

OIL & GAS



November 2024

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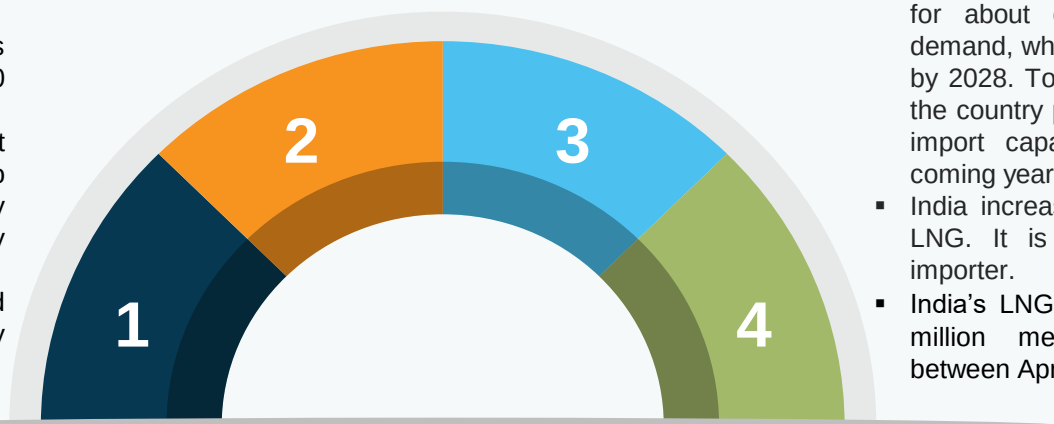
Executive summary

2. WORLD'S THIRD-LARGEST ENERGY CONSUMER

- According to IEA (India Energy Outlook 2021), primary energy demand is expected to nearly double to 1,123 million tonnes of oil equivalent, as the country's gross domestic product (GDP) is expected to increase to US\$ 8.6 trillion by 2040.

1. SECOND-LARGEST REFINER IN ASIA

- Indian refining capacity has increased from 215.1 Million Metric Tonne Per Annum (MMTPA) to 256.8 MMTPA in last 10 years.
- India is planning to double its refining capacity to 450-500 million tonnes by 2030.
- India, the world's fourth largest crude oil refiner, is expected to add one million barrels per day (mb/d) of refining capacity by 2028.
- India refining capacity is projected to increase to 309.5 MMTPA by the year 2028.



3. THIRD-LARGEST CONSUMER OF OIL

- According to OPEC, India's oil demand in 2024 is projected to be at 5.59 million barrels per day (b/d), up from 5.37 million b/d in 2023, resulting in a growth of 4.1%.
- India retains its spot as the third-largest consumer of oil in the world, as of 2023.
- The consumption of petroleum products has increased from 158.4 million metric tons (MMT) in FY14 to 234.3 MMT in FY24. Over the past decade, the compounded annual growth rate (CAGR) of total petroleum, oil, and lubricants (POL) consumption has been 4.0%.
- Domestic consumption of the petroleum products in the year 2023-24 was 233.3 MMTPA.

4. FOURTH-LARGEST LNG IMPORTER

- LNG import in the country accounted for about one-fourth of total gas demand, which is estimated to double by 2028. To meet this rising demand the country plans to increase its LNG import capacity to 50 MT in the coming years.
- India increasingly relies on imported LNG. It is the fourth-largest LNG importer.
- India's LNG import stood at 30,917 million metric tonnes (MMSCM) between April 2023 – March 2024.

Notes: MMT - Million Metric Tonnes, LNG - Liquefied Natural Gas, MMSCM - Million Metric Standard Cubic Meters

Source: News Articles, PPAC, IEA Report 2021



Advantage India

2. GROWING DEMAND

- India is the world's third-largest energy consumer globally.
- Crude oil imports increased by 5.7% and 0.9% during January 2024 and April-January 2023-24 respectively as compared to the corresponding period of the previous year.
- Diesel demand in India is expected to double to 163 MT by 2029-30, with diesel and petrol covering 58% of India's oil demand by 2045.
- Oil demand in India is projected to register a 2x growth to reach 11 million barrels by 2045.
- Consumption of natural gas in India is expected to grow by 25 billion cubic metres (BCM), registering an average annual growth of 9% until 2024.
- India's oil and gas production is expected to achieve a mid-decade peak between 2023-2032, around 2027, driven by the KG-Basin projects operated by Reliance Industries Limited and Oil and Natural Gas Corporation (ONGC)

1. SUPPORTIVE FDI GUIDELINES

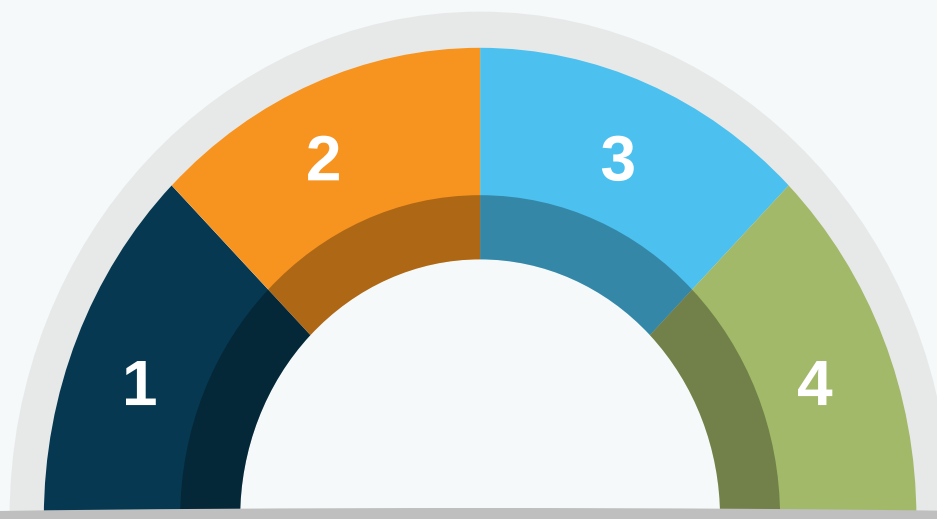
- In July 2021, the Department for Promotion of Industry and Internal Trade (DPIIT) approved an order allowing 100% foreign direct investments (FDIs) under automatic route for oil and gas PSUs.
- The FDI limit for public sector refining projects has been raised to 49% without any disinvestment or dilution of domestic equity in existing PSUs.

3. RAPID EXPANSION

- Indian refiners would add 56 million tonnes per annum (MTPA) by 2028 to increase domestic capacity to 310 MTPA.
- Indian refining capacity has increased from 215.1 Million Metric Tonne Per Annum (MMTPA) to 256.8 MMTPA in last 10 years.
- India aims to commercialise 50% of its SPR (strategic petroleum reserves) to raise funds and build additional storage tanks to offset high oil prices.
- In September 2021, the Indian government approved oil and gas projects worth Rs. 1 lakh crore (US\$ 13.46 billion) in Northeast India. These projects are expected to be completed by 2025.
- In February 2021, Prime Minister Mr. Narendra Modi announced that the Government of India plans to invest Rs. 7.5 lakh crore (US\$ 102.49 billion) on oil and gas infrastructure in the next five years.
- The industry is expected to attract US\$ 25 billion investment in exploration and production. Refining capacity in the country is expected to increase to 667 MTPA by 2040.

4. POLICY SUPPORT

- In budget 2024-25, Rs. 497.25 crore (US\$ 59.75 million) allocated to scheme for Development of Pipeline infrastructure for injection of Compressed Biogas (CBG) in City Gas Distribution (CGD) Network.
- In the Union Budget 2023-24, government has set target to Setting up coal gasification and liquefaction capacities of 100 MT by 2030 to reduce import of natural gas, methanol and ammonia.

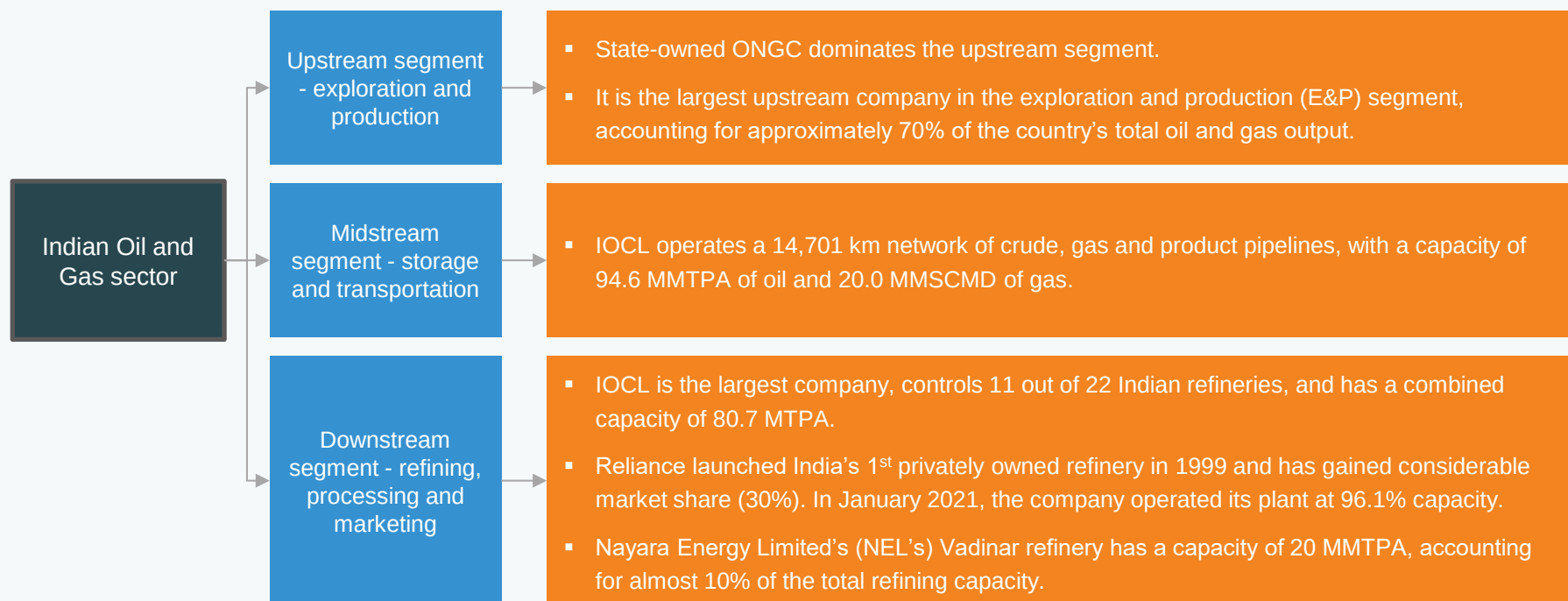


Market Overview And Trends



State-owned companies dominate oil and gas in India

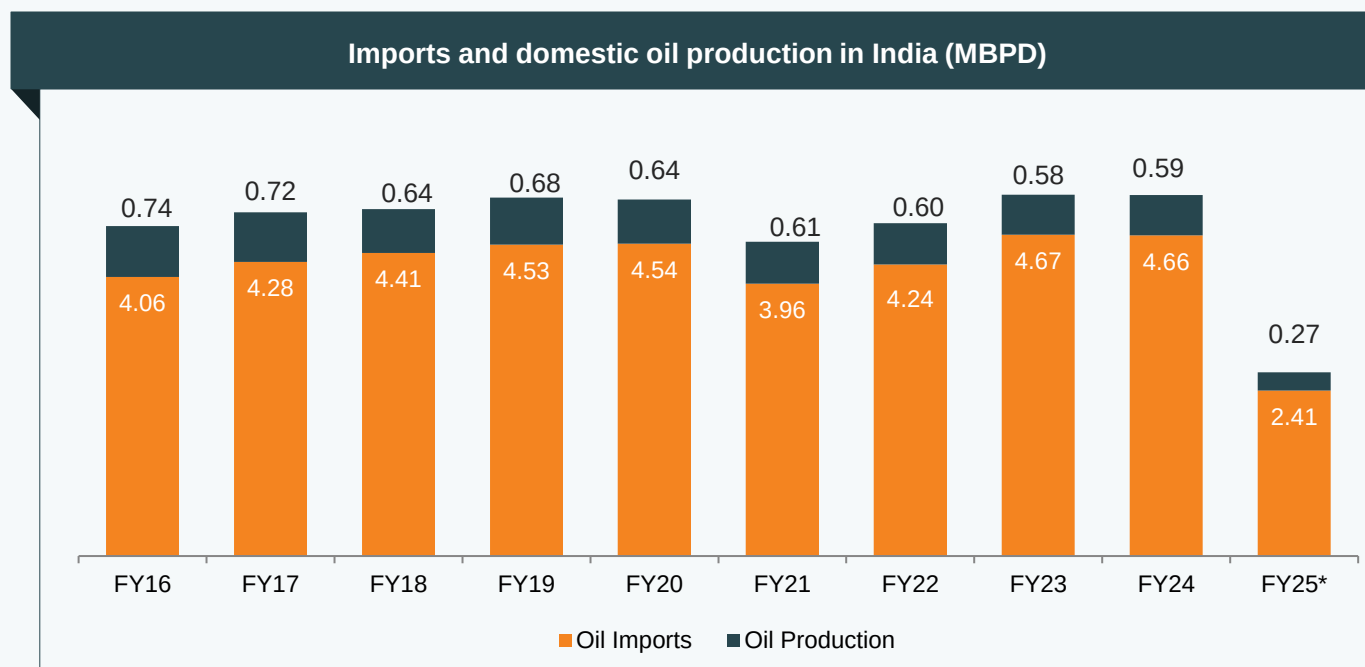
- India remained the third-largest energy consumer, as of 2023.
- India produced 2.42 MMT of crude oil in April 2024, of which 73% of the production was done by PSU companies.
- Assam, Gujarat and Rajasthan account for more than 96% of oil production in India.
- India's existing strategic oil reserves (SPR) is ~5.33 million tonnes.
- India had 4.7 thousand million barrels of proven oil reserves and produced 37.5 million tonnes in 2019.



Notes: bcm - Billion Cubic Metres, mbpd - Million Barrels Per Day, mmscmd - Million Metric Standard Cubic Metre Per Day, mmta -- Million Metric Tons Per Annum, ^As per IEA

Source: BP Statistical Review 2020, US Energy Information Administration, Petroleum Planning and Analysis Cell

Oil supply and demand in India



- Exports of Petroleum, Oils and Lubricants (POL) products increased by 9.6% in April 2024 as compared to the corresponding
- India's crude oil production stood at 13.26 MMT during April-September 2024.
- India's consumption of petroleum products stood at 137.64 MMT during April-September 2024.
- India's oil consumption is forecast to rise from 4.8 MBPD in 2019 to 7.2 MBPD in 2030 and 9.2 MBPD in 2050.
- Rapid economic growth is leading to greater outputs, which in turn is increasing the demand of oil for production and transportation.
- In FY25*, crude oil imports stood at 120.42 MMT.

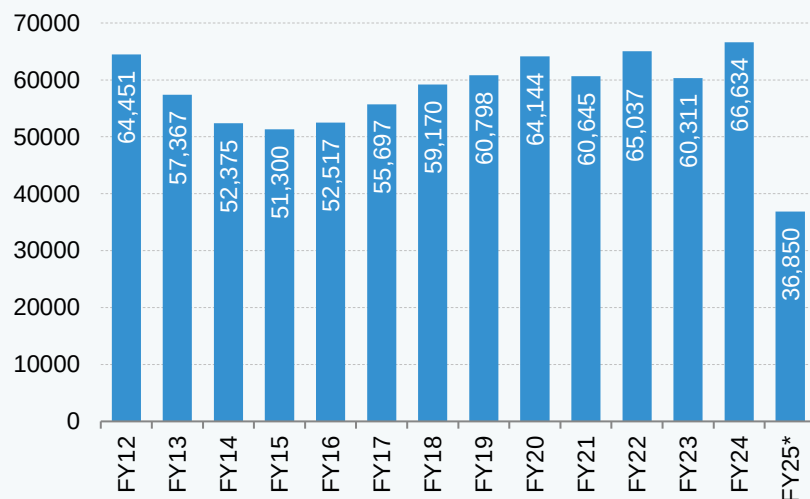
Note: CAGR - Compound Annual Growth Rate, MBPD - Million Barrels Per Day, P - Provisional, Based on 50 MMT = 1 MBPD, *Until September 2024

Source: Ministry of Petroleum and Natural Gas, BP Statistical Review 2020, Petroleum Planning & Analysis Cell

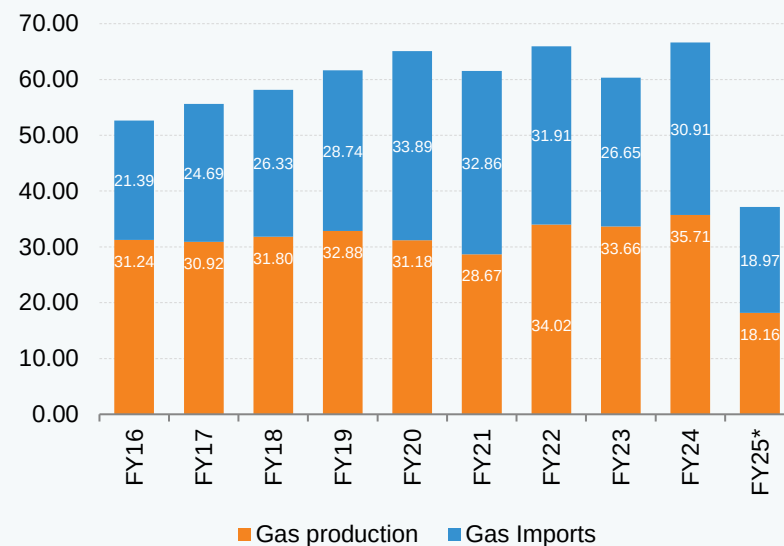


Gas supply and demand in India

Total Gas Consumption in India (MMSCM)



Domestic Gas Production and Imports (BCM)



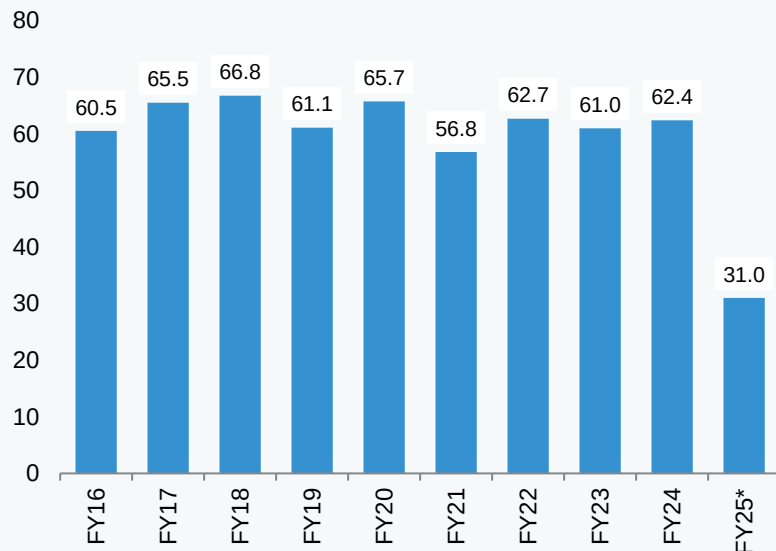
- Demand is not likely to simmer down anytime soon, given strong economic growth and rising urbanisation.
- Gas consumption is projected to reach 143.08 BCM by 2040. The Government is planning to invest US\$ 2.86 billion in upstream oil and gas production to double the natural gas production to 60 BCM and drill more than 120 exploration wells.
- According to the International Energy Agency (IEA), India's medium-term outlook for natural gas consumption remains solid due to rising infrastructure and supportive environment policies. Industrial consumers are expected to account for 40% of India's net demand growth. The demand is also expected to be driven by sectors such as residential, transport and energy.
- India's natural gas imports increased at a CAGR of 3.2% between FY16 and FY23.

Note: F - Forecast, BCM - Billion Cubic Metres, CAGR - Compound Annual Growth Rate, *Until September 2024

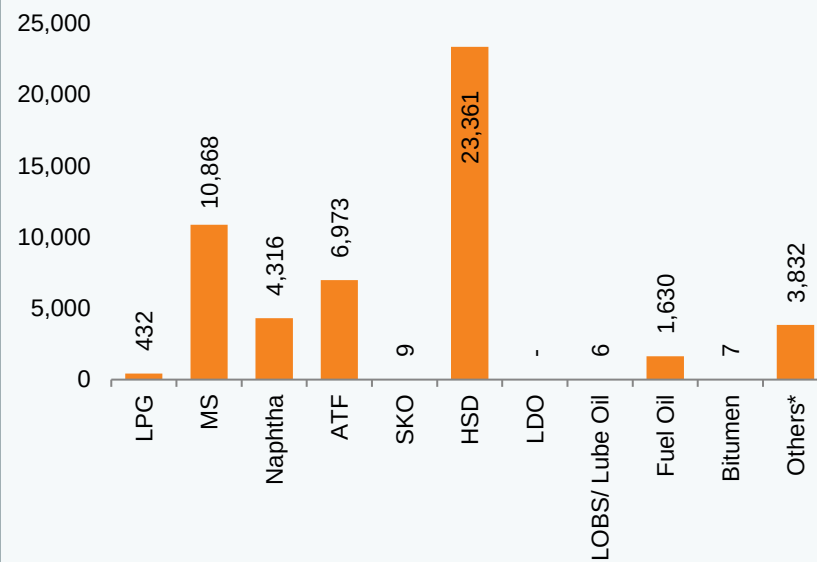
Source: PPAC, BP Statistical Review 2020

Exports of petroleum products from India

Exports of Petroleum Products from India (MMT)



Product-wise Exports of Petroleum Products from India in FY24
(thousand metric tonnes)



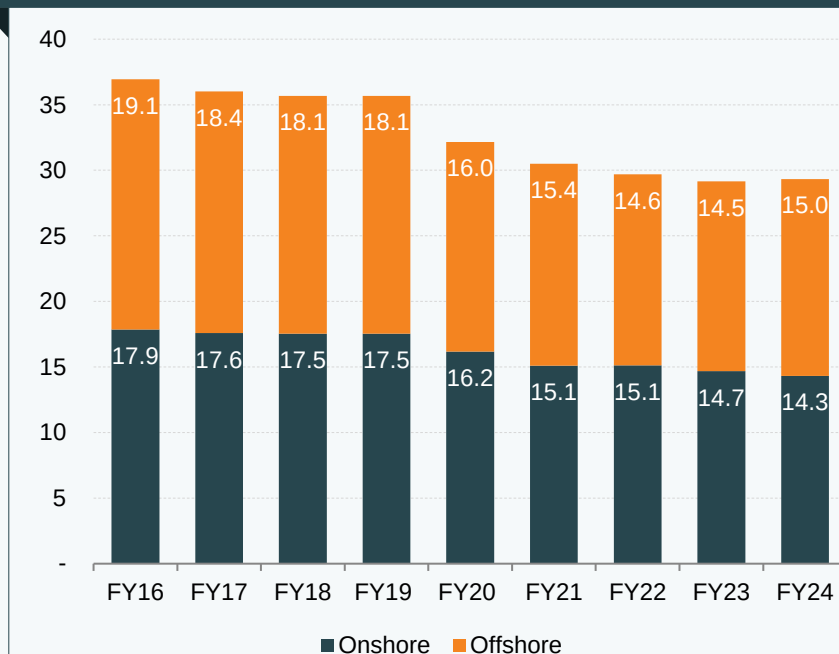
- India is one of the largest exporters of refinery products due to the presence of various refineries.
- Exports of petroleum products from India reached 62.4 MMT in FY24 from 61 MMT in FY23.
- In FY25* April-September petroleum product export stood at 31 MMT.
- Petroleum products worth US\$ 22 billion were exported in FY25*.
- HSD was the major export item among petroleum products, followed by MS, ATF and Naphtha.

Note: MMT - Million Metric Tonnes, P - Provisional, HSD - High speed Diesel, MS - Motor Spirit, ATF - Aviation Turbine Fuel, LPG - Liquefied Petroleum Gas, LDO - Light Diesel Oil, SKO - Superior Kerosene Oil, LOBS - Lubricating Oil Base Stocks, * - Others includes Petcoke/CBFS, Hexane, Benzene, MTO (Mineral Turpentine Oil), Sulphur, etc., *-Until June 2024

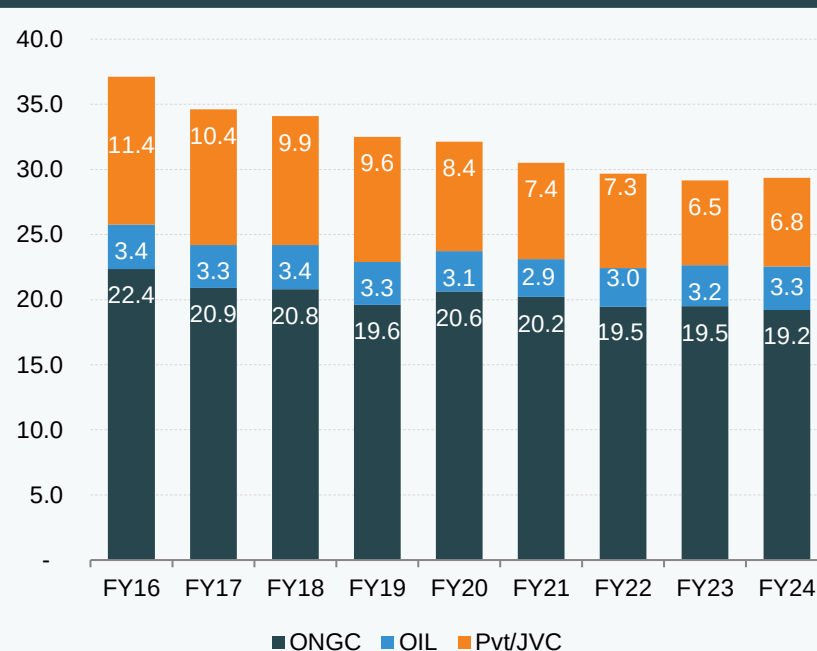
Source: PPAC, BP Statistical Review 2020

Upstream segment: crude oil and gas production... (1/2)

Annual Crude Oil Production (in MMT)



Crude Oil Production (in MMT)



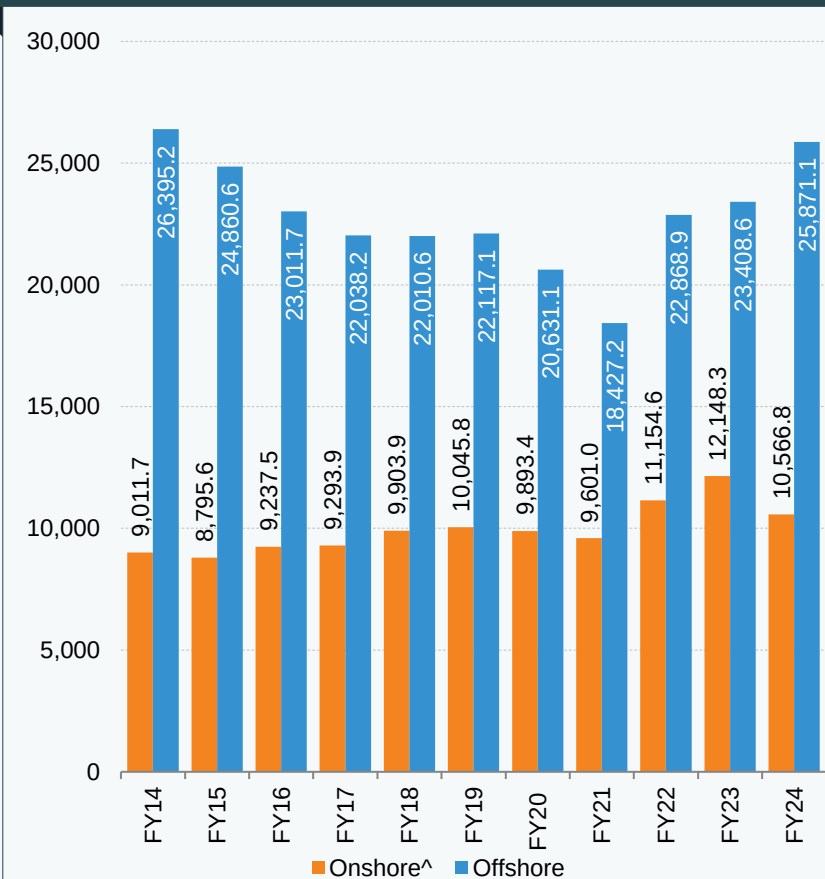
- Almost half of India's crude oil production is from offshore fields, although this share is diminishing in the past few years as production from the large, ageing Mumbai High field has declined.
- India's crude oil production in FY24 stood at 29.35 MMT.
- Onshore production accounted for 50.34%, while offshore contributed the remaining 49.66%.
- ONGC accounted for 66.78% of the total crude oil production in India in FY23.

Notes: MMT - Million Metric Tonne, JV - Joint Venture, P-Provisional, *Until January 2024

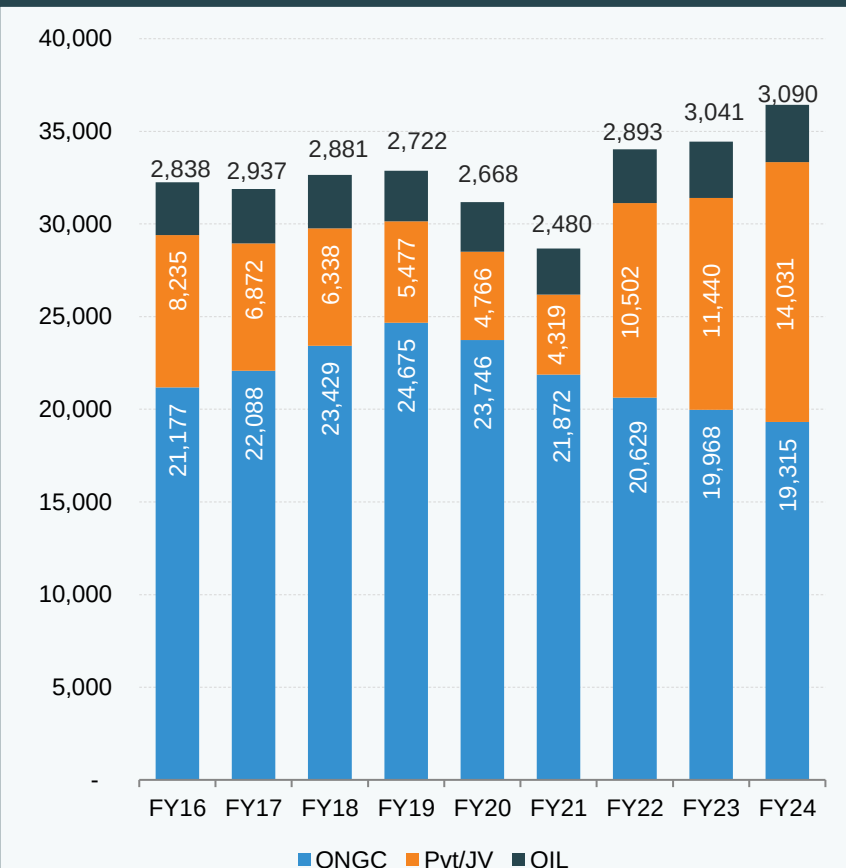
Source: Ministry of Petroleum and Natural Gas

Upstream segment: crude oil and gas production... (2/2)

Annual Gas Production (million metric standard cubic metre)



Annual Gas Production (million metric standard cubic metre)

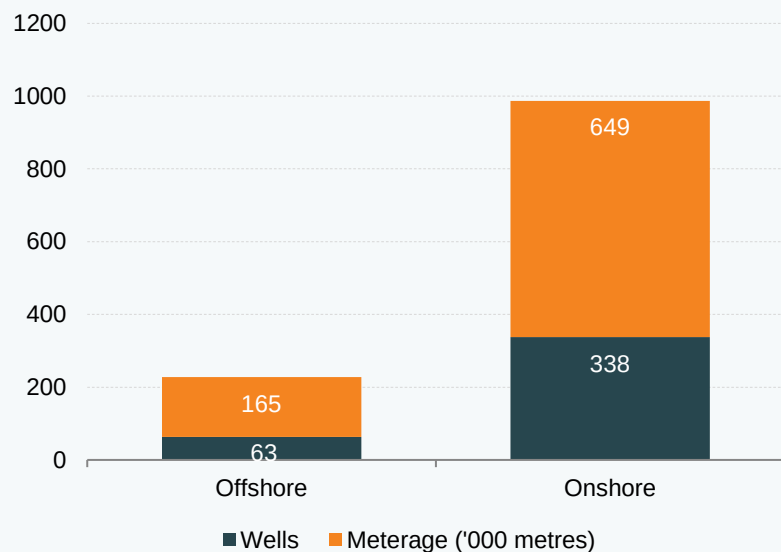


Note: JV - Joint Venture, ^Including CBM production, *Until March 2024

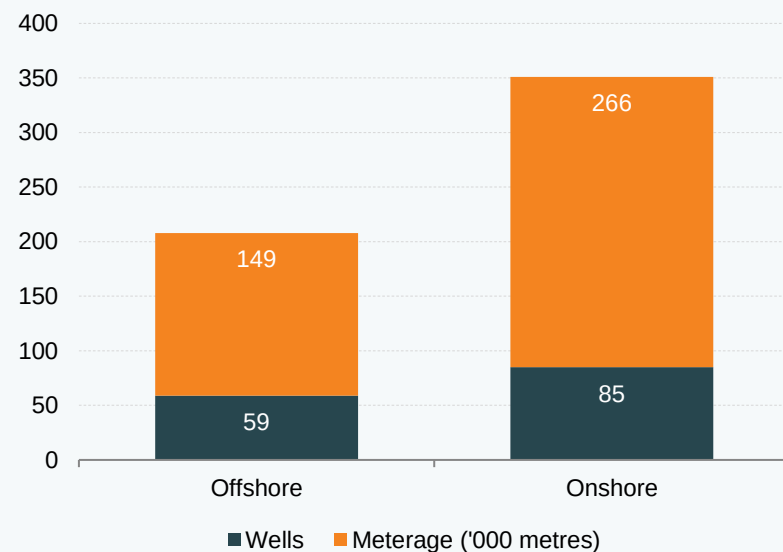
Source: Ministry of Petroleum and Natural Gas

Upstream segment: exploration and development activities

Development drilling activities (FY19)



Exploration activities (FY19)

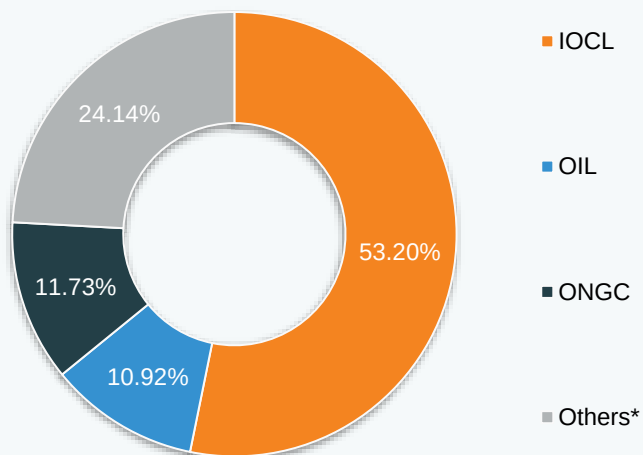


- In FY19, 1,228,000 metres of wells were explored, developed, and 545 wells were drilled in the country.
- State-owned oil companies undertake most of the upstream drilling and exploration work.
- The Government was planning to invest US\$ 2.86 billion in upstream oil and gas production to double the natural gas production to 60 BCM and drill more than 120 exploration wells by 2022.
- In February 2024, Prime Minister, Mr. Narendra Modi unveiled a strategic investment plan of US\$ 67 billion for the Indian gas sector over the next 5-6 years, to raise the share of natural gas in the primary energy mix from 6% to 15%.

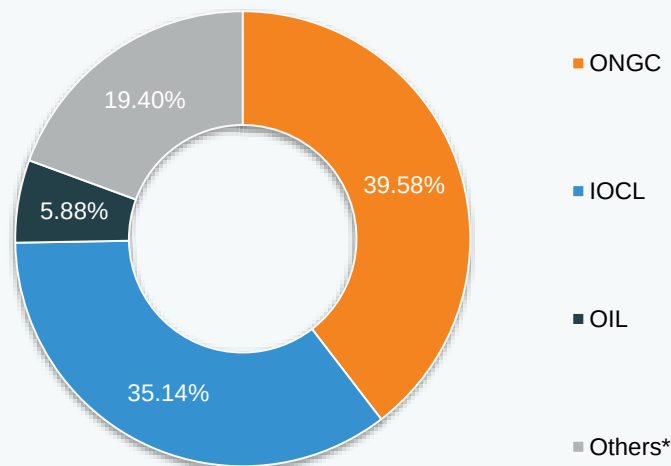
Source: Ministry of Petroleum and Natural Gas, BMI

Pipelines: crude pipeline network

Shares in Crude Oil Pipeline Network by Length
(out of 10,943 kms, as of October 1, 2024)



Shares in Crude Oil Pipeline Network by Capacity
(out of 153.1 MMTA, as of October 1, 2024)



- As of October 1, 2024, India had 10,943 kms of crude pipeline network, with a capacity of 153.1 MMTA.
- In terms of length, IOCL accounts for 53.20% (5,822 kms) of India's crude oil pipeline network.
- In terms of actual capacities, ONGC leads with 39.58%, followed by IOCL at 35.14%.

Note: km - Kilometre, MMTA - Million Metric Tonnes Per Annum, *Others includes HMEL, BPCL and Cairn

Source: Ministry of Petroleum and Natural Gas

Pipelines: existing pipelines in India

Length and capacity of products and crude oil pipeline by company (as of April 1, 2024)

	IOCL	BPCL ⁽¹⁾	HPCL ⁽²⁾	OIL	ONGC	Cairn	HMEL	Others (GAIL and Petronet India.)	Total industry
Length (kms)									
Product Pipeline	12,581	2,600	5,123	654	-	-	-	2,399	23,357
Crude oil Pipeline	5,822	937	-	1,193	1,284	688	1,017	-	10,941
Total	18,403	3,537	5,123	1,847	1,284	688	1,017	2,399	34,298
Capacity of Crude Oil Pipelines (MMTPA)									
Product Pipeline	70.6	22.6	35.2	1.7	-	-	-	10.2	140.3
Crude oil Pipeline	53.8	7.8	-	9.0	60.6	10.7	11.3	-	153.1
Total	124.4	30.4	35.2	10.7	60.6	10.7	11.3	10.2	293.4

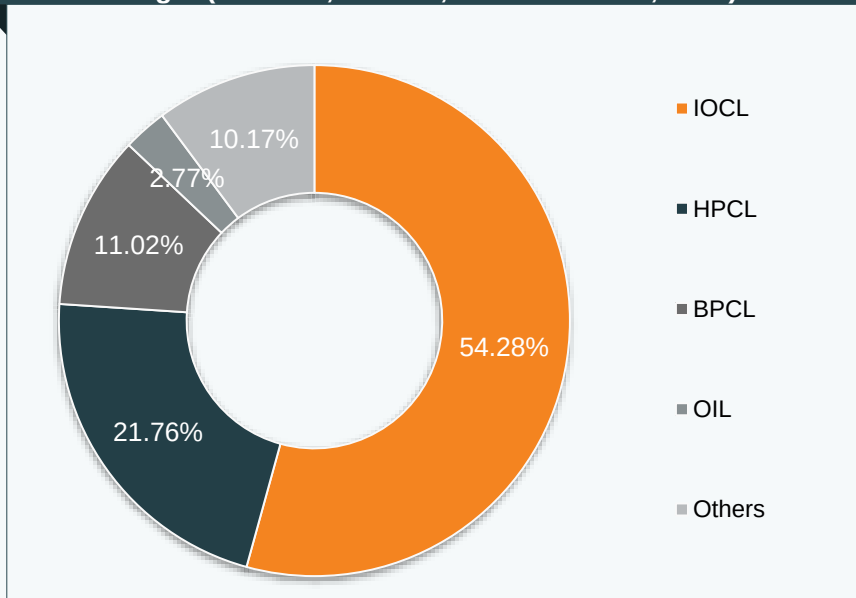
- Government of India is planning to invest Rs. 70,000 crore (US\$ 9.97 billion) to expand the gas pipeline network across the country.
- In February 2024, Prime Minister, Mr. Narendra Modi unveiled a strategic investment plan of US\$ 67 billion for the Indian gas sector over the next 5-6 years, to raise the share of natural gas in the primary energy mix from 6% to 15%.

Note: kms - Kilometres, MMTPA - Million Metric Tonnes Per Annum, ⁽¹⁾Includes Petronet Cochin-Coimbatore-Karur Product pipeline, ⁽²⁾Includes Petronet Mangalore-Hassan-Bangalore Product Pipeline

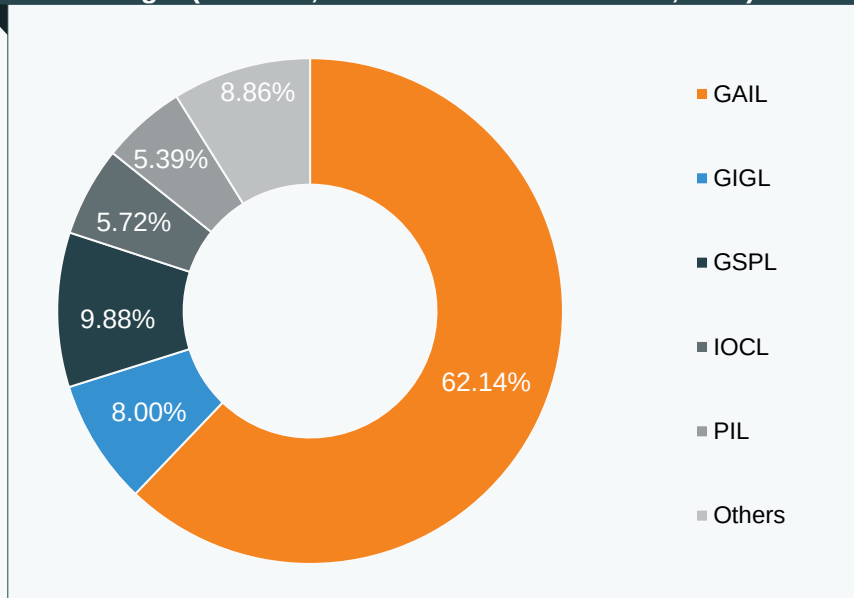
Source: Ministry of Petroleum and Natural Gas

Pipelines: refined products and LPG pipeline network

Shares in Crude Products Pipeline Network under Operation by Length (out of 23,593 kms, as of October 1, 2024)



Shares in Natural Gas Pipeline Network Under Operation By Length (out of 27,516 kms as of December 31, 2023)



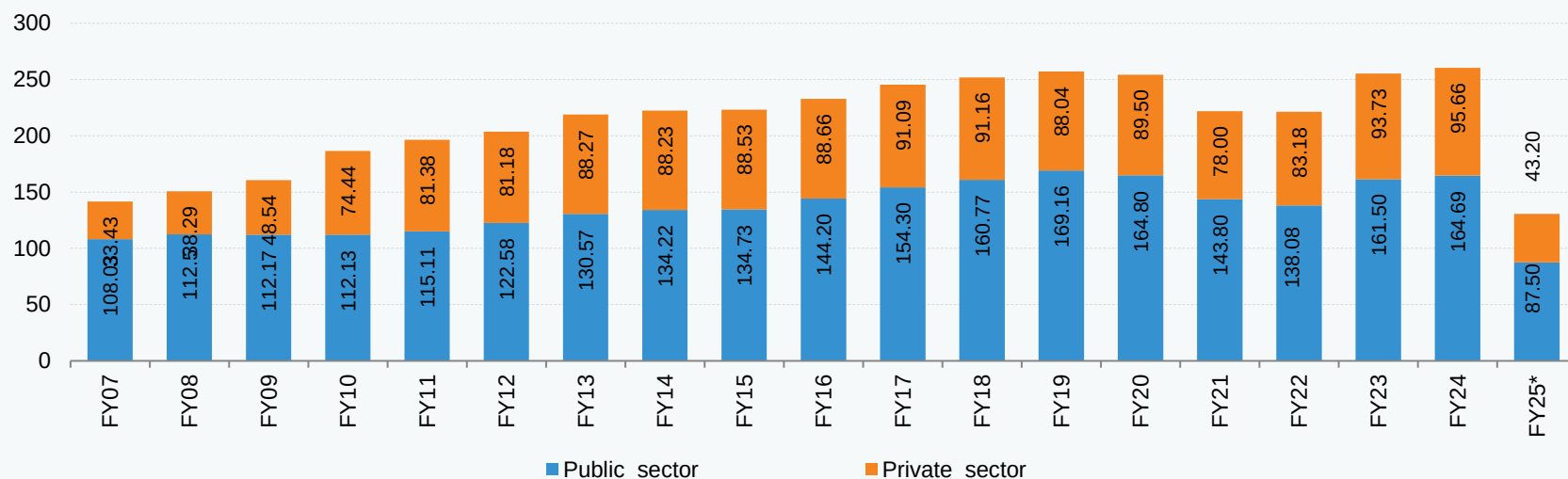
- With 12,807 kms of refined products pipeline in India, the Indian Oil Corporation Limited (IOCL) leads the segment with 54.28%, as of October 1, 2024.
- The top three companies, IOCL, HPCL and BPCL contribute to more than 80% of the total length of product pipeline network in the country.
- As of December 31, 2023, Gas Authority of India Ltd. (GAIL) had the largest share (62.14% or 17,099 kms) of the country's natural gas pipeline network (27,516 kms).

Note: km - Kilometre, MMTPA - Million Metric Tonnes Per Annum, LPG - Liquefied Petroleum Gas, IOC - Indian Oil Corporation, HPCL - Hindustan Petroleum Corporation Ltd, BPCL - Bharat Petroleum Corporation Ltd, OIL - Oil India Limited

Source: Ministry of Petroleum and Natural Gas

Downstream segment: refinery crude throughput... (1/2)

Refinery Crude Oil Processing Figures (MMT)



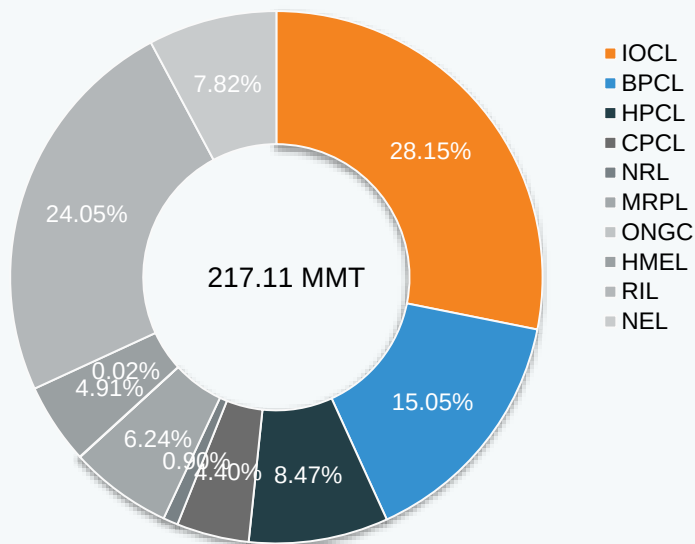
- India has 23 refineries - 18 are in the public sector, two in the joint sector and three in the private sector.
- India's state refineries have upgraded their facilities to comply with a new government requirement to produce oil products with the equivalent of Euro VI emission standards.
- Crude oil throughput of public sector refineries increased at a CAGR of 2.54%, from 108.03 MMT in FY07 to 161.50 MMT in FY23. At the same time, crude oil throughput of private sector refineries recorded growth at a CAGR of 6.66%, from 33.43 MMT to 93.73 MMT.

Note: MMT - Million Metric Tonne, Public Sector includes IOCL, BPCL, HPCL, CPCL and ONGC, Private sector includes RIL and NEL, *-Until September 2024

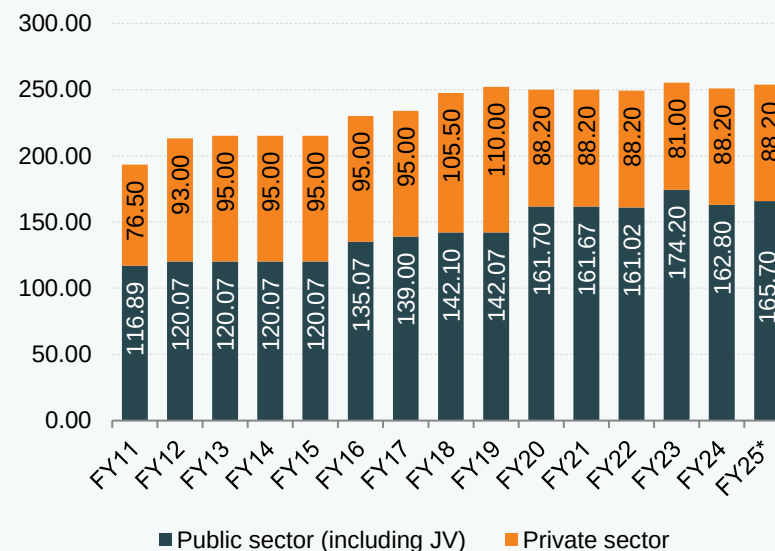
Source: Ministry of Petroleum and Natural Gas

Downstream segment: refinery crude throughput... (2/2)

**Shares in India's Total Refining Capacity
(as of January 1, 2024)**



Total Installed Refinery Capacity (MMT) (as of April 1, 2024)

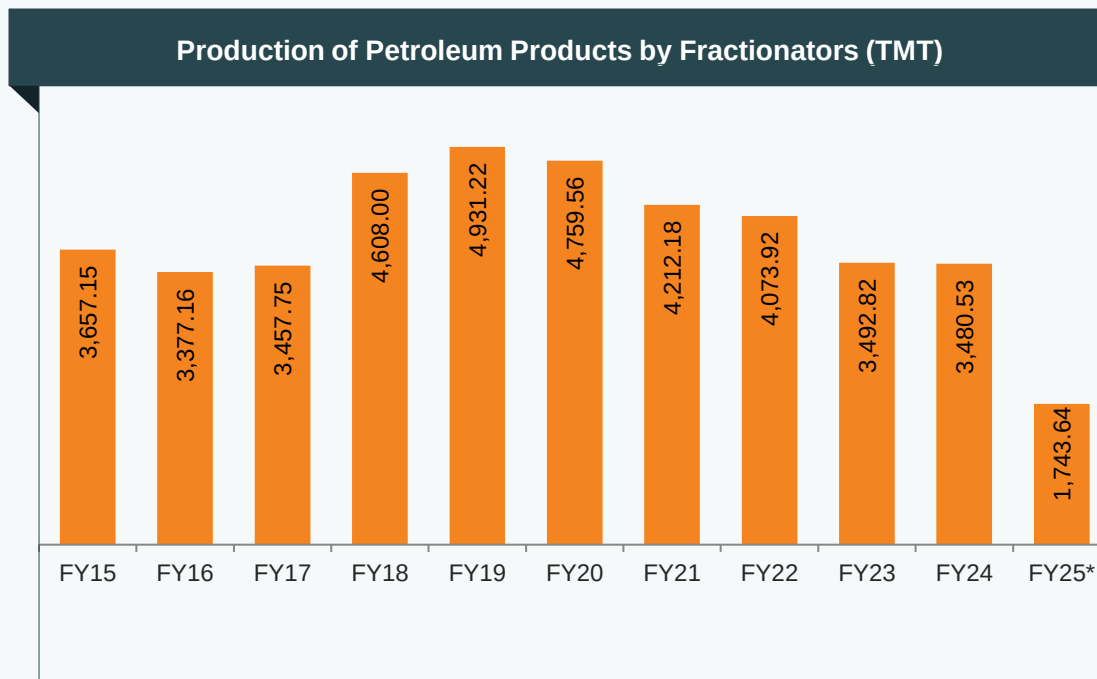


- In FY24, the oil sector's total installed refinery capacity stood at 253.9 MMT up to March 2024, and IOCL emerged as the largest domestic refiner with a capacity of 70.1 MMT.
- In FY24, the top three companies, IOC, RIL, and BPCL contributed over 69% to India's total refining capacity.
- In August 2021, India's state refiners announced plan to invest Rs. 2 lakh crore (US\$ 26.96 billion) by 2025 to increase oil refining capacity by 20% in India.

Note: MMT - Million Metric Tonne; HPCL - Hindustan Petroleum Corporation Ltd, BPCL - Bharat Petroleum Corporation Ltd, OIL - Oil India Limited, ONGC - Oil and Natural Gas Corporation, IOCL - Indian Oil Corporation Ltd, CPCL - Chennai Petroleum Corporation Limited, *Up to April 2024

Source: Ministry of Petroleum and Natural Gas, PPAC

Downstream segment: petroleum products



- Petroleum products derived from crude oil include light distillates such as LPG and naphtha; middle distillates such as kerosene; and heavy ends such as furnace, lube oils, bitumen, petroleum coke and paraffin wax.
- Production of petroleum products by fractionators reached 3,480.53 TMT in FY24 and 1,743.64 in FY25*.

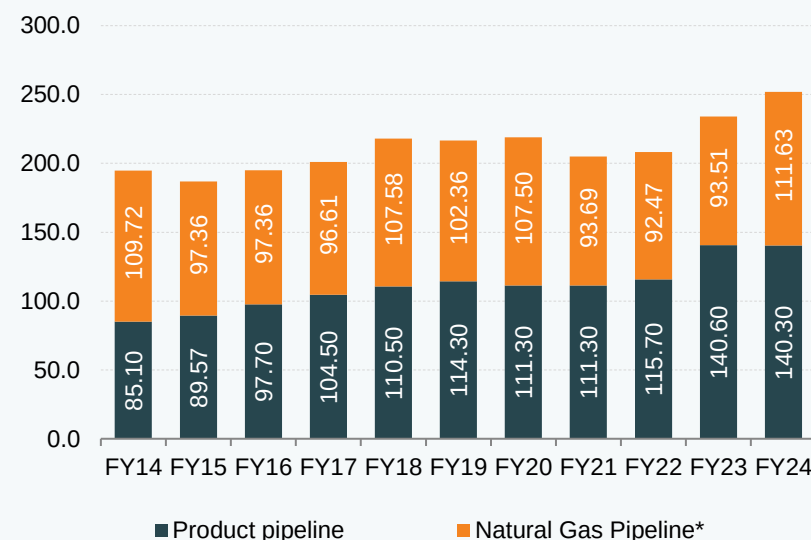
Note: MMT - Million Metric Tonne, TMT - Thousand Metric Tonne, P – Provisional, *-Until September 2024

Source: Ministry of Petroleum and Natural Gas

Downstream segment: distribution and marketing

- The total number of OMC retail outlets increased to 90,165, as of May 1, 2024, from 59,595 in FY17.
- In India, as of May 1, 2024, IOCL owned the highest number of retail outlets (37,511), followed by HPCL (22,050), and BPCL (21,865).
- As of May 1, 2024, there were 25,489 LPG distributors (under PSUs) in India.
- There are 289 aviation fuel station in India as of May 1, 2024, with IOCL having the majority.
- LPG Bottling capacity (TMTPA) (PSUs only) stood at 22,843 as of May 1, 2024.
- In term of active LPG domestic consumer (PSUs only), there were 32.6 crore users as on May 1, 2024

Downstream distribution statistics (MMT)



Pipeline	Capacity (MMTPA) as of October 1, 2024	Length (kms) as of October 1, 2024
Crude Pipeline	153.1	10,943
Product Pipeline	140.3	23,593
Natural Gas Pipeline	111.63 (as of March 31, 2023)	27,516 (as of December 31, 2023)

Note: MMT - Million Metric Tonne, MMTPA - Million Metric Tonnes Per Annum, OMC - Oil Marketing Companies, PSU - Public Sector Unit, *As of November 1, 2023

Source: Ministry of Petroleum and Natural Gas

State-wise list of CNG stations in the country (1/2)

State	CNG Stations as of September 30, 2024
Andhra Pradesh	196
Andhra Pradesh, Karnataka & Tamil Nadu*	45
Assam	23
Bihar	146
Bihar & Jharkhand*	15
Bihar & Uttar Pradesh*	26
Chandigarh, Haryana, Punjab & Himachal Pradesh*	30
Dadara & Nagar Haveli	6
Daman and Diu	5
Daman and Diu & Gujarat	15
Goa	12
Gujarat	1,011
Haryana	424
Haryana & Himachal Pradesh*	11
Haryana & Punjab*	27
Himachal Pradesh	14

State	CNG Stations as of September 30, 2024
Jharkhand	71
Karnataka	396
Kerala	146
Kerala and Puducherry*	14
Madhya Pradesh	311
Madhya Pradesh & Chhattisgarh*	9
Madhya Pradesh & Rajasthan*	36
Madhya Pradesh & Uttar Pradesh*	20
Maharashtra	922
Maharashtra & Gujarat*	73
Maharashtra & Madhya Pradesh*	16
National Capital Territory of Delhi (UT)	493
Odisha	108
Puducherry	2
Puducherry & Tamil Nadu*	8
Punjab	221
Punjab & Rajasthan*	19
Rajasthan	332

Source: Ministry of Petroleum and Natural Gas

* Some of the GAs authorized by PNGRB span areas in more than one state; Compressed natural gas (CNG)

State-wise list of CNG stations in the country (2/2)

State	CNG Stations as of September 30, 2024
Tamil Nadu	323
Telangana	195
Telangana & Karnataka*	11
Tripura	19
Uttar Pradesh	1,005
Uttar Pradesh & Rajasthan*	47
Uttar Pradesh & Uttarakhand*	30
Uttarakhand	26
West Bengal	137
Total	7125

Source: Ministry of Petroleum and Natural Gas

* Some of the GAs authorized by PNGRB span areas in more than one state; Compressed natural gas (CNG)

Key domestic oil and gas companies



Company	Ownership (%) as of FY24	Total Income from Operations in FY23 (US\$ billion)
Indian Oil Corporation Limited	51.50% state-owned	106.37
Reliance Industries	Public Listed	119.9
Bharat Petroleum Corporation Limited	52.98% state-owned	61.20
Hindustan Petroleum Corporation Limited	54.9% state-owned (through ONGC)	55.76
ONGC	58.89% state-owned	19.75
GAIL India Limited	51.90% state-owned	16.16
Oil India Limited	56.66% state-owned	4.52

Note: : FY - Indian Financial Year from April-March



Notable trends in the oil and gas sector

1. Coal Bed Methane (CBM)

- Production of CBM in April 2024 stood at 54.77 MMSCM..

2. Underground Coal Gasification (UCG)

- The technology was first widely used in the US in the 1800s and in India (Kolkata and Mumbai) in the early 1900s.
- UCG is currently the only feasible technology available to harness energy from deep unmineable coal seams economically and in an eco-friendly manner. It reduces capital outlay, operating costs and output gas expenses by 25-50% vis-a-vis surface gasification.

3. Gas hydrates and bio-fuels

- The Government initiated the National Gas Hydrate Programme (NGHP), a consortium of national E & P companies and research institutions, to map gas hydrates for use as an alternate source of energy.
- Bio-fuels (bio-ethanol and bio-diesel) are alternate sources of energy from domestic renewable resources. These have lower emissions compared to petroleum or diesel.



5. Open Acreage Licensing Policy

- Open Acreage Licensing Policy (OALP), which allows an explorer to study the data available and bid for blocks of his choice, has been initiated to increase foreign participation by global E & P companies like Shell, BP, Conoco Phillips, etc.
- In 2022, the Ministry of Petroleum and Natural Gas launched the ninth bid round under the OALP. Under this round, investors were offered around 223,031.4 square kilometre.

4. Oil & Gas Pricing

- As announced in May 2023, Jio-bp, the retail fuel joint venture of Reliance and bp will sell diesel mixed with detergents and dispersants at Rs. 1 cheaper per litre than gasoil sold by the state-run companies, such as IOCL, BPCL, and HPCL.
- Organisation of the Petroleum Exporting Countries (OPEC) meets 78% of India's crude oil demand, 59% LPG needs and 38% LNG consumption.
- India's oil demand in the year 2024 is expected to see a growth of 220,000 barrels per day to reach 5.57 million barrels per day, up 4.19% from 2023, as per an estimate by OPEC.

Strategies adopted... (1/4)

1

Expansion

- ONGC inked a Memorandum of Understanding (MoU) with NTPC Green Energy Limited (NGEL) to realize its Renewable energy objectives towards energy transition on September 27, 2023. The MoU will primarily explore the feasibility and setting up of Renewable Energy Projects in various domains.
- In September 2023, ONGC inked the Crude Oil Sales Agreement (COSA) with Mangalore Refinery and Petrochemicals Limited (MRPL) which is the largest single-location PSU refinery in the country.
- In August 2023, Oil and Natural Gas Corporation Limited (ONGC) signed a term contract with Bharat Petroleum Corporation Limited (BPCL) for the sale of crude oil from the Mumbai region, which marked the first-ever term contract under the Marketing Freedom regime.
- Indian refiner Bharat Petroleum Corporation Limited (BPCL) is planning to invest US\$ 18.16 billion over five years to grow its oil business and expand its renewable energy portfolio as it aims for a 2040 net zero goal.
- Tata Mining Limited signed an MoU with Gas Authority of India Limited (GAIL), in order to reduce carbon footprint in its operations, and for the supply of natural gas to its Ferro Alloys Plant at Athgarh in Odisha's Cuttack district. GAIL will supply the agreed quantity of natural gas through its pipeline from Gujarat to Athgarh.
- In February 2023, Oil India Limited commenced the project for India's first exploratory oil well in Mahanadi Onshore Basin in Odisha under OALP.
- In February 2023, Prime Minister launched E20 fuel at 84 retail outlets of oil marketing companies in 11 States/UTs along the lines of the ethanol blending roadmap.
- In February 2023, Essar Group plans to set up at least 200 liquefied natural gas (LNG) fuelling stations and serve small gas consumers in the country.
- In May 2022, ONGC announced plans to invest US\$ 4 billion from FY22-25 to increase its exploration efforts in India.
- In March 2022, the Board of IOCL approved plans to invest Rs. 7,282 crore (US\$ 932.6 million) for the development of City Gas Distribution (CGD) network in 9 geographical areas (GAs).
- In March 2022, the Board of Oil India approved an investment of Rs. 6,555 crore (US\$ 839.49 million) for the Numaligarh petrochemical project.
- In January 2022, Indian Oil Corp. Ltd. (IOCL) announced plans to expand its city gas distribution (CGD) business, looking to invest Rs. 7,000 crore (US\$ 918.6 million).
- In January 2022, Adani Total Gas Ltd (ATGL), a joint venture between the Adani Group and TotalEnergies, won licences to expand its City Gas Distribution (CGD) network to 14 new geographical areas, with an investment of Rs. 20,000 crore (US\$ 2.62 billion).

Source: Bloomberg Reports, News Articles

Strategies adopted... (2/4)

2

Diversification

- Oil companies are focusing on vertical integration for the next stage of growth. For instance, oil producer Oil India Ltd. is planning to build and operate refineries, while Indian Oil is planning to enter oil and gas exploration
- In July 2021, India diversified procurement for crude by announcing its first shipment from Guyana. This move also indicates a future roadmap for extended alliance with Guyana in the oil & gas sector.

3

Investments to enhance production

- Minister of Petroleum & Natural Gas Mr. Hardeep Singh Puri said the Exploration and Production (E&P) sector offers investment opportunities worth US\$ 100 billion by 2030.
- In February 2024, Prime Minister, Mr. Narendra Modi unveiled a strategic investment plan of US\$ 67 billion for the Indian gas sector over the next 5-6 years, to raise the share of natural gas in the primary energy mix from 6% to 15%.
- In February 2022, Minister of Petroleum & Natural Gas, and Housing & Urban Affairs, Mr. Hardeep Singh Puri, said that India will more than double its exploration area of oil and gas to 0.5 million sq. km. by 2025 and to 1 million sq. km. by 2030 with a view to increase domestic output.
- In November 2021, Oil and Natural Gas Corp. Ltd (ONGC) announced that it invested up to Rs. 6,000 crore (US\$ ~800 million) in the petrochemicals arm—ONGC Petro Additions Ltd. (OPaL)—to meet its equity requirements.

4

Commercial use of oil

- This flexibility will encourage the company to store more oil in the three strategic petroleum reserves built at Visakhapatnam, Mangalore, and Padur and will act as an insurance against supply and price disruptions.

Notes: ISEER - Indian Seasonal Energy Efficiency Ratio

Source: News Articles, techARC¹

Strategies adopted... (3/4)

5

Pilot project Initiated for Shale Gas Production in India

- Cairn Oil & Gas, a Vedanta Group company, has announced plans to invest US\$ 700 million to boost the drilling infrastructure at its 100 exploratory wells in the country, including in the pilot project for shale oil/gas in Rajasthan's Barmer region.
- Oil and Natural Gas Corp (ONGC) has started shale gas exploration by spudding the first Shale Gas well RNSG-1 in Burdwan district of West Bengal.
- In July 2021, Great Eastern Energy Corporation Limited (GEECL) announced plans to invest Rs. 15,000 crore (US\$ 1.96 billion) for shale gas core well exploration in West Bengal.

6

Move to non-conventional energy resources

- In April 2022, Indian Oil Corporation Limited, Larsen & Toubro and Goldman Sachs-backed renewable energy producer ReNew Power formed a joint venture by signing a term sheet. This JV will develop green hydrogen projects, helping India cut down its carbon emissions.
- In February 2022, Nepal and India agreed to form a Joint Hydro Development Committee to explore the possibility of viable hydropower projects.
- In September 2021, Indraprastha Gas Limited (IGL) signed a memorandum of understanding with the South Delhi Municipal Corporation (SDMC) to build a waste to energy plant in Delhi to fuel vehicles.
- In July 2021, Indian Oil Corporation (IOC) announced plans to establish India's first green hydrogen plant at the Mathura refinery to introduce green hydrogen activities and projects in the oil and gas sector in the country.

7

More focus upon small companies

- Private sector units like Adani, Sun Petrochemicals and few new entrants have bagged 1/3rd of small oil and gas fields.

Source: CEAMA, India Retail Report, Business Line, IMAP India, News Sources

Strategies adopted... (4/4)

8

Innovate for India

- In April 2022, Bharat Petroleum Corporation Ltd. (BPCL) and Microsoft established a strategic cloud partnership targeted at speeding up the company's digital transformation and influencing the oil and gas industry's future innovation.
- In February 2021, IndianOil Corp. Ltd. signed a 'statement of intent' with Greenstat Hydrogen India Pvt. Ltd. to establish a centre of excellence for hydrogen value chain and other related technologies such as hydrogen storage, fuel cells, etc.

9

Model Retail Outlet Scheme

- In November 2021, Indian Oil, Bharat Petroleum Corporation Limited and Hindustan Petroleum Corporation Limited announced the launch of Model Retail Outlet Scheme and a Digital Customer Feedback Programme called Darpan@petrolpump. These three oil PSUs have joined hands to launch Model Retail Outlets to enhance service standards and amenities across their networks, which serve over six crore consumers every day.

10

ONGC Videsh

- As of June 2021, ONGC Videsh is in the process of raising US\$ 525 million in overseas foreign money loans from a mixture of home and overseas lenders to repay bonds maturing in the subsequent months.
- ONGC Videsh, the abroad arm of the state-run explorer Oil and Natural Gas Corporation, is in discussion with half a dozen international and domestic banks for the loan.

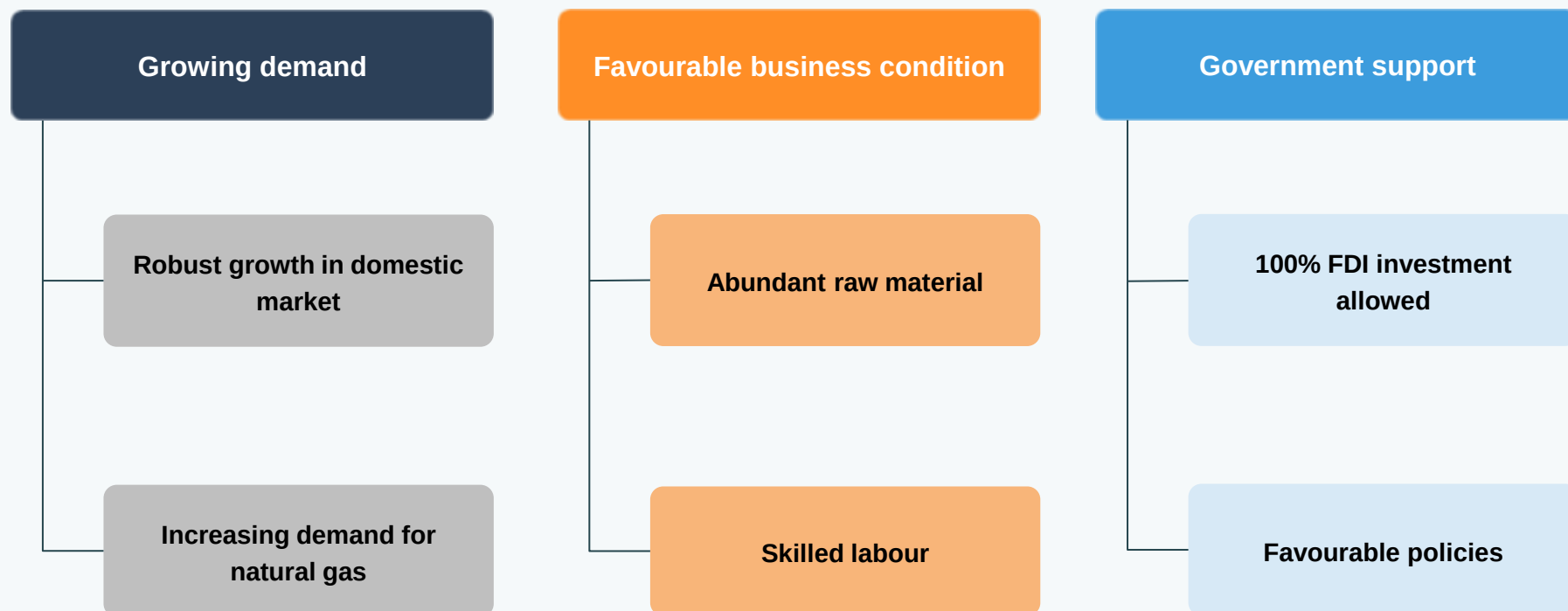
11

Government initiatives

- Prime Minister, Mr. Narendra Modi unveiled a strategic investment plan of US\$ 67 billion for the Indian gas sector over next 5-6 years.



Growth drivers

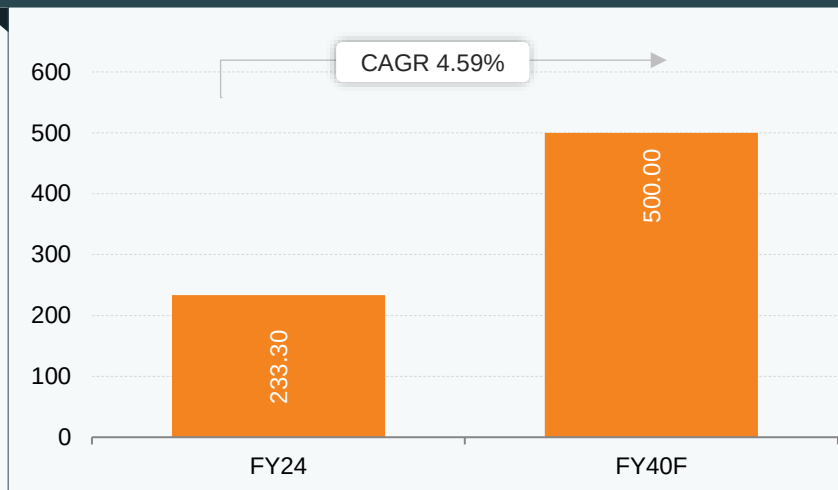


Notes: TCM - Trillion Cubic Metres, EandP - Exploration and Production

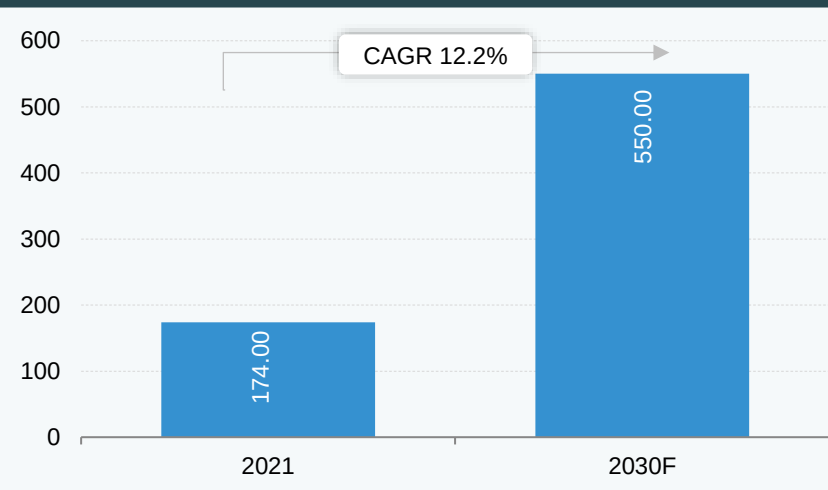
Source: Ministry of Petroleum and Natural Gas, US Energy Information Administration, BP Statistical Review of World 2015 Energy, June 2012; BMI

Rising demand

Crude oil consumption and forecast (MT)



Natural gas consumption and forecast (MCMPD)



- Energy demand of India is anticipated to grow faster than the energy demand of all major economies on the back of robust economic growth. Consequently, India's energy demand as a percentage of global energy demand is expected to rise to 11% in 2040 from 6% in 2017.
- Crude oil consumption is expected to grow at a CAGR of 4.59% to 500 million tonnes by FY40 from 233.3 million tonnes in FY24.
- Natural Gas consumption is forecast to increase at a CAGR of 12.2% to 550 MCMPD by 2030 from 174 MCMPD in 2021.
- Diesel demand in India is expected to double to 163 million tonnes by 2029-30.
- India's oil consumption is forecast to rise from 4.05 MBPD in FY22 to 7.2 MBPD in 2030 and 9.2 MBPD in 2050.
- According to IEA, India is projected to emerge as the largest contributor to global oil demand growth within the next seven years. The country, already the world's second-largest net importer, faces a 22% decline in domestic production, reaching 540 thousand barrels per day (b/d) by 2030 from the current 700 thousand b/d.

Notes: F-Forecast, MT - Million Tonnes, MCMPD - Million Cubic Metres Per Day

Source: BP Statistical Review of World Energy 2019, BP Energy Outlook 2019, News Articles

Regulatory overview of the industry

1

National Policy on Biofuels, 2018

- Proposed an indicative target of 20% blending of ethanol in petrol and 5% blending of biodiesel in diesel by 2030. In May 2022, this policy was amended, bringing the 20% target forward to 2025-26.
- Promoted advanced biofuels through a viability gap funding scheme of Rs. 5,000 crore (US\$ 745.82 million) in six years for 2G ethanol bio refineries along with additional tax incentives.

2

Ethanol Procurement Policy

- The Ministry of Petroleum and Natural Gas released an 'Ethanol Procurement Policy' on a long-term basis under the 'Ethanol Blended Petrol (EBP) Programme' (October 11, 2019) which covers modalities for long-term ethanol procurement, proposed mechanisms for long-term procurement contracts, pricing methodology and other topics.

3

Liquefied natural gas (LNG) policy

- The Ministry of Petroleum and Natural Gas released a draft LNG policy that aims to increase the country's LNG re-gasification capacity from 42.5 MTPA to 70 MTPA by 2030 and 100 MTPA by 2040.

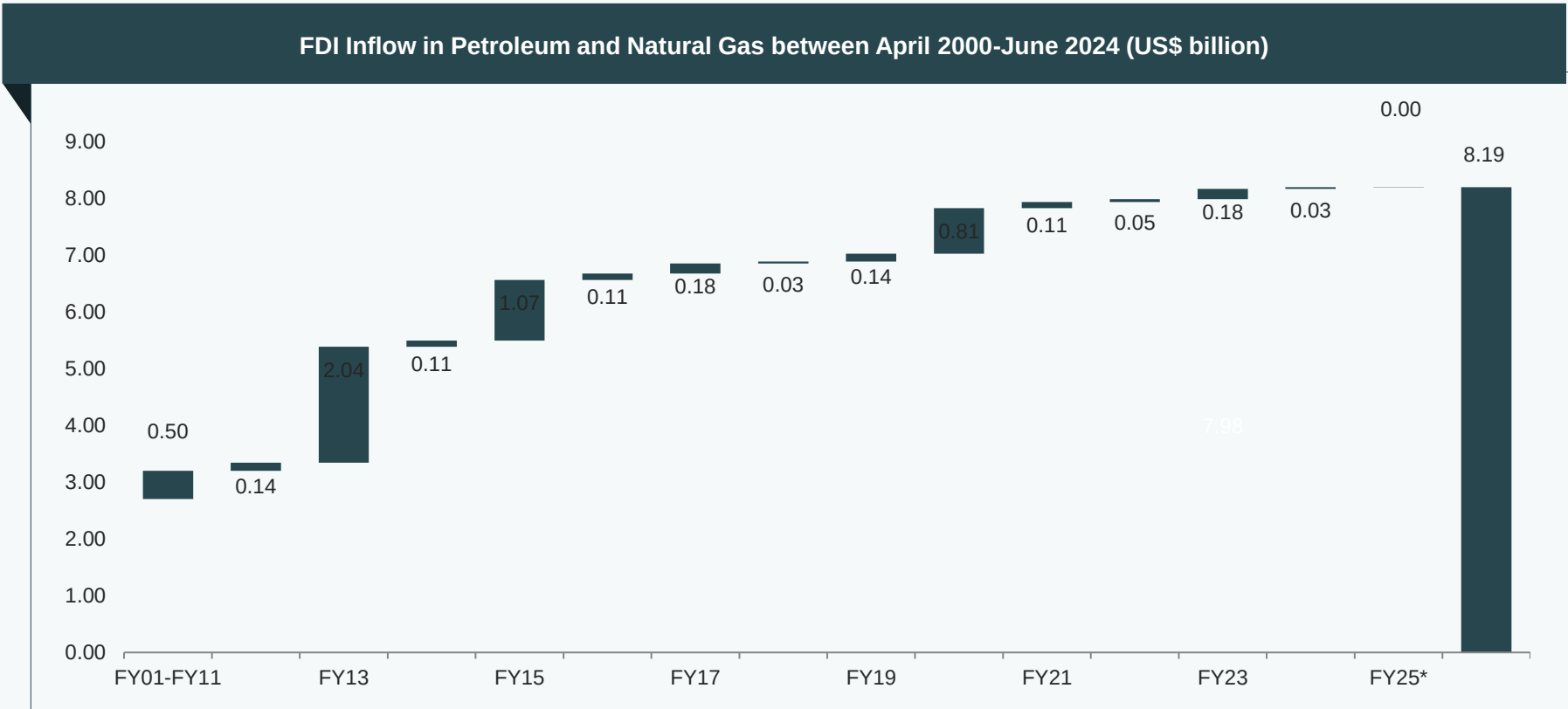
4

Open Acreage Licensing

- Launched in June 2017, it allowed companies to carve out area for petroleum exploration and production (E&P). The policy, launched under the Hydrocarbon Exploration and Licensing Policy (HELP), replaced New Exploration and Licensing Policy under which bidders did not have the freedom of carving out areas for E&P.

Source: CEAMA, India Retail Report, Business Line, IMAP India, News Sources

FDI investments in petroleum and gas in India



- FDI inflows in India’s petroleum and natural gas sector stood at US\$ 8.19 billion between April 2000-June 2024.
- India has invited global firms to invest in its strategic petroleum reserves (SPRs) owing to the country’s rising energy consumption. India’s share in global energy consumption is set to rise from 7% to 12% in 2050.

Source: Department Of Promotion Of Industry And Internal Trade

M&A activities in the Indian oil and gas sector

Date	Acquirer name	Target name	Value of deal (US\$ million)
Sept 2023	Oil and Natural Gas Corporation	ONGC Petro additions	1799
Jun 2022	Reliance New Energy Ltd (RNEL)	Shapoorji Pallonji Group's Sterling & Wilson Renewable Energy Ltd (SWREL)	525.5
Jun 2022	Adani Ports and SEZ Limited	Ocean Sparkle Limited (OSL)	201
Mar 2021	Oil India Ltd. (54.16%), Engineers India (4.4%) and Government of Assam (3.2%)	Bharat Petroleum Corporation (Numaligarh Refinery 61.5% stake)	1,361
Jan 2021	Total	Adani Green Energy (20% minority stake)	2,500
Dec 2020	Bharat Petroleum Corporation	Bharat Oman Refineries (BORL) (36.62% stake)	Not disclosed
Mar 2019	Brookfield	East West Pipeline (EWPL) (Previously known as Reliance Gas Transportation Infrastructure)	1,800
Apr 2018	Indian Oil Corporation Ltd (IOCL)	Shell Exploration & Production, Oman	329
Feb 2018	ONGC	HPCL (51.11% stake)	57,020.39
Feb 2018	ONGC Videsh	Abu Dhabi National Oil Co (10% stake in offshore oilfield)	600
Aug 2017	Rosneft	Essar Oil (49% stake)	1,290
Dec 2016	Oil and Natural Gas Corp's	Gujarat State Petroleum Co's	1,200
Dec 2015	ONGC Videsh Ltd. (OVL)	Vankor oil field	1,260
Jan 2015	Bharat Forge	Mecanique Generale Langroise	12.82

Source: Thomson Banker, News Articles

Opportunities



Opportunities

1. Midstream segment

- Expansion in the transmission network of gas pipelines.
- As of March 2022, the Petroleum and Natural Gas Regulatory Board (PNGRB) authorised the 34,135-km natural gas pipeline network to develop a national gas grid and boost the availability of natural gas in India.
- LNG imports have increased significantly, which provides an opportunity to boost production capacity.
- In light of mounting LNG production, huge opportunity lies for LNG terminal operation, engineering, procurement, and construction services.



2. Down stream segment

- India is already a refining hub with 23 refineries, and expansion is planned for tapping foreign investment in export-oriented infrastructure, including product pipelines and export terminals.
- The Petroleum and Natural Gas Regulatory Board (PNGRB), the downstream regulator, in March 2023, announced that it has amended the PNGRB Determination of Natural Gas Pipeline Tariff regulations to incorporate provisions for Unified Tariff for natural gas pipelines with a mission of “One Nation, One Grid, and One Tariff.” Based on the regulations, PNGRB has notified a levelized Unified Tariff of Rs. 73.93/MMBTU and created three tariff zones for Unified Tariff, where the first zone is up to a distance of 300 km from the gas source, the second zone is 300-1,200 km, and the third zone is beyond 1,200 km.
- Development of City Gas Distribution (CGD) networks similar to Delhi and Mumbai’s CGDs.
- India is set to expand its natural gas grid to 34,500 km by adding another 17,000 km worth of gas pipelines. The regasification capacity of the existing 42 MMT per annum was expected to be expanded to 61 MMT per year by 2022.
- Indian companies are expected to spend Rs. 100 billion (US\$ 1.35 billion) over three years on 1,000 liquefied natural gas (LNG) stations along main roads and industrial corridors and in mining areas to cut diesel consumption.

3. Upstream segment

- Locating new fields for exploration: 78% of the country’s sedimentary area is yet to be explored.
- Increasing the share of natural gas: The government is working towards increasing the share of gas from 6.3% (July 2022) to 15% of the energy mix by 2030.
- Development of unconventional resources: CBM fields in the deep sea.
- Opportunities for secondary/tertiary oil-producing techniques.
- Higher demand for skilled labour and oilfield services and equipment.

Note: MMBTU-Metric Million British Thermal Units

Key Industry Contacts



Contact information

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Glossary

- B/D (or bpd): Barrels Per Day
- MBPD (or mbpd): Million Barrels Per Day
- BCM (or bcm): Billion Cubic Metres
- CBM: Coal Bed Methane
- CGD: City Gas Distribution
- EandP: Exploration and Production
- FDI: Foreign Direct Investment
- FY: Indian Financial Year (April to March)
- FY20 implies April 2019 to March 2020
- GoI: Government of India
- Rs.: Indian Rupee
- PM: Prime Minister
- LNG: Liquefied Natural Gas
- MMT (or MMT): Million Metric Tonne
- MMTPA (or mmtpa): Million Metric Tonnes Per Annum
- EBITDA: Earning Before Interest Taxes Depreciation Amortisation
- NRL: Numaligarh Refinery Limited
- CPCL: Chennai Petroleum Corporation Limited
- HPCL: Hindustan Petroleum Corporation Limited
- BPCL: Bharat Petroleum Corporation Limited

Glossary

- IOC: Indian Oil Corporation Ltd
- EOL: Essar Oil Ltd
- RPL: Reliance Petroleum Limited
- MRPL: Mangalore Refinery and Petrochemicals Limited
- PCCK: Petronet Cochin-Coimbatore-Karur
- PMHB: Petronet Mangalore-Hassan-Bangalore
- OALP: Open Acreage Licensing Policy
- TOE (or toe): Tonnes of Oil Equivalent
- US\$: US Dollar
- ONGC: Oil and Natural Gas Corporation of India
- IOCL: Indian Oil Corporation Limited
- mn bbl: Million Barrels
- CAGR: Compound Annual Growth Rate
- JV: Joint Venture
- UCG: Underground Coal Gasification
- NGL: Natural Gas Liquids
- OMCs: Oil Marketing Companies
- NHGP: National Gas Hydrate Programme
- Wherever applicable, numbers have been rounded off to the nearest whole number

Exchange rates

Exchange Rates (Fiscal Year)

Year	Rs. Equivalent of one US\$
2004-05	44.95
2005-06	44.28
2006-07	45.29
2007-08	40.24
2008-09	45.91
2009-10	47.42
2010-11	45.58
2011-12	47.95
2012-13	54.45
2013-14	60.50
2014-15	61.15
2015-16	65.46
2016-17	67.09
2017-18	64.45
2018-19	69.89
2019-20	70.49
2020-21	73.20
2021-22	74.42
2022-23	78.60
2023-24	82.80
2024-25**	83.89

Exchange Rates (Calendar Year)

Year	Rs. Equivalent of one US\$
2005	44.11
2006	45.33
2007	41.29
2008	43.42
2009	48.35
2010	45.74
2011	46.67
2012	53.49
2013	58.63
2014	61.03
2015	64.15
2016	67.21
2017	65.12
2018	68.36
2019	69.89
2020	74.18
2021	73.93
2022	79.82
2023	82.61
2024*	83.70

*Note: *- Until October 2024, **- April- October 2024*

Source: Foreign Exchange Dealers' Association of India

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