सर्वश्रेष्ठ प्रकाशन के लिए प्रथम पुरस्कार से सम्मानित किया गया और यह पुरस्कार 19.12.2023 को जुबिली हॉल गुवाहाटी में आयोजित 62वें टोलिक (पीएसयू) बैठक के दौरान प्रदान किया गया।

नुमालीगढ़ रिफाइनरी लिमिटेड को वर्ष 2023–24 के दौरान राजभाषा कार्यान्वयन में उत्कृष्ट कार्य करने के लिए नगर राजभाषा कार्यान्वयन समिति टोलिक (पीएसयू) गुवाहाटी द्वारा "प्रशस्ति प्रमाण पत्र" से सम्मानित किया गया तथा उक्त पुरस्कार 19 दिसंबर 2023 को आयोजित नगर राजभाषा कार्यान्वयन समिति टोलिक (पीएसयू) की 62वीं बैठक के दौरान दिया गया।

14.3.4.7. अनुसंधान एवं विकास संबंधी कार्यकलाप

एनआरएल रिफाइनरी प्रचालन संबंधी सभी पहलुओं में तकनीकी उत्कृष्टता के कॉर्पोरेट उद्देश्यों को पूरा करने, नए मूल्यवर्धित उत्पादों को विकसित करने और मौजूदा पेट्रोलियम उत्पादों की गुणवत्ता को उन्नत करने के लिए तकनीकी इनपुट प्रदान करने के लिए शिक्षाविदों और अनुसंधान संगठनों के साथ साझेदारी के माध्यम से सीमित अनुसंधान एवं विकास संबंधी कार्यकलापों को आगे बढ़ा रहा है।

एनआरएल द्वारा वर्तमान में किए जा रहे नए उत्पाद विकास और अनुसंधान पहल इस प्रकार हैं:

1. **आईआईटी गुवाहाटी में संधारणीय सामग्री के लिए एनआरएल उत्कृष्टता केंद्र**

   एनआरएल ने विभिन्न रिफाइनरी और बायो रिफाइनरी शाखाओं से पर्यावरणीय रूप से संधारणीय सामग्रियों के विकास के लिए अनुसंधान एवं विकास संबंधी क्रियाकलापों को पूरा करने के लिए आईआईटी गुवाहाटी में संधारणीय सामग्री के लिए एनआरएल उत्कृष्टता केंद्र (एनआरएल–सीओई एसएम) की स्थापना की है। हाल ही में, एनआरएल सीओई में बायो–डिग्रेडेबल पॉलीमर पर पायलट संयंत्र स्थापित करने के लिए ट्रांसलेशनल सुविधा स्थापित की गई है, जिसमें ब्लोन फिल्म मशीन, इंजेक्शन मोल्डिंग, थर्मोफॉर्मिंग, कास्ट फिल्म एक्सट्रूडर आदि जैसे बायो–डिग्रेडेबल प्लास्टिक के डाउनस्ट्रीम प्रसंस्करण से संबंधित उपकरणों की श्रृंखला है। पायलट संयंत्र में सामान्य और बायोडिग्रेडेबल पॉलीमर दोनों से कैरी बैग, खिलौने, कटलरी, सजावटी सामान आदि सहित विभिन्न प्रकार की वस्तुओं के निर्माण की सुविधा है।

   एनआरएल–सीओई के अंतर्गत "तेल और जैव–रिफाइनरी शाखाओं से संधारणीय सामग्रियों के विकास" के लिए शोध परियोजना

चलाई जा रही है। यह परियोजना अब तक कतिपय नवीन तरीकों या प्रक्रियाओं का आविष्कार करने में सफल रही है।

2. **काजीरंगा विश्वविद्यालय और सीमांत विज्ञान एवं अनुप्रयोग संस्थान के साथ अनुसंधान सहयोग:**

एनआरएल ने काजीरंगा विश्वविद्यालय (केयू) और इंस्टीट्यूट ऑफ फ्रंटियर साइंस एंड एप्लीकेशन (आईएफएसए) के साथ एक समझौता ज्ञापन (एमओए) पर हस्ताक्षर किए हैं, जिसके तहत वे "पूर्वोत्तर भारत में पवन ऊर्जा क्षमता का आकलन" नामक शोध परियोजना को आगे बढ़ाने के लिए सहयोग करेंगे। यह सहयोग पूर्वोत्तर भारत में पवन ऊर्जा क्षमता के व्यवस्थित अन्वेषण के लिए अपनी तरह का पहला सहयोग है। एमओए के अनुसार, काजीरंगा विश्वविद्यालय, इंस्टीट्यूट ऑफ फ्रंटियर साइंस एंड एप्लीकेशन (आईएफएसए) के साथ तकनीकी सहयोग और एनआरएल से मिलने वाले वित्तपोषण के साथ इस परियोजना को लागू करेगा, जिसका उद्देश्य तीन साल की अवधि के लिए मोबाइल लिडार अवलोकनों का उपयोग करके नदी के वातावरण में उत्तर पूर्व भारत में वैक योग्य पवन ऊर्जा आकलन डेटा विकसित करना है।

3. **इंजीनियर्स इंडिया लिमिटेड (ईआईएल) के साथ अनुसंधान एवं विकास सहयोग**

क. **नए उत्पाद का विकास:** एनआरएल और ईआईएल ने रिफाइनरी की अमोनिया–समृद्ध खट्टी गैसों से जलीय अमोनिया के उत्पादन के लिए प्रौद्योगिकी के संयुक्त विकास और व्यावसायीकरण के लिए समझौता ज्ञापन (एमओए) पर हस्ताक्षर किए। एनआरएल ईआईएल की डिजाइन जानकारी और सल्फर रिकवरी यूनिट (एसआरयू) के संचालन के लिए एनआरएल की विशेषज्ञता का उपयोग करके जलीय अमोनिया उत्पादन के लिए एक संयंत्र स्थापित करेगा।

ख. **ओवरग्राउंड लिक्विड सल्फर लॉक:** ग्राउंड सल्फर सील को 70 किलोग्राम प्रति घंटे तरल सल्फर प्रवाह को कार्यान्वित करने के लिए डिजाइन किया जाएगा, जिसे ग्राउंड सल्फर सील के डिजाइन के लिए ईआईएल की विशेषज्ञता का उपयोग करके एनआरएल के एसआरयू में स्थापित किया जाएगा।

4. **सीएसआईआर के साथ अनुसंधान एवं विकास सहयोग: एनईआईएसटी**

एनआरएल, वैज्ञानिक एवं औद्योगिक अनुसंधान परिषद के तहत उत्तर पूर्व विज्ञान एवं प्रौद्योगिकी संस्थान, जोरहाट के साथ अनुसंधान सहयोग के कार्यढांचे के तहत "सोउर वाटर और रिट्रप्ड वाटर से फिनोल को अलग करना, इसका पुनः उपयोग और मूल्य संवर्धन" के लिए अनुसंधान एवं विकास परियोजना चला रहा है, जिसका उद्देश्य रिफाइनरी के वाटर फुटप्रिंट को कम करना और मूल्य वर्धित रसायनों का उत्पादन करना है। खोखले फाइबर झिल्ली मॉड्यूल का डिजाइन और विकसित करके प्रयोगशाला के पैमाने पर इसका प्रयोग सफलतापूर्वक किए गए हैं। एनआरएल के परिसर में स्थापित करने के लिए प्रमुख निष्पादन सुविधा का विकास किया जा रहा है

5. **सेंट एडमंड कालेज, शिलांग में अनुसंधान परियोजना**

एनआरएल ने कच्चे तेल, हाइड्रोकार्बन भंडारण टैंक बटम स्लज, और ईटीपी हाइड्रोकार्बन स्लज और ईटीपी हाइड्रोकार्बन स्लज और इसके जैव–प्रौद्योगिकी प्रयोजन के जैव–शोधन में साइनो बैक्टीरिया के उपयोग पर अनुसंधान कार्य के लिए सेंट एडमंड कॉलेज शिलांग को नियुक्त किया है। इस परियोजना का उद्देश्य कच्चे तेल, हाइड्रोकार्बन भंडारण टैंक तल कीचड़ और ईटीपी हाइड्रोकार्बन कीचड़ के जैव–शोधन में साइनो बैक्टीरिया का उपयोग करना है।

एनआरएल से एकत्र किए गए साइनो बैक्टीरिया के नमूनों की संसाधन पर महत्वपूर्ण विकास हासिल किया गया है और हाइड्रोकार्बन स्लज पर संसाधन बैक्टीरिया के साथ जैव संचयन अध्ययन की जांच की जा रही है।

उपर्युक्त अनुसंधान एवं विकास संबंधी कार्यकलाप के अपेक्षित परिणाम:

क. **बायो–डिग्रेडेबल प्लास्टिक के उत्पादन** के लिए स्वदेशी तकनीक के विकास से गैर–बायोडिग्रेडेबल पॉलीथीन–आधारित पैकेजिंग को प्रतिस्थापन करने में मदद मिलेगी और ठोस अपशिष्ट से प्रदूषण को कम करने में योगदान मिलेगा। बायो–डिग्रेडेबल प्लास्टिक बायो रिफाइनरी से मूल्य वर्धित शाखा होगी, जिसे असम बायो रिफाइनरी प्राइवेट लिमिटेड

(एबीपीएलएन) द्वारा कार्यान्वित किया जा रहा है। इस परियोजना का उद्देश्य बायो रिफाईनरी के उप–उत्पाद फुरफुरल स्टीम को बायोडिग्रेडेबल पॉलीमर, पॉलीकैप्रोलैक्टोन (पीसीएलआई) में प्रतिस्थापन करना है।

इस परियोजना के अंतर्गत अनुसंधान संबंधी कार्यकलापों के परिणामस्वरूप निम्नलिखित पेटेंट लागू किए गए हैं।

क. फुरफुरल को हाइड्रोक्सीमेथिल फुरफुरल में प्रतिस्थापन के लिए नया उत्प्रेरक (एसपीईईके)

ख. फुरफुरल, एचएमएफ फॉर्मेलिन, लेवुलिनिक एसिड के मिश्रण से एचएमएफ के शुद्धिकरण की नई प्रक्रिया

ख. पवन ऊर्जा संबंधी क्षमता की खोज:

टर्बाइन स्तर पर नदी संबंधी वातावरण में बहु–स्तरीय और बहु–स्थलीय उच्च आवृत्ति अवलोकन और विश्लेषण के माध्यम से एलआईडीएआर प्रौद्योगिकी का उपयोग करके पवन–ऊर्जा क्षमता का आकलन करना जो व्यवहार्य पवन ऊर्जा स्थापना के लिए प्रासंगिक असम के बैंकेबल पवन–ऊर्जा डेटाबेस प्रदान करेगा। परियोजना के परिणामों का उपयोग असम में वाणिज्यिक पवन ऊर्जा उत्पादन को उत्प्रेरित करने के लिए किया जा सकता है। इस प्रकार परियोजना में असम के लिए महत्वपूर्ण सामाजिक–आर्थिक लाभों की बहुत बड़ी क्षमता है। वर्तमान परियोजना सहित अवधारणा के प्रमाण के रूप में, इसे उत्तर–पूर्व के व्यापक क्षेत्रों को शामिल करने के लिए आसानी से संवर्धित किया जा सकता है।

ग. जलीय अमोनिया का उत्पादन:

एनआरएल और ईआईएल द्वारा संयुक्त रूप से विकसित स्वदेशी तकनीक का उपयोग करके, एनएच, की अपशिष्ट धारा से जलीय अमोनिया (25% एनएच,) का उत्पादन, एंजाइमों के उचित निष्पादन के लिए पीएच बनाए रखने के लिए जैव रिफाइनरी में जलीय अमोनिया की आवश्यकता को पूरा करेगा।

घ. ओवरग्राउंड सल्फर सील से संबंधित प्रौद्योगिकी विकास:

ओवरग्राउंड सल्फर सील प्रौद्योगिकी के विकास और व्यावसायीकरण से रिफाइनरियों को सल्फर रिकवरी इकाइयों में तरल सल्फर के तरल गैस चरण पृथक्करण में सुधार करने में मदद मिलेगी। इससे एसओएक्स उत्सर्जन में भी कमी आएगी।

ङ. सोउर वाटर और स्ट्रिप्ड वाटर से फिनोल को अलग करने के लिए प्रौद्योगिकी:

सोउर और स्ट्रिप्ड वाटर से फिनोल को अलग करने की प्रौद्योगिकी के विकास से वाटर फुटप्रिंट कम होगा और साथ ही रिफाइनरी से मूल्यवर्धित रसायन, फिनोल का उत्पादन होगा। फिनोल को अलग करने के लिए प्रौद्योगिकी का प्रयोगशाला आधारित निष्पादन सफलतापूर्वक पूरा हो गया है और एनआरएल साइट पर इसका निष्पादन करने के लिए एक पायलट संयंत्र की रूपरेखा और निर्माण प्रक्रियाधीन है।

च. साइनो बैक्टीरियल संसाधन के माध्यम से जैव–शोधन:

स्टोरेज टैंक बौटम और अपशिष्ट शोधन संयंत्र से हाइड्रोकार्बन संबंधी अपशिष्ट के जैव–उपचार में साइनो बैक्टीरिया का उपयोग खतरनाक अपशिष्ट के संधारणीय प्रबंधन में मदद करेगा।

14.3.4.8. ऊर्जा संरक्षण

एनआरएल ऊर्जा संरक्षण को बनाए रखने और इसकी दक्षता बढ़ाने को प्राथमिकता देता है। रिफाइनरी कई परिचालन मापदंडों में से मुख्य ऊर्जा निष्पादन संबंधी सूचकांक जैसे विशिष्ट ऊर्जा खपत (एसईसी) और ऊर्जा तीव्रता सूचकांक (ईआईआई) के लिए बारीकी से नजर रखती है। इकाई के निष्पादन का निरंतर आधार पर आकलन किया जाता है और सर्वश्रेष्ठ श्रेणी की तकनीक और वैश्विक ऊर्जा दक्षता वाले सर्वोत्तम कार्यप्रणाली प्रस्तुत करने का प्रयास जारी है। एसईसी में 61.6 एमबीएन और ईआईआई में 82.7% है, जबकि यह लक्ष्य क्रमशः 61.9% और 84.0% है, जो एमओपीएंडएनजी द्वारा निर्धारित दृढ़ लक्ष्य के भीतर है।

नुमालीगढ़ रिफाइनरी के पास 1.05 मैगावाट सौर फोटोवोल्टिक क्षमता का पोर्टफोलियो है, जो कुल कैप्टिव विद्युत उत्पादन का 0.4% है। वर्ष 2022–23 में परियोजना से कुल 983 एमडब्लूएच उत्पादन हुआ है, जो 10 लाख पाउंड सीओ2ई को कम करता है।

14.3.4.9. सीएसआर संबंधी कार्यकलाप

एनआरएल की सीएसआर और संधारणीयता कार्यकलाप कंपनी अधिनियम 2013 की अनुसूची VII के तहत विनिर्दिष्ट कार्यकलापों के अनुरूप है। एनआरएल ने कंपनी अधिनियम 2013 की धारा 135 के तहत निर्धारित शर्तों, कॉर्पोरेट कार्य मंत्रालय द्वारा

जारी सीएसआर नियमों और डीपीई द्वारा जारी सीएसआर और संधारणीयता पर लागू दिशानिर्देशों के अनुरूप "सीएसआर और संधारणीयता नीति" तैयार की है। इसके अतिरिक्त, एनआरएल ने असम के दरांग जिले के जिला प्रशासन के साथ स्वयं को घनिष्टता से जोड़ा है जिसे नीति आयोग द्वारा कंपनी को आकांक्षी जिले के रूप में आवंटित किया गया है।

एनआरएल निम्नलिखित विशेषताओं पर जोर दिया है **क)** स्वास्थ्य देखभाल, **ख)** शिक्षा और कौशल विकास, **ग)** स्वच्छता कार्य योजना, **घ)** आजीविका सृजन, **ङ)** अवसंरचना का विकास, **च)** अपनी सीएसआर नीति के अनुरूप कला, खेल, साहित्य और संस्कृति को बढ़ावा देना। इसके अतिरिक्त, एनआरएल के सीएसआर ने कंपनी अधिनियम, 2013 की अनुसूची VII के अंतर्गत विनिर्दिष्ट कार्यकलापों के अनुरूप महिलाओं को सशक्त बनाने, पर्यावरण संबंधी संधारणीयता सुनिश्चित करने और पशु कल्याण आदि जैसे अन्य क्षेत्रों में भी योगदान दिया है।

क. स्वास्थ्य देखभाल :

वित्त वर्ष 2022–23 में सीएसआर कार्यकलापों के विषयगत क्षेत्र "स्वास्थ्य और पोषण" होने के लिए मंत्रालय द्वारा जारी अधिसूचना के अनुसार, एनआरएल ने इस क्षेत्र में सामुदायिक स्वास्थ्य सेवा संबंधी सुधार हेतु व्यापक रूप से ध्यान दिया था। कुछ उल्लेखनीय परियोजनाएँ इस प्रकार हैं:

- एनआरएल ने असम के गोलाघाट में विभिन्न प्राथमिक स्वास्थ्य केंद्रों (पीएचसी) और सामुदायिक स्वास्थ्य केंद्रों (सीएचसी) के निर्माण और नवीनीकरण की पहल की है। नवीनीकरण कार्य में रोगियों को बेहतर चिकित्सा देखभाल प्रदान करने के लिए अवसंरचना की मरम्मत शामिल है। आज तक, परियोजना में 7 स्वास्थ्य केंद्र शामिल हैं।
- एनआरएल हरे कृष्ण फूड फॉर लाइफ कार्यक्रम और अक्षय पात्र फाउंडेशन के साथ अपनी साझेदारी के माध्यम से पोषण को बढ़ावा देने और जरूरतमंद लोगों को भोजन उपलब्ध कराने में भी महत्वपूर्ण भूमिका निभा रहा है।
- वीकेएनआरएल अस्पताल और नेत्र शिविर के माध्यम से आयोजित मोबाइल चिकित्सा स्वास्थ्य शिविर जारी हैं, साथ ही वीकेएनआरएल अस्पताल के माध्यम से समाज के कमजोर वर्ग के लोगों को रियायती उपचार प्रदान किया जा रहा है।
- कैंसर, फेफड़े और हृदय रोग, किडनी की समस्या आदि जैसी गंभीर बीमारियों के लिए अपनी चिकित्सा सहायता योजना सहित एनआरएल स्वास्थ्य सेवा के मामले में जरूरतमंद और आर्थिक रूप से कमजोर वर्ग को लगातार सहायता प्रदान कर रहा है।
- दूरदराज के क्षेत्रों में स्वास्थ्य सुविधाओं तक पहुंच सुनिश्चित करने के लिए असम के विभिन्न मेडिकल कॉलेजों, पीएचसी के साथ-साथ पश्चिम बंगाल, बिहार और अरुणाचल प्रदेश जैसे बाहरी राज्यों को कई एम्बुलेंस प्रदान की गईं।

ख. शिक्षा और कौशल विकास :

वर्ष के दौरान समाज को प्रभावित करने वाली कुछ परियोजनाएं इस प्रकार हैं:

- जारी "ज्ञानदीप छात्रवृत्ति योजना के अंतर्गत, कक्षा X और XII में उनके प्रदर्शन के आधार पर 295 छात्रों को लाभान्वित किया गया। बालिका शिक्षा को बढ़ावा देने के लिए कक्षा VII से X तक की शीर्ष तीन छात्राओं के लिए तैयार की गई 'प्रेरणा छात्रवृत्ति' के अंतर्गत कुल 298 छात्राओं को छात्रवृत्ति प्रदान की गई है। "सविदा श्रमिकों" के मेधावी बच्चों को दसवीं कक्षा की परीक्षा में उनके अच्छे परिणाम के लिए छात्रवृत्ति प्रदान की गई। इसके अतिरिक्त, 20 छात्रों को उच्च शिक्षा प्राप्त करने के लिए "प्रतिभा" योजना के अंतर्गत छात्रवृत्ति प्रदान की गई।
- एनआरएल निकटवर्ती विद्यालयों के कक्षा 9 और 10 के छात्रों के लिए सेंटर फॉर सोशल रिस्पॉन्सिबिलिटी एंड लीडरशिप, नई दिल्ली के माध्यम से कोचिंग सेंटर को सहायता प्रदान करना जारी रखा है। कोचिंग का उद्देश्य छात्रों को इंजीनियरिंग और मेडिकल पाठ्यक्रमों में दाखिला लेने के लिए योग्य बनाना है।

- एनआरएल ने असम के बिजनी में नॉर्थ ईस्ट मिलिट्री स्कूल में लड़कों के छात्रावास की पहली मंजिल के प्लिंथ प्लस ग्राउंड फ्लोर और छत के स्लैब का निर्माण किया है और साथ ही बीओपी फांसीदेवा, 176 बीएन बीएसएफ, सिलीगुड़ी के सीमावर्ती क्षेत्रों के लिए ई–शिक्षण अवसंरचना संबंधी सुविधाओं की स्थापना के लिए वित्तीय सहायता प्रदान की है।

- वेल्डिंग, फिटर और आतिथ्य क्षेत्र में किए गए कौशल विकास पहल गोलाघाट आईटीआई के माध्यम से जारी रखे जा रहे हैं और वर्तमान में कुल पांच ट्रेडों में 64 छात्र हैं।

- वीकेएनआरएल स्कूल ऑफ नर्सिंग ने जनवरी, 2022 से जीएनएम कोर्स करने के लिए 40 छात्रों के अपने 6वें बैच को नामांकित किया। वर्तमान में, स्कूल में 117 लड़कियां पढ़ रही हैं और छात्रों के 3 बैच पास हो चुके हैं।

- एनआरएल ने आईटीआई माजुली के लिए डीजी सेट प्रदान किया है और माजुली जिले के युवाओं के बीच व्यावसायिक प्रशिक्षण प्रदान करने के लिए फर्नीचर की खरीद के लिए वित्तीय सहायता भी दी है।

ग. स्वच्छता कार्य योजना:

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय द्वारा अधिदेशित इस कार्यक्रम के अंतर्गत, व्यय के विभिन्न मदों के अंतर्गत ₹ 5.90 करोड़ के लक्ष्य के स्थान पर ₹ 6.88 करोड़ की राशि व्यय की गई है।

- "जीवनधारा" परियोजना का उद्देश्य गांवों, स्कूलों और अन्य सामुदायिक स्थानों को स्वच्छ पेयजल उपलब्ध कराना है। वर्ष के दौरान, एनआरएल ने बिहार के दो अलग–अलग जिलों में दो आरओ पेयजल संयंत्रों की स्थापना और शुरूआत की है। इन सभी संयंत्रों को 3 वर्ष के वार्षिक अनुरक्षण संविदा के प्रावधान के साथ स्थापित किया गया था।

- एनआरएल ने विभिन्न नगर पालिकाओं/नगर समितियों को अपशिष्ट प्रबंधन उपकरण प्रदान किए हैं और प्रभावी अपशिष्ट प्रबंधन के लिए सरूपथर नगर समिति, बारपाथर नगर समिति जैसी विभिन्न नगर/बाजार समितियों और रिफाइनरी साइट की बाजार समितियों के बीच 45 औद्योगिक कूड़ेदान प्रदान किए हैं।

घ. आजीविका सृजन:

- असम सरकार के कृषि विभाग के साथ साझेदारी से पनबारी, बोकाखाट में एक सौर कोल्ड स्टोरेज परियोजना का उद्घाटन किया गया है। इस पहल का उद्देश्य क्षेत्र में जल्दी खराब होने वाली कृषि उपज के संरक्षण और भंडारण के लिए संधारणीय और लागत प्रभावी समाधान प्रदान करना है।

- एनआरएल द्वारा राजपुखुरी के जुरपुखुरी गांव में ड्रैगन फ्रूट गांव की स्थापना के लिए सहायता की है, जिससे किसानों को अपनी फसल पोर्टफोलियो में विविधता लाने, उनकी आय के स्तर को बढ़ाने और रोजगार के अवसर सृजन करने में मदद मिलेगी।

ङ. अवसंरचना का विकास:

- वित्तीय वर्ष के दौरान एनआरएल और इसके आसपास कई विकास कार्य शुरू किए गए, जिनमें ग्रामीण क्षेत्रों में ग्रामीण सड़क निर्माण एवं नवीनीकरण तथा अन्य अवसंरचना विकास कार्य आदि परियोजनाएं शामिल थीं।

- एनआरएल ने सरूपथर, श्री श्री उत्तर कमलाबाड़ी एक्सट्रा, माजुली और बोकाखाट में तीन खुली प्रेक्षागृह का निर्माण कार्य शुरू किया है। यह पहल क्षेत्र की समृद्ध सांस्कृतिक विरासत और विविधता के संवर्धन और संरक्षण के लिए मंच प्रदान करेगी।

- एनआरएल ने एनएच–39 से एनआरएल टाउनशिप सीमा दीवार के पास मौजूदा लोबोघाट रोड का विस्तार किया है और पीडब्ल्यूडी सरूपथार प्रादेशिक सड़क प्रभाग के तहत गोलाघाट दीमापुर रोड (मोइनापारा से रोंगाजन) की मरम्मत के लिए अपनी सीएसआर पहल के तहत वित्तीय सहायता प्रदान की है।

च. कला, खेल, साहित्य और संस्कृति को बढ़ावा देना:

- एनआरएल ने असम के जोरहाट में उच्च निष्पादन वाले खेल प्रशिक्षण और पुनर्वास केंद्र की स्थापना की पहल की है।

  इस पहल का उद्देश्य क्षेत्र के खिलाड़ियों और एथलीटों के प्रशिक्षण और विकास के लिए विश्व स्तरीय सुविधा प्रदान करना और उनकी चोट की रोकथाम और उसे ठीक करने के लिए विशेष सेवाएं प्रदान करना है।

- एनआरएल ने गोलाघाट जिला खेल संघ (जीडीएसए) स्टेडियम, गोलाघाट में फ्लड लाइट लगाने का काम शुरू किया है। फ्लड लाइट लगाने में एलईडी लाइट के साथ चार हाई मास्ट टावरों का निर्माण और केबल और वायरिंग बिछाना शामिल होगा और इससे स्टेडियम की रोशनी और दृश्यता में समग्र रूप से सुधार होगा और रात के समय खेल आयोजनों और कार्यकलापों का संचालन संभव होगा।

- एनआरएल, एनआरएल फुटबॉल अकादमी में उभरते फुटबॉलरों को प्रशिक्षण दे रहा है। कोविड महामारी के बाद एनआरएल ने नवंबर 2021 में फिर से अकादमी का संचालन शुरू कर दिया है। वर्तमान में, इसमें 13 वर्ष से कम आयु, 15 वर्ष से कम आयु, और 18 वर्ष से कम आयु के श्रेणियों में खेलने वाले 69 खिलाड़ी हैं और अकादमी के अंतर्गत 7 अलग–अलग फीडर सेंटरों में लगभग 700 खिलाड़ी हैं।

- एनआरएल ने अपनी सीएसआर पहल के अंतर्गत आजादी का अमृत महोत्सव के तत्वावधान में "हर घर तिरंगा अभियान" चलाया। इस अभियान के अंतर्गत स्वच्छता अभियान, विभिन्न प्रतियोगिताएं आयोजित की गई।

- एनआरएल ने असम के बिश्वनाथ चरियाली में "बीर भूमि" नामक स्मारक स्थल का विकास किया है। इस पहल का उद्देश्य भारतीय स्वतंत्रता आंदोलन के दौरान देश के लिए अपने प्राणों की आहुति देने वाले क्षेत्र के शहीदों और स्वतंत्रता सेनानियों को सम्मानित करना और उनकी स्मृति को स्मरण करना है।

  एनआरएल की वेबसाइट www.nrl.co.in पर सीएसआर कार्यकलाप का विवरण प्रदर्शित किया जाता है और इसे निरंतर आधार पर अद्यतन किया जाता है।

  पिछले चार वर्षों के दौरान एनआरएल द्वारा सीएसआर कार्यकलापों पर व्यय की गई राशि इस प्रकार है:

(राशि करोड़ रुपये में)

	2020-21	2021-22	2022-23	2023-24
सीएसआर परिव्यय	52.80	59.13	70.92	92.27
वास्तविक व्यय	53.19	74.14	74.12	94.18

14.3.4.10. पूर्वोत्तर क्षेत्र के विकास के लिए एनआरएल का योगदान

एनआरएल की स्थापना सरकार द्वारा "असम समझौते" के प्रावधानों के अंतर्गत पूर्वोत्तर क्षेत्र के सामाजिक–आर्थिक विकास के लिए आवश्यक जोर देने के उद्देश्य से की गई थी। पिछले कुछ वर्षों में, कंपनी हितधारकों की अपेक्षाओं को पूरा करने में सक्षम रही है और आज यह क्षेत्र की सबसे बड़ी परिचालन औद्योगिक इकाई है। पूर्वोत्तर क्षेत्रों के विकास के लिए एनआरएल के योगदान का सारांश नीचे दिया गया है।

मूल्य वर्धित परियोजनाओं में निवेश

एनआरएल की रिफाइनरी परियोजना ₹ 3,461 करोड़ की स्वीकृत परियोजना लागत के भीतर क्रियान्वित की गई थी। रिफाइनरी के शुरू होने के बाद से, एनआरएल जीविका और विकास सुनिश्चित करने के लिए कई मूल्य वर्धित परियोजनाओं को क्रियान्वित कर रहा है। पूर्वोत्तर सीमा पर सिलीगुड़ी में एक विपणन टर्मिनल की स्थापना को छोड़कर, ऐसी सभी परियोजनाएं पूर्वोत्तर क्षेत्र में है। इस पर एनआरएल का कुल निवेश नीचे दिए गए विवरण के अनुसार है:

क्र. सं	परियोजना	निवेश (करोड़ में)	टिप्पणी
1	10 टीएमटीपीए क्षमता का एलपीजी बॉटलिंग प्लांट	6	वर्ष 2002–03 में शुरू किया किया गया
2	कोक कैल्सीनेशन इकाई	90	वर्ष 2004–05 में शुरू किया किया गया
3	225 टीएमटीपीए क्षमता का मोटर स्पिरिट प्लांट	297	वर्ष 2006–07 में शुरू किया किया गया
4	सिलिगुन मार्केटिंग टर्मिनल	186	वर्ष 2008–09 में ऑयल इंडिया लिमिटेड की नूरनालीगढ़–सिलीगुड़ी उत्पाद पाइपलाइन से जुड़ी परियोजना के रूप में शुरू किया गया
5	डीजल गुणवत्ता उन्नयन परियोजना	435	100% क्षमता उपयोग कर बीएस–एचएसडी के उत्पादन के लिए वर्ष 2010–11 में शुरू किया गया
6	नेफ्था स्प्लिटर यूनिट	87	2013–14 में 160 टीएमटीपीए पेट्रोकेमिकल ग्रेड नेफ्था उत्पादन के लिए कमीशन किया गया
7	वैक्स परियोजना	676	मार्च 2015 में शुरू किया गया। एनआरएल 50टीएमटीपीए वैक्स उत्पादन करके देश में सबसे बड़ी वैक्स उत्पादक इकाई के रूप में उभरी है।
8	संयुक्त उद्यम में निवेश: असम गैस क्रैकर परियोजना	142	ब्रह्मपुत्र क्रैकर एंड पॉलीमर लिमिटेड में 10% इक्विटी भागीदारी
9	संयुक्त उद्यम में निवेश: दुलाजन से नुमालीगढ़ तक प्राकृतिक गैस पाइपलाइन	43	डीएनपी लिमिटेड में 26% इक्विटी भागीदारी।
10	डीजल हाइड्रोट्रीटर यूनिट (डीएचटी)	1,031	वर्ष 2018–19 में शुरू किया गया।
11	माउंडेड बुलेट प्रोजेक्ट	122	29.10.18 को यांत्रिक संबंधी कार्य पूर्ण होने की घोषणा की गई
12	संयुक्त उद्यम में निवेश: असम बायो रिफाइनरी प्राइवेट लिमिटेड	138	कार्यान्वयनाधीन (50% इक्विटी भागीदारी)
13	संयुक्त उद्यम में निवेश: इन्द्रधनुष गैस ग्रिड लिमिटेड	198	कार्यान्वयनाधीन (20% इक्विटी भागीदारी)
14	एलपीजी बॉटलिंग प्लांट की क्षमता में 10 से 42 टीएमटीपीए की वृद्धि	10	वर्ष 2017–18 में शुरू किया गया
15	एनआरईपी– नुमालीगढ़ में रिफाइनरी 6 मिलियन	18,968	कार्यान्वयनाधीन
16	पारादीप नुमालीगढ़ क्रूड ऑयल पाइपलाइन	9,058	कार्यान्वयनाधीन
17	ग्रीन हाइड्रोजन प्लांट–2.4 केटीपीए	170	कार्यान्वयनाधीन
18	डीसीयू का पुनरुद्धार	370	कार्यान्वयनाधीन
19	दबीदुबी एलपीजी सुविधा	338	कार्यान्वयनाधीन
20	पीएफसीसी इकाई में पावर रिकवरी टर्बाइन	293	कार्यान्वयनाधीन
21	पेट्रोरसायन परियोजना	7,231	कार्यान्वयनाधीन
22	एनआरईपी के लिए कोल ब्लम संरचनात्मक परियोजना	635	कार्यान्वयनाधीन
	कुल	**40,524**	

राजकोष में योगदान

वाणिज्यिक प्रचालन शुरू होने से लेकर वर्ष 2022–23 तक, एनआरएल ने केंद्र और राज्य के राजकोष में ₹ 51,658 करोड़ से अधिक का योगदान दिया है। पिछले तीन वर्षों और वर्तमान वर्ष के दौरान दिसंबर 2023 तक राजकोष में एनआरएल का योगदान निम्नानुसार है:

(राशि करोड़ रुपये में)

	2020-21	2021-22	2022-23	2023-24
केन्द्रीय राजकोष	5,863	5,330	4,358	3,389
राज्यिक राजकोष	605	480	658	430
कुल	**6,468**	**5,810**	**5,016**	**3,819**

औद्योगिक सफलता का प्रदर्शन

पिछले कुछ वर्षों में, एनआरएल पूर्वोत्तर भारत में सफल औद्योगिक के रूप में उभर कर आया है, जिससे इस क्षेत्र में भविष्य में निवेश को आकर्षित करने में सहायता मिली है।

14.4. अन्य सीपीएसई

14.4.1. भारत पेट्रो रिसोर्सेज लिमिटेड (बीपीआरएल)

भारत पेट्रो रिसोर्सेज लिमिटेड (बीपीआरएल) की सत्रह ब्लॉकों में भागीदारी है, जिनमें से आठ भारत में और नौ विदेश में हैं। इसके अतिरिक्त, बीपीआरएल के पास रूस में चार उत्पादन ब्लॉकों के लाइसेंस रखने वाली दो रूसी संस्थाओं में इक्विटी हिस्सेदारी है।

भारत में आठ ब्लॉकों में से पांच को नई अन्वेषण लाइसेंसिंग नीति (एनईएलपी) के विभिन्न दौरों के अंतर्गत अधिग्रहित किया गया था, एक ब्लॉक को खोजे गए छोटे क्षेत्रों (डीएसएफ) बोली दौर 1 के तहत और दो ब्लॉकों को ओपन एकरेज लाइसेंसिंग नीति (ओएएलपी) बोली दौर I के तहत संविदा प्रदान की गई थी।

नौ विदेशी ब्लॉकों में से पांच ब्राजील में, दो संयुक्त अरब अमीरात में और एक–एक मोजाम्बिक और इंडोनेशिया में हैं। बीपीआरएल के ब्लॉक अन्वेषण, मूल्यांकन, विकास और उत्पादन के विभिन्न चरणों में हैं। बीपीआरएल और उसकी सहायक कंपनियों के पास कुल एकरेज करीब 21,380 वर्ग किलोमीटर है, जिसमें से करीब 50% हिस्सा अपतटीय है।

रूस

बीपीआरएल, आईओसीएल और ओआईएल से मिलकर बने भारतीय संघ ("आईसी") ने सिंगापुर में निगमित अपनी पूर्ण स्वामित्व वाली सहायक कंपनियों और विशेष प्रयोजन तंत्र के माध्यम से एलएलसी तास–युर्याख नेफ्टेगाजडोब्याचा ("टीवाईएनजीडी एलएलसी") में 29.9% इक्विटी हिस्सेदारी है, अक्टूबर 2016 में रोसनेफ्ट से जेएससी वैंकोरनेफ्ट में 23.9% इक्विटी हिस्सेदारी प्राप्त की। जेएससी वैंकोरनेफ्ट के वोस्तोक एलएलसी में 50.1% शेयर, ओएनजीसी विदेश लिमिटेड में 26% शेयर और आईसी के पास वैंकोर इंडिया प्राइवेट लिमिटेड ("वीआईपीएल", सिंगापुर में आईसी सहायक कंपनियों की संयुक्त उद्यम कंपनी) के माध्यम से शेष 23.9% हिस्सेदारी प्राप्त की है। इस परिसंपत्ति में पूर्वी साइबेरिया में स्थित वानकोरकॉय क्षेत्र शामिल है, जिसमें बीपीआरएल की हिस्सेदारी 7.887% है। जेएससी वानकोर्नेफ्ट में 7.887% हिस्सेदारी के अधिग्रहण के लिए किए गए निवेश 589 मिलियन अमेरिकी डॉलर थी। टीवाईएनजीडी एलएलसी में, रोसनेफ्ट की 50.1% हिस्सेदारी है, ब्रिटिश पेट्रोलियम की 20% हिस्सेदारी है और आईसी की शेष 29.9% हिस्सेदारी है, जो तास इंडिया प्राइवेट लिमिटेड ("टीआईपीएल सिंगापुर में आईसी की सहायक कंपनियों की संयुक्त उद्यम कंपनी है") के माध्यम से है। इस परिसंपत्ति में पूर्वी साइबेरिया में स्थित श्रेडनेबोटुओबिस्कॉय क्षेत्र शामिल है। बीपीआरएल की हिस्सेदारी 9.867% है। एलएलसी टीवाईएनजीडी में 9.867% हिस्सेदारी के अधिग्रहण के लिए किए गए निवेश 430 मिलियन अमरीकी डालर थी।

लोअर जकुम

अबू धाबी अपतटीय शेलो वाटर में स्थित लोअर जकुम क्षेत्र सन 1967 से कच्चे तेल का उत्पादन कर रहा है। बीपीआरएल, ओवीएल और आईओसीएल से मिलकर बने भारतीय संघ ने मार्च 2018 में संयुक्त

अरब अमीरात के अबू धाबी में अपतटीय उत्पादक तेल परिसंपत्ति, लोअर जकुम कंसेशन में 10% हिस्सेदारी प्राप्त की।

लोअर जकुम कंसेशन में भारतीय संघ की हिस्सेदारी नीदरलैंड में निगमित एसपीवी फाल्कन ऑयल एंड गैस बीवी के माध्यम से है, जहाँ बीपीआरएल नीदरलैंड में अपनी स्टेप–डाउन सहायक कंपनी बीपीआरएल इंटरनेशनल वेंचर्स बीवी के माध्यम से 30% शेयर रखती है। एफओजी बीवी के शेयरधारक ओएनजीसी नाइल गंगा बीवी, बीपीआरएल इंटरनेशनल वेंचर्स बीवी और इंडऑयल ग्लोबल बीवी हैं, जिनकी क्रमशः 40%, 30% और 30% शेयरधारिता है। रियायत की अवधि 9 मार्च 2018 से 40 वर्ष है। लोअर जकुम रियायत में अन्य शेयरधारक अबू धाबी नेशनल ऑयल कंपनी (60%), जोडको (10%, जापान की इनपेक्स कॉर्पोरेशन की पूर्ण स्वामित्व वाली सहायक कंपनी), वाइना नेशनल पेट्रोलियम कॉर्पोरेशन (10%), इटली की ईएनआई (5%) और फ्रांस की टोटल एसए (5%) हैं। वर्तमान में दास ब्लेंड ग्रेड में औसतन 420,000 बीओपीडी कच्चे तेल का उत्पादन हो रहा है। वर्ष 2023–24 के दौरान, बीपीसीएल समूह रिफाइनरियों ने लोअर जकुम रियायत से अपने इक्विटी ऑयल के रूप में लगभग 4.02 मिलियन बैरल दास ब्लेंड कच्चे तेल का एकत्रित किया है। बीपीआरएल को अप्रैल 2023–दिसंबर 2023 के लिए 13.80 मिलियन अमरीकी डालर का लाभांश प्राप्त हुआ है। उत्पादन को बढ़ाने और उसका संवर्धन करने के लिए दीर्घावधिक विकास योजना–1 परियोजना कार्यान्वयनाधीन है।

मोजाम्बिक

मोजाम्बिक में, उत्तरी मोजाम्बिक के तट से दूर रोवुमा बेसिन, अपतटीय क्षेत्र 1 में प्राकृतिक गैस की विशाल मात्रा की खोज के बाद, क्षेत्र 1 रियायतकर्ताओं ने अपतटीय गोल्फिन्हो–अतुम खोज क्षेत्र से खोजी गई गैस के मुद्रीकरण के लिए 2 ट्रेन (2x6.56 एमएमटीपीए) ऑनशोर प्रारंभिक एलएनजी परियोजना विकसित करने के लिए 18 जून 2019 को अंतिम निवेश निर्णय (एफआईडी) की घोषणा की। एफआईडी की घोषणा से, गोल्फिन्हो–अतुम क्षेत्र विकास योजना प्रभावी हो गई और 30 वर्षों की विकास और उत्पादन अवधि शुरू हुई। जबकि परियोजना मार्च 2021 तक निर्धारित समय और बजट के भीतर थी, मार्च 2021 के अंत में अफुंगी परियोजना स्थल के आसपास सुरक्षा घटनाओं के कारण, ऑपरेटर ने जोओए, ईपीसीसी और अन्य सभी संविदाओं के अंतर्गत फोर्स मैज्योर (एफएम) घोषित किया क्योंकि वे सुरक्षित पेट्रोलियम संचालन करने के अपने दायित्वों को पूरा नहीं कर पाए थे। मोजाम्बिक सरकार शांति की बहाली और सुरक्षा स्थिति संबंधी समस्याओं का समाधान करने की दिशा में काम कर रही है। मोजाम्बिक सेना रवांडा और दक्षिण अफ्रीकी विकास समुदाय (एसएडीसी) की संयुक्त सेनाओं के साथ मिलकर इस क्षेत्र में अपने अभियान जारी रखे हुए है। क्षेत्र 1 परियोजना स्थानीय सामाजिक और आर्थिक अवसंरचना के विकास में सहायता कर रही है, और वर्तमान में कृषि, जल और स्वच्छता, स्वास्थ्य, शिक्षा, क्षमता निर्माण, मत्स्य पालन, सौर ऊर्जा और लघु व्यवसाय विकास के क्षेत्रों में विभिन्न परियोजनाओं को क्रियान्वित कर रही है। जबकि परियोजना अप्रत्याशित परिस्थितियों में बनी हुई है, संविदाकारों के साथ संबंध रचनात्मक बने हुए हैं और स्थानीय सामग्री, रोजगार और प्रशिक्षण आदि की संवेदनशीलता को देखते हुए स्थानीय मोजाम्बिक कंपनियों के साथ स्थिति की समीक्षा करने के लिए विशेष ध्यान रखा गया है। ऑपरेटर ने सूचित किया है कि साइट पर उपकरण और अवसंरचना संरक्षित और अच्छी स्थिति में है।

ब्राज़ील

आईबीवी ब्राज़ील (आईबीवी) को वर्ष 2008 में बीपीआरएल (बीपीसीएल की पूर्ण स्वामित्व वाली सहायक कंपनी) और बीआईएल की पूर्ण स्वामित्व वाली सहायक कंपनियों की 50:50 संयुक्त उद्यम कंपनी के रूप में निगमित किया गया था, जो उनकी विदेशी सहायक कंपनियों जैसे बीपीआरएल वेंचर्स (नीदरलैंड) और वीडियोकॉन एनर्जी, ब्रिटिश वर्जिन आइलैंड्स (वीईबीएल) के माध्यम से है। ब्राज़ील अमेरिका में भारत का सबसे बड़ा अपस्ट्रीम निवेश स्थल है और वैश्विक स्तर पर तीसरा सबसे बड़ा निवेश स्थल है। आईबीवी ने पहले ही 1.8 बिलियन अमरीकी डॉलर का निवेश किया है, जिसमें पेट्रोब्रास के साथ एसईएपी–I परियोजना के अंतर्गत बीएम–एसईएएल–11 रियायत के विकास के लिए आईबीवी की पूरी हिस्सेदारी (40%) के लिए सीसीईए द्वारा अनुमोदित 1.6 बिलियन अमरीकी डॉलर का अतिरिक्त परिव्यय शामिल है।

ब्राजील की परिसंपत्तियों में भागीदारी हित (पीआई) आईबीवी के पास है। हितों की वर्तमान स्थिति इस प्रकार है:

बीएम–एसईएएल–11 (40% पीआई, विकास चरण)

बीएम–सी–30 (35.714%, ऑपरेटर पेट्रोरियो के लिए आईसीसी लंदन में जेओए के अनुसार विवाद के अंतर्गत)

बीएम–पीओटी–16 (बंद कर दिया गया, औपचारिक प्रक्रियाधीन है)

बीएम–ईएस–24/24क (बंद कर दिया गया)

ऑनशोर ब्लॉक 1

बीपीआरएल ने आईओसीएल के साथ मिलकर सन 2018 में आयोजित अबू धाबी ब्लॉक लाइसेंसिंग बिड राउंड को सफलतापूर्वक जीता और 24 मार्च 2019 को ऑनशोर ब्लॉक 1 रियायत से सम्मानित किया गया। ऑनशोर ब्लॉक 1 रियायत एक विशेष प्रयोजन तंत्र (एसपीवी), ऊर्जा भारत प्राइवेट लिमिटेड (यूबीपीएल) सिंगापुर के माध्यम से आयोजित की जाती है, जहाँ बीपीआरएल सिंगापुर में अपनी स्वेप–डाउन सहायक कंपनी बीपीआरएल इंटरनेशनल सिंगापुर प्राइवेट लिमिटेड के माध्यम से 50% शेयरधारिता रखी है। यूबीपीएल, अन्वेषण चरण के दौरान ब्लॉक का ऑपरेटर है और ब्लॉक में 100% भागीदारी हित (पीआई) है। ब्लॉक की अन्वेषण अवधि 24 मार्च 2019 से प्रभावी 9 वर्षों के लिए है। ब्लॉक की न्यूनतम प्रतिबद्धता के अनुसार, यूबीपीएल को मार्च 2026 तक 179 मिलियन अमरीकी डॉलर की स्वीकृत निवेश सीमा के साथ पाँच अन्वेषण और चार मूल्यांकन कुओं को ड्रिल करने की आवश्यकता है। ऑनशोर ब्लॉक 1, रुवाइस नगर और रिफाइनिंग कॉम्प्लेक्स के आसपास अल धफरा क्षेत्र में स्थित 6,162 किमी² के क्षेत्र को शामिल करता है, जिसमें पश्चिम में तटीय क्षेत्र भी शामिल है।

इस क्षेत्र में रुवाइस और मिरफा नामक दो मौजूदा अविकसित तेल और गैस क्षेत्र हैं। आज की तारीख तक यूबीपीएल ने रुवाइस खोज के लिए 2 मूल्यांकन कुओं और 4 अन्वेषण कुओं की ड्रिलिंग पूरी कर ली है। परीक्षण के दौरान, रुवाइस मूल्यांकन कुआं आरडब्लू–11 ने @40/64" चोक आकार पर 4,000 बोप्ड प्रवाहित किया। अन्वेषण कुओं में से एक्सएन–79 ने ~250 बोप्ड प्रवाहित किया और भविष्य के कार्यकलापों के लिए स्थगित कर दिया। अपरंपरागत शिलैफ जलाशय को लक्षित करने वाले अन्वेषण कुआ एक्सएन–76 का परीक्षण वर्तमान में चल रहा है। मिरफा खोज के दो मूल्यांकन कुओं और एक अन्वेषण कुएँ की ड्रिलिंग की प्रतिबद्धता को 23 मार्च 2026 तक वैध दूसरी अन्वेषण अवधि में पूरा करने की योजना है।

रुवाइस खोज के लिए क्षेत्र विकास योजना (एफडीपी) 4 अक्टूबर 2022 को नियामक की स्वीकृति के लिए प्रस्तुत की गई थी। वर्तमान स्थिति के अनुसार, रियायत समझौते के दस्तावेजों पर हस्ताक्षर करने के लिए अबू धाबी सरकार की स्वीकृति का इंतजार है। मार्च 2024 के अंत तक पीसीए पर हस्ताक्षर किए जा सकते हैं। रुवाइस फील्ड से पहला तेल उत्पादन रियायत समझौते के निष्पादन के 18 महीने बाद मिलने की उम्मीद है। एसेट यूटिलाइजेशन एग्रीमेंट और क्रूड सेल्स एग्रीमेंट पर एडीएनओसी के साथ आगे का संरेखण प्रगति पर है। प्रस्तुत एफडीपी के अनुसार, क्षेत्र से उत्पादन को ~70 किलोमीटर की मल्टीफेज उत्पाद पाइपलाइन के माध्यम से एडीएनओसी की बु हासा प्रसंस्करण सुविधाओं तक पहुँचाया जाएगा। यूबीपीएल के पास या तो निर्यात टर्मिनलों में से किसी से अपना इक्विटी क्रूड उठाने या एडीएनओसी को बेचने का विकल्प है। यूबीपीएल बोर्ड ने रुवाइस फील्ड के विकास के लिए 166.8 मिलियन अमरीकी डॉलर के पूंजीगत व्यय को पहले ही मंजूरी दे दी है।

इंडोनेशिया

बीपीआरएल ने सितंबर 2009 में नुनुकन प्रोडक्शन शेयरिंग कॉन्ट्रैक्ट (पीएससी) में भाग लिया और इसकी स्टेप–डाउन सहायक कंपनी बीपीआरएल वेंचर्स इंडोनेशिया बीवी के माध्यम से 16.2% की भागीदारी हित (पीआई) है। पीटी पर्टामिना हुलु एनर्जी नुनुकन कंपनी (पीएचईएनसी), इंडोनेशिया की राष्ट्रीय तेल कंपनी पर्टामिना की पूर्ण स्वामित्व वाली सहायक कंपनी है, जिसके पास संघ में 83.8% 1 पीआई है और वह प्रचालक है। उत्पादन साझाकरण संविदा (पीएससी) पर 12 दिसंबर 2004 को हस्ताक्षर किए गए थे और यह 30 वर्षों की अवधि के लिए वैध है, अर्थात 2034 तक। यह ब्लॉक उत्तरी कालीमंतन प्रांत के तारकन बेसिन में बन्यू द्वीप के तट से दूर शेसी वाटर में स्थित है।

अन्वेषण चरण के तहत पीएससी के अनुसार प्रतिबद्ध न्यूनतम कार्य संबंधी कार्यक्रम पूरा हो चुका है। मूल्यांकन ड्रिलिंग कार्यक्रम, भूवैज्ञानिक, भूभौतिकीय और जलाशय अध्ययनों के परिणामों के साथ–साथ स्वतंत्र रिजर्व प्रमाणीकरण ने पारंग खोज से पुनर्प्राप्त करने योग्य तेल और गैस संसाधन मात्रा में महत्वपूर्ण कमी का संकेत दिया था। ब्लॉक में आगे का सफर तय करने के लिए विभिन्न वैकल्पिक विकल्पों का मूल्यांकन किया जा रहा है।

सीवी–ओएनएचपी–2017/9 (ऑनशोर कैम्बे बेसिन, गुजरात) साइट

कैम्बे बेसिन, गुजरात में ब्लॉक सीवी–ओएनएचपी–2017/9 को ओपन एकरेज लाइसेंसिंग पॉलिसी (ओएएलपी) बोली दौर–I के तहत बीपीआरएल को दिया गया था और ब्लॉक के रेवेन्यू शेयरिंग कॉन्ट्रैक्ट (आरएससी) पर 1 अक्टूबर 2018 को भारत सरकार के साथ हस्ताक्षर किए गए थे। बीपीआरएल 60%

पीआई के साथ ब्लॉक में प्रमुख प्रचालक है और ओएनजीसी 40% पीआई सहित भागीदार है।

आईपीएम निविदा को जीईएम पोर्टल के माध्यम से मंगाया गया और तीन कुओं की ड्रिलिंग और परीक्षण के लिए मेसर्स श्लमबर्गर को दिया गया। 2 स्थानों के लिए साइट निर्माण कार्य पूरा हो चुका है और तीसरे के लिए काम चल रहा है। पहला अन्वेषण कुआं 20 मार्च 2024 को शुरू होने की उम्मीद है।

सीवाई–ओएनएन–2002/2 (मदनम क्षेत्र, ऑनशोर कावेरी घाटी, तमिलनाडु)

कावेरी घाटी में ऑन–लैंड ब्लॉक सीवाई–ओएनएन –2002/2 में बीपीआरएल का पीआई 40% है, जिसमें ओएनजीसी 60% पीआई सहित प्रचालक है। अन्वेषण चरण के दौरान, संघ ने एक स्थान पर तेल की खोज की है, जिसका नाम मदनम आयल डिस्कवरी है। खोज के आधार पर, दो मूल्यांकन कुओं की ड्रिलिंग की गई। पहले मूल्यांकन कुएँ से गैस निकली, जिसकी पहचान तिरुनगरी गैस खोज के रूप में की गई। दूसरे मूल्यांकन कुएँ से तेल/गैस निकली। संघ ने क्षेत्र विकास चरण के तहत 10 कुओं की ड्रिलिंग पूरी कर ली है।

इस ब्लॉक में वर्तमान में 6 उत्पादक कुएं हैं, जिनका संयुक्त मासिक औसत तेल उत्पादन 5,673 टन (बीपीआरएल का हिस्सा 2,270 टन) है। वित्त वर्ष 2023–24 के दौरान, ब्लॉक से 67,880 टन तेल (बीपीआरएल का हिस्सा 27,152 टन) का उत्पादन किया गया है।

सीबी–ओएनएन–2010/11 (ऑनशोर कैम्बे घाटी, गुजरात)

सीबी–ओएनएन–2010/11, ऑन–लैंड ब्लॉक भारत सरकार द्वारा एक संघ को प्रदान किया गया है गेल, बीपीआरएल ईआईएल, बीएफआईएल और एमआईईएल शामिल हैं, जिसमें 25% पीआई ब्लॉक का प्रमुख प्रचालक है। बीपीआरएल के पास 25% हिस्सेदारी है और यह ब्लॉक का संयुक्त संचालक है।

संयुक्त परिचालन समझौते (जेओए) के तहत एमआईईएल के नकद भार भुगतान में चूक के कारण, अन्य गैर–चूककर्ता पक्षकार 15% पीआई के एमआईईएल वितरण को उनके मौजूदा हिस्से में अनुपातिक रूप में वितरित करने के लिए सहमत हुए हैं, जिसके लिए अनुमोदन के लिए डीजीएच को अनुरोध प्रस्तुत भेजा गया है। गैलियानल की फील्ड डेवलपमेंट प्लान (एफडीपी) को 10 फरवरी 2020 को मंजूरी दी गई थी और विकास संबंधी कार्यकलाप प्रगति पर हैं।

एए–ओएनएन–2010/3 (असम अराकान घाटी, असम)

एए–ओएनएन–2010/3, ऑन–लैंड ब्लॉक भारत सरकार द्वारा ओआईएल, ओएनजीसी और बीपीआरएल के एक संघ को प्रदान किया गया था। इसमें ऑयल का 40: पीआई है और वह ब्लॉक का प्रचालक है। बीपीआरएल के पास ब्लॉक में 20% पीआई और ओएनजीसी के पास 40% पीआई है। ब्लॉक के लिए पेट्रोलियम अन्वेषण लाइसेंस असम सरकार द्वारा 12 दिसंबर 2013 से प्रभावी रूप से प्रदान किया गया था। ब्लॉक में संघ द्वारा प्रतिबद्ध न्यूनतम कार्य कार्यक्रम (एमडब्ल्यूपी) पूरा हो गया है एमडब्ल्यूपी में 101 वर्ग किलोमीटर का 3डी एपीआई और 3,500 मीटर के लक्ष्य तक अन्वेषण कुएं की ड्रिलिंग शामिल थी। 3डी भूकंपीय आंकड़ों के विवरण के आधार पर, एलके+टीएच गठन की संभावना का खोज करने के लिए 6,450 मीटर की गहराई तक ड्रिलिंग करने के लिए कुएं की योजना बनाई गई थी। एसडीवाईए–1 कुआं खोदते समय 5,892 मीटर पर कुछ अड़चन आ गई थी और सुरक्षा कारणों से कुएं को फिर से डिजाइन किए बिना आगे ड्रिल करना संभव नहीं था। 6,450 मीटर की लक्षित गहराई के स्थान पर कुआं 5,892 मीटर तक ड्रिल किया गया और उसे बंद करके छोड़ दिया गया। अन्वेषण अवधि 17.05.2023 तक वैध थी। प्रचालक ने डीजीएच/एमओपीएंडएनजी से ब्लॉक में 3 वर्ष की विशेष छूट के लिए आवेदन किया है।

एए–ओएनएचपी–2017/12 (असम अराकान घाटी, असम और अरुणाचल प्रदेश)

भारत सरकार ने ओएएलपी। बोली दौर के तहत ओआईएल को ब्लॉक एए–ओएनएचपी–2017/12 प्रदान किया था। दिसंबर 2019 में बीपीआरएल ने 10% पीआई सहित ब्लॉक प्रचालक बना रहा। ब्लॉक के अन्य संघ साझेदार प्रचालक के रूप में ओआईएल (60% पीआई), आईओसी (20% पीआई) और नुमालीगढ़ रिफाइनरीज लिमिटेड (10%) हैं। संपूर्ण ब्लॉक 469 वर्ग किमी क्षेत्र में है, जिसमें से 468.50 वर्ग किमी असम में और 0.5 वर्ग किमी अरुणाचल प्रदेश में है।

अन्वेषण अवधि 23 नवंबर 2023 तक वैध थी। ब्लॉक में एयरबोर्न ग्रेविटी ग्रैडियोमेट्री सर्वेक्षण, 2डी और 3डी भूकंपीय डेटा एपीआई पूरा हो चुका है। दो अन्वेषण कुओं की ड्रिलिंग की प्रतिबद्धता थी। एविएशन रिसर्च सेंटर से अनापत्ति प्रमाणपत्र केवल एक एमडब्ल्यूपी कुएं (ओडब्ल्यूएमए) के लिए दी गई है। कुएं ओडब्ल्यूएमए के लिए वन विभाग से मंजूरी प्रतिक्षीत है।

14.4.2. बामर लॉरी इन्वेस्टमेंट्स लिमिटेड (बीएलआईएल):

भारत सरकार ने तेल के अपने नियोजित विनियमन और अर्थव्यवस्था के वैश्वीकरण के मद्देनजर, बीपी कंपनी लिमिटेड में अपने कुल इक्विटी धारण का 33.58% विनिवेश करने का निर्णय लिया है, जो प्रबंधन के साथ कार्यनीतिक साझेदार है। परिणामस्वरूप, पूर्ववर्ती सहायक कंपनी बामर लॉरी एंड कंपनी लिमिटेड (1) की शेयरधारिता को बामर लॉरी इन्वेस्टमेंट लिमिटेड (बीएलआईएल) के पक्षकार के रूप में अलग कर दिया गया, जिसे 20 सितंबर 2001 को कंपनी अधिनियम, 1956 के तहत निगमित किया गया था। भारत के राष्ट्रपति के पास प्रति ₹ 10 के 1,32,46,098 इक्विटी शेयर हैं, जो कंपनी में कुल चुकता इक्विटी पूंजी का 59.67% है। बीएलआईएल पेट्रोलियम और प्राकृतिक गैस मंत्रालय के प्रशासनिक नियंत्रण में है और इसका पंजीकृत कार्यालय कोलकाता में है। कंपनी के पास अपनी सहायक कंपनी, अर्थात बामर लॉरी एंड कंपनी लिमिटेड (बीएल) के इक्विटी शेयरों को रखने के अलावा कोई व्यावसायिक कार्यकलाप नहीं है। आय का मुख्य स्रोत बीएल से प्राप्त लाभांश आय है। लाभांश आय के अलावा, कंपनी अनुसूचित बैंकों की फॉक्सड/सावधि जमा योजनाओं में निवेश किए गए अपने अधिशेष निधियों से ब्याज अर्जित करती है। बीएलआईएल के संयुक्त उद्यम और सहायक कंपनियाँ निम्नानुसार हैं:

- बीएलआईएल का किसी भी कॉर्पोरेट संस्था के साथ कोई संयुक्त उद्यम नहीं है।
- बीएलआईएल की वर्तमान में एक सहायक कंपनी और एक स्टेप–डाउन सहायक कंपनी है, नामतः

i. बामर लॉरी एंड कंपनी लिमिटेड (कंपनी अधिनियम, 2013 की धारा 2(87) के अनुसार) (जिसे यहां इबीएलए कहा गया है) और इसके बदले में बीएल में एक सहायक कंपनी है, जैसा कि नीचे क्रम संख्या पप में उल्लिखित है।

ii. विशाखापत्तनम पोर्ट लॉजिस्टिक्स पार्क लिमिटेड (कंपनी अधिनियम, 2013 की धारा 2(87) (ii) के अनुसार)

14.4.3. तेल उद्योग विकास बोर्ड (ओआईडीबी)

14.4.3.1. बोर्ड के उद्देश्य और कार्य

तेल उद्योग विकास बोर्ड (ओआईडीबी) की स्थापना 13 जनवरी, 1975 को तेल उद्योग (विकास) अधिनियम, 1974 के तहत तेल उद्योग के विकास के लिए वित्तीय और अन्य सहायता प्रदान करने के लिए की गई थी। अधिनियम की धारा 6 में परिभाषित बोर्ड के कार्यों में, तेल उद्योग के विकास के लिए अनुकूल सभी कार्यकलापों को बढ़ावा देने के लिए ऋण और अनुदान सहित वित्तीय सहायता प्रदान करना शामिल है।

14.4.3.2. संगठनात्मक संरचना

तेल उद्योग विकास बोर्ड के अध्यक्ष सचिव, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय है और अन्य सदस्य निम्नानुसार हैं, अर्थात् सचिव, रसायन और पेट्रोकेमिकल विभाग, अपर सचिव और वित्तीय सलाहकार, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय, संयुक्त सचिव (पीएफसी–I), व्यय विभाग, वित्त मंत्रालय, संयुक्त सचिव (अन्वेषण), पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय, अध्यक्ष–आईओसीएल, ओएनजीसी, गेल के अध्यक्ष और प्रबंध निदेशक, बीपीसीएल, ईआईएल, महानिदेशक, हाइड्रोकार्बन महानिदेशालय, निदेशक (आरएंडडी), आईओसीएल और सचिव, तेल उद्योग विकास बोर्ड सदस्य सचिव के रूप में।

14.4.3.3. बोर्ड के संसाधन

अधिनियम के तहत परिकल्पित विभिन्न कार्यकलापों के लिए आवश्यक निधि, संसद द्वारा उचित विनियोजन के पश्चात स्वदेशी कच्चे तेल पर लगाए गए और एकत्र किए गए उपकर की आय से केंद्र सरकार द्वारा उपलब्ध कराई गई थी। अब तक, ओआईडीबी को उपकर संग्रह में से 1991–92 तक केंद्र सरकार से ₹ 902.40 करोड़ की राशि प्राप्त हुई है, जो आंतरिक उत्पादन के माध्यम से 31.03.2024 तक ₹ 12,041.85 करोड़ (अनंतिम) हो गई है।

14.4.3.4. निधियों का परिनियोजन

i) अनुदान

वर्ष 2023–24 के दौरान, ओआईडीबी ने संस्थानों को अनुदान जारी किया था। हाइड्रोकार्बन महानिदेशालय (डीजीएच), पेट्रोलियम संरक्षण अनुसंधान संघ (पीसीआरए), उच्च प्रौद्योगिकी केंद्र (सीएचटी), तेल उद्योग सुरक्षा निदेशालय (ओआईएसडी), पेट्रोलियम योजना और विश्लेषण सेल (पीपीएसी), आईएसपीआरएल को चरण–II एसपीआर की पूर्व–परियोजना कार्यकलाप और अन्य अनुसंधान एवं विकास परियोजनाओं के लिए ₹ 257.86 करोड़ की निधि प्रदान की गई है।



ii) ऋण

वर्ष के दौरान, गेल की जगदीशपुर हल्दिया धामरा पाइपलाइन परियोजना, आईजीजीएल की उत्तर पूर्व गैस ग्रिड परियोजना और बीसीपीएल की पेट्रोकेमिकल परियोजना के लिए तेल और गैस सार्वजनिक उपक्रमों को ऋण के माध्यम से ₹ 1,411.38 करोड़ की वित्तीय सहायता जारी की गई।



iii) इक्विटी

ओआईडीबी की पूर्ण स्वामित्व वाली सहायक कंपनी इंडियन स्ट्रेटेजिक पेट्रोलियम रिजर्व्स लिमिटेड (आईएसपीआरएल) को तीन स्थानों पर कच्चे तेल के लिए कार्यनीतिक भंडारण के निर्माण का काम सौंपा गया है। ओआईडीबी ने अब तक चरण–1 के तहत विशाखापत्तनम, मैंगलोर और पादुर में कच्चे तेल के भंडारण परियोजनाओं की स्थापना के लिए पूंजीगत लागत के लिए आईएसपीआरएल में इक्विटी निवेश के रूप में ₹ 3,790.05 करोड़ की राशि जारी की है। इसके अतिरिक्त, चरण–2 एसपीआर के लिए पूर्व–परियोजना कार्यकलापों के लिए अनुदान के रूप में आईएसपीआरएल को ₹ 21.97 करोड़ की राशि भी उपलब्ध कराई गई है।

iv) अग्रिम

ओआईडीबी ने अंडमान अपतटीय क्षेत्रों में भूकंपीय सर्वेक्षण करने और अनन्य आर्थिक क्षेत्र (ईईजेड) के गैर–मूल्यांकित अपतटीय बेसिनल क्षेत्रों के मूल्यांकन के लिए डीजीएच को कुल ₹ 965.69 करोड़ का ब्याज मुक्त वापसी योग्य अग्रिम प्रदान किया था, जिसमें से ₹ 565.28 करोड़ वित्तीय वर्ष 2023–24 के दौरान जारी किए गए थे।

v) राजभाषा कीर्ति पुरस्कार

राजभाषा नीति के सर्वोत्तम कार्यान्वयन के लिए, गृह मंत्रालय के राजभाषा विभाग द्वारा वर्ष 2022–23 के लिए राजभाषा **कीर्ति पुरस्कार** हेतु बोर्ड/संस्थाओं की श्रेणी के अंतर्गत तेल उद्योग विकास बोर्ड को "क" श्रेणी में द्वितीय पुरस्कार प्रदान किया गया।



इसके अतिरिक्त, वर्ष 2022–23 में राजभाषा के कार्यान्वयन के लिए नगर राजभाषा कार्यान्वयन समिति, नोएडा द्वारा भी तेल उद्योग विकास बोर्ड को प्रथम पुरस्कार प्रदान किया गया।

14.4.4. तेल उद्योग सुरक्षा निदेशालय (ओआईएसडी)

पेट्रोलियम और प्राकृतिक गैस मंत्रालय के अंतर्गत तकनीकी निदेशालय, तेल उद्योग सुरक्षा निदेशालय (ओआईएसडी) को मानकों को तैयार करने, सुरक्षा लेखा–परीक्षा के माध्यम से इसके कार्यान्वयन की देखरेख करने की जिम्मेदारी सौंपी गई है, ताकि सुरक्षा के स्तर को बढ़ाया जा सके और इस उद्योग में निहित जोखिम को कम किया जा सके। ओआईएसडी मानकों को तेल और गैस कंपनियों द्वारा स्व–नियामक आधार पर लागू किया जाता है।

अपतटीय तेल और गैस अन्वेषण, ड्रिलिंग, उत्पादन और संबंधित गतिविधियों में सुरक्षा को विनियमित करने के लिए पेट्रोलियम और प्राकृतिक गैस (अपतटीय परिचालन में सुरक्षा) नियम 2008 को भारत के राजपत्र में अधिसूचित किया गया था, और ओआईएसडी को जून 2008 में जारी राजपत्र अधिसूचना के अनुसार इन नियमों में निर्धारित शक्तियों और कार्यों का प्रयोग करने के लिए सक्षम प्राधिकारी के रूप में नामित किया गया है। निदेशालय, इन नियमों के प्रावधानों के तहत, अंतर्राष्ट्रीय कार्यप्रणाली के अनुरूप लक्ष्य निर्धारण दृष्टिकोण के अनुरूप अपतटीय प्रतिष्ठानों के संचालन के लिए अनुमोदन प्रदान करता है।

14.4.4.1. वित्त वर्ष 23–24 में OISD द्वारा सुरक्षा लेखा–परीक्षा:

ओआईएसडी समय–समय पर ऑनशोर और ऑफशोर ईएंडपी प्रतिष्ठानों, रिफाइनरी, गैस प्रसंस्करण संयंत्र, सेंट्रल टैंक फार्म, एलएनजी टर्मिनल, पेट्रोकेमिकल संयंत्र, क्रॉस कंट्री पाइपलाइन, एलपीजी बॉटलिंग प्लांट, एलपीजी आयात सुविधा, डिपो, टर्मिनल, एविएशन फ्यूलिंग स्टेशन और ल्यूब ब्लेंडिंग प्लांट के लिए बाहरी सुरक्षा लेखा–परीक्षा (ईएसए) करता है ताकि ओआईएसडी मानकों और वैधानिक विनियमों सहित उनके अनुपालन स्तर की निगरानी की जा सके। जनवरी 2023 से मार्च 2023, वित्त वर्ष 2023–24 और जनवरी 2023 से मार्च 2024 के लिए ओआईएसडी सुरक्षा लेखा–परीक्षा संबंधी निष्पादन नीचे विस्तृत रूप से दिया गया है:

प्रकार/प्रतिस्थापन	इकाई	जनवरी 2023 से मार्च 2023	वित्त वर्ष 2023–24		जनवरी 2023 से मार्च 2024
			योजना	वास्तविक	
रिफाइनरी / पैट्रोरसायन / जीपीपी / सीटीएफ / एलएनजी टर्मिनल	संख्या	03	23	29	32
विपणन प्रतिस्थापन(पीओएल)	संख्या	22	78	80	102
विपणन प्रतिस्थापन(एलपीजी)	संख्या	07	42	48	55
ईएंडपी ऑनशोर	संख्या	13	100	115	128
ईएंडपी ऑफशोर	संख्या	05	20	28	33
कार्पोरेट / एसबीयू स्तर पर सुरक्षा लेखा–परीक्षा	संख्या	01	05	05	06
प्रमुख पत्तन संबंधी लेखा–परीक्षा	संख्या	-	02	05	05
एसपीएम लेखा–परीक्षा	संख्या	05	02	06	11
आईसीजी के साथ आयल स्पील इमरजेंसी तत्परता के लिए संयुक्त निरीक्षण	संख्या	06	02	06	12
कुल योग	**संख्या**	**62**	**274**	**322**	**384**
क्रॉस कंट्री पाइपलाइन	किमी	1,883	11,000	12,362	14,245

टिप्पणी: यह वित्त वर्ष 2023–24 के दौरान ओआईएसडी द्वारा प्रतिस्थापन के साथ–साथ पाइपलाइनों के लिए किया गया अब तक का सबसे बड़ा लेखा–परीक्षा है।

14.4.4.2. शुरूआत पूर्व सुरक्षा संबंधी लेखा–परीक्षा

ओआईएसडी ग्रीन–फील्ड विकास और मौजूदा स्थानों पर प्रमुख अतिरिक्त सुविधाओं के लिए शुरूआत पूर्व सुरक्षा संबंधी लेखा–परीक्षा करता है, ताकि निर्माण चरण में ही वैधानिक आवश्यकता और ओआईएसडी मानकों का अनुपालन सुनिश्चित किया जा सके। जनवरी 2023 से मार्च 2023, वित्त वर्ष 2023–24 और जनवरी 2023 से मार्च 2024 के दौरान किए गए पीसीएसए की स्थिति निम्नानुसार है:

शुरुआत पूर्व सुरक्षा संबंधी लेखा–परीक्षा (पीसीएसए)	इकाई	जनवरी 2023 से मार्च 2023	वास्तविक 2023–24	जनवरी 2023 से मार्च 2024
रिफाइनरी / पैट्रोरसायन / जीपीपी / सीटीएफ / एलएनजी टर्मिनल	संख्या	04	18	22
विपणन प्रतिस्थापन (पीओएल)	संख्या	12	17	29
विपणन प्रतिस्थापन(एलपीजी)	संख्या	03	10	13
ईएंडपी क्षेत्र	संख्या	-	01	01
पाइपलाइन से संबंधित स्थान (पाइपलाईन की लंबाई किमी में)	संख्या (किमी)	05 (647.55)	17 (1701.7)	22 (2349.25)
कुल	**संख्या**	**24**	**63**	**87**

14.4.4.3. अपतटीय प्रतिष्ठानों के लिए संचालन की सहमति:

पेट्रोलियम और प्राकृतिक गैस (अपतटीय परिचालन में सुरक्षा) नियम 2008 के कार्यान्वयन की देखरेख करने के लिए सक्षम प्राधिकारी के रूप में ओआईएसडी अपतटीय प्रतिष्ठानों को संचालन की सहमति (सीटीओ) प्रदान करता है। वित्त वर्ष 2023–24 के लिए स्थिति इस प्रकार है:

अपतटीय प्रतिष्ठानों के लिए 'संचालन की सहमति':	इकाई	जनवरी 2023 से मार्च 2023	वास्तविक 2023–24	जनवरी 2023 से मार्च 2024
निर्धारित अपतटीय प्रतिस्थापन	संख्या	09	04	13
मोबाइल अपतटीय प्रतिस्थापन	**संख्या**	-	15	15
कुल	**संख्या**	**09**	**19**	**28**

14.4.4.4. ओआईएसडी मानकों का संशोधन

ओआईएसडी समिति के सदस्यों के अनुभव का लाभ उठाकर तथा राष्ट्रीय और अंतर्राष्ट्रीय मानकों का हवाला देकर सभी हितधारकों को शामिल करते हुए सहभागी प्रक्रिया के माध्यम से तेल और गैस उद्योग के लिए मानक विकसित करता है। ये मानक तेल और गैस उद्योग के विभिन्न पहलुओं में अंतर्निहित डिजाइन सुरक्षा, परिसंपत्ति अखंडता और सर्वोत्तम परिचालन संबंधी कार्यप्रणाली को शामिल करते हैं। ओआईएसडी मानकों की समय–समय पर समीक्षा की जाती है ताकि नए मानकों को विकसित करने, नवीनतम तकनीकी विकास के साथ–साथ जमीनी स्तर पर मौजूदा अनुभवों को शामिल करने के लिए मौजूदा मानकों को अद्यतन / संशोधित करने की आवश्यकताओं का पता लगाया जा सके।

ओआईएसडी ने तेल और गैस उद्योग के लिए 118 तकनीकी सुरक्षा मानक विकसित किए हैं। इनमें से 23 मानक पेट्रोलियम नियम, 2002, गैस सिलेंडर नियम, 2016, स्थिर और मोबाइल प्रेशर वेसल्स (अनफायर्ड) नियम, 2016, तेल खान विनियम, 2017 और पीएनजीआरबी विनियमों के वैधानिक प्रावधानों में शामिल हैं।

ओआईएसडी द्वारा 30 जून 2023 को सुरक्षा परिषद द्वारा 16 संशोधित मानकों को मंजूरी दी गई तथा इसे उद्योग के लिए जारी किया गया। वर्तमान में, "हाइड्रोजन सुरक्षा और संपीड़ित बायो गैस (सीबीजी) सुरक्षा" सहित 03 नए सुरक्षा मानक विकास के अधीन हैं तथा 55 मौजूदा मानक संशोधन के विभिन्न चरणों में हैं।

14.4.4.5. प्रशिक्षण/संगोष्ठी/सम्मेलन/कार्यशाला/वेबिनार

नवीनतम तकनीकी विकास, मामला अध्ययन आदि के प्रसार के लिए ओआईएसडी द्वारा तेल एवं गैस उद्योग के लिए प्रशिक्षण / संगोष्ठी / सम्मेलन / कार्यशाला / वेबिनार आयोजित किए जाते हैं।

ओआईएसडी ने जनवरी 2023 से मार्च 2023 के दौरान 163 लेखा–परीक्षकों के लिए 4 आंतरिक लेखा परीक्षक प्रशिक्षण, 480 प्रतिभागियों को शामिल करने वाले 2 सुरक्षा संवाद और अन्य ज्ञान साझाकरण सत्र आयोजित किए। इन कार्यक्रमों में कुल 1,225 प्रतिभागियों ने भाग लिया।

ओआईएसडी ने ऑडिटिंग कौशल को बढ़ाने के लिए वित्त वर्ष 2023–24 के दौरान 10 आंतरिक लेखा

परीक्षक प्रशिक्षण आयोजित किए। विभिन्न तेल और गैस उद्योगों के कुल 309 आंतरिक लेखा परीक्षकों को प्रशिक्षित किया गया।

वित्त वर्ष 2023–24 के दौरान, ओआईएसडी ने 12 आंतरिक लेखा परीक्षक प्रशिक्षण आयोजित किए। सुरक्षा संवाद वेबिनार में 3878 प्रतिभागियों ने विभिन्न विषयों पर चर्चा की, जिनमें "मॉक ड्रिल और सामान्य अवलोकन", "बाघजन घटना और ए लैंड रीबॉर्न नामक फिल्म", "ऑफशोर एसपीएम घटना और ऑनशोर पाइपलाइन फटने की घटना", "ठोस अपशिष्ट प्रबंधन, कार्यस्थलों पर स्वास्थ्य और स्वच्छता, पर्यावरण संरक्षण के उपाय, गुड हाउसकीपिंग और "स्वच्छता बनाए रखने की पहल", "रिफाइनरी में हुई घटनाओं पर केस स्टडी और विश्लेषण", "एलपीजी प्लांट में हाल की घटनाओं का मामला अध्ययन और एलपीजी बल्क/पैक ट्रक का निरीक्षण" आदि शामिल थे। उद्योग के डोमेन विशेषज्ञों ने गलतियों से सीखने के लिए अनुभव साझा किए।

नए जारी किए गए प्रमुख ओआईएसडी मानकों अर्थात 178 (परिवर्तन का प्रबंधन), 105 (वर्क परमिट सिस्टम), 206 (सुरक्षा प्रबंधन प्रणाली) और 227 (तेल और गैस उद्योग में आपातकालीन प्रतिक्रिया और तैयारी) के लिए प्रासंगिक मामला अध्ययन सहित सुरक्षा संवाद का आयोजन किया गया, ताकि उद्योग संशोधित मानकों, प्रमुख परिवर्तनों और लेखा–परीक्षा/दुर्घटना जांच के दौरान देखे गए उस विशेष मानक से संबंधित सामान्य अंतराल पर अपनी समझ बढ़ा सके।

ओआईएसडी ने एचएमईएल के साथ मिलकर 4 और 5 दिसंबर 2023 को बठिंडा, पंजाब में "सुरक्षा सम्मेलन–2023" का सफलतापूर्वक आयोजन किया, जिसमें तेल और गैस उद्योग से 128 प्रतिभागियों ने भाग लिया।

14.4.4.6. घटना की जांच और विश्लेषण:

ओआईएसडी घटना के मूल कारणों का विश्लेषण करने के लिए प्रमुख घटनाओं की जांच करता है। तेल और गैस उद्योग की प्रमुख घटनाओं का एक डेटाबैंक बनाए रखा जाता है और रुझानों, धारणा के क्षेत्रों और आवश्यक सुधारात्मक कार्रवाई का आकलन करने के लिए उसका विश्लेषण किया जाता है। फिर इन्हें आवधिक बुलेटिनों अर्थात 'सुरक्षा चेतना'; सुरक्षा संबंधी चेतावनी और मामला अध्ययन; संगोष्ठी और कार्यशालाएँ के माध्यम से उद्योग में प्रसारित किया जाता है।

जनवरी 2023 से मार्च 2023 के दौरान, ओआईएसडी द्वारा छह प्रमुख घटनाओं की जाँच की गई है, जिनमें से एक घटना की पीएनजीबीआर के साथ संयुक्त रूप से जाँच की गई थी।

वित्त वर्ष 2023–24 के दौरान ओआईएसडी द्वारा बारह प्रमुख घटनाओं की जाँच की गई है, जिनमें से तीन घटनाओं की पीएनजीआरबी के साथ संयुक्त रूप से जाँच की गई थी।

1 जनवरी 2023 से 31 मार्च 2024 तक, ओआईएसडी ने 18 प्रमुख दुर्घटनाओं की जाँच की, जिनमें से 4 घटनाओं की पीएनजीआरबी के साथ संयुक्त रूप से जाँच की गई।

वित्त वर्ष 2023–24 के दौरान ओआईएसडी की वेबसाइट पर कुल 13 मामला संबंधी अध्ययन अपलोड की गईं और 14 सुरक्षा संबंधी चेतावनी जारी किए गए। "सुरक्षा चेतना" ओआईएसडी न्यूज़लेटर के दो संस्करण में प्रकाशित किए गए हैं।

14.4.4.7. सुरक्षा परिषद:

सुरक्षा परिषद ने सचिव, पेट्रोलियम और प्राकृतिक गैस मंत्रालय की अध्यक्षता में दिनांक 30 जून 2023 को आयोजित परिषद की 40वीं बैठक में सुरक्षा पर एपेक्स निकाय, सुरक्षा संबंधी प्रदर्शन की समीक्षा की। बैठक के दौरान स्वीकृत और/या विचार–विमर्श किए गए मुख्य मुद्दे इस प्रकार हैं:

- वर्ष 2022–23 में ओआईएसडी द्वारा की जाने वाली प्रमुख कार्यकलाप और वर्ष 2023–24 के लिए कार्यकलाप योजना।
- दो वर्षों से अधिक समय से लंबित ओआईएसडी सुरक्षा संबंधी लेखा–परीक्षा अनुशंसाओं की अनुपालन स्थिति की समीक्षा और उनके धारणा क्षेत्र।
- 16 संशोधित ओआईएसडी मानकों को स्वीकृति।
- बाघजान ब्लोआउट घटना से संबंधित एचएलसी की अनुशंसाओं का अनुपालन।
- चक्रवात तौकते घटना से संबंधित एचएलसी की अनुशंसाओं का अनुपालन।
- वित्त वर्ष 2022–23 में ओआईएसडी के वास्तविक व्यय और वित्त वर्ष 2023–24 के लिए बजट अनुमान को स्वीकृति।

14.4.5. हाइड्रोकार्बन महानिदेशालय (डीजीएच)

हाइड्रोकार्बन महानिदेशालय (डीजीएच) की स्थापना 8 अप्रैल, 1993 को की गई थी, जिसका उद्देश्य भारतीय पेट्रोलियम और प्राकृतिक गैस संसाधनों के पर्यावरण और पेट्रोलियम कार्यकलापों के तकनीकी और आर्थिक पहलुओं के प्रति संतुलित दृष्टिकोण रखते हुए उनके उचित प्रबंधन को बढ़ावा देना था। डीजीएच की भूमिका और कार्य अन्य बातों के साथ–साथ निम्नलिखित है:–

- पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय की ओर से अन्वेषण और उत्पादन गतिविधियों के कार्यान्वयन के लिए केन्द्रीय एजेंसी।
- अन्वेषण कार्यनीतियों और उत्पादन नीतियों पर पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय को सलाह देना।
- देश में हाइड्रोकार्बन की खोज और इष्टतम दोहन से संबंधित मुद्दों पर पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय को तकनीकी सलाह प्रदान करना।
- तेल क्षेत्र (विनियमन और विकास) अधिनियम, 1948 और पेट्रोलियम एवं प्राकृतिक गैस नियमावली, 1959 के अंतर्गत दिए गए पेट्रोलियम अन्वेषण लाइसेंस के अंतर्गत काम करने वाली कंपनियों के अन्वेषण कार्यक्रमों की समीक्षा करना तथा सरकार को इन कार्यक्रमों की पर्याप्तता के बारे में सलाह देना।
- प्रचालन कंपनियों द्वारा खोजे गए और अनुमानित हाइड्रोकार्बन भंडार का मूल्यांकन करना
- कम्पनियों को अन्वेषण के लिए एकड़ भूमि की पेशकश के साथ–साथ कम्पनियों द्वारा एकड़ भूमि के त्याग से संबंधित मामलों पर सरकार को सलाह देना।
- परिचालन कंपनियों द्वारा प्रस्तावित हाइड्रोकार्बन भंडारों की व्यावसायिक खोजों के लिए विकास योजनाओं की समीक्षा करना तथा ऐसी योजनाओं की पर्याप्तता और प्रस्तावित दोहन दरों तथा उससे संबंधित मामलों पर सरकार को सलाह देना।
- परिचालन कंपनियों द्वारा पेट्रोलियम भण्डारों के प्रबंधन की समवर्ती समीक्षा और लेखापरीक्षा करना तथा भण्डारों के इष्टतम दोहन और पेट्रोलियम संसाधनों के संरक्षण के अनुरूप भण्डार प्रबंधन कार्यप्रणाली को सुनिश्चित करने के लिए आवश्यक किसी भी मध्य–पाठ्यक्रम सुधार पर सलाह देना।
- पेट्रोलियम अन्वेषण, ड्रिलिंग, भण्डारों के उत्पादन आदि से संबंधित आंकड़ों और नमूनों के संरक्षण, अनुरक्षण और भंडारण को विनियमित करना तथा कंपनियों को प्रस्तावित एकड़ के लिए आंकड़े संबंधी पैकेज तैयार करना।
- इससे संबंधित सभी अन्य मामले और ऐसे अन्य कार्य जो सरकार द्वारा समय–समय पर सौंपे जा सकते हैं।
- संविदा प्रबंधन कार्यों में सरकार की सहायता करना।
- गैस हाइड्रेट, शेल गैस/तेल और तेल शेल जैसी अपरंपरागत हाइड्रोकार्बन संसाधनों की खोज और विकास।

14.4.5.1. भारत के ईएंडपी क्षेत्र में सरकारी पहल

सरकार ने खोजे गए छोटे क्षेत्र (डीएसएफ) नीति, कोल बेड मीथेन (सीबीएम) नीति और हाइड्रोकार्बन अन्वेषण लाइसेंसिंग नीति (एचईएलपी) आदि जैसी पहलों के माध्यम से ईएंडपी क्षेत्र को छोटे और नए प्रवेशकों सहित व्यापक श्रेणी के संस्थानों के लिए खोल दिया है।

बढ़ी हुई अन्वेषण कार्यकलाप, नए हाइड्रोकार्बन भंडारों की खोज की संभावनाओं को बढ़ाने में महत्वपूर्ण भूमिका निभाती हैं, जिससे उत्पादन क्षमताएँ बढ़ती हैं। पहले से अनदेखे या कम खोजे गए क्षेत्रों में उद्यम करने से महत्वपूर्ण तेल और गैस भंडार मिलने की संभावना बढ़ जाती है। यह न केवल ईएंडपी उद्योग के विकास में योगदान देता है बल्कि देश की ऊर्जा मांगों को अधिक प्रभावी ढंग से पूरा करने में भी मदद करता है। देश में अन्वेषण कार्यकलापों में तेजी लाने के लिए, सरकार ने 3 जनवरी 2024 को ओएएलपी बोली दौर–IX शुरू

किया है, जिसमें अंतर्राष्ट्रीय प्रतिस्पर्धी बोली के माध्यम से अन्वेषण और विकास के लिए लगभग 1,36,000 वर्ग किमी क्षेत्र वाले 28 ब्लॉक पेश किए गए हैं। यह दौर पिछले सभी ओएएलपी दौरों से बहुत बड़ा है और इससे देश में अन्वेषण संबंधी कार्यकलापों को काफी बढ़ावा मिलने की उम्मीद है।

कर अवकाश, श्रेणी–II और III के आधार पर कोई राजस्व नहीं मिलने जैसे सरकारी प्रोत्साहन घरेलू उत्पादनों को अधिक व्यवहार्य और लागत प्रभावी बनाएंगे। एचईएलपी के अंतर्गत सुव्यवस्थित विनियमन और एकल लाइसेंस प्रणाली संबंधी विलम्ब को कम करती है और खोजों के मुद्रीकरण को तेजी से आगे बढ़ाती है।

प्रारंभिक मुद्रीकरण योजना खोज के अग्रिम मुद्रीकरण में मदद करेगी और घरेलू तेल और गैस उत्पादन को बढ़ाएगी।

इसके अतिरिक्त ईआर (संवर्धित रिकवरी) नीति मौजूदा क्षेत्रों से रिकवरी को अधिकतम करने के लिए बढ़ी हुई तेल रिकवरी (ईओआर) और बेहतर तेल रिकवरी (आईओआर) तकनीकों के उपयोग को प्रोत्साहित करेगी।

अपतटीय में लगभग 1 मिलियन वर्ग किलोमीटर नो–गो क्षेत्र को मुक्त किया गया जो दशकों से अन्वेषण के लिए अवरुद्ध था। इन पूर्ववर्ती "नो–गो" क्षेत्रों को जारी करने के बाद, अब तक 1,52,325 वर्ग किलोमीटर क्षेत्र के लिए बोलियाँ/हित की अभिव्यक्ति प्राप्त हुई है। हाल ही में ओएनजीसी द्वारा महानदी अपतटीय क्षेत्र में दो गैस संबंधी खोजें की गई हैं, जिसमें 94% क्षेत्र "नो–गो क्षेत्र" में है। अंडमान अपतटीय क्षेत्र को भी लंबे समय के बाद अन्वेषण और उत्पादन कार्यकलापों के लिए खोल दिया गया है। अब तक, ओएएलपी के अंतर्गत दिए गए ब्लॉकों में 12 हाइड्रोकार्बन खोजें की गई हैं, जिनमें से एक गुजरात में पहले से ही गैस (0.44 एमएमएससीएमडी) और कंडेनसेट (819 बीबीएल/दिन) का उत्पादन कर रहा है, जबकि अन्य खोजें मूल्यांकनाधीन हैं।

सरकार बोलीदाताओं को भारतीय तलछटी घाटी के गुणवत्तापूर्ण आंकड़े उपलब्ध कराने के लिए ऑनलैंड और ऑफशोर क्षेत्रों में भूकंपीय आंकड़ों के अधिग्रहण और स्ट्रेटीग्राफिक कुओं की ड्रिलिंग के लिए लगभग ₹ 7,500 करोड़ व्यय कर रही है।

सरकार ने भारत के अनन्य आर्थिक क्षेत्र (ईईजेड) से इतर ऑनलैंड में 20,000 एलकेएम और ऑफशोर में 30,000 एलकेएम के अतिरिक्त 2डी भूकंपीय आंकड़ों के अधिग्रहण को भी मंजूरी दी है।

14.4.5.2. व्यापारिक सुगमता के लिए पहल

सरकार ने निवेश और उत्पादन को बढ़ावा देने के लक्ष्य से अन्वेषण और उत्पादन (ईएंडपी) क्षेत्र में व्यापारिक सुगमता को प्राथमिकता दी है। प्रक्रियाओं और प्रक्रियाओं के सरलीकरण के परिणामस्वरूप अधिक पारदर्शी और कुशल प्रणाली तैयार की गई है, जो इस क्षेत्र में निवेश को प्रोत्साहित करती है।

डिजिटल क्रांति के युग में, सरकार प्रक्रिया दक्षता बढ़ाने और सरकारी सेवा वितरण में सुधार करने का प्रयास कर रही है। ईएंडपी क्षेत्र की मूल्य श्रृंखला में प्रक्रियाओं को सरल और डिजिटल बनाने के लिए कई उपाय लागू किए गए हैं। पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय (एमओपीएनजी) के अंतर्गत डीजीएच ने "स्व–प्रमाणन" सहित कई उपाए किए हैं। इससे स्व–प्रमाणन के आधार पर प्रमुख प्रक्रियाओं/अनुमोदनों को तेजी से अनुमोदन प्रदान किया जा सकता है। उत्पादन साझाकरण संविदा प्रबंधन प्रणाली, पेट्रोलियम अन्वेषण पट्टा/पेट्रोलियम खनन पट्टा संबंधी आंकड़ा प्रबंधन प्रणाली, उत्पादन डेटाबेस प्रबंधन प्रणाली, ई–बोली पोर्टल आदि जैसे कई प्रकार के अनुप्रयोग और प्रणालियाँ भी शुरू की गई हैं। ये उपकरण प्रचालकों को सुचारू संचालन, पारदर्शी संविदा प्रबंधन, त्वरित अनुमोदन और निकासी अनुदान, तथा संभावित निवेशकों के साथ जोड़ने में सहायता करते हैं।

14.4.6. उच्च प्रौद्योगिकी केंद्र (सीएचटी)

सन 1987 में स्थापित, उच्च प्रौद्योगिकी केंद्र (सीएचटी) भारत सरकार के वैज्ञानिक और तकनीकी कार्यक्रमों के कार्यान्वयन के लिए पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय की तकनीकी शाखा के रूप में कार्य करता है। सीएचटी के प्रमुख कार्यों में निम्नलिखित शामिल है:–

- रिफाइनरियों, पेट्रोकेमिकल्स और पाइपलाइनों के निष्पादन को बेंचमार्किंग करना
- सर्वोत्तम कार्यप्रणाली, विशेष अध्ययन, प्रचालन सुधार और प्रक्रिया प्रौद्योगिकी के माध्यम से रिफाइनरियों के निष्पादन में सुधार
- डाउनस्ट्रीम हाइड्रोकार्बन क्षेत्र में ऊर्जा दक्षता में सुधार
- पेट्रोलियम उत्पाद के गुणवत्ता में सुधार
- भावी संधारणीयता के लिए वैकल्पिक ऊर्जा के साथ एकीकरण और डाउनस्ट्रीम क्षेत्र में नई पहल
- हाइड्रोजन अनुसंधान सहित डाउनस्ट्रीम हाइड्रोकार्बन क्षेत्र में नवाचारों और अनुसंधान एवं विकास को बढ़ावा देना। पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय की हाइड्रोकार्बन पर वैज्ञानिक सलाहकार समिति (एसएसी) की कार्यकलापों का समन्वय
- आयात प्रतिस्थापन ईंधन, रसायन और उत्प्रेरक का विकास
- पीएम जी–वन योजना और साइट–2बी के कार्यान्वयन के लिए केन्द्रीय एजेंसी
- बायोमास एकत्रीकरण मशीनरी (बीएएम) की खरीद के लिए संपीड़ित जैव गैस (सीबीजी) उत्पादकों को वित्तीय सहायता
- सर्वोत्तम कार्यप्रणाली को साझा करना तथा सूचना एवं ज्ञान का प्रसार

14.4.6.1. की गई प्रमुख गतिविधियाँ

1. निष्पादन को बेंचमार्किंग करना

बेंचमार्किंग की शुरुआत मेसर्स सोलोमन एसोसिएट्स (एसए), यूएसए के माध्यम से वर्ष चक्र 2018 से की गई थी। रिफाइनरी और पाइप लाइन दोनों के लिए वर्ष चक्र 2022 के लिए अध्ययन पूरा हो गया है।

पेट्रोकेमिकल (क्रैकर और पॉलिमर) बेंचमार्किंग इकाइयों के लिए संविदा संबंधी कार्यकलाप प्रगति पर है

2. रिफाइनरी के निष्पादन में सुधार

भारतीय रिफाइनरियों के निष्पादन को विश्व की सर्वश्रेष्ठ रिफाइनरियों के बराबर लाने के उद्देश्य से, ऊर्जा दक्षता सुधार, प्रचालन उपलब्धता, ओपेक्स में कमी आदि को लक्षित करते हुए विभिन्न पहल की जा रही हैं, जिनका विवरण नीचे दिया गया है:

2.1. पी.ए.टी. (निष्पादन, उपलब्धि और व्यापार)

पीएटी चक्र–2 में रिफाइनिंग क्षेत्र के लिए ऊर्जा कटौती लक्ष्य 5.49% निर्धारित किया गया था जो 1.01 मिलियन टीओई के बराबर है। इसके स्थान पर, 8.05% की वास्तविक ऊर्जा कटौती, जो 1.48 मिलियन टीओई के बराबर है, प्राप्त की गई। वर्तमान पीएटी चक्र–6 (2020–21 से 2022–23) के लिए, 5.49% का क्षेत्रीय ऊर्जा कटौती लक्ष्य बरकरार रखा गया है, जो 1.17 मिलियन टीओई के ऊर्जा बचत लक्ष्य के बराबर है। पीएटी चक्र–6 पूरा हो चुका है और रिफाइनरियों की ऊर्जा कटौती का अंतिम सत्यापन प्रगति पर है।

2.2. पीएसयू रिफाइनरियों में 2030 तक मिशन क्यू–1

ऊर्जा खपत में सुधार के लिए पीएसयू रिफाइनरियों के लिए विशिष्ट ऊर्जा खपत पर दिशा–निर्देश तैयार किया गया है ताकि सभी रिफाइनरियों को सोलोमन बेंचमार्किंग के क्वार्टाइल 1 (क्यू–1) में लाया जा सके। यह लक्ष्य भारत के एनडीसी के साथ भी संरेखित है, जिसके अनुसार 2005 के आधार वर्ष की तुलना में 2030 तक विशिष्ट ऊर्जा खपत में 45% की कमी की जानी है।

2.3. फार्नेस दक्षता और स्टीम रिसाव पर वार्षिक लेखा परीक्षा

रिफाइनरियों में ऊर्जा दक्षता में सुधार और ऊर्जा खपत को कम करने के लिए, सीएचटी प्रति वर्ष फर्नेस/बॉयलर दक्षता या स्टीम रिसाव के क्षेत्रों में हर दूसरे वर्ष सर्वेक्षण आयोजित करता है। फर्नेस/बॉयलर दक्षता सर्वेक्षण वर्ष 2023 में आयोजित किया गया था जबकि स्टीम रिसाव लेखा–परीक्षा, साक्षम–2024 (जनवरी– 2024) के दौरान पूरा किया गया था।

2.4. रिफाइनरियों के लिए जल उपभोग मानदंडों का विकास और वाटर फूटप्रिंट में कमी:

वर्ष 2019–2022 में 2.901 एम³/घंटे के लक्ष्य की तुलना में 2,360 एम³/घंटे जल उपभोग की बचत की गई है। वर्ष 2025 तक जल उपभोग में 3.435 एम³/घंटे की और कमी लाने के लिए काम चल रहा है। आज की तारीख तक 1,160 एम³/घंटे की बचत की गई है।

2.5. पीएसयू रिफाइनरियों का रिफाइनरी निष्पादन संबंधी सुधार कार्यक्रम (आरपीआईपी):

पीएसयू तेल कंपनियों को उत्पाद पैटर्न और उनकी गुणवत्ता, संचालन उत्कृष्टता में सुधार, ऊर्जा खपत और उत्सर्जन को कम करने आदि में सहायता करने के लिए सीएचटी ने दो चरणों में आरपीआईपी शुरू करने के लिए अनुभवी सलाहकार को नियुक्त किया है। चरण–I पीएसयू रिफाइनरियों (एचपीसी–मुंबई और विशाख, बीपीसी–मुंबई और कोच्चि, आईओसी–पानीपत, पारादीप और मथुरा) ने आरपीआईपी चरण–1 में भाग लिया है। आरपीआईपी चरण–1 के अंतर्गत उपर्युक्त उद्देश्यों को लक्षित करने वाली कई योजनाओं की पहचान की गई है और तेल कंपनियों द्वारा उनका कार्यान्वयन किया जा रहा है। दूसरे चरण में, शेष 8 रिफाइनरियों (आईओसी–बरौनी, गुजरात, हल्दिया, बोंगाईगांव, गुवाहाटी, डिग्बोई, सीपीसीएल–मनाली और एनआरएल) के लिए संबंधित रिफाइनरियों द्वारा कार्रवाई की जा रही है।

3. ग्रीन हाइड्रोजन ट्रांजिशन के लिए कार्यनीतिक हस्तक्षेप (साईट–2वी)

साइट 2वी भारत में नवीन और नवीकरणीय ऊर्जा मंत्रालय (एमएनआरई) द्वारा ग्रीन हाइड्रोजन ट्रांजिशन (साइट) कार्यक्रम के लिए कार्यनीतिक हस्तक्षेप के हिस्से के रूप में शुरू की गई योजना है। इसका उद्देश्य निर्माताओं को वित्तीय प्रोत्साहन प्रदान करके ग्रीन हाइड्रोजन के उत्पादन को बढ़ावा देना है।

साइट 28 योजना के अंतर्गत, कार्यान्वयन एजेंसी/एजेंसियां रिफाइनरी या कई रिफाइनरियों के लिए सबसे कम लागत पर ग्रीन हाइड्रोजन के उत्पादन और आपूर्ति के लिए मांग को एकत्रित करेंगी और बोलियां आमंत्रित करेंगी। मोड 28 का ट्रैच । प्रति वर्ष 2,00,000 मीट्रिक टन की बोली क्षमता प्रदान करता है। एमएनआरई ने दिनांक 16 जनवरी 2024 को अपने पत्र के माध्यम से अधिसूचित किया है कि मोड 20 के तहत योजना का क्रियान्वयन तेल एवं गैस कंपनियों तथा उच्च प्रौद्योगिकी केंद्र (सीएचटी) द्वारा किया जाएगा। सीएचटी सचिवीय प्रबंधकीय एवं क्रियान्वयन सहायता प्रदान करने के लिए जिम्मेदार होगा, जिसमें लाभार्थियों के दावों की जांच, संवितरण दावों की जांच एवं समाधान, प्रगति की निगरानी, आदि शामिल है तथा इसके साथ–साथ समय–समय पर पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय द्वारा सौंपी गई अन्य जिम्मेदारियां भी पूरी की जाएंगी।

4. स्वदेशी प्रौद्योगिकी के नवोन्मेष एवं विकास को बढ़ावा देना

सीएचटी राष्ट्रीय महत्व की परियोजनाओं सहित डाउनस्ट्रीम हाइड्रोकार्बन क्षेत्र के लिए अनुसंधान परियोजनाओं की पहचान करने एवं उन्हें वित्तपोषित करने तथा ऊर्जा परिवर्तन को सुगम बनाने में पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय की हाइड्रोकार्बन पर वैज्ञानिक सलाहकार समिति (एसएसी) की कार्यकलापों का समन्वय करता है।

हाइड्रोजन अनुसंधान: सीएचटी ने विभिन्न मार्गों से हाइड्रोजन के उत्पादन, वाहन निर्माता एवं परिवहन संचालकों के साथ गठजोड़ करके ईंधन सेल बसों के विकास, हाइड्रोजन के भंडारण एवं वितरण, एचसीएनजी के उत्पादन तथा दिल्ली में एचओएनजी ईंधन वाली बसों के निष्पादन के लिए विभिन्न परियोजनाओं को वित्तपोषित किया है।

5. प्रधानमंत्री जीवन योजना का क्रियान्वयन

प्रधानमंत्री जीवन योजना की घोषणा वर्ष 2014 में की गई थी। 2जी इथेनॉल प्रौद्योगिकियों को बढ़ावा देने और ग्रामीण अर्थव्यवस्था को समर्थन देने के लिए मार्च, 2019 में इस योजना को मंजूरी दी गई थी। इस योजना का वित्तीय परिव्यय ₹ 1,969.5 करोड़ है। इस योजना के कार्यान्वयन के लिए सीएचटी को केन्द्रीय एजेंसी नियुक्त किया गया है। पीएम जी–वन योजना की संचालन समिति ने 6 वाणिज्यिक परियोजनाओं और 4 निष्पादन परियोजनाओं के लिए वित्तीय सहायता को मंजूरी दी है। 6 वाणिज्यिक परियोजनाओं में से 100 केएलपीडी की क्षमता वाला आईओसीएल पानीपत संयंत्र पहले से ही 2जी इथेनॉल का उत्पादन कर रहा है और बांस फीडस्टॉक पर आधारित 185 केएलएफडी की क्षमता वाला असम बायो रिफाइनरी प्राइवेट लिमिटेड (एबीआरपीएल) शुरू होने वाला है।

6. बायोमास एकत्रीकरण मशीनरी (बीएएम) की खरीद के लिए संपीड़ित बायो गैस (सीबीजी) उत्पादकों को वित्तीय सहायता:

भारत सरकार ने अधिसूचना एफ. संख्या एल–16020/02/2023–जीपी–1 (ई–45833), दिनांक 2 फरवरी 2024 के माध्यम से वित्त वर्ष 2023–24 से वित्त वर्ष 2026–27 की अवधि के लिए ₹ 564.75 करोड़ के कुल वित्तीय परिव्यय सहित बायोमास एकत्रीकरण मशीनरी की खरीद के लिए संपीड़ित बायो गैस (सीबीजी) उत्पादकों को वित्तीय सहायता प्रदान करने की योजना को मंजूरी दी है. सीएचटी को इस योजना के लिए परियोजना निगरानी एजेंसी (पीएमए) के रूप में नियुक्त किया गया है। सीएचटी ने योजना के कार्यान्वयन के लिए एक समर्पित पोर्टल विकसित किया है। योजना के तहत आवेदन 1 अप्रैल 2024 से जमा किया जा सकता है।

7. पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय को वैश्विक निविदा पूछताछ प्रस्तावों का प्रसंस्करण और अनुशंसा करना:

सामान्य वित्तीय नियम (जीएफआर) 2017 के नियम 161 (पअ) के तहत ₹ 200 करोड़ तक की राशि के आयातित वस्तुओं की खरीद केवल सक्षम प्राधिकारी (कैबिनेट सचिवालय/प्रशासनिक मंत्रालय) से आवश्यक अनुमोदन प्राप्त करने के बाद ही की जा सकती है।

इस संबंध में, सीएचटी को मंत्रालय के संबंधित प्रशासनिक प्रभाग को इस संबंध में प्रस्ताव प्रस्तुत करने से पहले डाउनस्ट्रीम और मिडस्ट्रीम क्षेत्र से संबंधित प्रस्तावों की जांच करने और तकनीकी रूप से सिफारिश करने का काम सौंपा गया है। वित्तीय वर्ष 2023–2024 के दौरान, कुल 69 प्रस्तावों पर कार्रवाई की गई है।

8. पीसीआरए से सीएचटी को हस्तांतरित कार्यकलाप:

पीसीआरए के विघटन के बाद, पीसीआरए की अनुसंधान एवं विकास संबंधी कार्यकलापों को सीएचटी को सौंप दिया गया है।

9. ऊर्जा प्रौद्योगिकी सम्मेलन (ईटीएम):

26 ईटीएम जिसे पहले रिफाइनिंग और पेट्रोकेमिकल्स प्रौद्योगिकी सम्मेलन (आरपीटीएम) के नाम से जाना जाता था, का आयोजन ईआईएल और एनआरएल के साथ आईईसीसी (भारत मंडपम) प्रगति मैदान, नई दिल्ली में दिनांक 9–11 अक्टूबर, 2023 के दौरान किया गया था। इस सम्मेलन का विषय 'उभरती ऊर्जा प्रवृत्तियों और रिफाइनिंग का भविष्य' रखा गया था। इस कार्यक्रम में 15 तकनीकी सत्रों में 77 मौखिक पेपर (8 पैनल बद्ध और 58 विदेशी कंपनियों के वक्ताओं सहित) और 66 डिजिटल पोस्टर सत्रों (जिनमें 47 विदेशी कंपनियों का प्रतिनिधित्व करने वाले सत्र शामिल थे) के साथ–साथ 27 प्रदर्शनी स्टॉल भी थे और इसमें भारत और विदेश से 1,300 से अधिक प्रतिनिधियों/आमंत्रित लोगों ने भाग लिया था।





माननीय पेट्रोलियम एवं प्राकृतिक गैस मंत्री श्री हरदीप सिंह पुरी ने 26वें ऊर्जा प्रौद्योगिकी सम्मेलन का उद्घाटन किया

10. कार्यकलाप समिति की बैठकें (एसीएम)/वेबिनार:

सर्वोत्तम परिचालन कार्यकलापों और सुधारों को साझा करने तथा नवीनतम विकासों पर सूचना के प्रसार के उद्देश्य से, सीएचटी ने रिफाइनिंग क्षेत्र और पाइपलाइन संचालन में महत्वपूर्ण क्षेत्रों/प्रौद्योगिकियों में 24 एसीएम/वेबिनार आयोजित किए। इन बैठकों में उद्योग, लाइसेंसधारकों और आपूर्तिकर्ताओं से बड़ी संख्या में प्रतिभागियों ने भाग लिया।

11. पुरस्कार:

सीएचटी पेट्रोलियम और प्राकृतिक गैस मंत्रालय, भारत सरकार द्वारा स्थापित निम्नलिखित वार्षिक पुरस्कारों से सक्रिय रूप से जुड़ा हुआ है।

- रिफाइनरी निष्पादन सुधार पुरस्कार
- सक्षम पुरस्कार (स्टीम लीक और फ्यूमस्ते दक्षता सर्वेक्षणों पर आधारित)
- आरएंडडी में नवोन्मेष पुरस्कार

14.4.7. राजीव गांधी पेट्रोलियम प्रौद्योगिकी संस्थान, जायस, अमेठी

14.4.7.1. नए शैक्षणिक कार्यक्रम:

राजीव गांधी पेट्रोलियम प्रौद्योगिकी संस्थान (आरजीआईपीटी) ने केमिकल इंजीनियरिंग (मेजर: पेट्रोकेमिकल्स और पॉलिमर इंजीनियरिंग) केमिकल इंजीनियरिंग (मेजर: रिन्यूएबल इंजीनियरिंग) और पेट्रोलियम इंजीनियरिंग (मेजर: एप्लाइड पेट्रोलियम जियोसाइंस), अपने पेट्रोलियम और ऊर्जा पेशकशों को बढ़ाते हुए, और उद्योग के सुझावों को अपनाते हुए, अपने आधुनिक पेशकशों का विस्तार करते हुए जैसे नए बी.टेक कार्यक्रम में जोड़कर अपनी शैक्षणिक पेशकशों का विस्तार किया है।

14.4.7.2. अनुसंधान और विकास:

आरजीआईपीटी के बौद्धिक संसाधन पारंपरिक क्षेत्रों से लेकर एआई/एमएल/आईओटी जैसे अल्ट्रा–उन्नत क्षेत्रों तक फैले हुए हैं, जो इसे बुनियादी और उन्नत शोध कार्यों के माध्यम से समाधान प्रदान करने के लिए प्रेरित करते हैं। संकाय सदस्य विभिन्न विभागों द्वारा प्रायोजित परियोजनाओं में शामिल हैं, जिनमें विज्ञान और प्रौद्योगिकी विभाग, विज्ञान और इंजीनियरिंग अनुसंधान बोर्ड, परमाणु ऊर्जा विभाग, वैज्ञानिक और औद्योगिक अनुसंधान परिषद, पेट्रोलियम संरक्षण अनुसंधान संघ, अल्पसंख्यक कार्य मंत्रालय, ऑयल इंडिया लिमिटेड, ऑयल एंड नेचुरल गैस लिमिटेड, चेन्नै पेट्रोलियम कॉर्पोरेशन लिमिटेड, हिंदुस्तान एयरोनॉटिक्स लिमिटेड और एनटीपीसी एनर्जी टेक्नोलॉजी रिसर्च अलायंस आदि शामिल हैं।

14.4.7.3. समर्पित पोर्टल सहित केंद्रीय इंस्ट्रूमेंटेशन सुविधाएं:

आरजीआईपीटी ने इस वर्ष अनुसंधान और बाहरी उपयोगकर्ताओं के लिए 288 उच्च–स्तरीय इंस्ट्रूमेंटेशन प्रदान करने के लिए समर्पित केंद्रीय इंस्ट्रूमेंटेशन सुविधा (सीआईएफ) की स्थापना की है, जिसमें एक ऑनलाइन पोर्टल प्रणाली है। यह सीआईएफ स्वतंत्र केंद्र की छत्रछाया में काम करता है, जो आंतरिक अनुसंधान एवं विकास संबंधी कार्यकलापों और विदेशी शैक्षणिक संस्थानों, अनुसंधान एवं विकास संस्थानों और भारत भर के उद्योगों को पूरा करता है। सीआईएफ सामग्री व्यवहार को समझने के लिए अनुसंधान एवं विकास की आठ प्रमुख श्रेणियों के तहत परीक्षण प्रदान करता है, जिसमें विश्लेषणात्मक विज्ञान, क्रोमैटोग्राफी, संक्षारण इंजीनियरिंग, ईंधन प्रौद्योगिकी, भूवैज्ञानिक और भूभौतिकीय विज्ञान, स्पेक्ट्रोस्कोपी, सतह और इमेजिंग विज्ञान और थर्मल विज्ञान शामिल हैं। बाहरी उपयोगकर्ताओं से अन्य संगठनों की तुलना में कम दरों पर शुल्क लिया जाता है, जिससे भारत में व्यापक वैज्ञानिक जनसंख्या तक इंस्ट्रूमेंटेशन सुविधाओं का विस्तार होता है।

14.4.7.4. आरजीआईपीटी में डीएसटी–निधि समावेशी प्रौद्योगिकी व्यवसाय इनक्यूबेशन केंद्र:

राष्ट्रीय विशेषज्ञ सलाहकार समिति (एनईएसी) ने डीएसटी–निधि समावेशी प्रौद्योगिकी व्यवसाय इनक्यूबेटर (आई–टीबीआई) कार्यक्रम के अंतर्गत सहायता के लिए भारत के संधारणीय विकास के लिए ऊर्जा, स्वास्थ्य सेवा और कृषि क्षेत्रों में नवाचार और उद्यमिता' नामक परियोजना की सिफारिश की है। परियोजना का उद्देश्य उद्यमिता और स्टार्ट–अप पारिस्थितिकी तंत्र को बढ़ावा देने के लिए आरजीआईपीटी में आई–टीबीआई स्थापित करना है। समिति ने प्रस्तावित आई–टीबीआई के लिए प्राथमिक क्षेत्र के रूप में ऊर्जा, स्वच्छ ईंधन, स्वास्थ्य सेवा, कृषि आदि पर जोर देने की सिफारिश की है। इस परियोजना के लिए डीएसटी से ₹ 3.24 करोड़ की सहायता मिली है।

14.4.7.5. उद्योग–अकादमिक सहयोग:

सीपीसीएल और आरजीआईपीटी ने निम्नलिखित दो क्षेत्रों में सहयोग करने के लिए दो समझौतों पर हस्ताक्षर किए, (i) इथेनॉल–मिश्रित पेट्रोल जंग को रोकने के लिए संक्षारण अवरोधक सूत्र और (ii) चावल के भूसे और हरे नारियल के छिलकों से माइक्रोसेल्यूलोज, नैनोसेल्यूलोज और ईंधन के निष्पादन के लिए संयंत्र उत्पादन की स्थापना। इसके अतिरिक्त, ओएनजीसी मेहसाणा एसेट और आरजीआईपीटी ने बेहतर तेल रिकवरी और प्रवाह आश्वासन अनुप्रयोगों के लिए चिपचिपे कच्चे तेल के माइक्रोवेव–असिस्टेड मोबिलाइजेशन नामक परियोजना पर काम करने पर सहमति व्यक्त की। इसके अतिरिक्त, आरजीआईपीटी ने संयुक्त

शैक्षणिक और अनुसंधान पहलों के लिए माइक्रोसॉफ्ट इंडिया के साथ समझौता ज्ञापन पर हस्ताक्षर किए।

14.4.7.6. प्रमुख कार्यक्रम:

i. दिनांक 09 मार्च 2024 को यूपी सीएसटी प्रायोजित बौद्धिक संपत्ति अधिकारों पर एक दिवसीय कार्यशाला का आयोजन किया गया।

ii. 18 मार्च 2024 को एसईआरबी प्रायोजित ऊर्जा–स्वतंत्र भारत के लिए नेक्स्टजेन स्पेक्ट्रो मा(इक्रो) स्कोपिक विधि पर एक दिवसीय कार्यशाला का आयोजन किया गया।

iii. दिनांक 26 फरवरी से 9 मार्च 2024 तक आईओसीएल अधिकारियों के लिए पेट्रोलियम रिफाइनिंग प्रौद्योगिकी पर 2 सप्ताह का आवासीय प्रशिक्षण कार्यक्रम आयोजित की गई।

iv. दिनांक 17–18, फरवरी 2024 को संधारणीय विकास के लिए निवल शून्य और ऊर्जा परिवर्तन पर आईसीएसएसआर द्वारा वित्तपोषित अंतर्राष्ट्रीय सम्मेलन का आयोजन किया गया।

v. दिनांक 10–14 फरवरी, 2024 को स्मार्ट सेंसिंग और इंटरनेट ऑफ एवरीथिंग के लिए कृत्रिम बुद्धिमत्ता पर एसईआरबी प्रायोजित कार्यशाला का आयोजन किया गया।

vi. दिनांक 27–31 दिसंबर, 2023 को आरजीआईपीटी ने संयुक्त रूप से 76वीं भारतीय केमिकल इंजीनियरिंग कांग्रेस (केमकॉन) 2023 का आयोजन किया।

vii. दिनांक 20 नवंबर से 2 दिसंबर 2023 तक सीपीसीएल अधिकारियों के लिए रिफाइनिंग टेक्नोलॉजी पर 2 सप्ताह का आवासीय प्रशिक्षण कार्यक्रम का आयोजन किया गया।

viii. दिनांक 06–08 नवंबर, 2023 तक पर्यावरण, सामाजिक, शासन और जिम्मेदार नेतृत्व के लिए आईओसीएल हेतु प्रशिक्षण कार्यक्रम का आयोजन किया गया।

14.4.7.7. समाचार पत्र (ऊर्जाप्रवाह) का पहला संस्करण:

समाचार पत्र (ऊर्जाप्रवाह) का पहला संस्करण का शुभारंभ दिनांक 04 मार्च 2024 को श्री अरुण कुमार सिंह, अध्यक्ष और सीईओ, ओएनजीसी, श्री भास्कर ज्योति फुकन, एमडी, एनआरएल की उपस्थिति में श्री रामेश्वर तेली, माननीय केंद्रीय राज्य मंत्री, पेट्रोलियम एवं प्राकृतिक गैस तथा श्रम एवं रोजगार द्वारा किया गया।

14.4.7.8. नए भवन का उद्घाटन:

माननीय महिला एवं बाल विकास मंत्री श्रीमती स्मृति जुबिन ईरानी ने दिनांक 6 मार्च 2024 को 'ऊर्जा' बालिका छात्रावास और इलेक्ट्रिकल एवं इलेक्ट्रॉनिक्स भवन का उद्घाटन किया।

14.4.7.9. निर्माण संबंधी कार्यकलाप: बाल छात्रावास और नया शैक्षणिक भवन:

आरजीआईपीटी जायस परिसर के मौजूदा परिसर में 17,056 एम² के प्लिंथ क्षेत्र के लिए नया बाल छात्रावास भवन बनाया जा रहा है और इसका दिसंबर 2025 तक पूरा होने की उम्मीद है। बाल छात्रावास भवन के पूर्ण निर्माण के बाद अपेक्षित छात्रों की संख्या लगभग 950 होंगे और निर्माण की अनुमानित लागत ₹ 63.50 करोड़ है।

तदनुसार, आरजीआईपीटी के मौजूदा परिसर में 6,762 एम² क्षेत्र में नया शैक्षणिक भवन बनाया जा रहा है। उक्त भवन के पूरा होने की अपेक्षित तिथि दिसंबर 2024 है और उक्त निर्माण की अनुमानित लागत ₹ 18.81 करोड़ है।

14.4.7.10. ऊर्जा संस्थान, बेंगलुरु (आरजीआईपीटी केंद्र, जायस, अमेठी):

ऊर्जा संस्थान, बेंगलुरु (ईआईबी), आरजीआईपीटी जैस केंद्र, ऊर्जा के क्षेत्र में प्रौद्योगिकी–प्रचालित शैक्षणिक और अनुसंधान संबंधी कार्यक्रमों को बढ़ावा देने के लिए प्रतिष्ठित शैक्षणिक और अनुसंधान केंद्र है। ईआईबी अस्थायी रूप से श्री वेंकटेश्वर कॉलेज ऑफ इंजीनियरिंग विद्या नगर क्रॉस, इंटरनेशनल एयरपोर्ट रोड, बेंगलुरु में स्थित ट्रांजिट कैंपस द्वारा प्रचालित की जा रही है।

14.4.7.11. ईआईबी वर्तमान में तीन एम.टेक कार्यक्रम प्रदान कर रहा है, अर्थात नवीकरणीय ऊर्जा, इलेक्ट्रिक वाहन प्रौद्योगिकी और आंकड़े संबंधी विज्ञान। इलेक्ट्रिकल और इलेक्ट्रॉनिक्स इंजीनियरिंग, मैटेरियल साइंस एंड इंजीनियरिंग और कंप्यूटर साइंस एंड इंजीनियरिंग के विषयों में पीएचडी भी प्रदान किए जाते हैं।

इस केंद्र में वर्तमान में कुल 15 एम.टेक. के छात्र और 14 पीएच.डी. के छात्र हैं जो हरित ऊर्जा,

इलेक्ट्रिक वाहन प्रौद्योगिकी और ऊर्जा प्रणालियों में कृत्रिम बुद्धिमत्ता के अनुप्रयोगों के क्षेत्र में काम कर रहे हैं। वर्ष 2023–24 में 38 छात्रों को स्नातक की डिग्री मिली है।

14.4.7.12. निर्माण की स्थिति:

ऊर्जा संस्थान बेंगलुरु के स्थायी शिविर का निर्माण वर्तमान में सर्वे संख्या 127पी, कंबालीपुरा गांव, सुलीबेले होबली, होसाकोटे तालुक, बेंगलुरु ग्रामीण जिले में प्रगति पर है। निर्माण की योजना में चारदीवारी, शैक्षणिक ब्लॉक, लड़कों के लिए दो छात्रावास, लड़कियों के लिए छात्रावास और एक भोजन कक्ष का निर्माण शामिल है। चारदीवारी का निर्माण पूरा हो चुका है। लड़कों के एक छात्रावास का निर्माण कार्य 70% पूरा हो चुका है और दूसरे का निर्माण कार्य 15% पूरा हो चुका है। लड़कियों के छात्रावास का निर्माण कार्य 30% पूरा हो चुका है। भोजन कक्ष का निर्माण कार्य 80% पूरा हो चुका है। भूतल और 2 मंजिला भवन सहित शैक्षणिक ब्लॉक का निर्माण कार्य 70% पूरा हो चुका है।

14.4.7.13. असम ऊर्जा संस्थान (एईआई), शिवसागर (आरजीआईपीटी जयस का केंद्र):

नये भवनों का उद्घाटन:

अकादमिक ब्लॉक, बाल छात्रावास और बालिका छात्रावास का उद्घाटन दिनांक 4 मार्च 2024 को श्री रामेश्वर तेली, माननीय केंद्रीय राज्य मंत्री, पेट्रोलियम एवं प्राकृतिक गैस और श्रम और रोजगार, भारत सरकार द्वारा श्री अरुण कुमार सिंह, अध्यक्ष और सीईओ, ओएनजीसी और श्री भास्कर ज्योति फुकन, एमडी, एनआरएल की उपस्थिति में किया गया।

14.4.7.14. 5 टीपीडी संपीड़ित बायोगैस (सीबीजी) संयंत्र की स्थापना:

ऑयल इंडिया लिमिटेड ने शिवसागर में असम ऊर्जा संस्थान (एईआई) में अत्याधुनिक 5 टीपीडी सीबीजी संयंत्र स्थापित करने की प्रतिबद्धता जताई है। संयंत्र सीबीजी उत्पादन के लिए आधुनिक तकनीक से लैस होगा

14.4.7.15. किफायती परिवहन के लिए दीर्घकालिक विकल्प निर्माण:

बाल छात्रावास–2 (जी+3), भोजन कक्ष, शैक्षणिक भवन, अतिरिक्त बालकों और बालिकाओं के लिए छात्रावास (जी+4), और संकाय सदस्यों के लिए आवास (जी+6) का निर्माण कार्य प्रगति पर है।

14.4.8. आईआईपीई–भारतीय पेट्रोलियम एवं ऊर्जा संस्थान, विशाखापत्तनम

14.4.8.1. प्रस्तावना:

भारत सरकार ने आंध्र प्रदेश पुनर्गठन अधिनियम 2014 में किए गए प्रावधानों के अनुसार वर्ष 2016 में विशाखापत्तनम में पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय (एमओपीएनजी) के तत्वावधान में भारतीय पेट्रोलियम एवं ऊर्जा संस्थान (आईआईपीई) की स्थापना की है। संसद द्वारा अधिनियमित भारतीय पेट्रोलियम एवं ऊर्जा संस्थान अधिनियम 2017 ने इसे राष्ट्रीय महत्व का संस्थान घोषित किया है। भारत सरकार द्वारा इस संस्थान की स्थापना का मुख्य उद्देश्य पेट्रोलियम एवं ऊर्जा क्षेत्रों के लिए कुशल इंजीनियरों की आपूर्ति में मात्रात्मक और गुणात्मक कमी को पूरा करना और इन क्षेत्रों के विकास के लिए आवश्यक अनुसंधान संबंधी कार्यकलापों को बढ़ावा देना है। आईआईपीई में अनुसंधान का प्राथमिक लक्ष्य देश की जीवाश्म और गैर–नवीकरणीय ऊर्जा मांगों को पूरा करना रहा है। संस्थान को एचपीसीएल, ओएनजीसी, आयल, गेल और आईओसीएल जैसे प्रमुख तेल सार्वजनिक उपक्रमों द्वारा ऊर्जा केन्द्रित विशिष्ट संस्थान के रूप में सह–प्रचारित किया जाता है।

कार्यक्रम/पाठ्यक्रम: एप्लाइड जियोलॉजी में एम. एससी. और पीएचडी शोध पाठ्यक्रम के अतिरिक्त आईआईपीई वर्तमान में पेट्रोलियम इंजीनियरिंग, केमिकल इंजीनियरिंग, मैकेनिकल इंजीनियरिंग के अतिरिक्त 4 वर्षीय बी.टेक. कार्यक्रम प्रस्तावित कर रहा है। छात्रों को उनकी जेईई (एडवांस्ड) रैंकिंग के आधार पर बी.टेक कार्यक्रमों में और जेएएम (मास्टर्स के लिए संयुक्त प्रवेश परीक्षा) के माध्यम से एम. एससी कार्यक्रमों में प्रवेश दिया जाता है। बी.टेक. छात्रों के चौथा बैच (2019–23) ने जून 2023 के महीने में स्नातक डिग्री प्राप्त किया। वर्तमान में संस्थान में 357 छात्र विभिन्न पाठ्यक्रमों में अध्ययन कर रहे हैं, जिसमें 71 पीएचडी शोध विद्वान शामिल हैं।

संस्थान ने अन्य प्रमुख शैक्षणिक कार्यकलाप शुरू की हैं जिसमें अंतर्राष्ट्रीय ऐच्छिक, वैश्विक छात्र इंटर्नशिप, अमेरिकी विश्वविद्यालयों के साथ बी.टेक. –एमएस कार्यक्रम, उद्योग–प्रायोजित मास्टर कार्यक्रम, आगंतुक शोधकर्ता और आईआईएम विशाखापत्तनम के साथ संयुक्त एमबीए शामिल हैं।

नौकरी: 31 मार्च 2024 तक, संस्थान ने शैक्षणिक वर्ष के लिए 70% की नौकरी दर हासिल की है. वर्ष 2020–24 बैच के शेष पात्र छात्र वर्तमान में साक्षात्कार के अंतिम चरण में हैं और परिणामों से 30 अप्रैल, 2024 तक 100% नौकरी के लक्ष्य को पूरा करने की उम्मीद है। कुल 36 कंपनियों ने छात्रों को ऑन–कैंपस / ऑफ–कैंपस साक्षात्कार आयोजित किए और इस वर्तमान शैक्षणिक वर्ष के दौरान अब तक की सबसे अधिक सीटीसी की पेशकश की गई है जो कि 20.73 एलपीए है। इस वर्ष नौकरी प्रदान करने के लिए तेल और ऊर्जा क्षेत्रों और एनालिटिक्स और परामर्श से कई नई प्रमुख कंपनियों को भी शामिल किया गया है, जैसे कि हॉलिबर्टन, रिलायंस बीपी, टोटल एनर्जीज, एचपीसीएल राजस्थान रिफाइनरी, जिंदल ड्रिलिंग, विप्रो और टाटा ग्रुप आदि।

अनुसंधान और विकास: संस्थान में वर्तमान में ₹ 45.20 करोड़ रुपये के कुल परिव्यय के साथ 16 किफायती परिवहन के लिए दीर्घकालिक विकल्प शोध परियोजनाएँ हैं। वर्ष 2023–24 के दौरान, विभिन्न शोध प्रायोजक एजेंसियों द्वारा संकाय को ₹ 38.64 करोड़ की राशि के साथ 12 परियोजनाएँ स्वीकृत की गई हैं, जिसमें समुद्री जल से 1 टीपीडी हाइड्रोजन उत्पादन के लिए ग्रीन हाइड्रोजन संयंत्र स्थापित करने के लिए एनटीपीसी की शोध परियोजना शामिल है। वर्ष के दौरान, शोध लेख, पुस्तक अध्याय, पुस्तकें और सम्मेलन पत्रों के रूप में कुल 43 प्रकाशन किए गए।

शोध संबंधी संसाधन को प्रोत्साहित करने के लिए, संस्थान ने संस्थान अनुसंधान अनुदान (आईआरजी) शुरू किया, जो संकाय सदस्यों के लिए सीड अनुदान के रूप में कार्य करता है। संस्थान ने विदेशी सहयोग को बढ़ावा देने के लिए संचयी आकस्मिकता और सैंडविच पीएच.डी. कार्यक्रम भी शुरू किया।

स्थायी परिसर: आंध्र प्रदेश सरकार ने आईआईपीई के लिए स्थायी परिसर के निर्माण के लिए अनकापल्ली जिले (पहले विशाखापत्तनम जिला) के सब्बावरम मंडल के वंगाली गांव में 201.80 एकड़ की भूमि निःशुल्क आवंटित की है। आंध्र प्रदेश सरकार ने मार्च, 2023 के महीने में संस्थान के नाम पर हस्तांतरित भूमि हस्तांतरित कर दी है।

आंतरिक भूमि के चारों ओर की चारदीवारी का काम आंध्र प्रदेश इंडस्ट्रियल इंफ्रास्ट्रक्चर लिमिटेड (एपीआईआईसी) द्वारा पूरा कर लिया गया है। स्थायी परिसर में भवनों के निर्माण का काम केंद्रीय लोक निर्माण विभाग (सीपीडब्ल्यूडी) को सौंपा गया है। पूर्वी शैक्षणिक ब्लॉक, बालक छात्रावास (02 नग), मेस ब्लॉक, स्टाफ क्वार्टर और अतिथि गृह का निर्माण संबंधी कार्यकलाप प्रगति पर है। 31.03.2024 तक स्थायी परिसर में कुल 22% निर्माण संबंधी कार्यकलाप पूरी हो चुकी हैं। निर्माण कार्यकलाप के पूरा होने की अपेक्षित अंतिम तिथि (चरण–1) जुलाई, 2025 है। संस्थान ने स्थायी परिसर (चरण–1) के निर्माण के लिए 31.03.2024 तक सीपीडब्ल्यूडी को ₹ 165.88 करोड़ जारी किए है।

स्थायी परिसर के निर्माण के लिए भूमि पूजन: भाग्य के नगर विशाखापत्तनम में विश्व स्तरीय संस्थान के निर्माण संबंधी कार्यकलाप के उपलक्ष्य में, संस्थान का भूमि पूजन 02 मार्च 2024 को माननीय प्रधान मंत्री श्री नरेंद्र मोदी द्वारा वीडियो कॉन्फ्रेंस के माध्यम से उलाओ, बेगूसराय, बिहार से माननीय केंद्रीय पेट्रोलियम एवं प्राकृतिक गैस और आवासन और नगरी कार्य मंत्री श्री हरदीप एस पुरी की उपस्थिति में किया गया। इस कार्यक्रम में श्री पंकज जैन, सचिव, एमओपीएंडएनजी, भारत सरकार और प्रो. शालिवाहन, निदेशक, आईआईपीई उपस्थित थे।

समझौता ज्ञापन: आईआईपीई ने इस वर्ष, शैक्षणिक और अनुसंधान उद्देश्यों के लिए ह्यूस्टन विश्वविद्यालय (यूओएच), यूएसए; स्टोनी ब्रुक विश्वविद्यालय, यूएसए; ऊफा स्टेट पेट्रोलियम टेक्नोलॉजिकल यूनिवर्सिटी; शरीफ यूनिवर्सिटी ऑफ टेक्नोलॉजी (एसयूटी), तेहरान फॉर एकेडेमिक एंड रिसर्स पर्पोज और पर्यावरण प्रबंधन और सिस्टम इंजीनियरिंग लैब (ईएमएसईएल), क्यूंग ही विश्वविद्यालय, कोरिया फॉर एनवाईरनमेंट, ऊर्जा अनुसंधान, शिक्षा और प्रबंधन के साथ समझौता ज्ञापन पर हस्ताक्षर किए हैं। ह्यूस्टन विश्वविद्यालय के साथ समझौता ज्ञापन पर 15.01.2024 को श्री पंकज जैन, सचिव, पेट्रोलियम एवं प्राकृतिक गैस, भारत सरकार की गरिमामयी उपस्थिति में हस्ताक्षर किए गए थे।

इसके अतिरिक्त, संस्थान ने एम.टेक छात्रों को अध्येतावृत्ति, उनके संयंत्र में इंटर्नशिप और संभावित नौकरी के लिए सहायता प्रदान करने के लिए मेसर्स ग्रीनको फाउंडेशन, जी–टेक, गीतम आरएंडडी सहयोग के लिए डिम्ड विश्वविद्यालय, कौशल विकास, प्रशिक्षण और उद्योग सहयोग के लिए मेसर्स पार्किंग कंसल्टेंट्स, हैदराबाद के साथ, अनुसंधान एवं विकास इंटरैक्टिव कार्यक्रम के लिए ऑयल इंडिया लिमिटेड के साथ, ऊर्जा क्षेत्र के उभरते क्षेत्रों में शिक्षा, प्रशिक्षण और अनुसंधान के क्षेत्र में सहयोग के लिए सीएसआईआर–केंद्रीय खनन और ईंधन अनुसंधान संस्थान, उद्योगों संबंधी बातचीत/सहयोग में सुरक्षा के लिए कौशल विकास हेतु प्रशिक्षण के लिए पेट्रोलियम और विस्फोटक सुरक्षा संगठन के साथ समझौता ज्ञापन पर हस्ताक्षर किए।

कार्यबल और महिला कर्मचारी: आईआईपीई में वर्तमान में 29 संकाय सदस्य और 17 गैर–शिक्षण कर्मचारी हैं, जिनमें से 05 महिला कर्मचारी हैं।

14.4.8.2. कार्यशालाएं और संगोष्ठी:

हाइड्रोजन शिखर सम्मेलन: हाइड्रोजन पर केंद्रित 3 दिवसीय वैश्विक ऊर्जा पर्यावरण शिखर सम्मेलन अर्थात संस्थान द्वारा 24–26 जुलाई, 2023 को विशाखापत्तनम में हाइड्रोजन ऊर्जा संसाधन एवं अवसर (हीरो) 2023' नामक कार्यशाला आयोजित की गई।

आरईयूएसजी–2023: संस्थान में 25–26 अगस्त 2023 को 'संधारणीय विकास के लिए नवीकरणीय ऊर्जा उपयोग' पर 2 दिवसीय कार्यशाला आयोजित की गई, जिसका उद्देश्य नवीकरणीय ऊर्जा उत्पादन और इसके उपयोग से जुड़ी चुनौतियों पर चर्चा करना था।

ईबीएलटी–2024: संस्थान ने 24–25 जनवरी 2024 को साक्ष्य आधारित पुस्तकालय परिवर्तन: नेक्स्टजेन उपयोगकर्ताओं के लिए गुणवत्ता सेवाएँ (ईबीएलटी–2024) पर दो दिवसीय राष्ट्रीय स्तरीय सम्मेलन आयोजित किया। इस कार्यक्रम में विभिन्न प्रमुख संस्थानों के 80 से अधिक प्रतिनिधियों और विशेषज्ञों ने भाग लिया।

ईई एंड एमएम–2024: संस्थान में दिनांक 1–2 फरवरी 2024 को ऊर्जा के लिए पृथ्वी की सामग्री: मेटल टू मार्केट (ईईएंडएमएम–2024) पर दो दिवसीय राष्ट्रीय सम्मेलन आयोजित किया गया। सम्मेलन के मुख्य विषय ऊर्जा उद्देश्यों के लिए पृथ्वी द्वारा उपलब्ध कराए जाने वाले प्राकृतिक संसाधन थे, जिनमें हाइड्रोकार्बन, परमाणु ईंधन, श्वेत हाइड्रोजन और भूतापीय ऊर्जा शामिल हैं।

चेमईईई–2024: संस्थान ने 19–21 फरवरी 2024 के दौरान विशाखापत्तनम में 'रासायनिक, ऊर्जा और पर्यावरण इंजीनियरिंग में प्रवृत्ति (चेमईईई–2024)' पर अंतर्राष्ट्रीय सम्मेलन का आयोजन किया, जिसमें ऊर्जा परिवर्तन के महत्व और रोजगार सृजन में स्टार्ट–अप की भूमिका पर जोर दिया गया।

अपरंपरागत हाइड्रोकार्बन संसाधन पर वेबिनार: अवसर और चुनौतियाँ: संस्थान ने 28–29 मार्च 2024 के दौरान खजर विश्वविद्यालय के छात्रों के लिए अपरंपरागत हाइड्रोकार्बन संसाधन: अवसर और चुनौतियाँ पर दो दिवसीय वेबिनार का आयोजन किया, ताकि तेल और गैस उद्योग में तेजी से जटिल होते परिचालनों का पूरा अवलोकन प्रदान करने के लिए पेट्रोलियम अन्वेषण से लेकर उत्पादन संबंधी कार्यकलाप के लिए जानकारी प्रदान की जा सके।

14.4.8.3. भावी संयंत्र:

(i) वर्ष 2023 से नए परिसर का निर्माण शुरू किया गया और दिसंबर 2024 तक अस्थायी परिसर से नए स्थायी परिसर में स्थानांतरित करना।

(ii) विश्व प्रतिष्ठित संस्थानों/विश्वविद्यालयों के साथ समझौता ज्ञापनों का कार्यान्वयन और वर्ष 2024 तक पेटेंट प्राप्त करने के लिए गुणवत्तापूर्ण अनुसंधान को प्रोत्साहित करना

(iii) संस्थान अनुसंधान पाठ्यक्रमों के लिए विदेशी नागरिकों को आमंत्रित करेगा

14.4.9. पेट्रोलियम नियोजन एवं विश्लेषण प्रकोष्ठ (पीपीएसी)

14.4.9.1. प्रस्तावना: पेट्रोलियम क्षेत्र में प्रशासित मूल्य निर्धारण तंत्र (एपीएम) को समाप्त करने और पूर्ववर्ती तेल समन्वय समिति (ओसीसी) को समाप्त करने के बाद दिनांक 01 अप्रैल, 2022 से पेट्रोलियम नियोजन एवं विश्लेषण प्रकोष्ठ (पीपीएसी) की स्थापना पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के संबद्ध कार्यालय के रूप में की गई थी। पेट्रोलियम एवं प्राकृतिक गैस सचिव की अध्यक्षता में शासी निकाय और पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के वरिष्ठ अधिकारी तथा प्रमुख तेल एवं गैस सार्वजनिक उपक्रमों के मुख्य कार्यकारी सदस्य के रूप में, पीपीएसी के कामकाज में आवश्यक पर्यवेक्षण और दिशा–निर्देश प्रदान करते हैं। पीपीएसी से अपेक्षा की जाती है कि वह भारत सरकार को, अन्य बातों के साथ–साथ, हाइड्रोकार्बन क्षेत्र संबंधी आंकड़ों और नीति विश्लेषण के लिए प्रामाणिक स्रोत होने की दृष्टि से निम्नलिखित कार्यों के निर्वहन में सहायता करे;

क. तेल एवं गैस क्षेत्र पर सूचना डेटा बैंक का अनुरक्षण

ख. अंतर्राष्ट्रीय तेल बाजार और घरेलू कीमतों में रुझानों का विश्लेषण

ग. पीओएल मांग का पूर्वानुमान

घ. तेल एवं गैस तथा ऊर्जा क्षेत्र से संबंधित अध्ययन

ङ. पेट्रोलियम आयात और निर्यात संबंधी प्रवृत्ति का पूर्वानुमान और मूल्यांकन

च. सरकार को विशेष रूप से पेट्रोलियम उत्पादों के मूल्य निर्धारण और पीएमयूवाई सहित राजसहायता योजनाओं के प्रशासन पर इनपुट प्रदान करना

छ. सरकारी दिशा–निर्देशों के अनुसार छह महीने के आधार पर घरेलू प्राकृतिक गैस की कीमत और एचटी एचपी गैस की अधिकतम सीमा का निर्धारण और अधिसूचना

14.4.9.2. तेल और गैस क्षेत्र के लिए नियमित एमआईएस रिपोर्ट का महत्वपूर्ण डेटाबेस और प्रसार: पीपीएसी कच्चे तेल और पेट्रोलियम उत्पादों के उत्पादन, खपत, आयात और निर्यात तथा तेल अवसंरचना से संबंधित आंकड़े सुरक्षित करता है।

यह प्राकृतिक गैस के उत्पादन, एलएनजी के आयात और प्राकृतिक गैस की खपत और सीजीडी क्षेत्र से संबंधित आंकड़े भी सुरक्षित करता है। पीपीएसी के अधिदेश के तहत पीपीएसी की वेबसाइट http://ppac.gov.in के साथ–साथ ऐप्पल ऐप स्टोर और गूगल प्ले स्टोर पर उपलब्ध मोबाइल ऐप "पीपीएसीई" पर कई दैनिक, पाक्षिक, मासिक, छमाही और वार्षिक रिपोर्ट प्रकाशित की जाती हैं। ये रिपोर्ट कच्चे तेल और पेट्रोलियम उत्पादों की दैनिक कीमतों, पीओएल उत्पादों की खपत और उद्योग बिक्री समीक्षा, एलपीजी बिक्री, कच्चे तेल का प्रसंस्करण और उत्पादन, पीओएल उत्पादों का आयात और निर्यात, प्राकृतिक गैस की खपत और आयात आदि से संबंधित हैं। पेट्रोलियम उत्पादों पर नियमित रिपोर्ट और प्रविष्टि के अतिरिक्त, पीपीएसी मांग पर कई अध्ययन भी करता है। एमएस, एचएसडी, एलपीजी, गैस आदि की आपूर्ति, परिवहन और मूल्य निर्धारण भी करता है। पीपीएसी की रिपोर्ट नीति निर्माताओं की सहायता करती है और उद्योग के साथ–साथ तेल और गैस क्षेत्र में अन्य संस्थानों और संगठनों द्वारा भी इसकी बहुत मांग और सराहना की जाती है।

14.4.9.3. महत्वपूर्ण कार्यकलाप: पीपीएसी द्वारा वर्ष 2021–22 के दौरान की गई कुछ महत्वपूर्ण कार्यकलाप इस प्रकार थीं:

1. **गहरे पानी, अति गहरे पानी और उच्च दबाव–उच्च तापमान वाले क्षेत्रों में खोजों से उत्पादित गैस के लिए घरेलू प्राकृतिक गैस मूल्य निर्धारण और अधिकतम मूल्य: नए घरेलू प्राकृतिक गैस मूल्य निर्धारण दिशानिर्देश, 2014 के प्रावधानों के तहत अधिसूचित और जारी करने के लिए:**

नए घरेलू प्राकृतिक गैस मूल्य निर्धारण दिशानिर्देश, 2014 के अनुरूप 01.04.2022 से 30.09.2022, 01.10.2022 से 31.03.2023 और 01.04.2023 की अवधि के लिए घरेलू प्राकृतिक गैस की कीमतें अधिसूचित की गईं।

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने 21 मार्च 2016 की अधिसूचना के माध्यम से गहरे पानी, अति गहरे पानी और उच्च दबाव–उच्च तापमान

वाले क्षेत्रों में खोजों से उत्पादित गैस के लिए वैकल्पिक ईंधन के लैंडेड मूल्य के आधार पर अधिकतम मूल्य के अधीन मूल्य निर्धारण स्वतंत्रता सहित विपणन स्वतंत्रता की अनुमति दी थी। गैस की कीमत उक्त अधिसूचना के अंतर्गत अप्रैल 2022 से सितंबर 2022 और अक्टूबर 2022 से मार्च 2023 की अवधि के लिए पीपीएसी द्वारा अधिकतम सीमा अधिसूचित की गई थी।

अवधि	घरेलू गैस मूल्य (अमेरीकि डॉलर/एमएमबीटीयू)	गहरे पानी/अति गहरे पानी (अधिकतम मूल्य) (अमरीकि डॉलर/एमएमबीटीयू)
01 नवंबर, 2014 – 31 मार्च 2015	5.05	-
01 अप्रैल, 2015 – 30 सितम्बर, 2015	4.66	-
01 अक्टूबर, 2015 से 31 मार्च, 2016	3.82	-
01 अप्रैल, 2016 – 30 सितम्बर, 2016	3.06	6.61
01 अक्टूबर, 2016 से 31 मार्च, 2017	2.5	5.3
01 अप्रैल, 2017 – 30 सितम्बर, 2017	2.48	5.56
01 अक्टूबर, 2017 से 31 मार्च, 2018	2.89	6.3
01 अप्रैल, 2018 – 30 सितम्बर, 2018	3.06	6.78
01 अक्टूबर, 2018 से 31 मार्च, 2019	3.36	7.67
01 अप्रैल, 2019 – 30 सितम्बर, 2019	3.69	9.32
01 अक्टूबर, 2019 से 31 मार्च, 2020	3.23	8.43
01 अप्रैल, 2020 – 30 सितम्बर, 2020	2.39	5.61
01 अक्टूबर, 2020 से 31 मार्च, 2021	1.79	4.06
01 अप्रैल, 2021 – 30 सितम्बर, 2021	1.79	3.62
01 अक्टूबर, 2021 से 31 मार्च, 2022	2.9	6.13
01 अप्रैल, 2022 – 30 सितम्बर, 2022	6.1	9.92
01 अक्टूबर, 2022 से 31 मार्च, 2023	8.57	12.46

इसके अतिरिक्त, मासिक घरेलू प्राकृतिक गैस की कीमतें दिनांक 08.04.2023 से आगे की अवधि के लिए, प्रत्येक महीने के आखिरी दिन को, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के दिनांक 07 अप्रैल 2023 के संकल्प एल–12015/1/2022–जीपी–II के अनुसार अधिसूचित की गई थी।

जबकि गैस की अधिकतम सीमा (एचपी–एचटी मूल्य) को पीपीएसी द्वारा दिनांक 21 मार्च 2016 की अधिसूचना के अंतर्गत अप्रैल 2023 से सितंबर 2023 और अक्टूबर 2023 से मार्च 2024 की अवधि के लिए अधिसूचित की गई थी।

अवधि	घरेलू गैस संगणित मूल्य (अमेरिकी डॉलर/ एमएमबीटीयू में)	ओएनजीसी/ओआईएल के लिए घरेलू गैस संगणित मूल्य (अमेरिकी डॉलर/ एमएमबीटीयू में)	अवधि	एचपी–एचटी गैस की अधिकतम मूल्य (अमेरिकी डॉलर/ एमएमबीटीयू में)
08 अप्रैल 2023–30 अप्रैल 2023	7.92	6.50	अप्रैल 2023–सितम्बर 2023	12.12
01 मई 2023–31 मई 2023	8.27	6.50		
01 जून 2023– 30 जून 2023	7.58	6.50		
01 जुलाई 2023–31 जुलाई 2023	7.48	6.50		
01 अगस्त 2023–31 अगस्त 2023	7.85	6.50		
01 सितम्बर 2023–30 सितम्बर 2023	8.60	6.50		
01 अक्टूबर 2023–31 अक्टूबर 2023	9.20	6.50	अक्टूबर 2024–सितम्बर 2024	9.96
01 नवम्बर 2023–30 नवम्बर 2023	9.12	6.50		
01 दिसंबर 2023–31 दिसंबर 2023	8.47	6.50		
01 जनवरी 2024–31 जनवरी 2024	7.82	6.50		
01 फरवरी 2024–29 फरवरी 2024	7.85	6.50		
01 मार्च 2024–31 मार्च 2024	8.17	6.50		
01 अप्रैल 2023–30 अप्रैल 2023	8.38	6.50		
01 अक्टूबर 2022–31 मार्च 2023	8.57	12.46	अप्रैल 2024–सितम्बर 2024	9.96

प्राकृतिक गैस की कीमतें जीसीवी आधारित है।

2. ऊर्जा में आयात निर्भरता कम करने के लिए दिशा–निर्देश: एकीकृत निगरानी एवं सलाहकार समिति द्वारा गठित कार्यसमूहों द्वारा प्रदान किए गए निविष्टि के आधार पर पीपीएसी ने ऊर्जा में आयात निर्भरता को कम करने के लिए दिशा–निर्देश संबंधी कार्यनीतिक मसौदा दस्तावेज तैयार किया है। इससे पहले, मार्च 2015 में ऊर्जा संगम में माननीय प्रधानमंत्री द्वारा दिए गए आह्वान पर काम करते हुए इस समिति ने अप्रैल 2016 में 'ऊर्जा में आयात निर्भरता को कम करने के लिए दिशा–निर्देश' हेतु अपनी रिपोर्ट प्रस्तुत की, जिसमें तेल एवं गैस क्षेत्र में आयात निर्भरता में कमी लाने के लिए पांच व्यापक कार्यनीतियों की रूपरेखा तैयार गई। तथापि वर्तमान वैश्विक परिदृश्यों, बदलती गतिशीलता और तेल एवं गैस क्षेत्र में आयात निर्भरता को कम करने में मदद करने वाले नए क्षेत्रों को जोड़ने के मद्देनजर, माननीय पेट्रोलियम एवं प्राकृतिक गैस मंत्री की अध्यक्षता में आईएमएसी (एकीकृत निगरानी एवं सलाहकार समिति) के निदेशों के अनुसार संशोधित मसौदा कार्यनीति दस्तावेज तैयार किया गया है और इसकी समीक्षा के लिए पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय को प्रस्तुत किया गया है।

पुनर्मूल्यांकित कार्यनीतियों आईएमएसी द्वारा गठित छह कार्य समूहों से प्राप्त निविष्टि है, जिनका उद्देश्य वित्त वर्ष 2016 से वित्त वर्ष 2020 तक तेल/गैस/कोयला और समग्र ऊर्जा क्षेत्र में आयात निर्भरता को कम करने के लिए दिशा–निर्देश की प्राप्ति की दिशा में संबंधित मंत्रालयों/विभागों द्वारा की गई विभिन्न पहलों के प्रभाव का अध्ययन, विश्लेषण और मात्रा निर्धारित करना है। इन रिपोर्टों को एकत्रित और संकलित किया गया है और तेल और गैस के आयात में कमी करने के लिए भारत की कार्यनीति पर एकीकृत दृष्टिकोण को ध्यान में रखते हुए प्रस्तुत किया जा रहा है। यह रिपोर्ट

आयात में कमी संबंधी दिशा–निर्देशों में परिकल्पित नीतियों/उपाय संबंधी समग्र पुनर्मूल्यांकन है और वर्ष 2024–25 तक आयात पर निर्भरता को कम करने में पुनर्मूल्यांकित दिशा–निर्देश को लागू करने के लिए समयसीमा सहित ऊर्जा मांग और बचत पर उनके प्रभाव के संदर्भ में इन कार्यनीतियों/पहलों के कारण सभी कार्रवाई योग्य बिंदुओं का मानचित्रण करती है। तैयार किए गए कार्यनीतिक दस्तावेज के आधार पर, प्रमुख निष्पादन सूचकांकों (केपीआई) की पहचान की जाएगी और आगे की निगरानी के लिए डैशबोर्ड तैयार किया जाएगा। पेट्रोलियम और प्राकृतिक गैस मंत्रालय ने डैशबोर्ड निगरानी के लिए नोडल नियुक्त करने के लिए विभिन्न मंत्रालयों और विभागों से नामांकन मांगे हैं।

3. **ऊर्जा मांग आकलन मॉडल (ईडीपीएम):** पीपीएसी ने वर्ष 2040 तक रिफाइनिंग क्षमता बढ़ाने के लिए कार्य समूह के "पेट्रोलियम उत्पादों की मांग" उप–समूह के भाग के रूप में छह अंतिम उपयोग मांग क्षेत्रों (अर्थात परिवहन, खाना पकाने, उद्योग, कृषि, दूरसंचार और भवन) में पेट्रोलियम उत्पादों की कुल अंतिम खपत के दीर्घकालिक आकलन विकसित किए हैं, जिसमें 3 अलग–अलग परिदृश्य (स्वच्छ ईंधन के लिए ऊर्जा परिवर्तन के आधार पर आधार रेखाएं, परिवर्तन और परिवर्तन) शामिल हैं। इस मॉडल ने विभिन्न अवधियों और क्षेत्रों के लिए तीन मुख्य परिदृश्यों के विभिन्न चरणों पर विचार करके तेल की मांग के लिए "इष्टतम" परिदृश्य पर भी विचार किया है। इसे विभिन्न समय–सीमाओं में परिवर्तन के विभिन्न स्तरों को दर्शाने के लिए तैयार किया गया है। वर्ष 2020 के आधार वर्ष वाले पहले के मॉडल को 2022 के आधार वर्ष के साथ अद्यतन किया गया था और इसे देश की वर्तमान गतिशीलता और ऊर्जा नीतियों के अनुरूप पुनर्गणना किया गया है। (5 वर्ष के अंतराल सहित 2022–2047)। मांग अनुमानों के आधार पर, पीपीएसी ने इस अवधि के लिए रिफाइनिंग क्षमता की मसौदा रिपोर्ट पर काम किया है।

4. **तेल और गैस संबंधी आंकड़ों के लिए आभासी विश्लेषणात्मक मॉड्यूल:** पीपीएसी का विजन देश में आंकड़ों के लिए सबसे प्रामाणिक आधिकारिक स्रोत तैयार करना है। पीपीएसी विभिन्न ओएमसी, सरकारी विभागों और मंत्रालयों से तेल और गैस संबंधी आंकड़े लेता है और रिपोर्ट तैयार करता है, जो रुझानों का विश्लेषण करने और निर्णय और नीतियां बनाने में मदद करता है।

अपनी प्रक्रिया को सुदृढ़ करने के लिए, पीपीएसी नवीनतम तकनीकों, सॉफ्टवेयर और कार्यप्रणाली का उपयोग करता है। इसके अनुरूप, पीपीएसी ने विभिन्न ओएमएस एकत्र किए गए शीर्ष आंकड़ों के आधार पर एसएएस आभासी विश्लेषणात्मक मंच तैनात किया है। जानकारी व्यक्त करने के आधुनिक ग्राफिकल तरीकों सहित आभासी विश्लेषणात्मक क्षमताएँ, पीपीएसी के उपयोगकर्ताओं को रिपोर्ट बनाने और कुशलतापूर्वक और तेजी से अंतर्दृष्टि की पहचान करने में मदद करती है।

आंकड़े संग्रहण, भंडारण और प्रसार की पूरी प्रक्रिया को मानकीकृत किया गया है, और विभिन्न जाँचों और सत्यापनों सहित विभिन्न प्रकार की सांख्यिकीय रिपोर्ट तैयार करने और सार्थक अंतर्दृष्टि और प्रवृत्ति के लिए स्वच्छ और प्रमाणिक आंकड़ों का उपयोग किया जाता है। आंकड़ों और रिपोर्ट की किसी भी समय, कहीं भी उपलब्धता सहित यह प्रक्रिया आसान, कुशल और अधिक सुव्यवस्थित हो गई है।

14.4.9.4. तेल और गैस क्षेत्र के लिए कई कार्यनीतिक समितियों/अध्ययन समूहों में पीपीएसी की भागीदारी: पीपीएसी खुदरा दुकानों और एलपीजी वितरक नेटवर्क के लिए मूल्य निर्धारण, दूरस्थ खुदरा दुकानों का सत्यापन, 2014 के दिशानिर्देशों के संदर्भ में नामांकन क्षेत्रों से प्राकृतिक गैस उत्पादन की निरंतर व्यवहार्यता के उपाय और प्राथमिक ऊर्जा मिश्रण में गैस की खपत का हिस्सा बढ़ाने की कार्यनीति जैसी विभिन्न अध्ययनों/कार्यकलापों में शामिल है। पीपीएसी राष्ट्रीय सुरक्षा परिषद सचिवालय (एनएससीएस) के तत्वावधान में किए गए "युद्ध के दौरान पोत परिवहन के मार्ग में परिवर्तन" पर बहु–एजेंसी अध्ययन भी शामिल था और स्थिति के नियमित अद्यतन के लिए सचिव पत्तन, जहाजरानी और जलमार्ग की अध्यक्षता वाली डायवर्जन समिति और महानिदेशक, नौसेना संचालन की अध्यक्षता वाली कार्य स्तरीय डायवर्जन समिति का सदस्य भी था। पीपीएसी ने 'घरेलू मांग, ईंधन निर्यात और 2047 तक रिफाइनिंग क्षमता का आकलन' के लिए महानिदेशक पीपीएसी की अध्यक्षता में पेट्रोलियम और प्राकृतिक गैस मंत्रालय को रिपोर्ट सौंपी।

14.4.10. पेट्रोलियम एवं प्राकृतिक गैस नियामक बोर्ड (पीएनजीआरबी)

पेट्रोलियम एवं प्राकृतिक गैस नियामक बोर्ड (पीएनजीआरबी) का गठन पीएनजीआरबी अधिनियम, 2006 के अंतर्गत किया गया था, जिसे 31 मार्च, 2006 को राजपत्रित अधिसूचना के माध्यम से अधिसूचित किया गया था। अधिनियम में पेट्रोलियम, पेट्रोलियम उत्पादों और प्राकृतिक गैस से संबंधित विनिर्दिष्ट कार्यकलापों में जुड़े उपभोक्ताओं और संस्थाओं के हितों की रक्षा करने और प्रतिस्पर्धी बाजारों को बढ़ावा देने तथा उससे संबंधित या उसके आनुषंगिक मामलों के लिए पीएनजीआरबी की स्थापना का प्रावधान है। अधिनियम के अंतर्गत बोर्ड को कच्चे तेल और प्राकृतिक गैस के उत्पादन को छोड़कर पेट्रोलियम, पेट्रोलियम उत्पादों और प्राकृतिक गैस के शोधन, प्रसंस्करण, भंडारण, परिवहन, वितरण, विपणन और बिक्री को विनियमित किया गया है ताकि देश के सभी हिस्सों में पेट्रोलियम, पेट्रोलियम उत्पादों और प्राकृतिक गैस की निर्बाध और पर्याप्त आपूर्ति सुनिश्चित की जा सके। पीएनजीआरबी का विजन निम्नानुसार है-

'पेट्रोलियम, पेट्रोलियम उत्पादों और प्राकृतिक गैस के न्यूनतम लागत पर कुशल परिवहन और वितरण के लिए बुनियादी ढांचे में निवेश के प्रवाह को सुविधाजनक बनाने तथा निष्पक्ष व्यापार प्रथाओं और संस्थाओं के बीच प्रतिस्पर्धा के माध्यम से उपभोक्ता हितों के उच्च स्तर के संरक्षण के माध्यम से तीव्र और व्यवस्थित विकास के साथ एक जीवंत ऊर्जा बाजार का निर्माण करना ताकि भारतीय अर्थव्यवस्था की बढ़ी हुई प्रतिस्पर्धात्मकता और ग्राहक संतुष्टि सुनिश्चित की जा सके।'

पीएनजीआरबी ने दिनांक 31 मार्च 2024 तक देश भर में 33,478 किमी प्राकृतिक गैस पाइपलाइन नेटवर्क को अधिकृत किया है। 22,481 किमी पाइपलाइन प्रचालन में हैं, जिसमें कॉमन कैरियर टाई-इन कनेक्टिविटी, समर्पित पाइपलाइन और सब ट्रांसमिशन पाइपलाइन शामिल हैं और शेष पाईपलाइन निर्माणाधीन हैं।

पीएनजीआरबी ने दिनांक 31 मार्च 2024 तक देश भर में 13,596 किमी पेट्रोलियम और पेट्रोलियम उत्पाद संबंधी पाइपलाइनों को भी अधिकृत किया है, इसमें से 9,223 किमी पाइपलाइन प्रचालन में हैं और शेष पाइपलाइन निर्माणाधीन हैं।

सीजीडी नेटवर्क के क्षेत्र का विस्तार करने के लिए, पीएनजीआरबी ने 12 और 12ए सीजीडी बोली दौर के अंतर्गत 7 जीए के लिए प्राधिकरण प्रदान किया है। अब तक देश भर में सीजीडी नेटवर्क के विकास के लिए 307 जीए को अधिकृत किया गया है। पाइप्ड नेचुरल गैस कनेक्शन प्रदान करना नगर गैस डिस्ट्रीब्यूशन (सीजीडी) नेटवर्क के विकास का भाग है और इसे पीएनजीआरबी द्वारा अधिकृत संस्थाओं से किया जाता है। दिनांक 31 मार्च 2024 तक, इन संस्थाओं ने 1.29 करोड़ घरेलू पीएनजी कनेक्शन प्रदान किए हैं और देश भर में 6,861 सीएनजी स्टेशन स्थापित किए हैं।

पीएनजीआरबी ने भारत ऊर्जा सप्ताह ('आईईडब्लू') 2024, गोवा के दौरान दिनांक 5-8 फरवरी 2024 के बीच पेट्रोलियम और प्राकृतिक गैस विनियामकों के अंतर्राष्ट्रीय सम्मेलन के उद्घाटन संस्करण का आयोजन किया। सम्मेलन का उद्देश्य प्राकृतिक गैस विकास के लिए प्रभावी विनियामक कार्यढाँचे तैयार करने के लिए सूचना साझा करने के लिए दक्षिण और दक्षिण-पूर्व एशियाई देशों के बीच क्षेत्रीय सहयोग करना था। इसमें बांग्लादेश, इंडोनेशिया, मलेशिया, श्रीलंका और थाईलैंड के ऊर्जा विनियामक प्राधिकरणों के साथ-साथ अंतर्राष्ट्रीय उद्योग के नेताओं ने भाग लिया।

पीएनजीआरबी ने तीन उच्च-स्तरीय समितियों का गठन भी किया है ताकि:-

i. डाउनस्ट्रीम तेल और गैस क्षेत्र में मौजूदा सुरक्षा ढाँचे की समीक्षा की जा सके।

ii. मौजूदा उपभोक्ता संरक्षण प्रावधानों की समीक्षा की जा सके और व्यापक उपभोक्ता संरक्षण कार्यढाँचा सुनिश्चित करने के लिए भविष्य की योजना सुझाया जा सके।

iii. विजन 2040-भारत में प्राकृतिक गैस अवसंरचना तैयार करना।

इसके साथ ही, पीएनजीआरबी विश्व बैंक के सहयोग से 'प्राकृतिक गैस पाइपलाइनों और नगर गैस वितरण नेटवर्क में हाइड्रोजन के संवरण के लिए विधि' के लिए महत्वपूर्ण अध्ययन कर रहा है। पीएनजीआरबी ने नगर गैस वितरण नेटवर्क और ऑटोमोटिव ईंधन के वितरण के लिए तकनीकी और सुरक्षा विनियमनों में संशोधन भी किया है।

14.4.11. ब्रह्मपुत्र क्रैकर एंड पॉलीमर लिमिटेड (बीसीपीएल)

असम गैस क्रैकर परियोजना (एजीसीपी) की शुरुआत दिनांक 15 अगस्त 1985 को केंद्र सरकार और ऑल असम स्टूडेंट्स यूनियन (एएएसयू) और ऑल असम गण संग्राम परिषद (एएजीएसपी) के बीच हुए समझौता ज्ञापन के अनुसरण में की गई थी।

डिब्रूगढ़ जिले के लेपेटकाजटा में स्थित एजीसीपी को आर्थिक कार्य मंत्रिमंडल समिति (सीसीईए) ने दिनांक 18 अप्रैल, 2006 को ₹ 5460.61 करोड़ (निर्धारित लागत) की कुल परियोजना लागत पर मंजूरी दी थी। परियोजना को लागू करने के लिए दिनांक 08 जनवरी 2007 को मेसर्स ब्रह्मपुत्र क्रैकर एंड पॉलीमर लिमिटेड (बीसीपीएल) नामक संयुक्त उद्यम कंपनी का गठन किया गया था। परियोजना में समय और लागत में दो बार वृद्धि देखी गई। सीसीईए ने दिनांक 16.11.2011 को एजीसीपी के लिए संशोधित लागत अनुमान–1 (आरसीई–1) पर विचार कर ₹ 8920 करोड़ के संशोधित लागत अनुमान को मंजूरी दी थी, जिसे जुलाई, 2016 में आरसीई–II में संशोधित कर ₹ 9965 करोड़ कर दिया गया। परियोजना को अंततः 02 जनवरी, 2016 को शुरू किया गया और 05 फरवरी, 2016 को माननीय प्रधान मंत्री द्वारा राष्ट्र को समर्पित किया गया।

गेल (इंडिया) लिमिटेड बीसीपीएल का मुख्य प्रवर्तक है, जिसकी 70% इक्विटी भागीदारी है और शेष 30% इक्विटी ऑयल इंडिया लिमिटेड (ओआईएल), नुमालीगढ़ रिफाइनरी लिमिटेड (एनआरएल) और असम सरकार द्वारा समान रूप से साझा की जाती है। परिसर के लिए मेसर्स ऑयल और मेसर्स ओएनजीसी से प्राकृतिक गैस और मेसर्स एनआरएल से नेफ्था फीडस्टॉक है। इस परिसर को प्राकृतिक गैस और नेफ्था को संसाधित करने के लिए तैयार किया गया है ताकि 2,20,000 टन प्रति वर्ष (टीपीए) एलएलडीपीई/एचडीपीई (रैखिक कम घनत्व पॉलीइथिलीन/उच्च घनत्व पॉलीइथिलीन) और प्रति वर्ष 60,000 टन (टीपीए) पीपी (पॉली–प्रोपलीन) का उत्पादन किया जा सके। बीसीपीएल का मुख्य परिसर लेपेटकाटा, जिला डिब्रूगढ़ में स्थित है। बीसीपीएल की दुलियाजान, जिला डिब्रूगढ़ और लकवा, जिला शिवसागर में संबद्ध इकाइयाँ हैं।

आर्थिक कार्य मंत्रिमंडल समिति ने दिनांक 24 दिसंबर 2019 को ₹ 4600 करोड़ की अनुमानित लागत से बीसीपीएल को 15 वर्ष के संयंत्र संचालन के लिए फीडस्टॉक राजसहायता को मंजूरी दी है और देश के उत्तर–पूर्वी क्षेत्र के विकास को गति देने के लिए बीसीपीएल के प्रशासनिक नियंत्रण को रसायन और पेट्रोकेमिकल्स विभाग से पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय को हस्तांतरित करने की भी मंजूरी दी है। बीसीपीएल ने वर्ष 2023–24 में 91% क्षमता पर प्रचालन किया है। बीसीपीएल ने वित्तीय वर्ष की पहली तिमाही के दौरान वार्षिक टर्नअराउंड भी देखा है। गेल (इंडिया) लिमिटेड बीसीपीएल उत्पादों का मुख्य विपणक है। बीसीपीएल ने बांग्लादेश के अतिरिक्त भूटान में भी अपने उत्पाद की बिक्री बढ़ा दी है। वित्त वर्ष 2023–24 के दौरान, कंपनी ने ₹ 2978.55 करोड़ का राजस्व अर्जित किया है और ₹ 160.22 करोड़ का घाटा उठाया है। दिनांक 31.03.2024 तक कंपनी की कुल संपत्ति ₹ 3001.36 करोड़ है।

बीसीपीएल की दो परियोजनाएँ ब्यूटेन–1 और द्वितीय चरण हाइड्रोजनीकृत पायरो गैसोलीन निर्माणाधीन चरण में हैं, जिनकी संशोधित लागत अनुमान 817.92 करोड़ है और यांत्रिक रूप से अगस्त 2025 तक पूरा होने की उम्मीद है, जिससे मूल्य वर्धित उत्पाद और उप–उत्पाद बनाने में मदद मिलेगी, जिससे आने वाले समय में बेहतर आय और उत्पाद स्लेट की प्राप्ति होगी।

14.4.12. इंद्रधनुष गैस ग्रिड लिमिटेड (आईजीजीएल)

इंद्रधनुष गैस ग्रिड लिमिटेड (आईजीजीएल) आईओसीएल ओएनजीसी, गेल ऑयल और एनआरएल की समान इक्विटी योगदान वाली संयुक्त उद्यम कंपनी है जिसे प्रतिष्ठित नॉर्थ ईस्ट गैस ग्रिड (एनईजीजी) परियोजना के कार्यान्वयन के लिए दिनांक 10.08.2018 को निगमित किया गया था। एनईजीजी का लगभग 1656 किलोमीटर लंबी प्राकृतिक गैस पाइपलाइन नेटवर्क है जिसकी डिजाइन क्षमता 4.75 एमएमएससीएमडी है और इसे ₹ 9,265 करोड़ की अनुमानित लागत से कार्यान्वित किया जा रहा है।

इस परियोजना की परिकल्पना पूर्वोत्तर के लिए हाइड्रोकार्बन विजन 2030 के अनुरूप की गई थी, जिसका उद्देश्य आठ पूर्वोत्तर राज्यों अर्थात असम, अरुणाचल प्रदेश, मेघालय, त्रिपुरा, मिजोरम, नागालैंड, मणिपुर और सिक्किम को राष्ट्रीय गैस ग्रिड और पूर्वोत्तर के स्वदेशी गैस स्रोतों से जोड़ना है। एनईजीजी की आधारशिला दिनांक 09.02.2019 को माननीय प्रधान मंत्री श्री नरेंद्र मोदी द्वारा रखी गई थी। आर्थिक कार्य मंत्रिमंडलीय समिति (सीसीईए) ने दिनांक 08.01.2020 को एनईजीजी परियोजना के लिए ₹ 5,559 करोड़ (परियोजना की अनुमानित कुल लागत का 60% अर्थात ₹ 9,265 करोड़) की व्यवहार्यता अंतर निधियन/पूंजी अनुदान को मंजूरी दी थी। एनईजीजी परियोजना के कार्यान्वयन के लिए पीएनजीआरबी से अंतिम स्वीकृति दिनांक 17.11.2020 को प्राप्त हुई थी।

एनईजीजी परियोजना कार्यनीतिक महत्व वाली परियोजना है और इस परियोजना के क्रियान्वयन से उत्तर पूर्व क्षेत्र में उपभोक्ताओं, औद्योगिक, नगरी गैस वितरण नेटवर्क को विश्वसनीय और निर्बाध प्राकृतिक गैस की आपूर्ति सुनिश्चित होगी, जिससे क्षेत्र के औद्योगिक और आर्थिक विकास को बढ़ावा मिलने की उम्मीद है, साथ ही पर्यावरण का संरक्षण होगा और उत्तर पूर्व में गैस आधारित अर्थव्यवस्था के विकास के लिए सरकार के प्रयासों को बल मिलेगा। एनईजीजी परियोजना की निर्माण संबंधी कार्यकलाप तेजी से आगे बढ़ रहा हैं और मार्च 2025 तक पूरी होने की उम्मीद है।

14.4.13. भारतीय स्ट्रेटेजिक पेट्रोलियम रिजर्व लिमिटेड (आईएसपीआरएल)

भारत सरकार ने देश की ऊर्जा सुरक्षा के कार्यनीतिक उद्देश्य को पूरा करने के हित में दिनांक 7 जनवरी 2004 को स्ट्रेटेजिक पेट्रोलियम रिजर्व लिमिटेड (एसपीआर) सुविधाओं का निर्माण करने का निर्णय लिया, क्योंकि भारत आर्थिक कार्यकलापों और विकास का समर्थन करने और अपने नागरिकों की ऊर्जा आवश्यकताओं को पूरा करने के लिए कच्चे तेल के आयात पर बहुत अधिक निर्भर है, ये एसपीआर आपूर्ति श्रृंखला व्यवधानों की किसी भी स्थिति से निपटने के लिए बफर के रूप में काम करेंगे, विशेष रूप से बाहरी कारणों से। ऐसे आपातकालीन भंडार देश को कच्चे तेल के आयात में व्यवधान की स्थिति में भी अपने रिफाइनरियों को कच्चे तेल से पोषित रखने और देश भर में पेट्रोलियम उत्पादों की निर्बाध आपूर्ति सुनिश्चित करने में मदद करेगी। असाधारण परिस्थितियों में, कच्चे तेल के बफर स्टॉक का उपयोग वैश्विक तेल की कीमतों में असामान्य उछाल को आंशिक रूप से कम करने के लिए किया जा सकता है।

एसपीआर सुविधाओं के निर्माण के लिए भारत सरकार के निर्णय को क्रियान्वित करने हेतु दिनांक 16 जून 2004 को इंडियन ऑयल कॉर्पोरेशन लिमिटेड की सहायक कंपनी के रूप में विशेष प्रयोजन तंत्र (एसपीवी) इंडियन स्ट्रेटेजिक पेट्रोलियम रिजर्व लिमिटेड (आईएसपीआरएल) की स्थापना की गई। इसके बाद जनवरी 2006 में, आईएसपीआरएल तेल उद्योग विकास बोर्ड (ओआईडीबी) की पूर्ण स्वामित्व वाली सहायक कंपनी बन गई।



भूमिगत कार्यनीतिक कंदरा का दृश्य

आईएसपीआरएल चरण–I

एसपीआर कार्यक्रम के प्रथम चरण के अंतर्गत, आईएसपीआरएल ने तीन स्थानों पर 5.33 एमएमटी क्षमता सहित भूमिगत चट्टान गुफाओं में कच्चे तेल का उत्पादन पूरा किया है, जिनमें आंध्र प्रदेश में विशाखापत्तनम (1.33 एमएमटी) और कर्नाटक में मैंगलोर (1.5 एमएमटी) और पादुर (2.5 एमएमटी) शामिल हैं।

सभी तीन सुविधाएं अर्थात विशाखापत्तनम, मैंगलोर और पादुर को क्रमशः जून 2015, अक्टूबर 2016 और दिसंबर 2018 में शुरू किया गया था और दिनांक 10 फरवरी 2019 को माननीय प्रधान मंत्री द्वारा राष्ट्र को समर्पित किया गया था।

कार्यनीतिक कच्चे तेल की रिहाई/बिक्री अंतर–मंत्रालयी सशक्त समिति के माध्यम से की जाती है, जिसकी अध्यक्षता पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के सचिव करते हैं, तथा वित्त मंत्रालय के व्यय विभाग के सचिव और पोत परिवहण मंत्रालय के सचिव इसके सदस्य होते हैं।

कोविड–19 महामारी ने पूरी दुनिया को जकड़ लिया था और वैश्विक स्तर पर लॉकडाउन लागू किया गया था, जिससे दुनिया भर में कच्चे तेल की मांग प्रभावित हुई और भारत में भी इसका प्रभाव पड़ा है। पेट्रोलियम उत्पादों की मांग में भारी कमी के परिणामस्वरूप रिफाइनरियां न्यूनतम क्षमता पर काम कर रही थीं। इसके साथ ही कच्चे तेल की आपूर्ति में वृद्धि के कारण मांग–आपूर्ति में असंतुलन उत्पन्न हो गया, जिससे दुनिया भर में कच्चे तेल की कीमतों में भारी कमी आई थी। कच्चे तेल की मौजूदा कम कीमतों का लाभ उठाने के लिए, मध्य पूर्व के देशों से कच्चे तेल की खरीद करके कार्यनीतिक भंडार को भर दिया गया था।

एसपीएल कोर क्रिटिकल सॉवरेन क्रूड ऑयल मल्र्स के संरक्षक के रूप में भंडारण सुविधाओं का संचालन करता है, यह आपूर्ति व्यवधान के दौरान कार्यनीतिक कच्चे तेल के स्टॉक को जारी करने और निकालने का समन्वय करता है।

14.4.13.1.अबू धाबी नेशनल ऑयल कंपनी (एडीएनओसी) के साथ करार

एडीएनओसी और आईएसपीआरएल के बीच दिनांक 10 फरवरी 2018 को करार पर हस्ताक्षर किए गए थे, जिससे एडीएनओसी को मैंगलोर में डिब्बे का उपयोग करने की अनुमति मिली। करार के अनुसार, एडीएनओसी ने वर्ष 2018 में आईएसपीआरएल मैंगलोर कैवर्न में लगभग 58 मिलियन बैरल कच्चा तेल भरा। एडीएनओसी इस तेल के 50% हिस्से का उपयोग भारत में अपने ग्राहकों को वाणिज्यिक आपूर्ति के रूप में कर सकता है, जबकि बाकी हिस्सा प्राकृतिक आपदा या भू-राजनीतिक कारकों के कारण आपूर्ति में व्यवधान जैसी आपात स्थितियों से निपटने के लिए भारत सरकार के निर्देशों पर जारी किए जाने वाले कार्यनीतिक भंडारण के रूप में रहता है।

एडीएनओसी ने एडीएनओसी और आईएसपीआरएल के बीच करार की शर्तों के अनुसार दिसंबर 2019 में एचपीसीएल, विजाग को सफलतापूर्वक अपनी पहली वाणिज्यिक खेप भेजी। उसके बाद एडीएनओसी नियमित रूप से मैंगलोर एसपीआर से भारतीय रिफाइनरियों को कच्चे तेल की खेप बेच रहा है और संविदा की शर्तों के अनुसार पुनःपूर्ति कर रहा है।



सचिव (आईसी) एमओपीएनजी ने पाइपर का दौरा किया

14.4.13.2.व्यावसायीकरण

दिनांक 08 जुलाई 2021 को मंत्रिमंडल ने व्यावसायीकरण कार्यों के लिए कार्यनीतिक पेट्रोलियम रिजर्व (एसपीआर) के चरण–I के अंतर्गत तैयार किए गए पेट्रोलियम भंडार के भाग का उपयोग करने के प्रस्तावों को मंजूरी दे दी है

आईएसपीआरएल ने किराए पर लेने के लिए जगह बनाने के लिए अगस्त 2021 से जून 2023 तक राज्यिक प्रचालित रिफाइनर एचपीसीएल और एमआरपीएल को कच्चा तेल जारी किया।

आईएसपीआरएल ने भारत सरकार के भारत कोष खाते में कच्चे तेल की बिक्री से प्राप्त राजस्व के रूप में ₹ 5,372 करोड़ की संचयी राशि जमा की।





दिनांक 07.02.2024 को आईईडब्लू गोवा में एचपीसीएल के साथ करार पर हस्ताक्षर किए गए



मैंगलोर (भंडारण क्षमता: 1.5 एमएमटी)



आईएसपीआरएल मैंगलोर में बीसीएमसी ड्रिल



भूमिगत कार्यनीतिक कंदरा का दृश्य

14.4.13.3.चरण–I के व्यावसायीकरण की स्थिति

विशाखापत्तनम में कंदरा क: आईएसपीआरएल ने विशाखापत्तनम में 19 जनवरी 2024 से एचपीसीएल को 300 टीएमटी (2.17 मिलियन बैरल) क्षमता किराए पर दी है। 7 फरवरी 2024 को गोवा में आईईडब्ल्यू 2024 की पृष्ठभूमि में आईएसपीआरएल के सीईओ और एमडी और एचपीसीएल के ईडी (आईटी) द्वारा अतिरिक्त सचिव एमओपीएनजी, सचिव ओआईडीबी, सीएमडी, एचपीसीएल और आईएसपीआरएल और एचपीसीएल के अन्य वरिष्ठ अधिकारियों की उपस्थिति में एक औपचारिक समझौते पर हस्ताक्षर किए गए। लीज पर दी गई क्षमता का उपयोग एचपीसीएल द्वारा बसरा मीडियम क्रूड ऑयल के भंडारण के लिए किया जाएगा। किसी आपात स्थिति में, इस कच्चे तेल के उपयोग पर पहला अधिकार भारत सरकार का होगा। इसके साथ ही आईएसपीआरएल ने आत्मनिर्भरता की दिशा में पहला कदम उठाते हुए राजस्व अर्जित करना शुरू कर दिया है।

कंदरा ख–मंगलोर: मैंगलोर के कंदरा–ख में उपलब्ध लगभग 750 टीएमटी क्षमता और विजाग कैवर्न ख में उपलब्ध लगभग 200 टीएमटी क्षमता को किराए पर लेने का भी प्रस्ताव है। आईएसपीआरएल फ्लोटिंग ईओआई के लिए आवश्यक अनुमोदन प्राप्त करने का कार्य प्रक्रियाधीन है।

आईएसपीआरएल हितधारकों के साथ 20% क्षमता की बिक्री/खरीद की रूपरेखा पर भी विचार कर रहा है।

चरण–II परियोजनाएं

कैबिनेट ने दिनांक 08 जुलाई 2021 को चंडीखोल (4एमएमटी) और पादुर (2.5 एमएमटी) में चरण II के अंतर्गत वाणिज्यिक सह कार्यनीतिक भंडार के विकास के साथ–साथ पीपीएम मोड पर समर्पित एसपीएम और संबंधित पाइपलाइनों के प्रस्ताव को मंजूरी दे दी थी।

मेसर्स डेलोइट को आरएफपी तैयार करने के लिए लेन–देन सलाहकार और मेसर्स एजेडआईआई तथा साझेदार को पीपीपी मॉडल के लिए आवश्यक चरण 1 के रियायती समझौते की तैयारी के लिए कानूनी सलाहकार नियुक्त किया गया है।

I. कर्नाटक राज्य के उडुपी जिले के पादुर में, चरण 2 के अंतर्गत 2.5 एमएमटी कार्यनीतिक पेट्रोलियम भंडार।

पादुर परियोजना के लिए भूमि अधिग्रहण के लिए आईएसपीआरएल ने नवंबर 2020 में केआईएडीबी को 210 एकड़ भूमि अधिग्रहण की आवश्यकता प्रस्तुत की थी।

केआईएडीबी ने दिनांक 22 फरवरी 2023 को 214.79 एकड़ पादुर भूमि के लिए अंतिम राजपत्रित अधिसूचना जारी की थी। भूमि दर तय होने के बाद मांग नोट के आधार पर जून 2023 में केआईएडीबी को कुल ₹ 160.67 करोड का भुगतान किया गया है। केआईएडीबी डीसी, उडुपी के परामर्श से आरएंडआर पैकेज को अंतिम रूप देने और भूमि मालिकों को मुआवजा देने का कार्य प्रक्रियाधीन है।

आरएंडआर पैकेज को अंतिम रूप देने और भूमि मालिकों को मुआवजा देने के बाद, जून 2024 तक भूमि का अधिग्रहण होने की उम्मीद है। रियायतकर्ता करार के लिए भार मुक्त भूमि प्रदान करना एक शर्त है।

कुछ महीनों में भूमि अधिग्रहण की उम्मीद को देखते हुए, पादुर चरण II के लिए आरएफपी दिनांक 21.02.2024 को प्रकाशित किया गया है।

II. ओडिशा के जाजपुर जिले के चंदीखोल में चरण II के अंतर्गत 4.0 एमएमटी कार्यनीतिक पेट्रोलियम भंडार ओडिशा सरकार को चंदीखोल, जिला जाजपुर में 400 एकड़ भूमि के लिए आवेदन प्रस्तुत किया गया था, जबकि चंदीखोल परियोजना के लिए भूमि आवंटन हेतु आवेदन का मूल्यांकन करते समय आईएसपीआरएल को एसपीआर के निर्माण के लिए वैकल्पिक स्थलों की खोज करने की सलाह दी गई है।

आईएसपीआरएल ने ओडिशा में वैकल्पिक स्थल की पहचान करने के लिए ईआईएल को नियुक्त किया था। इसके बाद, ईआईएल ने डेस्कटॉप अध्ययन के बाद, वैकल्पिक स्थलों का मूल्यांकन करने के लिए संयुक्त दौरा किया था। ईआईएल ने दिनांक 06 जुलाई 2023 को आईएसपीआरएल को अपनी रिपोर्ट प्रस्तुत की, जिसमें व्यवहार्यता अध्ययन करने के लिए सिद्ध गुम्फा हिल साइट की सिफारिश की गई।

एएसआई (भारतीय पुरातत्व सर्वेक्षण) द्वारा स्थल का सर्वेक्षण किया जा रहा है।

एएसआई की मंजूरी मिलने के बाद, आईएसपीआरएल वैकल्पिक भूमि के लिए ओडिशा सरकार से सैद्धांतिक मंजूरी मांगेगा और व्यवहार्यता अध्ययन के साथ आगे बढ़ेगा।

III. चरण विस्तार

दिनांक 17 फरवरी 2023 को प्रत्यायोजित निवेश बोर्ड (डीआईबी) ने मैंगलोर एमएसईजेडएल में एसपीआर और संबंधित सुविधाओं के निर्माण के लिए मैंगलोर स्पेशल इकोनॉमिक ज़ोन लिमिटेड (एमएसईजेडएल) से भारतीय सामरिक पेट्रोलियम रिज़र्व लिमिटेड (आईएसपीआरएल) द्वारा भूमि (154.9 एकड़) के अधिग्रहण के प्रस्ताव को मंजूरी दी थी। आईएसपीआरएल ने दिनांक 17 मार्च 2023 को एमएसईजेडएल के साथ मैंगलोर क्षेत्र में 154.90 एकड़ भूमि के सयत्र के लिए समझौता ज्ञापन पर हस्ताक्षर किए हैं। आईएसपीआरएल ने समझौता ज्ञापन की शर्तों के अनुसार भूमि के लिए कुल लीज प्रीमियम राशि के 10% के रूप में ₹ 22.69 करोड़ की राशि का भुगतान किया है।

उपरोक्त स्थल के लिए विस्तृत व्यवहार्यता रिपोर्ट तैयार करने का काम ईआईएल को दिया गया है। विभिन्न सर्वेक्षण और भू–तकनीकी जांच पूरी होने वाली है।



मैंगलोर के चरण–I विस्तार भूमि के लिए एमएसईजेडएल के साथ समझौता ज्ञापन पर हस्ताक्षर

14.4.13.3. ओमान टैंक टर्मिनल कंपनी (ओटीटीसीओ) के साझादारी

ओमान वर्तमान में ओमान में दुकम पत्तन के पास रास मरकज़ में संधारणीय ऊर्जा सुरक्षा परियोजना का निर्माण कर रहा है। वर्ष 2014 में स्थापित ओमान टैंकिंग टर्मिनल कंपनी (ओटीटीसीओ), जो एक वाणिज्यिक कंपनी ओक्यू की पूर्ण स्वामित्व वाली सहायक कंपनी है और ओमान सल्तनत सरकार के पूर्ण स्वामित्व वाली कंपनी है, जिसकी उपरोक्त परियोजना को विकसित करने में प्रमुख भूमिका रही है।

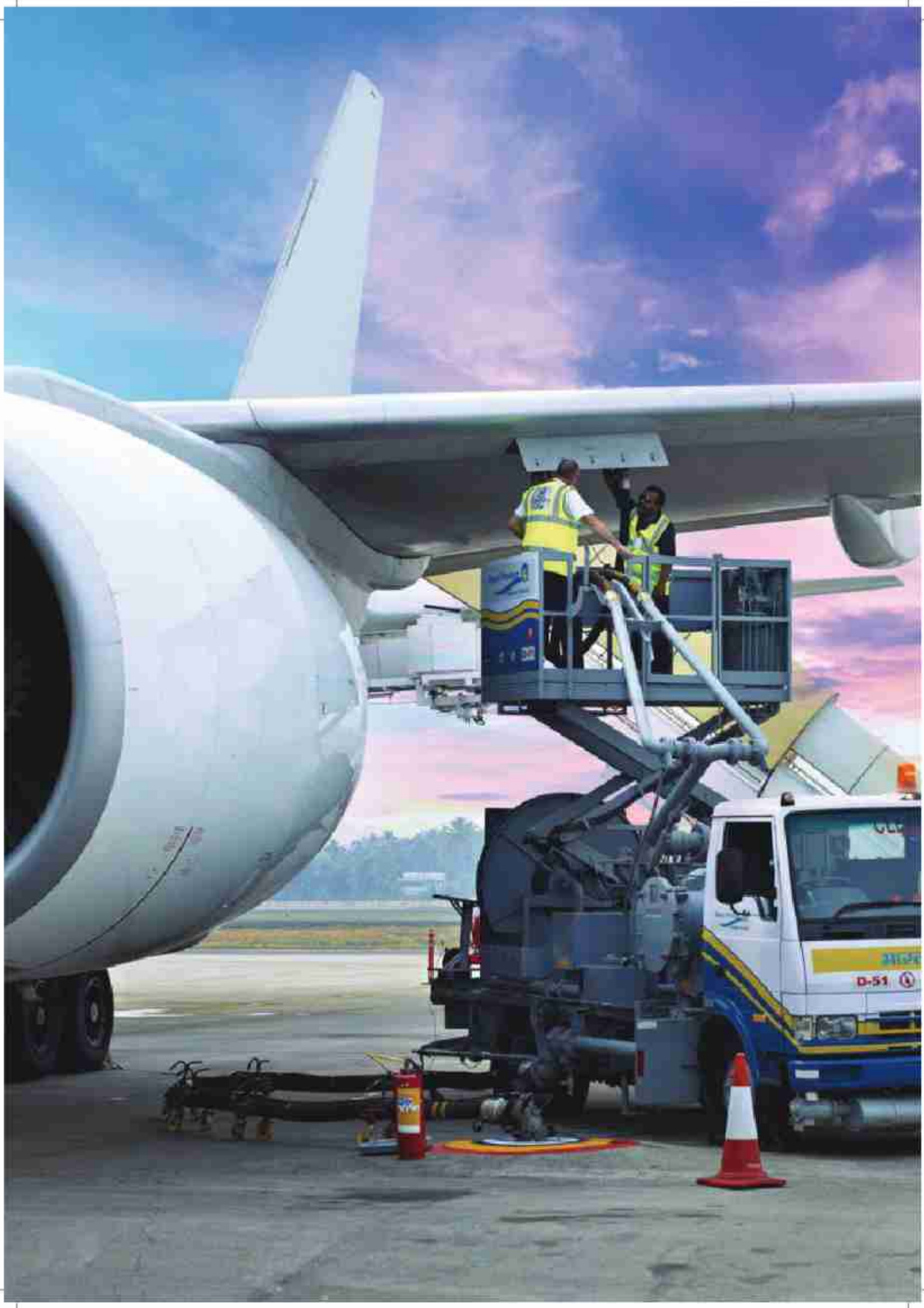
ओटीटीसीओ ओमान में भंडारण और पाइपलाइन परिसंपत्तियों के नेटवर्क का स्वामित्व, संचालन और अनुरक्षण करता है। ओटीटीसीओ की विकास कार्यनीति ओमान का स्वतंत्र भंडारण भागीदार बनने और स्थानीय, क्षेत्रीय और अंतर्राष्ट्रीय ग्राहक पोर्टफोलियो को भंडारण सेवाएँ प्रदान करने पर ध्यान–केंद्रित है।

ओटीटीसीओ ने मस्कट के भारतीय दूतावास के माध्यम से रास मरकज़ परियोजना में भाग लेने के लिए आईएसपीआरएल को एक अवसर प्रदान किया है। ओटीटीसीओ ने पहले ही रास मरकज़ में जमीन के ऊपर कच्चे तेल के भंडारण टैंकों में 5.2 मिलियन बीबीएल क्षमता का निर्माण किया है और उन्हें वर्ष 2022 में शुरू कर दिया है। समर्पित एसपीएम और संबंधित पाइपलाइनों को भी शुरू कर दिया गया है।

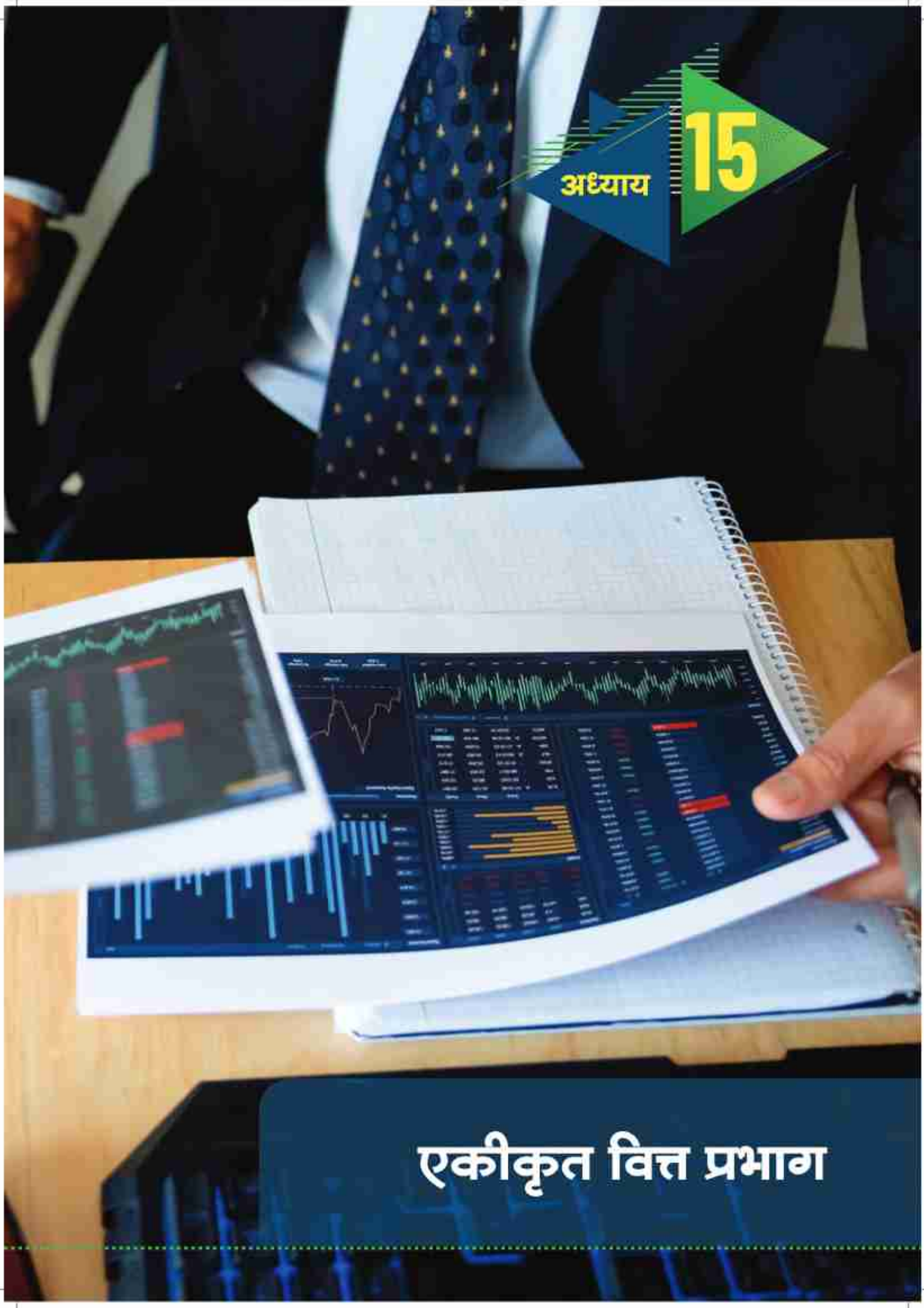
आईएसपीआरएल के सीईओ और एमडी तथा डिप्टी सीईओ की टीम ने भारतीय दूतावास के अधिकारियों के साथ दिनांक 21 फरवरी 2023 को टैंक स्टोरेज (5.2 मिलियन बीबीएल) और एसपीएम की हाल ही में शुरू की गई सुविधाओं को देखने के लिए रज मरकज़ में ओटीटीसीओ टर्मिनल का दौरा किया। साइट के दौरे के बाद, रस मरकज़ परियोजना के दूसरे चरण में आईएसपीआरएल की भागीदारी के लिए ओटीटीसीओ के सीईओ श्री आर्ड वान हूफ के साथ चर्चा की गई।

दिनांक 25 जून 2023 को जमीन के ऊपर भंडारण टैंकों के निर्माण के लिए व्यवहार्यता अध्ययन हेतु आईएसपीआरएल ने ओटीटीसीओ के साथ समझौता ज्ञापन पर हस्ताक्षर किए हैं।









अध्याय 15

एकीकृत वित्त प्रभाग

15 एकीकृत वित्त प्रभाग

अपर सचिव एवं वित्त सलाहकार के नेतृत्व में आईएफडी को प्रशासनिक मंत्रालय/विभाग के सचिव को सहायता प्रदान करने के साथ–साथ वित्त मंत्रालय का प्रतिनिधित्व करने की दोहरी जिम्मेदारी सौंपी गई है।

वित्तीय सलाहकारों से प्रशासनिक सचिवों को निम्नलिखित पर सलाह देने की अपेक्षा की जाती है:

i) नीति के वित्तीय प्रभावों पर ध्यान देने के साथ नीति निर्माण और;

ii) वित्त मंत्रालय द्वारा निर्धारित समग्र मैक्रो–फ्रेमवर्क में विभागीय लक्ष्यों और उद्देश्यों के अनुसार सिफारिशें करना।

इसके कारण, आईएफडी को मंत्रालय/विभाग की नीतियों और प्राथमिकताओं की पूरी समझ होना और दैनिक आधार पर लेन–देन संबंधी निर्णय लेने में सचिव का मार्गदर्शन करना अपेक्षित है। वित्त मंत्रालय द्वारा परिभाषित वित्तीय औचित्य के दायरे में, इस प्रभाग को बजटीय सत्यनिष्ठा से समझौता किए बिना क्षेत्रीय प्राथमिकताओं/लक्ष्यों/उद्देश्यों/परिणामों को ध्यान में रखना चाहिए।

इस उत्तरदायित्व का निर्वहन निम्नलिखित कार्य आबंटन के अनुसार दो अनुभागों के माध्यम से किया जाता है:

(i) मंत्रालय के मुख्य बजट को तैयार करने और इसे अंतिम रूप देने के संबंध में बजट संबंधी कार्य।

(ii) नीतिगत सलाह

(iii) संसद से संबंधित कार्य

(iv) अन्वेषण संबंधी नीतिगत मामलों पर सलाह

(v) लेखा परीक्षा मामले

(vi) पेट्रोलियम और प्राकृतिक गैस मंत्रालय के प्रशासनिक, स्थापना और व्यक्तिगत मामलों की वित्तीय सहमति/पुनरीक्षण।

(vii) सीपीएसई से संबंधित नीतिगत मामलों पर सलाह

(viii) अन्य नीतिगत मामलों पर सलाह



बीपीसीएल मैक लुब्रिकेंट

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय की वार्षिक रिपोर्ट 2023-24 के लिए इनपुट (बजट अनुमान)

(₹ करोड़ में)

योजना/मद का नाम	वास्तविक व्यय 2022-23	बजट अनुमान 2023-24	वास्तविक व्यय 2023-24
राजस्व खंड			
सचिवालय–आर्थिक सेवाएं	46.07	51.90	43.83
राज्य सरकारों को डिफ्रेंशियल रॉयल्टी का भुगतान	1.11	0.00	20.31
कच्चे तेल के सामरिक भंडार के लिए आईएसपीआरएल को भुगतान (ओ एंड एम)	123.27	202.81	152.93
प्रधान मंत्री जी–वन योजना	37.88	227.26	75.75
राष्ट्रीय जैव–ईंधन निधि	0.00	0.00	0.00
प्रत्यक्ष लाभ अंतरण–एलपीजी	180.00	180.00	1460.00
गरीब परिवारों को एलपीजी कनेक्शन	5663.38	0.01	8500.00
पूर्वोत्तर क्षेत्र के लिए देय राजसहायता सहित अन्य देय राजसहायता (घरेलू प्राकृतिक गैस)	810.99	1633.02	1633.00
बीसीपीएल/असम गैस क्रैकर कॉम्प्लेक्स को फीडस्टॉक राजसहायता	131.00	392.06	563.00
परियोजना प्रबंधन व्यय	32.00	52.00	84.00
इंद्रधनुष गैस ग्रिड लिमिटेड (आईजीजीएलद्ध–पूर्वोत्तर प्राकृतिक गैस पाइपलाइन ग्रिड का हिस्सा (कार्यक्रम घटक)	1528.50	1800.00	1043.38
नुमालीगढ़ रिफाइनरी विस्तार परियोजना	245.00	500.00	475.50
घरेलू एलपीजी में अंडर रिकवरी के लिए पीएसयू ओएमसी को एकमुश्त अनुदान	22000.00	0.00	0.00
भारत में मर्चेंट जहाजों की शुरूआत के लिए प्रोत्साहन योजना	84.04	290.44	87.75
वैश्विक जैवईंधन गठबंधन	0.00	0.00	60.00
बायोमास के संग्रह के लिए वित्तीय सहायता प्रदान करने की योजना	0.00	0.00	0.00
भारतीय पेट्रोलियम ऊर्जा संस्थान	29.25	168.00	90.00
सोसायटी फॉर पेट्रोलियम लैबोरेट्रीज	0.22	1.24	0.00
कुल (राजस्व)	**30,912.71**	**5,498.74**	**14,289.46**
पूंजी खंड			
भूमि की खरीद के लिए आईएसपीआरएल को भुगतान (चरण–I सामरिक पेट्रोलियम भंडार का विस्तार)	0.00	0.00	40.00
इंडियन स्ट्रेटेजिक पेट्रोलियम रिजर्व लिमिटेड (आईएसपीआरएल) चरण II (गुहा का निर्माण)	0.00	508.00	0.00
कच्चे तेल भंडार के लिए इंडियन स्ट्रेटेजिक पेट्रोलियम रिजर्व लिमिटेड (आईएसपीआरएल) को भुगतान	0.00	5000.00	0.00
तेल विपणन कंपनियों को पूंजी सहायता	0.00	30000.00	0.00
सचिवालय–आर्थिक सेवाएँ	0.00	0.98	0.76
कुल (पूंजी)	**0.00**	**35,508.98**	**40.76**
कुल योग (राजस्व+पूंजी)	**30,912.71**	**41,007.72**	**14,330.22**

16.2. राजस्व पूंजी प्राप्तियां*

(₹ हजार में)

छः माह की कुल प्राप्तियां		विस्तृत शीर्षों तक	कुल प्राप्तियां			2023-2024		2024-2025
अप्रैल–सितंबर	अप्रैल–सितंबर		2020-2021	2021-2022	2022-2023	बजट अनुमान	संशोधित अनुमान	बजट अनुमान
2022-2023	2023-2024							
32220068	15288113	लाभ पेट्रोलियम	37458596	86749572	77328163	90406807	29933877	42889500
41933333	39483200	रॉयल्टी	35585349	57194897	100640000	81533062	91959297	91634023
107125	144851	पीईएल शुल्क	330000	204600	257100	150000	144851	217277
16208	111423	पीएलपी	30200	26200	38900	27000	222846	222846
74,276,734	**5,50,27,587**	कुल	**7,34,04,145**	**14,41,75,269**	**17,82,64,163**	**17,21,16,869**	**12,22,60,871**	**13,49,63,646**

*दिनांक 30.11.2022 तक एकत्रित जानकारी/डाटा



राजस्व प्राप्तियां–लाभांश (दिनांक 30.11.2022 तक)

(₹ हजार में)

क्र. सं.	सीपीएसई/ बैंक का नाम	दिनांक 31/3/2023 की स्थिति के अनुसार पीएकेबालिक जारीदारी	दिनांक 31/3/2023 की स्थिति के अनुसार ऋण इक्विटी अनुपात	2022-23 के लिए सरकार को संदत्त लाभांश		2022-23 के लिए संदत्त कुल लाभांश (कॉलम क+ख का योग)	2023-24 में भुगतान किया जाने वाला 2022-23 के लिए अंतरिम लाभांश	2023-24 के दौरान संदत्त कुल लाभांश (कॉलम ख+घ का योग)	31/3/2023 की स्थिति के अनुसार सरकारी/ सरकारी समर्थन	31/3/2023 की स्थिति के अनुसार सामान्य आरक्षिती	2023-24 के दौरान पूंजीगत व्यय	2024-25 के लिए अनुमानित पूंजीगत व्यय
				2022-23 में अंतरिम लाभांश	2023-24 में संभाव्य/भुगतान किया जाने वाला अंतिम लाभांश							
				क	ख	ग = क + ख	घ	ङ				
1	इंजीनियर्स इंडिया लिमिटेड			576917	288549	865466	576917	865466	10588719	18246392	980000	500000 (#)
2	गेल (इंडिया) लिमिटेड	78370833	0.22	13550320	0	13550320	0	0	1737750	0	100110000	81300000 (@)
3	एचपीसीएल	497529600	1.8	0	0	0	0	0	5385700	0	120000000	125000000 ($)
4	आईओसीएल	738945000	0.98	0	21816599	21816599	36360999	58177598	7730000	988932600	303950000	309090000
5	ओएनजीसी	39499320	0.03	79641974	3704263	83346237	81632165	85336428	216340460	2377898270	356400000	358500000
6	ऑयल	111613300	0.32	8908462	3379072	12287534	7162100	10541172	13511500	332808500	48960000	52040000
7	बीपीसीएल	194415961	0.69	0	4596734	4596734	13741544	18338278	18813165	339106488	100000000	130000000
8	सचामर लॉरी इन्वेस्टमेंट लिमिटेड			0	437121	437121	0	437121	7271	531603	0	0
	कुल	**1,66,03,74,014**	**4.04**	**10,26,77,673**	**3,42,22,338**	**13,69,00,011**	**13,94,73,725**	**17,36,96,063**	**27,41,14,565**	**4,05,75,23,853**	**1,03,04,00,000**	**1,05,64,30,000**

(#) दिनांक 31.03.2023 तक की नकद और नकद समतुल्य राशि तुलन पत्र में दर्शाई गई है, जिसमें ग्राहक की ओर से धारित राशि, अग्रिम में प्राप्त आय, ग्राहकों से अग्रिम, अवैतनिक लाभांश, अव्ययित सीएसआर आदि शामिल है, जिनकी कुल राशि ₹ 7797888 हजार है।

(@) वर्ष 2023–24 और 2024–25 के लिए लाभांश अनुमान (अंतरिम और अंतिम) बोर्ड से प्राप्त अनुमोदन / सिफारिश और शेयरधारकों से प्राप्त अनुमोदन के अधीन है।

($) शून्य राशि के संदर्भ में, दिनांक 31.01.2018 को भारत सरकार और ओएनजीसी के बीच शेयर खरीद करार के अनुसार, एचपीसीएल के 51.11% इक्विटी शेयर ओएनजीसी द्वारा अधिग्रहित किए गए हैं और शेयरधारिता पैटर्न में इस बदलाव के कारण, वित्त वर्ष 2017–18 और उसके बाद के लिए लाभांश केवल ओएनजीसी को भुगतान किया जाता है / देय है।

Ministry of Petroleum and Natural Gas
CS Budget Allocation & Trend Analysis

In FY 22-23 MoP&NG actual expenditure was 0.74% of Government of India actual expenditures
In FY 23-24, 97.7% of MoP&NG budget has been allocated to 11 CS Schemes

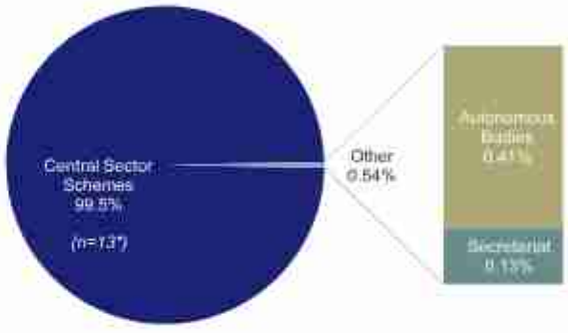
Ministry Expenditure FY 2012-13 to 2022-23
MoP&NG

In INR cr



*Note: Figure for 2023-24 is Budget Estimates**
Sources: Union Budget 2022-23; PRS.

Demand for Grants 2023-24
MoP&NG



**Zero budget schemes are excluded from the count of schemes*
Source: Demand for Grants, Budget (2023-24)

Ministry of Petroleum and Natural Gas
CS Budget Allocation & Trend Analysis

Top 4 schemes contribute to over 94% of the MoP&NG 2023-24 CS budget allocations

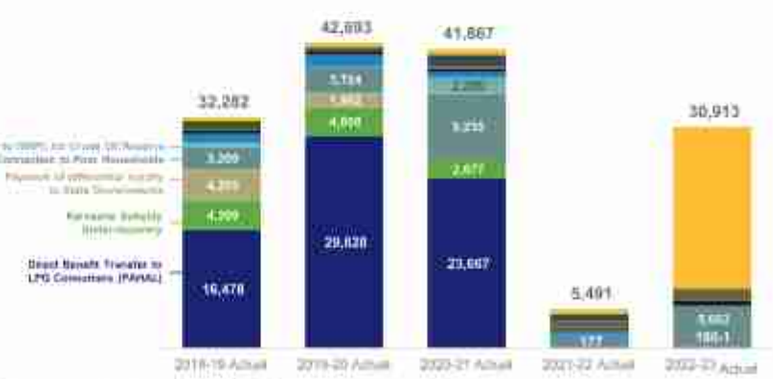
In INR cr

Demand for Grants 2023-24
MoP&NG | By Scheme



- Top 4 schemes: **Capital support to Oil Marketing Companies, Payment to ISPRL for Crude Oil Reserve, Indradhanush Gas Grid Ltd, Other Subsidy Payable including NE Region** contribute to 94% of CS 2023-24 Budget allocations
- *Others includes ISPRL Phase II construction of caverns), Payment to ISPRL for Strategic Crude Oil Reserve (O and M), PM Ji-VAN Yojna, Direct Benefit Transfer - LPG, LPG Connection to Poor Households, Feedstock Subsidy to BCPL/Assam Gas Cracker Complex, Project Management Expenditure, Numaligarh Refinery Expansion Project and Scheme for promotion of flagging of merchant ships in India*

CS Budget Trend (FY19-23)
MoP&NG | 5 Year Trend | By Schemes

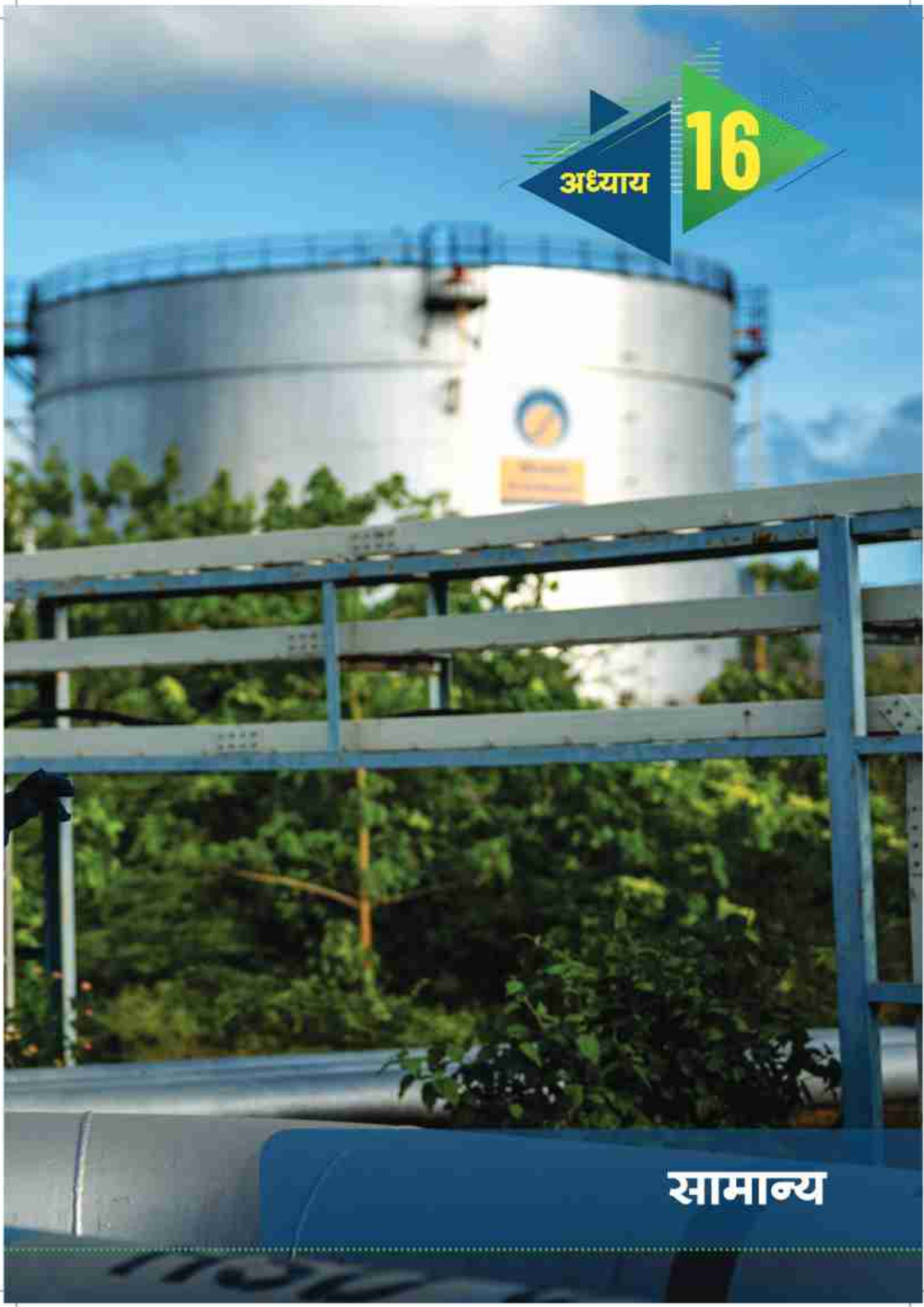


- The budget on **Direct Benefit Transfer- LPG FY 23-24 BE** was equal to FY 22-23 Actuals
- The **BE 23-24 of LPG Connection to Poor Households** has decreased significantly as compared to FY 22-23 Actuals.
- The budget on **Other subsidy payable including for NE Region in BE 23-24** has significantly as compared to FY22-23 Actuals.
- **Feedstock subsidy** to BCPL/Assam GCC was recently transferred from Min Chemicals & Fertilizers to MoP&NG
- The budget on **Indradhanush Gas Grid Ltd has also increased in FY 23-24 BE as compared to FY 22-23 Actuals.**

RE - Revised Estimates BE - Budget Estimates
Source: Demand for Grants, Budget (2018-19, 19-20, 20-21, 21-22, 22-23, 23-24)







अध्याय 16

सामान्य

16 सामान्य

सरकारी कामकाज में हिंदी का प्रगामी प्रयोग

16.1.1. मंत्रालय और इसके उपक्रमों में आधिकारिक कामकाज में राजभाषा हिंदी को बढ़ावा देने के लिए पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय ने हिंदी के उपयोग को बढ़ाने के लिए कई कदम उठाए हैं। इन कदमों में हिंदी कार्यशालाओं का आयोजन, मंत्रालय और उसके उपक्रमों के अनुभागों का मौके पर निरीक्षण, हिंदी पखवाड़े का आयोजन, हिंदी सलाहकार समिति, राजभाषा कार्यान्वयन समिति आदि की बैठकें आयोजित करना शामिल है।

16.1.2. मंत्रालय में माननीय पेट्रोलियम एवं प्राकृतिक गैस मंत्री की अध्यक्षता में एक हिंदी सलाहकार समिति कार्यरत है। माननीय पेट्रोलियम एवं प्राकृतिक गैस राज्य मंत्री इस समिति के उपाध्यक्ष हैं। समिति में छह संसद सदस्य, नौ गैर–सरकारी सदस्य हैं, इसके अलावा मंत्रालय और मंत्रालय के अधीन सार्वजनिक क्षेत्र के उपक्रमों के वरिष्ठ अधिकारी इसके आधिकारिक सदस्य हैं। समिति का कार्य सरकारी कामकाज में राजभाषा को बढ़ावा देने के लिए मंत्रालय को सलाह प्रदान करना है। इस समिति की बैठक दिनांक 25.11.2022 को नई दिल्ली में आयोजित की गयी।

16.1.3. इसी प्रकार मंत्रालय में संयुक्त सचिव (सामान्य एवं प्रशासन) की अध्यक्षता में एक राजभाषा कार्यान्वयन समिति भी कार्य कर रही है। इस समिति का कार्य मंत्रालय और इसके उपक्रमों में राजभाषा की प्रगति की समीक्षा करना और इसके प्रचार–प्रसार के लिए सुझाव देना है। समीक्षाधीन वर्ष के दौरान समिति की नियमित बैठकें आयोजित की गईं और समिति के सुझावों पर अनुवर्ती कार्रवाई की गई।

16.1.4. संसदीय राजभाषा समिति ने हमारे सार्वजनिक क्षेत्र के उपक्रमों के लगभग 47 कार्यालयों का दौरा किया जिसमें ओआईएल, ओएनजीसी, आईओसीएल, बीपीसीएल, एचपीसीएल, गेल, बामर लॉरी और ईआईएल आदि के कार्यालय शामिल हैं और इन कार्यालयों में राजभाषा की प्रगति की समीक्षा की। समिति ने अनेक अवसरों पर हिंदी के प्रचार–प्रसार के लिए इन कार्यालयों द्वारा किए गए प्रयासों की सराहना की। इन कार्यालयों द्वारा समिति को दिए गए आश्वासनों पर अनुवर्ती कार्रवाई की गई है। इन बैठकों में मंत्रालय के वरिष्ठ अधिकारियों ने भी भाग लिया।

16.1.5. समीक्षाधीन वर्ष के दौरान, मंत्रालय ने राजभाषा नियम, 1976 के नियम 10(4) के तहत हमारे पीएसयू



आईओसीएल जैसलमेर आउटलेट

के कुछ कार्यालयों को अधिसूचित किया। हमारे पीएसयू में राजभाषा की प्रगति का आकलन करने और निर्धारित लक्ष्यों के अनुसरण में राजभाषा विभाग द्वारा जारी वार्षिक कार्यक्रम 2023–24 में मंत्रालय के वरिष्ठ अधिकारियों ने हमारे पीएसयू के 36 से अधिक कार्यालयों का निरीक्षण किया और इन कार्यालयों में हिंदी की प्रगति की समीक्षा की। मौके पर ही संबंधित अधिकारियों को कमियों को दूर करने के सुझाव दिए गए।

16.1.6. अधिकारियों को हिंदी में अधिक से अधिक कार्य करने में सहायता करने और ऐसा करने में उनके संकोच को दूर करने के लिए मंत्रालय में नियमित हिंदी कार्यशालाएं आयोजित की गईं। इन कार्यशालाओं में बड़ी संख्या में अधिकारियों ने भाग लिया और इन कार्यशालाओं में दिए गए सुझावों से लाभान्वित हुए। इसके परिणामस्वरूप मंत्रालय में हिंदी पत्राचार का प्रतिशत काफी बढ़ गया है।

16.1.7. राजभाषा विभाग के निर्देशानुसार मंत्रालय में दिनांक 14 सितम्बर से 28 सितम्बर 2023 तक हिन्दी पखवाड़े का आयोजन किया गया। इस अवसर पर, हमारे सभी अधिकारियों के साथ–साथ सभी पीएसयू को माननीय मंत्री जी का एक संदेश जारी किया गया। इस पखवाड़े के दौरान विभिन्न हिंदी प्रतियोगिताओं सहित विभिन्न गतिविधियों का आयोजन किया गया। इन प्रतियोगिताओं में बड़ी संख्या में मंत्रालय के अधिकारियों ने भाग लिया और सफल उम्मीदवारों को पुरस्कार दिए गए।

16.1.8. 22–23 दिसम्बर, 2023 को ऊटी में संयुक्त सचिव (सामान्य एवं प्रशासन) की अध्यक्षता में चौथा पेट्रोलियम राजभाषा सम्मेलन सफलतापूर्वक आयोजित किया गया। पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के प्रशासनिक नियंत्रण के अधीन सभी पीएसयू/संगठनों के बहुत–से राजभाषा अधिकारियों ने इस कार्यक्रम में भाग लिया।

16.1.9. मंत्रालय के हिंदी प्रभाग को सौंपे गए महत्वपूर्ण कार्यों में से एक मंत्रालय के विभिन्न दस्तावेजों का अनुवाद करना है। हिंदी प्रभाग ने इन दायित्वों का सफलतापूर्वक निर्वहन किया। संसद प्रश्न, कैबिनेट नोट और संसदीय स्थायी समिति संबंधी सामग्री, एमओयू आदि सहित विभिन्न दस्तावेजों का अनुवाद समय पर किया गया।

16.2. सूचना का अधिकार

भारत सरकार की दिनांक 15 जून, 2005 की राजपत्र अधिसूचना के अनुसार पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में सूचना का अधिकार (आरटीआई) अधिनियम–2005 लागू किया गया है। आरटीआई अधिनियम अन्य बातों के साथ–साथ लोक प्राधिकरणों के कामकाज में पारदर्शिता और जवाबदेही को बढ़ावा देने के लिए बनाया गया है।

सूचना का अधिकार अधिनियम–2005 के प्रावधान के अनुसार, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में अवर सचिव/सहायक निदेशक को उनके कार्य आबंटन के संबंध में केंद्रीय लोक सूचना अधिकारी (सीपीआईओ) के रूप में नामित किया गया है। तदनुसार, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में निदेशक/उप सचिव/आर्थिक सलाहकार को प्रथम अपीलीय प्राधिकारी (एफएए) के रूप में नामित किया गया है। कार्य के आबंटन में परिवर्तन को ध्यान में रखते हुए इस मंत्रालय के सीपीआईओ/एफएए की सूची को नियमित रूप से अद्यतन किया जा रहा है।

आरटीआई अधिनियम 2005 की धारा 4(2) के तहत सूचना अर्थात जनता को स्वतः संज्ञान लेकर नियमित अंतराल पर सूचना प्रदान करने के लिए मंत्रालय की वेबसाइट को नियमित रूप से अद्यतन किया जा रहा है।

कार्मिक और प्रशिक्षण विभाग द्वारा आरटीआईएमआईएस नामक एक ऑनलाइन प्रणाली शुरू की गई है। इस ऑनलाइन प्रणाली की सहायता से जनता से प्राप्त आवेदनों एवं अपीलों का निर्धारित समय–सीमा में निस्तारण किया जा रहा है। नागरिकों को समयोचित और परेशानी मुक्त तरीके से जानकारी प्रदान करने और पारदर्शिता को बढ़ावा देने के लिए, इस मंत्रालय के प्रशासनिक नियंत्रण के अधीन सभी तेल और गैस सार्वजनिक उपक्रम और अन्य संगठन अब डीओपीटी के ऑनलाइन आरटीआईएमआईएस पोर्टल पर हैं।

अभिलेखों का डिजिटलीकरण सुनिश्चित करने के लिए, त्वरित और समय पर निपटान के लिए भौतिक रूप में प्राप्त आरटीआई आवेदनों और अपीलों को स्कैन, अपलोड और मंत्रालय के संबंधित सीपीआईओ और एफएए को अग्रेषित किया जा रहा है।

जनवरी, 2023 से मार्च, 2024 के दौरान, मंत्रालय में आरटीआई अधिनियम, 2005 के तहत 2920 आवेदन/प्राप्तियां और 101 अपीलें प्राप्त हुई हैं।

16.3. स्टार्ट–अप इंडिया

तेल और गैस क्षेत्र की स्टार्ट–अप इंडिया पहल के तहत, वित्त पोषण और सलाह के लिए व्यक्तिगत सार्वजनिक उपक्रमों द्वारा खुले विज्ञापनों के माध्यम से प्रस्ताव/आवेदन आमंत्रित किए जाते हैं। प्रस्तावों के विषयों में तेल पीएसयू के अपस्ट्रीम/मिडस्ट्रीम/डाउनस्ट्रीम कार्यों में सामाजिक प्रासंगिकता के विषयों के अलावा, इंटरनेट ऑफ थिंग्स (आईओटी) का लाभ उठाना, बिजनेस प्रोसेस का डिजिटलीकरण, हरित ईंधन, वैकल्पिक ऊर्जा, हाइड्रोकार्बन उद्योग के लिए बेहतर प्रौद्योगिकियां शामिल हैं। स्टार्ट–अप आवेदन प्राप्त करने के दौर से पहले, तेल पीएसयू भी समय–समय पर स्टार्ट–अप के लिए अपनी प्रतिभा दिखाने और नवीन विचार प्रदान करने के लिए हैकथॉन/आइडिएशन चैलेंज का आयोजन करते हैं।

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के अधीन सार्वजनिक क्षेत्र के उपक्रमों ने ₹495 करोड़ का स्टार्टअप फंड तैयार किया है। वर्तमान में तेल और गैस पीएसयू द्वारा लगभग ₹262 करोड़ के संवितरित कोष मूल्य के साथ 270 स्टार्टअप को वित्त पोषित किया जा रहा है। तेल और गैस पीएसयू द्वारा समर्थित कुछ स्टार्टअप पहले ही परिपक्व हो चुके हैं।

16.4. कौशल विकास

कौशल भारत पहल के तहत, 26 अप्रैल, 2016 को सोसायटी रजिस्ट्रीकरण अधिनियम, 1860 के तहत हाइड्रोकार्बन क्षेत्र कौशल परिषद (एचएसएससी) की स्थापना की गई थी। कौशल विकास के क्षेत्र में सहयोग के लिए पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय तथा कौशल विकास और उद्यमिता मंत्रालय के बीच 28 नवंबर, 2016 को एक समझौता ज्ञापन पर हस्ताक्षर किए गए।

राष्ट्रीय व्यावसायिक मानक (एनओएस)/योग्यता पैक (क्यूपी) विकास के लिए उद्योग सदस्यों के परामर्श से कई उच्च प्राथमिकता वाले ट्रेडों की पहचान की गई। अब तक, 44 क्यूपी को राष्ट्रीय कौशल योग्यता समिति (एनएसक्यूसी) द्वारा अनुमोदित किया गया है।

हाइड्रोकार्बन क्षेत्र के लिए छह नगरों अर्थात भुवनेश्वर, विजाग, कोच्चि, अहमदाबाद, गुवाहाटी और रायबरेली में कौशल विकास संस्थान (एसडीआई) स्थापित किए गए हैं। मार्च, 2024 तक, इन एसडीआई में 34,773 से अधिक प्रशिक्षुओं को प्रशिक्षित किया जा चुका है।

कौशल विकास संस्थान (एसडीआई), भुवनेश्वर का स्थायी परिसर, जो एक उद्योग के लिए तैयार प्रतिभा पूल बनाने के लिए अत्याधुनिक अवसंरचना और प्रौद्योगिकी का उपयोग करके विश्व स्तरीय उद्योग आधारित कौशल प्रशिक्षण प्रदान करने की परिकल्पना करता है, 20 अगस्त, 2021 को राष्ट्र को समर्पित किया गया था।

16.5. लोक शिकायत

मंत्रिमंडल सचिवालय, भारत सरकार के दिशा–निर्देशों के अनुसार, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में लोक शिकायत प्रकोष्ठ कार्यशील है। यह प्रकोष्ठ इस मंत्रालय के प्रशासनिक नियंत्रण के अधीन सार्वजनिक क्षेत्र की तेल और गैस कंपनियों और अन्य संगठनों के विरुद्ध जन सदस्यों की शिकायतों को संभालता है।

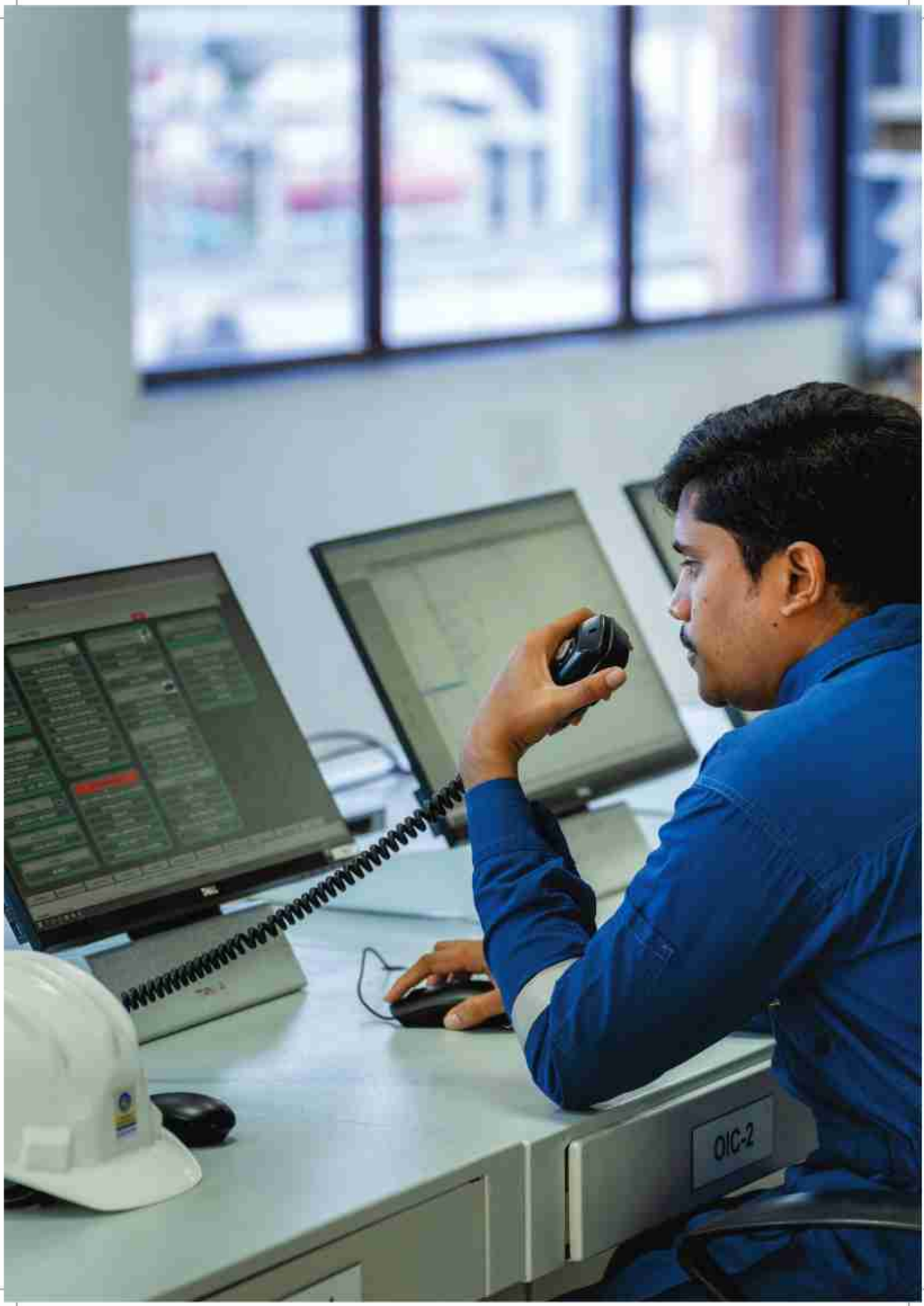
लोक शिकायत विभाग, प्रशासनिक सुधार और लोक शिकायत विभाग और सरकार के अन्य विभागों के साथ–साथ जनता के सदस्यों के माध्यम से प्राप्त जन शिकायतों की नियमित निगरानी सुनिश्चित करने के लिए हर संभव प्रयास किए जा रहे हैं।

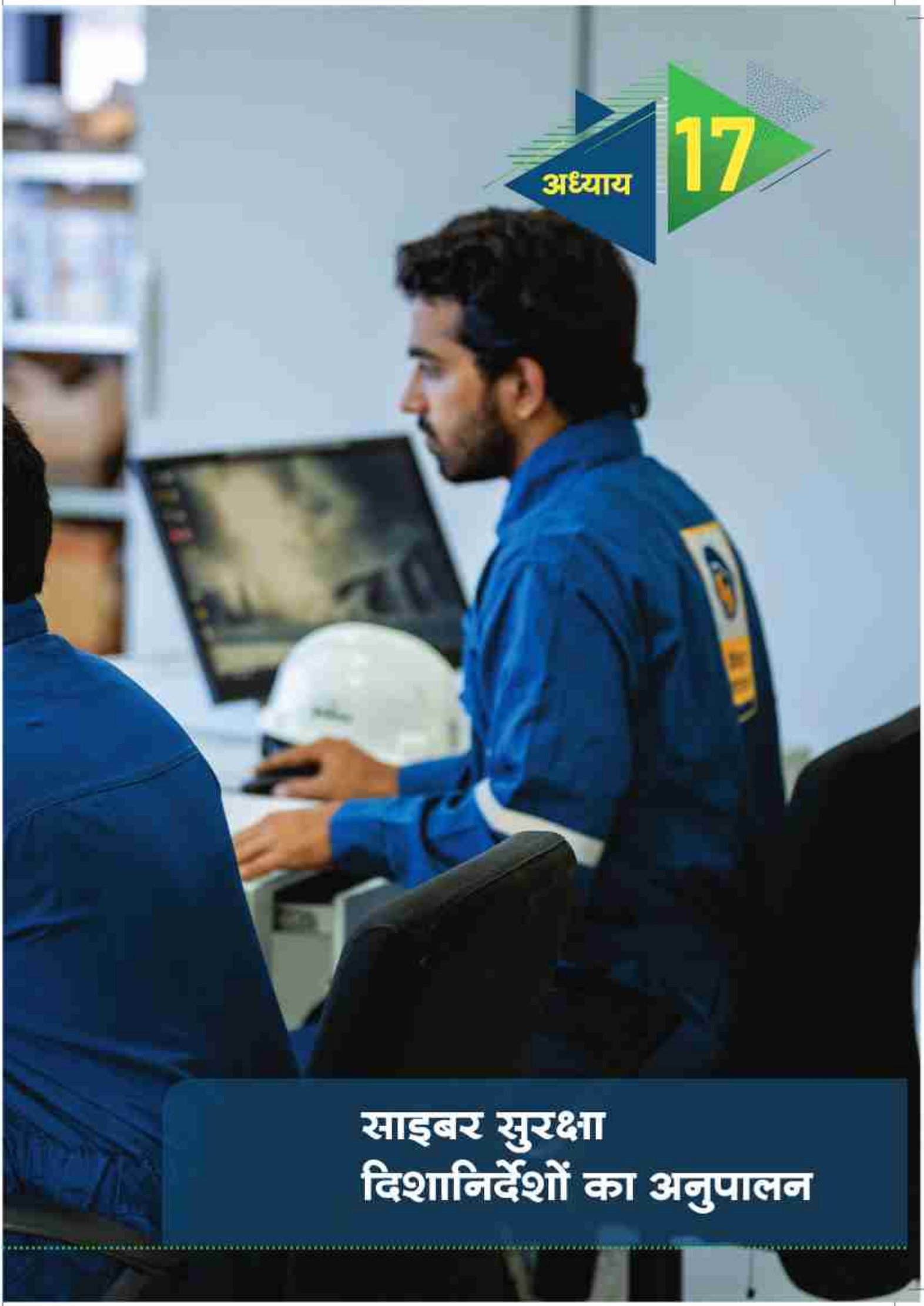
जून, 2008 में "केन्द्रीकृत लोक शिकायत निवारण और निगरानी प्रणाली" (सीपीग्राम्स) नामक एक ऑनलाइन प्रणाली शुरू की गई है। सीपीग्राम्स की सहायता से, जनता और अन्य लोगों से लोक शिकायतों को तेजी से प्राप्त किया जाता है, इसके विषय के अनुसार तुरत विश्लेषण किया जाता है और शीघ्र निवारण के लिए संबंधितों को अग्रेषित किया जाता है।

इसके अलावा, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय में एक व्यवस्थित तंत्र भी विकसित किया गया है ताकि लोक शिकायतों का त्वरित और शीघ्र निवारण सुनिश्चित किया जा सके। पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय और तेल एवं गैस पीएसयू में लंबित लोक शिकायतों की समीक्षा वरिष्ठ अधिकारियों द्वारा नियमित रूप से की जाती है।

जनवरी, 2023 से मार्च, 2024 के दौरान प्राप्त कुल 23,112 लोक शिकायतों में से 31 मार्च, 2024 तक 96% का निपटान किया जा चुका है।


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अध्याय 17

साइबर सुरक्षा दिशानिर्देशों का अनुपालन

17 साइबर सुरक्षा दिशानिर्देशों का अनुपालन

01. राष्ट्रीय महत्वपूर्ण सूचना अवसंरचना संरक्षण केंद्र (एनसीआईआईपीसी) ने तेल क्षेत्र को महत्वपूर्ण क्षेत्रों में से एक के रूप में अभिचिह्नित किया है। देश की आवश्यक सेवाओं और अर्थव्यवस्था को चालू रखने के लिए महत्वपूर्ण अवसंरचना की सुरक्षा परमावश्यक है। तेल क्षेत्र उत्पादकता बढ़ाने, कार्यकरण दक्षता में सुधार करने के लिए अपने संचालन और अभिशासन के लिए सूचना और संचार प्रौद्योगिकी (आईसीटी) और प्रचालन प्रौद्योगिकी का तेजी से उपयोग कर रहा है। वृद्धिशील आईसीटी को अपनाने से साइबर सुरक्षा खतरों और हमलों का जोखिम बढ़ गया है। यह मंत्रालय, मंत्रालय और इसके संबद्ध सार्वजनिक उपक्रमों के भीतर साइबर सुरक्षा की आवश्यकता को समझता है ताकि यह सुनिश्चित किया जा सके कि उनकी प्रणाली सुरक्षित और जोखिम के प्रति सुदृढ़ है।

02. इस मंत्रालय और इससे संबद्ध पीएसयू ने अपने–अपने संगठन में सीआईएसओ/उप सीआईएसओ की नियुक्ति की है। सर्वोत्तम सूचना सुरक्षा प्रणाली परिपाटियों के अनुसार एक संरचित तंत्र सुनिश्चित करने के लिए, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के सचिव को इसके अध्यक्ष तथा मंत्रालय और इससे संबद्ध पीएसयू के सीआईएसओ को इसके सदस्य के रूप में शामिल करते हुए "पेट्रोलियम के लिए साइबर संकट प्रबंधन समिति" का गठन किया गया है। यह समिति, तेल पीएसयू की सीसीएमपी/साइबर सुरक्षा प्रणालियों की स्थिति की समीक्षा करती है और खामियों की पहचान करती है।

03. यह सुनिश्चित करने के लिए कि साइबर सुरक्षा को केवल तकनीकी मुद्दे के रूप में नहीं बल्कि प्रबंधन मुद्दे के रूप में माना जाए, सीआईएसओ द्वारा पीएसयू के निदेशक मंडल के समक्ष तिमाही में एक बार प्रस्तुतिकरण देना अनिवार्य कर दिया गया है। अब सीआईएसओ, पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय की सभी तेल पीएसयू/संबद्ध कार्यालयों के सीआईएसओ/आईटी प्रमुखों और एनसीआईआईपीसी/आईwसी/सीईआरटी–इन/एनआईसी के प्रतिनिधियों के साथ तिमाही बैठकें आयोजित की जा रही हैं, जिसमें साइबर सुरक्षा के लिए तैयारियों की स्थिति, साइबर सुरक्षा कार्यान्वयन में पीएसयू द्वारा सामना की जा रही बाधाओं पर चर्चा की जा रही है।

04. विभागों और कर्मचारियों के लिए साइबर हमलों से मुक्त कार्य परिवेश के निर्माण तथा नेटवर्क और एप्लीकेशन के संबंध में सुरक्षा के लिए इलेक्ट्रॉनिक्स और सूचना प्रौद्योगिकी मंत्रालय और गृह मंत्रालय द्वारा जारी दिशा–निर्देशों को संकलित कर अनुपालन के लिए मंत्रालय में प्रसारित किया गया है।

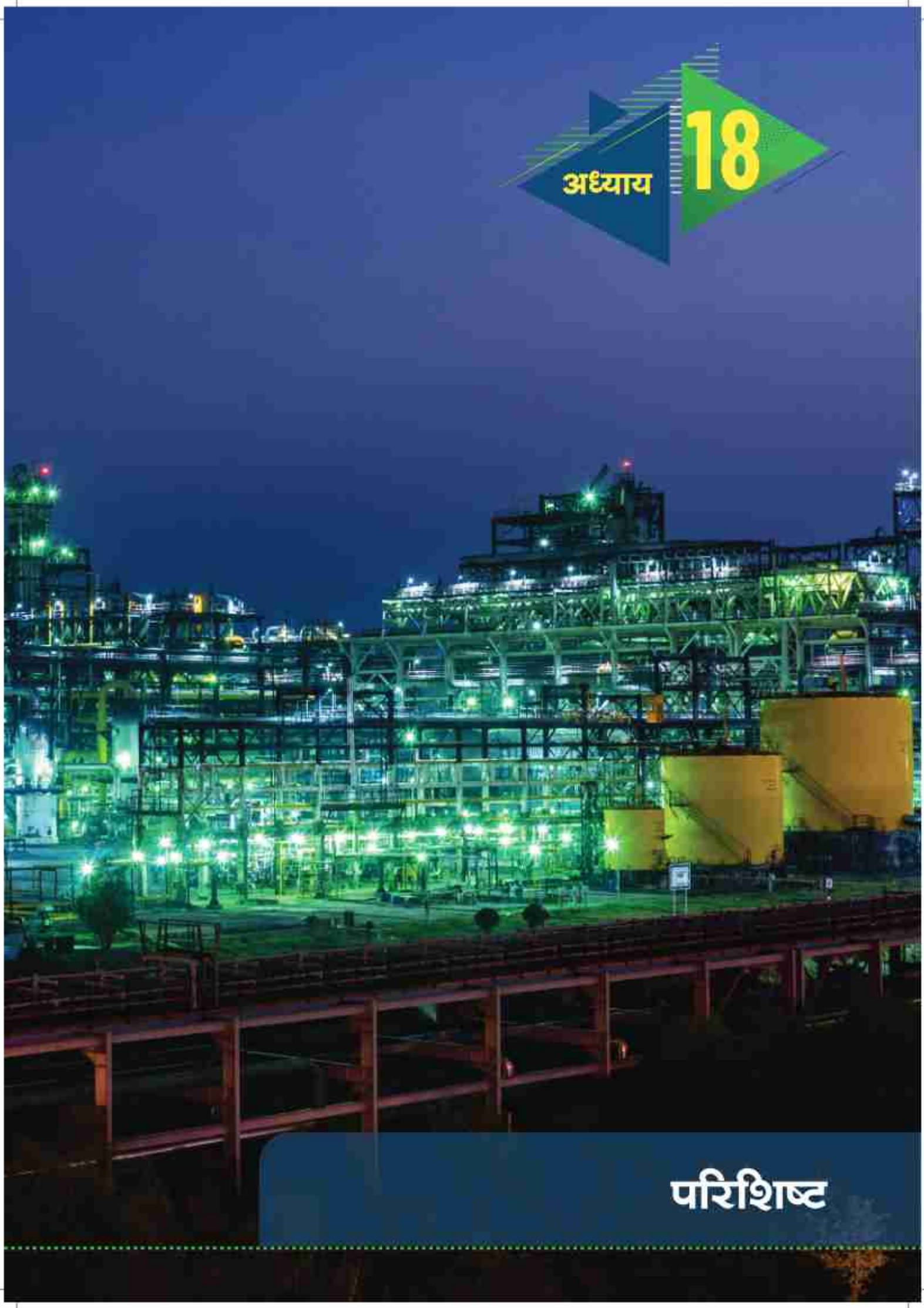
05. मंत्रालय में सभी डेस्कटॉप मशीनों की हार्डवेयर सूची तैयार की गई है। अब मंत्रालय में संस्थापित डेस्कटॉप में ईडीआर (एंडपॉइंट डिटेक्शन रिस्पॉन्स) समाधान (मैलवेयर हमलों से नेटवर्क की सुरक्षा के लिए) और साथ ही यूनिफाइड एंडपॉइंट मैनेजमेंट (यूईएम) टूल (दोनों एनआईसी द्वारा प्रदान किए गए) लागू किए गए हैं।

06. सर्वर सुरक्षा के लिए सीईआरटी–इन द्वारा दिए गए सभी दिशानिर्देशों का ध्यान रखा जा रहा है, जिसमें फायरवॉल का परिनियोजन, ईडीआर क्लाइंट अनुशंसाएं, सर्वर लॉग का रखरखाव, वीपीएन एक्सेस का प्रावधान, सर्वर एक्सेस पर प्रतिबंध, डिफॉल्ट उपयोगकर्ता को डिसेबल करना, एसएसएल का कार्यान्वयन आदि शामिल हैं। इस मंत्रालय के अधीन सभी सार्वजनिक उपक्रमों को सभी दिशानिर्देशों को लागू करने और सीईआरटी–इन और अन्य सरकारी एजेंसी द्वारा जारी एडवाइजरी का पालन करने का निर्देश दिया गया है।

07. साइबर सुरक्षा के जोखिम को न्यूनतम करने के लिए साइबर जागरूकता दिवस के एक भाग के रूप में इस मंत्रालय के अधिकारियों और कर्मचारियों के लिए समय–समय पर प्रशिक्षण और जागरूकता कार्यक्रम आयोजित किए जाते हैं।


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अध्याय
18
परिशिष्ट

18 परिशिष्ट

परिशिष्ट-I

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय

1. प्राकृतिक गैस और कोल बेड मीथेन, गैस हाइड्रेट्स और शेल गैस सहित पेट्रोलियम संसाधनों का अन्वेषण और दोहन।
2. प्राकृतिक गैस, कोल बेड मीथेन और पेट्रोलियम उत्पादों सहित पेट्रोलियम का उत्पादन, आपूर्ति, वितरण, विपणन और मूल्य निर्धारण।
3. ल्यूब संयंत्रों सहित तेल रिफाइनरियां।
4. पेट्रोलियम और पेट्रोलियम उत्पादों के लिए योजक।
5. जैव–ईंधन के लिए सम्मिश्रण और सम्मिश्रण निर्देश के साथ–साथ इस तरह के सम्मिश्रण के लिए मानक निर्धारित करना।
6. जैव ईंधन और उसके मिश्रित उत्पादों का विपणन, वितरण और खुदरा बिक्री।
7. जैव–ईंधन से संबंधित समग्र समन्वय, जैव–ईंधन संबंधी राष्ट्रीय नीति, जैव–ईंधन की नीति, जैव–ईंधन के निर्माण में सहायता के लिए नीति/योजना, राष्ट्रीय जैव–ईंधन विकास बोर्ड की स्थापना और मौजूदा संस्थागत तंत्र को मजबूत करना और जैव–ईंधन के परिवहन, स्थैतिक और अन्य अनुप्रयोगों पर अनुसंधान, विकास और प्रदर्शन।
8. ल्यूब सम्मिश्रण और ग्रीस।
9. पेट्रोलियम उत्पादों का संरक्षण।
10. मंत्रालय के तहत सभी उद्योगों की योजना, विकास, नियंत्रण और सहायता।
11. विदेशों में तेल और गैस की इक्विटी हासिल करके और अंतर्राष्ट्रीय तेल और गैस पाइपलाइन परियोजनाओं में भागीदारी करके ऊर्जा सुरक्षा को मजबूत करना।
12. इंडियन स्ट्रेटेजिक पेट्रोलियम रिजर्व लिमिटेड (आईएसपीआरएल) के माध्यम से कार्यनीतिक पेट्रोलियम रिजर्व का निर्माण और नियंत्रण।
13. पेट्रोलियम योजना और विश्लेषण प्रकोष्ठ (पीपीएसी)।
14. हाइड्रोकार्बन महानिदेशालय (डीजीएच), उच्च प्रौद्योगिकी केंद्र (सीएचटी), तेल उद्योग विकास बोर्ड (ओआईडीबी), पेट्रोलियम संरक्षण अनुसंधान संघ सहित सूची में निर्दिष्ट किसी भी विषय से संबंधित सभी संबद्ध या अधीनस्थ कार्यालय या अन्य संगठन (पीसीआरए), आदि।
15. तेल क्षेत्र सेवाओं की योजना, विकास और विनियमन।
16. भारत के इंजीनियरों का प्रशासन, उनकी सहायक कंपनियों और संयुक्त उद्यम शामिल हैं।
17. इस सूची में शामिल विषय के अंतर्गत आने वाली सार्वजनिक क्षेत्र की परियोजना, ऐसी परियोजनाओं को छोड़कर जो किसी अन्य मंत्रालय/विभाग को विशेष रूप से आवंटित की गई हैं।
18. तेल क्षेत्र (विनियमन और विकास) अधिनियम, 1948 (1948 का 53)।
19. तेल और प्राकृतिक गैस आयोग (उपक्रम का अंतरण और निरसन) अधिनियम, 1993 (1993 का 65)।
20. पेट्रोलियम पाइपलाइन (भूमि में उपयोगकर्ता के अधिकार का अधिग्रहण) अधिनियम, 1962 (1962 का 50)।
21. ईएसएसएसओ (भारत में उपक्रम का अधिग्रहण) अधिनियम, 1974 (1974 का 4)।
22. तेल उद्योग (विकास) अधिनियम, 1974 (1974 का 47)।
23. बर्मा–शैल (भारत में उपक्रम का अधिग्रहण) अधिनियम, 1976 (1976 का 2)।
24. कैलटेक्स (कैल्टेक्स ऑयल रिफाइनिंग (इंडिया) लिमिटेड और भारत में कैलटेक्स (इंडिया) लिमिटेड के उपक्रम के शेयरों का अधिग्रहण अधिनियम, 1977।
25. पेट्रोलियम अधिनियम, 1934 (1934 का 30) और उसके अधीन बनाए गए नियमों का प्रशासन।
26. बामर लॉरी इन्वेस्टमेंट लिमिटेड और बामर लॉरी एंड कंपनी लिमिटेड का प्रशासन।
27. पेट्रोलियम एवं प्राकृतिक गैस नियामक बोर्ड अधिनियम, 2006।
28. ब्रह्मपुत्र क्रैकर एंड पॉलीमर लिमिटेड से संबंधित मामले।
29. किफायती परिवहन के लिए दीर्घकालिक विकल्प (एसएटीएटी) पहल से संबंधित मामले।
30. गैस अथॉरिटी ऑफ इंडिया लिमिटेड (गेल) से संबंधित मामले।
31. प्राकृतिक गैस पाइपलाइनों से संबंधित मामले।
32. एलएनजी टर्मिनलों से संबंधित मामले।
33. राजीव गांधी पेट्रोलियम प्रौद्योगिकी संस्थान (आरजीआईपीटी) अधिनियम, 2007।
34. भारतीय पेट्रोलियम और ऊर्जा संस्थान (आईआईपीई), अधिनियम 2017 (2018 का 3) से संबंधित मामले।
35. द्रवीकृत पेट्रोलियम गैस (आपूर्ति और वितरण का विनियमन) आदेश, 2000।
36. एलपीजी (डीबीटीएल) पहल के प्रत्यक्ष लाभ अंतरण से संबंधित मामले।
37. मिट्टी के तेल (डीबीटीके) में प्रत्यक्ष लाभ अंतरण से संबंधित मामले।
38. प्रधानमंत्री उज्ज्वला योजना (पीएमयूवाई) से संबंधित मामले।

परिशिष्ट-II

पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के प्रशासनिक नियंत्रण के अधीन सार्वजनिक क्षेत्र के उपक्रमों और अन्य संगठनों की सूची।

I. तेल कंपनियां जिनमें 31.03.2024 तक की स्थिति के अनुसार भारत सरकार की शेयरधारिता है

1. ऑयल एंड नैचुलर गैस कॉर्पोरेशन लिमिटेड 58.89%
2. इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल) 51.50%
3. भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड 52.98%
4. गेल (इंडिया) लिमिटेड 51.52%
5. इंजीनियर्स इंडिया लिमिटेड 51.32%
6. ऑयल इंडिया लिमिटेड 56.66%
7. बामर लॉरी एंड कंपनी लिमिटेड

बामर लॉरी एंड कंपनी लिमिटेड में भारत सरकार की कोई प्रत्यक्ष हिस्सेदारी नहीं है। बामर लॉरी इंवेस्टमेंट्स लिमिटेड (बीएलआईएल), जो एक सरकारी कंपनी है, बामर लॉरी एंड कंपनी लिमिटेड में 61.8% शेयर की धारक है। केंद्रीय सरकार, बामर लॉरी इन्वेस्टमेंट्स लिमिटेड में 59.57% की शेयरधारक है।

II. सहायक और अन्य कंपनियां।

1. ओएनजीसी विदेश लिमिटेड–ओएनजीसी के पूर्ण स्वामित्व वाली कंपनी।
2. मैंगलोर रिफाइनरी एंड पेट्रोकेमिकल्स लिमिटेड– ओएनजीसी की सहायक कंपनी।
3. हिंदुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड (एचपीसीएल) – ओएनजीसी की सहायक कंपनी।
4. पेट्रोनेट एमएचबी लिमिटेड (पीएमएनबीएल)– ओएनजीसी की सहायक कंपनी।
5. ओएनजीसी ग्रीन लिमिटेड– ओएनजीसी की पूर्ण स्वामित्वाधीन कंपनी।
6. भारत पेट्रो रिसोर्सेज लिमिटेड– बीपीसीएल की सहायक कंपनी।
7. बीपीसीएल–केआईएएल फ्यूल फार्म फैसिलिटी प्राइवेट लिमिटेड– बीपीसीएल की सहायक कंपनी।
8. नुमालीगढ़ रिफाइनरीज लिमिटेड– ओआईएल इंडिया लिमिटेड की सहायक कंपनी।
9. चेन्नै पेट्रोलियम कॉर्पोरेशन लिमिटेड– आईओसीएल की सहायक कंपनी।
10. आईओसी ग्लोबल कैपिटल मैनेजमेंट आईएफएससी लिमिटेड– आईओसीएल की सहायक कंपनी।
11. सर्टिफिकेशन इंजीनियर्स इंटरनेशनल लिमिटेड– ईआईएल की पूर्ण स्वामित्व वाली सहायक कंपनी।
12. गेल गैस लिमिटेड– गेल के पूर्ण स्वामित्व वाली कंपनी।
13. ब्रह्मपुत्र क्रैकर एंड पॉलिमर लिमिटेड– गेल की सहायक कंपनी।
14. कोंकण एलएनजी लिमिटेड– गेल की सहायक कंपनी।
15. त्रिपुरा नेचुरल गैस कंपनी लिमिटेड– गेल की सहायक कंपनी।
16. बंगाल गैस कंपनी लिमिटेड– गेल की सहायक कंपनी
17. गेल मैंगलोर पेट्रोकैमिकल्स लिमिटेड– गेल की पूर्ण स्वामित्वाधीन सहायक कंपनी।

III. अन्य संगठन

1. तेल उद्योग विकास बोर्ड
2. तेल उद्योग सुरक्षा निदेशालय
3. उच्च प्रौद्योगिकी केंद्र
4. पेट्रोलियम योजना एवं विश्लेषण प्रकोष्ठ
5. हाइड्रोकार्बन महानिदेशालय
6. राजीव गांधी पेट्रोलियम और प्रौद्योगिकी संस्थान
7. पेट्रोलियम एवं प्राकृतिक गैस नियामक बोर्ड
8. भारतीय पेट्रोलियम ऊर्जा संस्थान
9. इंडियन स्ट्रेटेजिक पेट्रोलियम रिजर्व लिमिटेड

परिशिष्ट-III

कच्चे तेल और प्राकृतिक गैस का उत्पादन

राज्य/क्षेत्र	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24 (पी)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I. कच्चे तेल का उत्पादन (टीएमटी)						
आंध्र प्रदेश	296	243	195	202	236	250
अरुणाचल प्रदेश	43	56	53	48	47	52
असम	4309	4093	3902	3988	4164	4359
गुजरात	4626	4707	4651	4627	4850	4950
राजस्थान	7667	6653	5891	5887	5074	4421
तमिलनाडु	395	415	410	367	324	294
त्रिपुरा	-	-	-	3	3	2
पश्चिम बंगाल	-	-	-	0.05	0.01	0.00
अपतटीय	16868	16003	15391	14569	14480	15027
कच्चे तेल का कुल उत्पादन	**34,203**	**32,170**	**30,494**	**29,691**	**29,179**	**29,357**
जिसमें से						
ओएनजीसी– नामांकन	21042	20627	20183	19451	19493	19210
ओआईएल–नामांकन	3293	3107	2937	2987	3156	3344
प्राइवेट/जेवी–पीएससी+आरएससी/सीबीएम	9868	8436	7374	7253	6530	6803
II. प्राकृतिक गैस का उत्पादन (एमएमएससीएम)						
आंध्र प्रदेश	1081	912	827	809	710	722
अरुणाचल प्रदेश	28	46	55	58	53	40
असम	3289	3141	2995	3371	3557	3489
गुजरात	1402	1342	1138	1017	923	926
झारखंड (सीबीएम)	4	5	2	4	10	5
मध्य प्रदेश (सीबीएम)	357	345	334	290	264	234
राजस्थान	1483	1883	2040	2619	2340	2199
तमिलनाडु	1208	1097	911	1067	1109	1016
त्रिपुरा	1554	1473	1634	1531	1675	1525
पश्चिम बंगाल (सीबीएम)	350	306	307	389	399	411
अपतटीय	22117	20635	18429	22869	23409	25871
प्राकृतिक गैस का कुल उत्पादन	**32,873**	**31,184**	**28,673**	**34,024**	**34,450**	**36,438**
जिसमें से						
ओएनजीसी– नामांकन	24675	23746	21872	20629	19969	19316
ओआईएल– नामांकन	2722	2668	2480	2893	3041	3090
पीएससी व्यवस्था	5477	4770	4321	10502	11440	14032

पी: अनंतिम

टिप्पणी: 1. कच्चे तेल के उत्पादन में कंडेनसेट शामिल है।

2. राउंडिंग ऑफ के कारण आंकड़ों को टैली नहीं किया गया हो सकता है।

स्रोत: ओएनजीसी, ओआईएल और डीजीएच

परिशिष्ट-IV

संस्थापित क्षमता और रिफाइनरी अपरिष्कृत थ्रुपुट (कच्चा तेल संसाधित)

(आंकड़े टीएमटी में)

रिफाइनरी	संस्थापित क्षमता	रिफाइनरी अपरिष्कृत थ्रुपुट					
	01.04.2024	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24 (पी)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(क) सार्वजनिक क्षेत्र	**1,57,316**	**1,56,692**	**1,52,629**	**1,33,693**	**1,45,491**	**1,61,500**	**1,65,751**
1. आईओसीएल, गुवाहाटी, असम-1962	1200	863	892	849	730	1080	1000
2. आईओसीएल, बरौनी, बिहार-1964	6000	6661	6516	5469	5620	6785	6618
3. आईओसीएल, कोयाली, गुजरात-1965	13700	13505	13075	11603	13474	15567	15202
4. आईओसीएल, हल्दिया, पश्चिम बंगाल-1975	8000	7965	6463	6759	7305	8506	8060
5. आईओसीएल मथुरा, उत्तर प्रदेश-1982	8000	9737	8948	8926	9123	9573	9191
6. आईओसीएल, डिगबोई, असम-1901	650	676	664	605	708	713	710
7. आईओसीएल, पानीपत, हरियाणा-1998	15000	15281	15038	13181	14849	13810	14305
8. आईओसीएल, बोंगाईगाँव, असम-1974	2700	2513	2045	2450	2639	2775	3009
9. आईओसीएल, पारादीप, ओडिशा-2016	15000	14616	15778	12508	13217	13599	15213
कुल आईओसीएल	**70,250**	**71,816**	**69,419**	**62,351**	**67,665**	**72,408**	**73,308**
10. बीपीसीएल, मुंबई, महाराष्ट्र-1955	12000	14773	15017	12941	14437	14546	15052
11. बीपीसीएल, कोच्चि, केरल-1963	15500	16051	16515	13282	15402	16017	17314
12. बीओआरएल, बीना, मध्य प्रदेश-2011	7800	5716	7913	6190	7410	7841	7133
कुल बीपीसीएल	**35,300**	**36,539**	**39,445**	**32,412**	**37,248**	**38,404**	**39,499**
13. एचपीसीएल, मुंबई, महाराष्ट्र-1954	9500	8671	8065	7374	5558	9804	9505
14. एचपीसीएल, विशाखापत्तनम, आंध्र प्रदेश-1957	13700	9773	9115	9050	8410	9287	12689
कुल एचपीसीएल	**23,200**	**18,444**	**17,180**	**16,425**	**13,968**	**19,091**	**22,194**
15. सीपीसीएल, मनाली, तमिलनाडु-1965	10500	10271	10161	8243	9040	11316	11642
16. सीपीसीएल-सीबीआर, नारीमनम तमिलनाडु-1993	0	423	-	-	-	-	-
कुल सीपीसीएल	**10,500**	**10,695**	**10,161**	**8,243**	**9,040**	**11,316**	**11,642**
17. एनआरएल, नुमालीगढ़, असम-1999	3000	2900	2383	2707	2624	3091	2510
18. एमआरपीएल, मैंगलोर, कर्नाटक-1996	15000	16231	13953	11475	14871	17116	16533
19. ओएनजीसी, तत्तीपाका, आंध्र प्रदेश-2001	66	66	87	81	75	74	66
(ख) निजी और संयुक्त उद्यम क्षेत्र	**99,500**	**1,00,513**	**1,01,757**	**88,080**	**96,213**	**93,733**	**95,660**
20. आरआईएल, जामनगर, गुजरात-1999	33000	31752	33019	34100	34757	34433	34390
21. आरआईएल, जामनगर (एसईजेड), गुजरात-2008	35200	37393	35876	26841	28264	27872	28300
कुल आरआईएल	**68,00**	**69,145**	**68,895**	**60,941**	**63,021**	**62,305**	**62,690**
22. एनईएल, वाडीनार, गुजरात-2006	20000	18896	20620	17067	20164	18692	20322
23. एचएमईएल, बठिंडा, पंजाब-2012	11300	12473	12242	10072	13027	12735	12648
कुल योग (क+ख)	**2,56,816**	**2,57,205**	**2,54,386**	**2,21,773**	**2,41,704**	**2,55,233**	**2,61,411**

टिप्पणी: राउंडिंग ऑफ के कारण आंकड़े टैली नहीं किए गए हो सकते हैं।

पी: अनंतिम

स्रोत: सीपीएसई

परिशिष्ट-V

पेट्रोलियम उत्पादों का उत्पादन

(आंकड़े टीएमटी में)

उत्पाद	2018-19	2019-20	2020-21	2021-22	2022-23 (पी)	2023-24 (पी)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
एलपीजी	12786	12823	12072	12238	12831	12779
मोटर स्पिरट	38039	38616	35779	40238	42817	45081
नेफ्था	19600	20577	19381	19994	17036	18274
एटीएफ	15479	15238	7092	10294	15039	17124
केरोसीन	4056	3211	2393	1913	941	983
एचएसडी	110556	111120	100441	107176	113776	115943
एलडीओ	681	620	729	805	646	657
कुल ईंधन तेल	**9,968**	**9,253**	**7,431**	**8,921**	**10,263**	**10,442**
जिसमें से						
क) फर्नेस ऑयल	9534	8858	7071	8509	9590	9698
ख) एलएसएचएस/एचएचएस/आरएफओ	434	395	360	412	673	744
ल्यूब ऑयल	949	932	1069	1173	1445	1352
बिटुमन	5564	4892	4902	5111	4914	5240
पेट्रोलियम कोक	13663	14650	12040	15508	15387	15054
अन्य	31015	31008	30185	30934	31444	33129
पेट्रोलियम उत्पादों का कुल उत्पादन	**2,62,356**	**2,62,940**	**2,33,513**	**2,54,306**	**2,66,539**	**2,76,058**
जिसमें से						
रिफाइनरी	**2,57,425**	**2,58,181**	**2,29,301**	**2,50,254**	**2,63,047**	**2,72,576**
क्रैकशनेटर्स	**4,931**	**4,760**	**4,212**	**4,051**	**3,492**	**3,482**

टिप्पणी: राउंडिंग ऑफ के कारण आंकड़े टैली नहीं किए गए हो सकते हैं।

पी: अनंतिम

स्रोत: सीपीएसई

परिशिष्ट-VI

पेट्रोलियम उत्पादों का उपभोग

(आंकड़े टीएमटी में)

उत्पाद	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
(1)	(2)	(3)	(4)	(5)	(6)	(7)
एलपीजी	24907	26330	27558	28330	28504	29664
मोटर स्पिरट	28284	29975	27969	30849	34976	37219
नेफ्था	14131	14268	14100	14277	12127	13812
एसकेओ	3460	2397	1798	1494	490	479
एटीएफ	8300	7999	3698	5008	7378	8247
एचएसडीओ	83528	82602	72713	76687	85900	89626
एलडीओ	598	628	855	1020	726	782
ईंधन तेल (एफओ+एलएसएचएस)	6564	6302	5586	6255	6958	6520
ल्यूब्स/वैक्स	3668	3833	4097	4570	3737	4087
बिटुमन	6708	6720	7524	7874	8041	8807
पेट्रोलियम कोक	21346	21708	15605	15772	18343	20319
अन्य	11723	11365	12791	12099	15842	14696
कुल उपभोग	**2,13,216**	**2,14,127**	**1,94,295**	**2,04,233**	**2,23,022**	**2,34,259**

टिप्पणी: उपभोग में तेल कंपनियों द्वारा बिक्री, स्वयं की खपत और प्रत्यक्ष निजी आयात शामिल है।

पी: अनंतिम

स्रोत: पीपीएसी

कच्चे तेल और पेट्रोलियम उत्पादों का आयात/निर्यात

परिशिष्ट-VII

वस्तु	2018-19			2019-20			2020-21			2021-22			2022-23			2023-24 (पी)		
	टीएमटी	₹ करोड़	मिलियन अमरीकी $	टीएमटी	₹ करोड़	मिलियन अमरीकी $	टीएमटी	₹ करोड़	मिलियन अमरीकी $	टीएमटी	₹ करोड़	मिलियन अमरीकी $	टीएमटी	₹ करोड़	मिलियन अमरीकी $	टीएमटी	₹ करोड़	मिलियन अमरीकी $
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
आयात																		
1. कच्चे तेल का आयात	2,26,498	7,83,183	1,11,915	2,26,955	7,17,001	1,01,376	1,96,461	4,59,779	62,248	2,12,382	9,01,262	1,20,675	2,32,700	12,60,372	1,57531	2,33,118	11,00,589	1,32,838
2. एलएनजी आयात	21,545	73,888	10,558	24,417	68,467	9,663	25,055	58,329	7,881	23,417	1,00,521	13,472	19,852	1,37,210	17,114	23,334	1,09,785	5,45,631
3. पेट्रोलियम उत्पाद का आयात	33,348	1,13,665	16,341	43,788	1,25,742	17,689	43,248	1,09,430	14,770	39,017	1,76,835	23,656	44,598	2,15,854	26,912	48,668	1,90,914	23,046
पेट्रोलियम उत्पाद का आयात																		
एलपीजी	13235	49939	7178	14809	50347	7070	16476	53752	7242	17043	91468	12235	18335	107191	13344	18475	87144	10517
एमएस	670	3104	445	2146	9610	1357	1351	4950	674	671	3895	519	1069	8846	1094	717	5494	662
नेफ्था	2082	9665	1391	1662	6678	941	1199	3844	518	237	1499	199	897	4781	593	1244	6811	822
एटीएफ	259	1392	200	65	309	45	0	0	0	0	0	0	0	0	0	0	0	0
एसकेओ	0	0	0	0	0	0	3	12	2	0	0	0	0	0	0	0	0	0
एचएसडी	555	2486	360	2796	11619	1632	648	1960	265	43	253	34	322	3584	454	42	315	38
एलओबीएस / ल्यूब्स ऑयल	2457	13349	1910	2675	11869	1673	2693	12170	1647	3058	19704	2642	2152	18449	2301	2400	19045	2301
ईंधन तेल	1419	4782	696	4583	11791	1650	6454	14312	1936	8980	32815	4379	8563	33474	4202	9055	33669	4061
बिटुमन	877	2149	309	1630	3634	510	2055	4325	586	2581	7678	1029	2797	9945	1237	3234	10838	1310
पेटकोक	7926	10350	1494	10674	9713	1374	8256	6410	861	4213	8203	1097	8664	18157	2263	10956	14310	1729
अन्य	3869	16449	2358	2749	10172	1438	4112	7695	1038	2189	11319	1521	1799	11425	1425	2544	13288	1607
कुल आयात (1+2+3)	2,81,391	9,70,736	1,38,814	2,95,159	9,11,209	1,28,728	2,64,763	6,27,537	84,899	2,74,815	11,78,618	1,57,803	2,97,151	16,13,435	2,01,557	3,05,120	14,01,288	7,01,515
निर्यात																		
एलपीजी	417	1976	283	463	1970	277	452	1797	241	513	3214	430	540	3891	486	525	3213	388
एमएस	12885	60419	8641	12710	54512	7708	11606	36530	4977	13482	81649	10879	13127	102800	12868	13461	92875	11238
नेफ्था	6963	28893	4137	8897	31509	4439	6509	18643	2530	6861	37231	4984	5714	33357	4184	5251	26856	3245
एविएशन / टर्बाइन ऑयल	7389	34030	4867	6906	28458	4021	3544	9377	1287	5186	27112	3661	7264	58598	7285	8579	57961	6995
केरोसीन	19	98	14	176	560	78	15	48	7	14	77	10	11	100	13	11	82	10
डीजल	27931	123882	17675	31653	123919	17481	30576	81611	11132	32407	164741	22088	28496	230826	28861	28193	182281	22047
ल्यूब्स	8	106	15	8	96	13	15	93	12	10	114	15	14	205	26	8	254	30
ईंधन तेल	2197	6537	923	1527	3811	537	1177	2318	313	1757	6633	890	1841	7834	973	2015	7746	936
बिटुमन	23	72	10	25	89	13	7	23	3	6	28	4	9	42	5	8	34	4
पेटकोक / सीबीएफएस	1124	3255	463	465	1096	155	577	292	39	187	553	74	284	648	81	28	23	3
अन्य	2140	8429	1208	2854	7998	1128	2290	6436	865	2330	10449	1402	3717	20427	2542	4357	22828	2756
पेट्रोलियम उत्पादों का निर्यात	61,096	2,67,697	38,236	65,685	2,54,018	35,848	56,769	1,57,168	21,406	62,755	3,31,801	44,438	61,015	4,58,729	57,323	62,437	3,94,153	47,653
निवल आयात	2,20,295	7,03,040	1,00,578	2,29,474	6,57,192	92,880	2,07,995	4,70,369	63,493	2,12,061	8,46,817	1,13,365	2,36,136	11,54,707	1,44,234	2,42,683	10,07,135	6,53,862
पेट्रोलियम उत्पाद का निवल निर्यात	27,747	1,54,031	21,895	21,898	1,28,276	18,159	13,521	47,738	6,636	23,738	1,54,966	20,782	16,417	2,42,875	30,411	13,768	2,03,239	24,607

पी: अनंतिम

2- अन्य निर्यात में पीजीओ, बेंजीन, एमटीओ और सल्फर शामिल है।

स्रोत: पेट्रोलियम योजना एवं विश्लेषण प्रकोष्ठ।

परिशिष्ट-VIII

आंतरिक एवं बाहरी बजटीय संसाधन

(आकड़े ₹ करोड़ में)

सीपीएसई	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
	वास्तविक	वास्तविक	वास्तविक	वास्तविक	वास्तविक	वास्तविक
(1)	(2)	(3)	(4)	(5)	(6)	(7)
सीपीएसई–वार आंतरिक एवं अतिरिक्त बजट संसाधन						
ओएनजीसी	29450	29538	26859	27741	30208	37494
ओवीएल	5827	5435	5734	4681	2704	3259
ओआईएल	3181	4247	13332	4367	5534	5390
गेल	7143	4562	6253	7148	9099	11426
आईओसीएल	28208	31421	28684	30391	37287	42236
बीपीसीएल	10993	11064	11064	11860	12120	11702
एचपीसीएल	12438	16311	14700	16771	14084	14412
एमआरपीएल	1072	1318	2179	674	625	1600
सीपीसीएल	1314	961	583	636	654	611
एनआरएल	465	529	1029	3605	6596	7984
बीएल	132	46	43	22	52	59
ईआईएल	87	171	733	70	62	132
कुल (आई और ईबीआर)	**1,00,309**	**1,05,603**	**1,11,194**	**1,07,968**	**1,19,027**	**1,36,304**
अन्वेषण और उत्पादन क्षेत्र	49613	44769	52994	46376	48125	55417
रिफाइनिंग और विपणन क्षेत्र	46990	56668	51446	54948	61822	69763
पेट्रो–रसायन क्षेत्र	3487	3949	5979	6551	8966	10933
इंजीनियरिंग क्षेत्र	219	217	776	93	114	191
कुल (आई और ईबीआर)	**1,00,309**	**1,05,603**	**1,11,194**	**1,07,968**	**1,19,027**	**1,36,304**

स्रोत: केंद्रीय सार्वजनिक क्षेत्र के उपक्रम।

वित्त वर्ष 2022–23 की तुलना में वित्त वर्ष 2023–24 के लिए कर पूर्व लाभ (पीबीटी) और कर पश्चात लाभ (पीएटी) में पीएसयू–वार भिन्नता

ऑयल एंड नेचुरल गैस कॉर्पोरेशन (ओएनजीसी)

वित्त वर्ष 2023–24 के लिए ओएनजीसी का पीबीटी वित्त वर्ष 2022–23 (पुनः घोषित) के ₹52,089 करोड़ की तुलना में बढ़कर ₹53,016 करोड़ हो गया है। वित्त वर्ष 2023–24 के लिए ओएनजीसी का पीएटी भी वित्त वर्ष 2022–23 (पुनः घोषित) के ₹40,097 करोड़ की तुलना में बढ़कर ₹40,526 करोड़ हो गया है। पीबीटी और पीएटी में वृद्धि मुख्य रूप से ब्याज और लाभांश आय में वृद्धि और वित्त वर्ष 2023–24 के दौरान बट्टे खाते में डाली गई अन्वेषण लागत में कमी के कारण हुई है, जिसे प्रचालन व्यय में वृद्धि और डीडीएंडआई (मूल्यह्रास, ह्रास और हानि) लागत में वृद्धि के कारण आंशिक रूप से ऑफसेट किया गया है।

इंडियन ऑयल कॉर्पोरेशन लिमिटेड (आईओसीएल)

आईओसीएल का कर–पूर्व लाभ (पीबीटी) वित्त वर्ष 2023–24 में ₹52,344 करोड़ था, जबकि वित्त वर्ष 2022–23 में यह ₹9,698 करोड़ था और कर–पश्चात लाभ (पीएटी) पिछले वित्त वर्ष के ₹8,242 करोड़ की तुलना में ₹39,619 करोड़ रहा। वित्त वर्ष 2022–23 की तुलना में 2023–24 के लिए पीबीटी और पीएटी में वृद्धि मुख्य रूप से पिछले वर्ष की तुलना में कुछ पेट्रोलियम उत्पादों पर बेहतर विपणन मार्जिन के कारण है। हालांकि, पिछले वर्ष की तुलना में अंतरराष्ट्रीय बाजार में उत्पाद क्रैक में कमी के परिणामस्वरूप रिफाइनिंग मार्जिन में कमी से विपणन मार्जिन में वृद्धि कुछ हद तक ऑफसेट हो गई। इसके अलावा, विनिमय घाटे में कमी ने भी लाभप्रदता में वृद्धि में योगदान दिया है।

गैस अथॉरिटी इंडिया लिमिटेड (गेल)

वित्त वर्ष 2023–24 में गेल का कर–पूर्व लाभ (पीबीटी) 75.5% बढ़कर ₹11,555 करोड़ हो गया, जबकि वित्त वर्ष 2022–23 में यह ₹6,584 करोड़ था। वित्त वर्ष 2023–24 में कर–पश्चात लाभ (पीएटी) 66.6% बढ़कर ₹8,836 करोड़ हो गया, जबकि वित्त वर्ष 2022–23 में यह ₹5,302 करोड़ था। वित्त वर्ष 2023–24 के दौरान मजबूत प्रदर्शन मुख्य रूप से सभी प्रमुख खंडों में बेहतर भौतिक प्रदर्शन से प्रेरित है।

ऑयल इंडिया लिमिटेड (ओआईएल)

वर्ष 2023–24 के लिए कर–पूर्व लाभ (पीबीटी) ₹6,745.40 करोड़ है, जबकि वर्ष 2022–23 में यह ₹8,857.04 करोड़ था। यह कमी मुख्य रूप से कच्चे तेल और प्राकृतिक गैस की कीमतों में कमी के कारण हुई है, जो वित्त वर्ष 2023–24 में क्रमशः यूएसडी 83.03/बीबीएल और यूएसडी 6.50/एमएमबीटीयू है, जबकि वित्त वर्ष 2022–23 में यह क्रमशः यूएसडी 95.47/बीबीएल और यूएसडी 7.34/एमएमबीटीयू है। इसके अलावा कंपनी ने वर्ष 2023–24 के दौरान रॉयल्टी पर सेवा कर और जीएसटी के लिए ₹3079.33 करोड़ का प्रावधान किया है। वर्ष 2023–24 के लिए कर–पश्चात लाभ (पीएटी) ₹5,551.85 करोड़ है।

भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड (बीपीसीएल)

बीपीसीएल के लिए वित्त वर्ष 2023–24 की तुलना में 2022–23 में कर–पूर्व लाभ (पीबीटी) और कर–पश्चात लाभ (पीएटी) में भिन्नता:

(आंकड़े करोड़ ₹ में)

विवरण	2023-24	2022-23
कर पूर्व लाभ/(हानि)	35,548	2,217
कर पश्चात् लाभ/(हानि)	26,674	1,870

वित्त वर्ष 2022–23 की तुलना में वित्त वर्ष 2023–24 में पीबीटी और पीएटी में वृद्धि मुख्य रूप से विपणन मार्जिन में वृद्धि, जो पिछले वर्ष में कम थी, विदेशी मुद्रा घाटे में कमी, कम वित्त लागत आदि के कारण है, जिसे आय पर उच्च कर द्वारा ऑफसेट किया गया है।

इंजीनियर्स इंडिया लिमिटेड (ईआईएल)

वित्त वर्ष 2023–24 के दौरान, पीबीटी और पीएटी क्रमशः ₹470.41 करोड़ और ₹356.99 करोड़ है, जबकि वित्त वर्ष 2022–23 में यह ₹440.04 करोड़ और ₹342.15 करोड़ था। लाभप्रदता में वृद्धि मुख्य रूप से अन्य आय में वृद्धि, ग्राहकों के साथ संविदाओं के निपटान, देनदारों में कमी पर अधिक ध्यान और अंतर्राष्ट्रीय प्रचालन से राजस्व में वृद्धि के कारण हुई है।

ओएनजीसी विदेश लिमिटेड (ओवीएल)

वित्त वर्ष 2022–23 और वित्त वर्ष 2023–24 के बीच कंपनी की लाभप्रदता में गिरावट आई है। कर पूर्व लाभ (पीबीटी) ₹2,125 करोड़ से घटकर ₹1,579 करोड़ हो गया, और स्वामियों को आरोप्य कर पश्चात् लाभ (पीएटी) ₹1,700 करोड़ से घटकर ₹690 करोड़ हो गया। यह प्रभाव मुख्य रूप से सखालिन–1 से राजस्व का गैर–लेखांकन, उच्च हानि और वित्त वर्ष 2022–23 की तुलना में वित्त वर्ष 2023–24 में कच्चे तेल की 4% कम कीमत वसूली के कारण हुआ।

हिंदुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड (एचपीसीएल)

वित्त वर्ष 2023–24 के लिए, एचपीसीएल ने वित्त वर्ष 2022–23 के लिए ₹11,915 करोड़ के कर–पूर्व निवल घाटे की तुलना में ₹19,153 करोड़ का कर–पूर्व लाभ (पीबीटी) दर्ज किया है। वित्त वर्ष 2023–24 के दौरान कच्चे तेल और पेट्रोलियम उत्पादों की कीमतों में नरमी आई, जो वित्त वर्ष 2022–23 के दौरान असाधारण रूप से उच्च और अस्थिर थीं। वित्त वर्ष 2022–23 के दौरान दबावग्रस्त विपणन मार्जिन की तुलना में वित्त वर्ष 2023–24 के दौरान चुनिंदा मोटर ईंधनों पर विपणन मार्जिन अधिक था। परिवर्धित थ्रूपुट और प्रचालन दक्षता के कारण वित्त वर्ष 2023–24 के लिए सकल रिफाइनिंग मार्जिन (जीआरएम) भी वित्त वर्ष 2022–23 की तुलना में अधिक था।

एचपीसीएल ने वित्त वर्ष 2023–24 के दौरान ₹14,694 करोड़ का कर–पश्चात लाभ (पीएटी) दर्ज किया है, जबकि वित्त वर्ष 2022–23 के दौरान ₹8,974 करोड़ का निवल घाटा हुआ था।

मैंगलोर रिफाइनरी एंड पेट्रोकेमिकल्स लिमिटेड (एमआरपीएल)

एमआरपीएल ने वित्त वर्ष 2022–23 के लिए ₹4,239 करोड़ की तुलना में ₹5,521 करोड़ का कर–पूर्व लाभ (पीबीटी) दर्ज किया है। यह मुख्य रूप से मजबूत संचालन और रिफाइनरी मार्जिन में सुधार के कारण हुआ। वित्त वर्ष 2023–24 के लिए सकल रिफाइनिंग मार्जिन (जीआरएम) वित्त वर्ष 2022–23 के 9.88 डॉलर/बीबीएल की तुलना में 10.36 डॉलर/बीबीएल रहा। वित्त वर्ष 2023–24 के लिए कर–पश्चात लाभ (पीएटी) वित्त वर्ष 2022–23 के ₹2,638 करोड़ की तुलना में ₹3,596 करोड़ रहा।

वामर लॉरी एंड कंपनी लिमिटेड (बीएल)

वर्ष 2022–23 की तुलना में वर्ष 2023–24 के लिए पीबीटी में 31.87% और पीएटी में 32.24% का सकारात्मक अंतर विनिर्माण व्यवसाय (एसबीयू–ग्रीसेस और लुब्रिकेंट्स, एसबीयू–औद्योगिक पैकेजिंग) और एसबीयू–यात्रा और अवकाश के बेहतर प्रदर्शन (टर्नओवर और लाभप्रदता में वृद्धि) के कारण है।

चेन्नै पेट्रोलियम कॉर्पोरेशन लिमिटेड (सीपीसीएल)

सीपीसीएल ने वित्त वर्ष 2023–24 में ₹79,207 करोड़ का टर्नओवर, ₹3,660 करोड़ का कर–पूर्व लाभ और ₹2,711 करोड़ का कर–पश्चात लाभ दर्ज किया, जबकि वित्त वर्ष 2022–23 में ₹90,801 करोड़ का टर्नओवर, ₹4,809 करोड़ का कर–पूर्व लाभ और ₹3,534 करोड़ का कर–पश्चात लाभ दर्ज किया था।

सीपीसीएल ने 11.642 एमएमटी के अब तक के सबसे अधिक क्रूड थ्रूपुट के साथ शानदार प्रचालन प्रदर्शन और फीड ऑप्टिमाइजेशन के साथ विश्वसनीयता पर केंद्रित सुधार के कारण वर्ष 2023–24 में अपना उत्कृष्ट वित्तीय प्रदर्शन जारी रखा, जिससे सेकेंडरी यूनिट्स पिछले सर्वश्रेष्ठ को पार करने में सक्षम हुईं।

वित्त वर्ष 2023–24 के लिए सकल रिफाइनिंग मार्जिन (जीआरएम) 8.64 अमेरिकी डॉलर प्रति बैरल (सिंगापुर जीआरएम: 6.81 डॉलर प्रति बैरल) दर्ज किया गया, जबकि पिछले वित्त वर्ष में यह 11.91 अमेरिकी डॉलर प्रति बैरल (सिंगापुर जीआरएम: 8.96 डॉलर प्रति बैरल) था। सीपीसीएल ने पिछले दो वर्षों में लगातार सिंगापुर जीआरएम से बेहतर प्रदर्शन किया है, जिसका मुख्य कारण अनुकूलित रिफाइनरी उत्पादन, बेहतर उत्पाद वितरण, कच्चे तेल की खरीद कार्यनीति और कुशल सेकेंडरी यूनिट प्रसंस्करण क्षमताएं हैं।

नुमालीगढ़ रिफाइनरी लिमिटेड (एनआरएल)

वर्ष 2022–23 का कर–पूर्व लाभ (पीबीटी) पिछले वित्तीय वर्ष के ₹4,847.85 करोड़ की तुलना में 2.17% बढ़कर ₹4,953.23 करोड़ रहा, जिसका मुख्य कारण कुल सकल मार्जिन में वृद्धि और अधिक इन्वेंट्री लाभ है। तदनुसार, कंपनी ने वर्ष 2022–23 के लिए कर–पश्चात लाभ (पीएटी) के साथ ₹3,702.79 करोड़ का रिकॉर्ड लाभ दर्ज किया, जो पिछले वर्ष के ₹3,561.56 करोड़ की तुलना में ₹141.23 करोड़ की वृद्धि दर्शाता है।

ब्रह्मपुत्र क्रैकर एंड पॉलीमर लिमिटेड (बीसीपीएल)

ब्रह्मपुत्र क्रैकर एंड पॉलीमर (बीसीपीएल) का कर–पूर्व लाभ (पीबीटी) वित्त वर्ष 2023–24 में 206: घटकर ₹(–) 204.44 करोड़ रह गया, जबकि वित्त वर्ष 2022–23 में यह ₹192.69 करोड़ था। कर–पश्चात लाभ (पीएटी) वित्त वर्ष 2023–24 में 219% घटकर ₹(–)160.22 करोड़ रह गया, जबकि वित्त वर्ष 2022–23 में यह ₹134.23 करोड़ था। कम उत्पादन, कम कीमतों और फीडस्टॉक की उच्च लागत के कारण लाभ में कमी आई।

परिशिष्ट-X

वित्त वर्ष 2023–24 तक 80 सीएजी लेखापरीक्षा पैरा थे। वित्त वर्ष 2023–24 के दौरान 7 सीएजी लेखापरीक्षा पैरा के निपटान के बाद, दिनांक 31.03.2024 तक मंत्रालय में 73 सीएजी लेखापरीक्षा पैरा लंबित हैं। इन 73 सीएजी लेखापरीक्षा पैरा में से 70 लेखापरीक्षा पैरा के उत्तर सीएजी को सौंप दिए गए हैं। 70 सीएजी लेखापरीक्षा पैरा में से 28 लेखापरीक्षा पैरा पर विधीक्षा टिप्पणियां प्राप्त हुई हैं, जिन पर आगे की कार्रवाई की जा रही है। इसके अलावा, वर्ष 2017 में, 1 पीएसी रिपोर्ट संख्या 34 में 5 पैरा हैं, जिन पर मंत्रालय द्वारा पीएसी को उत्तर भेजे गए हैं। हालाँकि, पीएसी से उसी पर जांच टिप्पणियां प्राप्त हुई हैं, जिस पर आवश्यक कार्रवाई की जा रही है।

वित्त वर्ष 2023–24 तक प्राप्त सीएजी लेखापरीक्षा पैरा पर कृत कार्रवाई (एटीएन) की वर्षवार स्थिति

(दिनांक 31.03.2024 तक की स्थिति के अनुसार)

क्र. सं.	वर्ष	सीएजी के उन पैरा की संख्या जिन पर निपटान हेतु एटीएन सीएजी को प्रस्तुत किया जाना है	(दिनांक 31.03.2024 तक की स्थिति के अनुसार)		
			सीएजी के उन पैरा की संख्या जिन पर अभी तक प्राथम एटीएन नहीं की गई है	ऐसे एटीएन की संख्या, जो भेजे गए किंतु सीएजी द्वारा टिप्पणियों के साथ वापस किए गए	ऐसे एटीएन की संख्या, जो मंत्रालय द्वारा भेजे गए लेकिन सीएजी से जांच संबंधी टिप्पणियां प्राप्त नहीं हुई हैं
	(i)	(ii)	(iii)	(iv)	(v)
1	2008	1	-	1	-
2	2009	1	-	1	-
3	2011	2	-	2	-
4	2012	2	-	2	-
5	2013	4	-	2	2
6	2014	2	-	1	1
7	2015	3	-	1	2
8	2016	7	-	4	3
9	2017	5	-	2	3
10	2018	5	-	2	3
11	2019	10	-	3	7
12	2020	4	-	-	4
13	2021	9	-	5	4
14	2022	9	-	2	7
15	2023	9	3	-	6

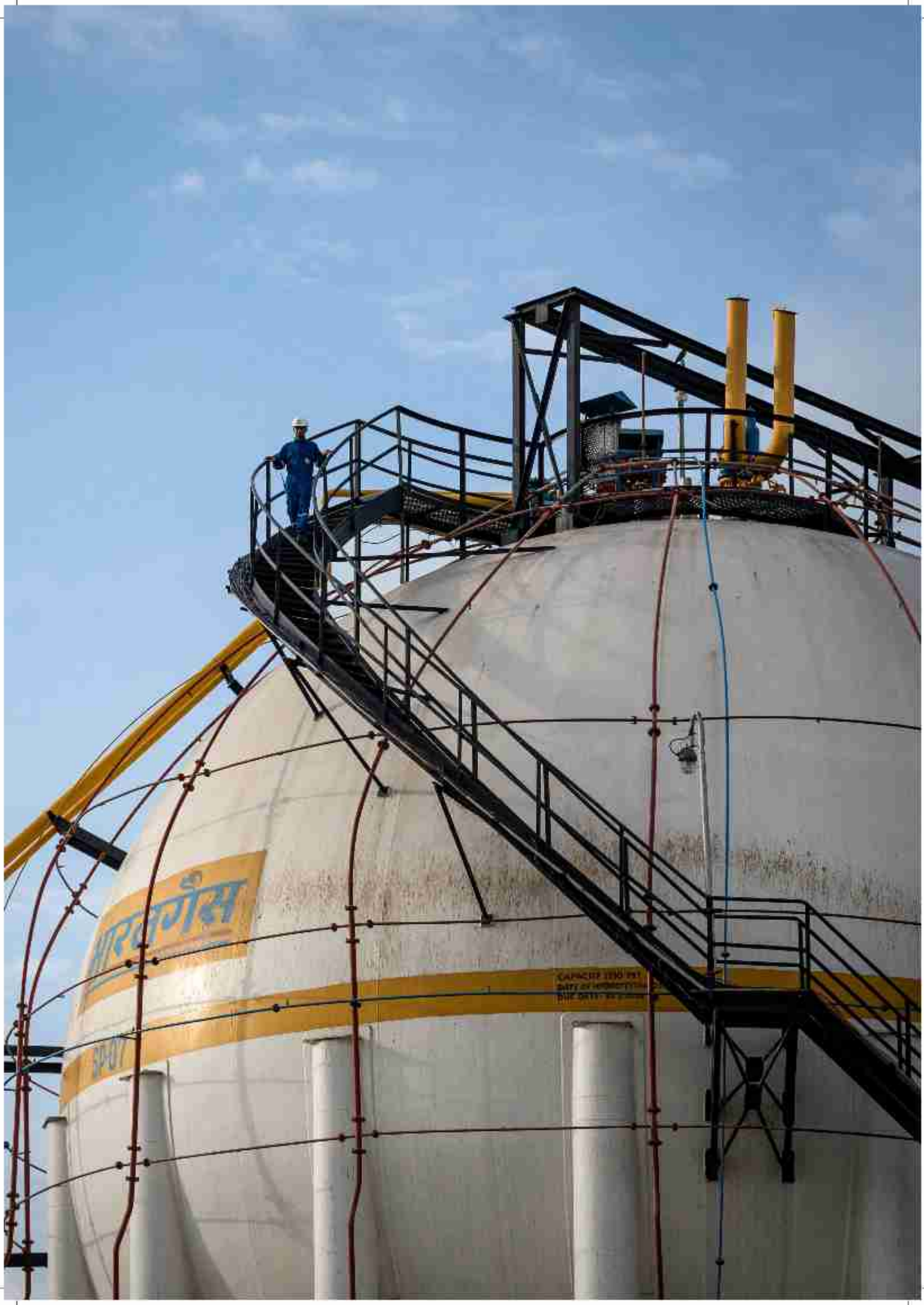
परिशिष्ट-XI

भारतीय सार्वजनिक क्षेत्र के उपक्रमों द्वारा विदेशों में अधिगृहीत परिसंपत्तियों की सूची

क्र. सं.	देश	परिसंपत्ति का नाम	कंपनी का नाम	प्रतिभागी कंपनियां
1.	आस्ट्रेलिया	उत्पादन लाइसेंस टी/एल1 (गोला फील्ड)	प्राइज पेट्रोलियम कंपनी लिमिटेड (सिंगापुर में अपनी 100% सहायक कंपनी प्राइज पेट्रोलियम इंटरनेशनल प्राइवेट लिमिटेड के माध्यम से)	बीच एनर्जी (ऑपरेशंस) लिमिटेड, बीच एनर्जी (बास गैस) लिमिटेड, बीच एनर्जी लिमिटेड, प्राइज पेट्रोलियम इंटरनेशनल प्राइवेट लिमिटेड
2		प्रतिधारण पट्टे टी/आरएल 2, 4 और 5 (ट्रेफोइल और अन्य)		बीच एनर्जी (ऑपरेशंस) लिमिटेड (ऑपरेटर), बीच एनर्जी लिमिटेड, प्राइज पेट्रोलियम इंटरनेशनल प्राइवेट लिमिटेड
3	अजरबैजान	एसीजी	ओवीएल	ओएनजीसी विदेश लिमिटेड, बीपी (ऑपरेटर), एजएसीजी, एमओएल, आईएनपीईएक्स, इक्विनोर एब्सरॉन एएस, एक्सॉनमोबिल, टीपीएओ, इटोचू
4		बीटीसी पाइपलाइन	ओवीएल	ओएनजीसी बीटीसी लिमिटेड, बीपी (ऑपरेटर), एजबीटीसी, एमओएल, आईएनपीईएक्स, इक्विनोर एब्सरॉन एएस, टीपीएओ, इटोचू, टोटल, ईएनआई, एक्सॉन
5	बांग्लादेश	एसएस–04	ओवीएल ओआईएल	ओनजीसी विदेश लिमिटेड (ऑपरेटर), ऑयल इंडिया लिमिटेड, बीएपीईएक्स (कैरिड)
6		एसएस–09	ओवीएल ओआईएल	ओनजीसी विदेश लिमिटेड (ऑपरेटर), ऑयल इंडिया लिमिटेड, बीएपीईएक्स (कैरिड)
7	ब्राजील	बीसी–10	ओवीएल	ओएनजीसी विदेश लिमिटेड, शेल (ऑपरेटर), कतर एनर्जी
8		बीएम–सील–4	ओवीएल	ओएनजीसी विदेश, पेट्रोब्रास (ऑपरेटर)
9		बीएम–सील–11 (2 ब्लॉक)	बीपीआरएल	पेट्रोब्रास, आईबीवी
10		बीएम–सी–30 (1 ब्लॉक)	बीपीआरएल	पेट्रोरियो, आईबीवी
11	कनाडा	पीएनडब्ल्यू परियोजना	आईओसीएल	पेट्रोनास एनर्जी कनाडा लिमिटेड (पीईसीएल) (ऑपरेटर), सिनोपेक हुआडियन, इंडऑयल मॉटनी लिमिटेड (आईएमएल), पेट्रोलियम ब्रुनेई मॉटनी होल्डिंग्स लिमिटेड
12	कोलम्बिया	एमईसीएल	ओवीएल	ओएनजीसी विदेश, एसआईपीसी
13		सीपीओ–5	ओवीएल	ओएनजीसी विदेश (ऑपरेटर), जिवोपार्क
14		आर सी–10	ओवीएल	ओएनजीसी विदेश (ऑपरेटर), इकोपेट्रोल
15		एसएसजेएन 7	ओवीएल	ओएनजीसी विदेश, कैनाकोल एनर्जी लिमिटेड (ऑपरेटर)
16	गेबॉन	ब्लॉक शक्ति–II	आईओसीएल ओआईएल	ओआईएल (ऑपरेटर), आईओसीएल

क्र. सं.	देश	परिसंपत्ति का नाम	कंपनी का नाम	प्रतिभागी कंपनियां
17	इंडोनेशिया	नुनुकन	बीपीआरएल	पर्टामिना, बीपीआरएल VI बीवी
18	ईरान	ब्लॉक फारजाद–बी	ओवीएल	ओएनजीसी विदेश लिमिटेड (ऑपरेटर), आईओसी, ऑयल
19	ईराक	ब्लॉक 20 (पूर्ववर्ती ब्लॉक 8)	ओवीएल	ओएनजीसी विदेश लिमिटेड
20	लीबिया	संविदा क्षेत्र 43	ओवीएल	ओएनजीसी विदेश लिमिटेड
21		क्षेत्र 95 / 96	ओआईएल ओवीएल	ऑयल, आईओसीएल, सिपेक्स (ऑपरेटर)
22	मोजाम्बिक	अपतटीय क्षेत्र 1, रोवुमा बेसिन	ओवीएल ओआईएल बीपीआरएल	ओएनजीसी विदेश रोवुमा लिमिटेड, बीआरईएमएल (ओएनजीसी विदेश लिमिटेड, ओआईएल का संघ), टोटल एनर्जीज (ऑपरेटर), ईएनएच, मित्सुई, बीपीआरएल, पीटीटीईपी
23	म्यांमार	ब्लॉक ए–1	ओवीएल	ओएनजीसी विदेश, एमओजीई, पॉस्को इंटरनेशनल (ऑपरेटर), कोगास, गेल
		ब्लॉक ए–3	ओवीएल	
24		ब्लॉक ए–1 एवं ए–3	गेल (इंडिया) लिमिटेड	
25		अपतटीय मध्य–धारा गैस पाइपलाइन (पाइपको 1)	ओवीएल गेल (इंडिया) लिमिटेड	ओएनजीसी विदेश, एमओजीई, पॉस्को इंटरनेशनल (ऑपरेटर), कोगास, गेल
26		तटवर्ती गैस पाइपलाइन (एसईएजीपी) (पाइपको 2)	ओवीएल गेल (इंडिया) लिमिटेड	ओएनजीसी नील गंगा बी.वी., सीएनयूओसी(ओ), एमओजीई, पॉस्को इंटरनेशनल, गेल, केजी–एसईएजीपी
27		ब्लॉक बी–2	ओवीएल	ओएनजीसी विदेश (ऑपरेटर), एम एंड एस (कैरिड)
28		ब्लॉक ईपी–3	ओवीएल	ओएनजीसी विदेश (ऑपरेटर), एम एंड एस (कैरिड)
29	नाइजीरिया	ओएमएल 142	आईओसीएल ओआईएल	सप्रिट ऑयल (ऑपरेटर), सनटेरा नाइजीरिया लिमिटेड, (संयुक्त उद्यम साझेदार: सनटेरा, इंडियनऑयल, ओआईएल)
30	ओमान	मुखियाजाना	आईओसीएल	आईओसीएल सिंगापुर प्राइवेट लिमिटेड (आईएसपीएल), ऑक्सिडेंटल मुख्रैजना एलएलसी, ओमान ऑयल, लीवा एनर्जी लिमिटेड (मुबाडाला), पीटीटीईपी (पार्टनर्स) (ओमान) कॉर्पोरेशन
31	रूस	सखालिन–1	ओवीएल	ओएनजीसी विदेश लिमिटेड, सोडेको, रोसनेफ्ट की सहायक कंपनियां (एसएमएनजी और आरएन एस्ट्रा)
32		वैनकॉर्नेफ्ट	ओवीएल ओआईएल आईओसीएल बीपीआरएल	ओएनजीसी विदेश वैंकोरनेफ्ट प्राइवेट लिमिटेड, वोनकोर इंडिया प्राइवेट लिमिटेड (आईओसीएल सिंगापुर प्राइवेट लिमिटेड, ऑयल इंडिया इंटरनेशनल प्राइवेट लिमिटेड, बीपीआरएल इंटरनेशनल सिंगापुर प्राइवेट लिमिटेड का संघ), वोस्तोक ऑयल एलएलसी
33		इम्पीरियल एनर्जी	ओवीएल	ओएनजीसी विदेश लिमिटेड
34		तास युरयाख	आईओसीएल ओआईएल बीपीआरएल	रोसनेफ्ट, तास इंडिया प्राइवेट लिमिटेड (टीआईपीएल) बीपी रशियन इन्वेस्टमेंट लिमिटेड
35		लाइसेंस–61	ओआईएल	ऑयल इंडिया इंटरनेशनल बी.वी. नीदरलैंड, पेट्रोनेफ्ट रिसोर्सेज

क्र. सं.	देश	परिसंपत्ति का नाम	कंपनी का नाम	प्रतिभागी कंपनियां
36	दक्षिण सूडान	जीपीओसी	ओवीएल	ओएनजीसी विदेश लिमिटेड, सीएनपीसी, पेट्रोनास, नीलपेट
37		एसपीओसी	ओवीएल	ओएनजीसी विदेश लिमिटेड, पेट्रोनास, नीलपेट
38	सीरिया	एएफपीसी	ओवीएल	एसएसपीडी (ऑपरेटर), एचईएसबीवी (ओएनजीबीवी और सीएनपीसी के साझेदार)
39		ब्लॉक 24	ओवीएल	ओएनजीसी विदेश लिमिटेड, आईपीआरएमईएल (ऑपरेटर), टीओएम
40	सऊदी अरब अमीरात	लोअर जकुम कन्सेशन	ओवीएल आईओसीएल बीपीआरएल	ओवीएलएफओजीबीवी–फालकन ऑयल एंड गैस बी.वी. (ओएनजीसी विदेश, आईओसी, बीपीआरएल का संघ), एडीएनओसी, आईएनपीईएक्स–जोडको, सीएनपीसी, टोटल, ईएनआई
41		तटवर्ती ब्लॉक 1	आईओसीएल बीपीआरएल	यूबीपीएल (बीपीआरएल और आईओसीएल का संयुक्त उद्यम)
42	संयुक्त राज्य अमरीका	निओब्रारा शेल परियोजना	आईओसीएल	आईओसीएल यूएसए इनकॉर्पोरेशन, वेरदाद रिसोर्सेज एलएलसी; हैमो ऑयल एंड गैस एलएलसी
43		ईगल फोर्ड संयुक्त उद्यम (जेवी)	गेल ग्लोबल (यूएसए) इनकॉर्पोरेशन (जीजीयूआई)– गेल की 100% सहायक कंपनी	टेक्सास अमेरिकन रिसोर्सेज II, एलएलसी, ("टीएआर"), रिजमार, गेल ग्लोबल (यूएसए) इनकॉर्पोरेशन
44	वेनेजुएला	सेंट क्रिस्टोफर	ओवीएल	ओएनजीसी विदेश लिमिटेड, सीवीपी–पीडीवीएसए, पीडीवीएसए सोशल
45		कारबोबो परियोजना–1	ओवीएल ओआईएल आईओसीएल	ओएनजीसी विदेश लिमिटेड,पीडीवीएसए रेपसोल, आईओसीएल, ओआईएल
46	वियतनाम	ब्लॉक 06.1	ओवीएल	ओएनजीसी विदेश लिमिटेड, जरुबेजनेफ्ट ईपी वियतनाम बी.वी., पेट्रो वियतनाम
47		ब्लॉक 128	ओवीएल	ओएनजीसी विदेश लिमिटेड


भारतगैस



पेट्रोलियम एवं प्राकृतिक
गैस मंत्रालय
भारत सरकार