



# India's Petroleum Industry

## *Fueling Growth and Innovation*

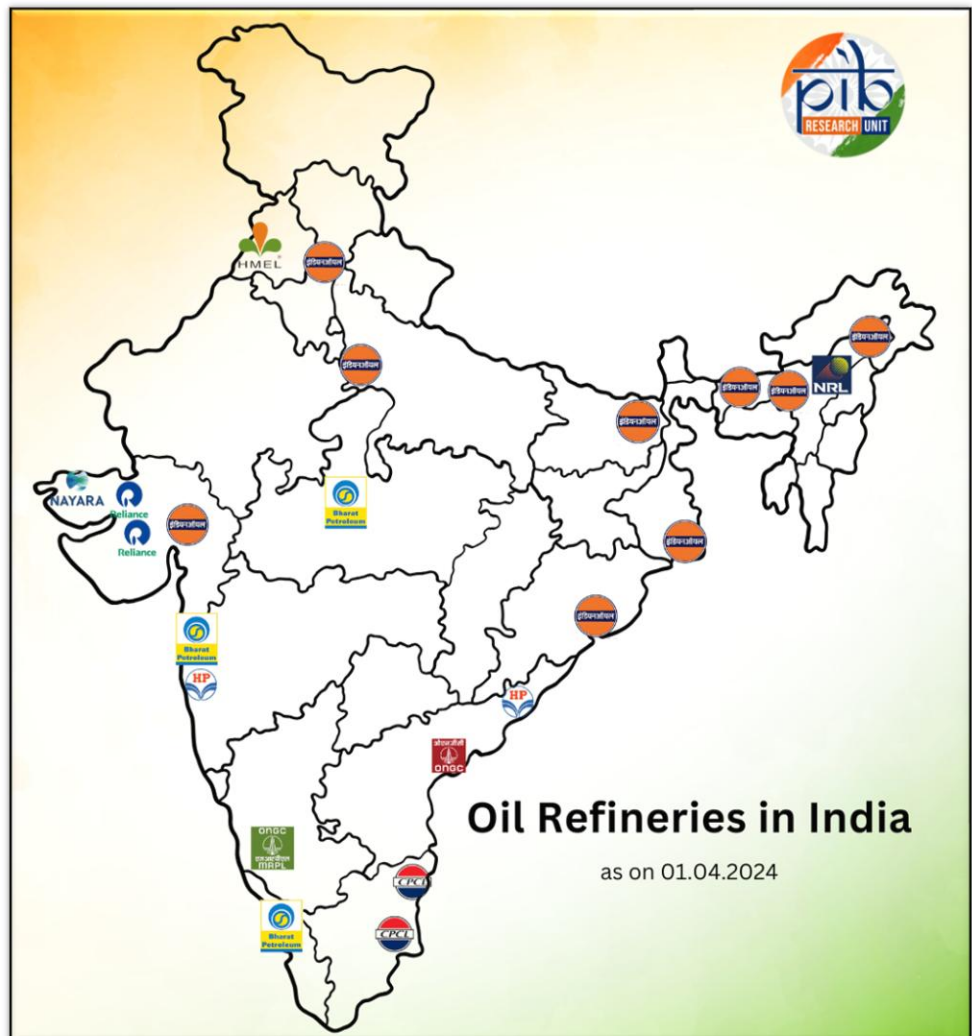
(Ministry of Petroleum and Natural Gas)

January 27, 2025

### Introduction

India's petroleum industry is a comprehensive sector encompassing exploration, production, refining, distribution, and marketing of **petroleum** and its **by-products**. This includes **upstream** activities like extraction of crude oil and natural gas, **midstream** activities such as transportation and storage, and **downstream** processes including refining and distribution of fuels like petrol, diesel, LPG, and kerosene. A critical contributor to India's energy basket, the petroleum industry ensures energy security and underpins various economic activities.

At present, India has **nineteen Public-Sector Undertaking (PSU) refineries**, **three Private-Sector refineries**, and **one Joint Venture refinery**.



**The country's refining capacity increased from 215.066 Million Metric Tons per annum (MMTPA) in April 2014 to 256.816 MMTPA in April 2024.**

### Origin and Brief History

The roots of India's petroleum industry trace back to 1867 when the first oil well was drilled in **Digboi, Assam**. This discovery marked the inception of the country's exploration and production activities. The establishment of the **Indian Oil Corporation in 1959** heralded a structured approach to refining and distribution. Over the decades, the sector witnessed significant expansion, from small-scale refineries to a robust



network capable of meeting domestic and export demands. Today, India's petroleum industry stands as a symbol of resilience and innovation, evolving in response to global and domestic energy challenges.

### Industry Development and Evolution



The Indian petroleum industry has evolved significantly, driven by technological advancements and policy reforms. The **1990s** marked a pivotal era with economic liberalization, leading to increased private and foreign investment. Public sector undertakings (PSUs) like **ONGC** and **Indian Oil Corporation** have played a crucial role in exploration and refining. Establishing state-of-the-art refineries, such as **Jamnagar Refinery in Gujarat**, has bolstered refining capacities, making India a refining hub in Asia. Furthermore, government initiatives like the **National Exploration Licensing Policy (NELP)** have incentivized exploration activities.



India's energy landscape is rapidly evolving. The country boasts 651.8 million metric tons of recoverable crude oil reserves and 1,138.6 billion cubic meters of recoverable natural gas reserves within its sedimentary basins.

**Here are some recent updates in India's petroleum industry:**

1. India is on track to increase its exploration acreage to **1million** square kilometers by **2030**, with a **16%** increase expected in **2025**.
2. The price of a domestic LPG cylinder in India is among the lowest worldwide, with costs as low as Rs. 803 per 14.2 Kg cylinder. For PMUY households, after a targeted subsidy of Rs 300 per cylinder, the effective price is Rs 503/ cylinder.

3. The **approval process** for exploration and production activities in the petroleum industry has now been **simplified**, reducing 37 approval processes to just 18, of which nine are now available for **self-certification**.
4. Introducing the **Oilfields (Regulation and Development) Amendment Bill in 2024** ensures policy stability for oil and gas producers, and enables single license for all hydrocarbons. This bill was recently passed by the Rajya Sabha on December 3, 2024.

### Foreign trade of Petroleum

India has witnessed a remarkable surge in petroleum product exports over the last decade. The country's refining capacity, now exceeding **250 million** metric tonnes per annum (MMTPA), has enabled it to cater to global markets.

Key export destinations include **South Asian, African, and European countries**. The government's emphasis on export-oriented growth and establishing **Special Economic Zones (SEZs) for refineries** have further boosted this trend. Exports not only contribute to foreign exchange reserves but also enhance India's stature as a global energy supplier.

Details	Unit/ Base	2022-23 (P)	2023-24 (P)	November		April-November	
				2023-24 (P)	2024-25 (P)	2023-24 (P)	2024-25 (P)
1 Crude oil production in India <sup>†</sup>	MMT	29.2	29.4	2.4	2.3	19.6	19.1
2 Consumption of petroleum products*	MMT	223.0	234.3	18.7	20.4	152.4	157.5
3 Production of petroleum products	MMT	266.5	276.1	22.8	23.5	181.2	186.4
4 Gross natural gas production	MMSCM	34,450	36,438	3,041	2,972	24,081	24,243
5 Natural gas consumption	MMSCM	59,969	67,512	5,408	5,877	44,091	48,682
6 Imports & exports:							
Crude oil imports	MMT	232.7	234.3	18.6	19.1	154.0	159.4
	\$ Billion	157.5	133.4	11.5	10.0	87.4	91.8
Petroleum products (POL) imports*	MMT	44.6	48.7	4.0	4.4	31.9	33.9
	\$ Billion	26.9	22.9	2.1	2.2	15.1	16.1
Gross petroleum imports (Crude + POL)	MMT	277.3	283.0	22.6	23.5	185.9	193.4
	\$ Billion	184.4	156.3	13.6	12.2	102.5	108.0
Petroleum products (POL) export	MMT	61.0	62.6	5.7	5.3	40.9	42.1
	\$ Billion	57.3	47.7	4.3	3.5	31.6	28.9
LNG imports*	MMSCM	26,304	31,795	2,416	2,941	20,486	24,798
	\$ Billion	17.1	13.3	1.1	1.2	8.7	10.0
Net oil & gas imports	\$ Billion	144.2	121.9	10.4	9.8	79.6	89.0
7 Petroleum imports as percentage of India's gross imports (in value terms) <sup>^^</sup>	%	25.8	23.1	21.3	18.3	22.7	22.7
8 Petroleum exports as percentage of India's gross exports (in value terms) <sup>^^</sup>	%	12.7	10.9	12.9	9.0	11.3	10.0
9 Import dependency of crude oil (on POL consumption basis)	%	87.4	87.8	87.8	89.1	87.6	88.1

#Includes condensate; \*Private direct imports are prorated for the period Oct'24 to Nov'24 for POL. LNG imports figure from DGCIS are prorated for Oct'24 to Nov'24. Total may not tally due to rounding off. ^^ India's Import and Exports for Nov'24 is prorated.



## Share in GDP

As per the information provided by the Ministry of Statistics and Programme Implementation, **Gross Value Addition (GVA)** of manufacture of Coke and Refined Petroleum Products has increased from Rs.1.56 lakh Crore in 2012-13 to **Rs. 2.12 lakh Crore in 2022-23** (as per first revised estimates) which has also contributed in increase of **All India GDP** from Rs.99.44 lakh Crore to **Rs. 269.49 lakh Crore** in the corresponding period, at current prices. This industry also provides direct and indirect employment to millions, spanning exploration, refining, distribution, and retail sectors. The industry's value chain supports ancillary industries such as petrochemicals, logistics, and manufacturing. The sector enhances socio-economic stability by fostering skill development and offering diverse career opportunities.

## Global Ranking in Refining and Supply

India ranks among the top five refining nations globally, thanks to its **robust infrastructure** and **strategic geographic location**. The country is the **seventh-largest exporter** of refined petroleum products. Facilities like the **Jamnagar refinery**, one of the world's largest, underscore India's dominance in the refining sector. This global standing enhances India's energy security and positions it as a key player in international energy markets. **International Energy Agency (IEA)** in February 2024 assessed that India will become the **largest source of global oil demand growth** between now and 2030. India is the second-largest economy in biofuel blending, following Brazil.

Metric	India's Global Rank
Exporter of Refined Products	7th
Ethanol Blending in Petrol	2nd
BioFuel Producer	3rd
LNG Terminal Capacity	4th
Refining Capacity (MMTPA)	4th

## Technological Advancements in Petroleum Industry

Adopting cutting-edge technologies has been pivotal to the petroleum industry's growth. **Enhanced Oil Recovery (EOR) techniques, digitalization, and the use of artificial intelligence (AI)** have optimized exploration and production processes. Refineries are increasingly adopting green technologies to minimize environmental impact. Projects such as bio-refineries and the development of alternative fuels like **compressed bio-gas (CBG)** showcase the industry's commitment to sustainability and innovation.

## Government Initiatives

The Indian government has launched several initiatives to bolster the petroleum sector. Here are some key schemes:

1. **Pradhan Mantri JI-VAN Yojana:** Supporting bio-ethanol projects such as second generation and third generation plants for sustainable fuel production.
2. **Strategic Petroleum Reserves:** Enhancing energy security through storage facilities. In India, the SPR is primarily located at **three** underground storage facilities in **Visakhapatnam, Mangalore, and Padur (Karnataka)**, with a total capacity of **5.33 Million Metric Tonnes (MMT)** of crude oil managed by the Indian Strategic Petroleum Reserve Limited (ISPRL).
3. **Ethanol Blending Program:** Promoting biofuels to reduce dependence on fossil fuels and curb emissions. The government has a target of achieving **20%** ethanol blending in petrol by **2025-26**. Since the inception of the EBP Programme, ethanol blending has increased from 38 crore litres in the Ethanol Supply Year (ESY) 2013-14 to **over 707.4 crore litres** in ESY 2023-24.
4. **City Gas Distribution Network Expansion:** Expanding piped natural gas (PNG) and compressed natural gas (CNG) infrastructure by covering **733** districts in 34 states/UTs covering almost **100%** of the mainland area and almost **100%** of total geographical area of the country.
5. **Energy Security Initiatives:** Investing in overseas exploration and acquisition of oil blocks.

## Moving towards Greener Fuels

1. **SATAT Initiative (Sustainable Alternative Towards Affordable Transportation):** The SATAT initiative invites potential investors to set up **Compressed Biogas (CBG)** production plants. The aim is to make better use of agricultural residue, cattle dung, and municipal solid waste, and provide farmers with an additional source of revenue.
2. **Mission Green Hydrogen:** Promoting green hydrogen production to reduce carbon footprint. According to the Ministry of New and Renewable Energy, a global demand of over **100 MMT** of Green Hydrogen and its derivatives like **Green Ammonia** is expected to emerge by **2030**. Aiming at about **10%** of the global market, India can potentially export about 10 MMT Green Hydrogen/Green Ammonia per annum. The production capacity targeted by 2030 is likely to leverage over **8 lakh crore ₹** in total investments and create over **6 lakh jobs**. Nearly **50 MMT** per annum of **CO2 emissions** are expected to be **averted** as a result of the various Green Hydrogen initiatives under the Mission. Achievement of Mission

targets is expected to contribute to **India's energy security** and reduce a cumulative **1 lakh crore worth of fossil fuel imports by 2030₹** .

3. **National Bio-Energy Programme**: Focused on bio-energy production and reducing waste.
4. **Hydrocarbon Exploration and Licensing Policy (HELP)**: Encouraging private investment in exploration and production.

### Implications for India's Growth and Development

The petroleum industry's expansion has multifaceted implications. Economically, it **boosts GDP, foreign exchange** earnings, and **industrial growth**. Politically, **energy independence** strengthens India's global standing and reduces strategic vulnerabilities. Socially, the industry's growth promotes **rural development** through improved energy access and employment.

### Future Prospects

India's petroleum industry faces a dynamic future, shaped by global energy transitions and domestic demand. **Increasing investments in exploration, expanding refining capacities, and embracing renewable energy sources** will define its trajectory. Initiatives like **green hydrogen production** and **carbon capture technologies** highlight the sector's adaptability. With a focus on sustainability and energy efficiency, India is poised to maintain its leadership in the global energy landscape while aligning with its climate commitments.

Key Area	Future Target
Refining Capacity	309.5 MMTPA by 2030
Ethanol Blending	20% by 2025-26
Green Hydrogen Production	5 MMTPA by 2030
Exploration Acreage	1 million sq. kms. by 2030

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**Santosh Kumar/ Ritu Kataria/ Rishita Aggarwal**

## Annexure 1

### Refineries in India:

Refinery Location	Name of the Company	Name Plate Capacity (MMTPA)
	<b>PSU Refineries</b>	
Digboi - 1901	Indian Oil Corporation Ltd.	0.650
Guwahati – 1962	Indian Oil Corporation Ltd.	1.200
Barauni – 1964	Indian Oil Corporation Ltd.	6.000
Koyali – 1965	Indian Oil Corporation Ltd.	13.700
Bongaigaon – 1974	Indian Oil Corporation Ltd.	2.700
Haldia – 1975	Indian Oil Corporation Ltd.	8.000
Mathura – 1982	Indian Oil Corporation Ltd.	8.000
Panipat – 1998	Indian Oil Corporation Ltd.	15.000
Paradip - 2016	Indian Oil Corporation Ltd.	15.000
Manali – 1965	Chennai Petroleum Corporation Ltd.	10.500
Cauvery Basin* - 1993	Chennai Petroleum Corporation Ltd.	0.000
Mumbai – 1954	Hindustan Petroleum Corporation Ltd.	9.500
Vizag – 1957	Hindustan Petroleum Corporation Ltd.	13.700
Mumbai – 1955	Bharat Petroleum Corporation Ltd.	12.000
Bina^ – 2011	Bharat Petroleum Corporation Ltd.	7.800
Kochi - 1963	Bharat Petroleum Corporation Ltd.	15.500
Numaligarh – 2000	Numaligarh Refinery Ltd.	3.000
Mangalore – 1996	Mangalore Refinery and Petrochemicals Ltd.	15.000
Tatipaka, AP - 2001	Oil and Natural Gas Corporation Ltd.	0.066

<b>Refinery Location</b>	<b>Name of the Company</b>	<b>Name Plate Capacity (MMTPA)</b>
<b>Total PSU Refineries</b>		<b>157.316</b>
	<b>JV Refineries</b>	
Bathinda - 2012	HPCL Mittal Energy Ltd.	11.300
<b>Total JV Refineries</b>		<b>11.300</b>
	<b>Private Sector Refineries</b>	
DTA-Jamnagar - 1999	Reliance Industries Ltd.	33.000
SEZ-Jamnagar - 2008	Reliance Industries Ltd.	35.200
Vadinar - 2006	Nayara Energy (Formerly Essar Oil Ltd.)	20.000
<b>Total Private Sector</b>		<b>88.200</b>
<b>Grand Total</b>		<b>256.816</b>

\* The Cauvery Basin refinery is under capacity augmentation.

^The Bina oil refinery, in the year 2021, become wholly owned subsidiary of Bharat Petroleum Corporation Limited – a 'Maharatna' PSU of Government of India.