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# India's Oil and Gas Dependence and Supply Balance in 2024–25: Evidence from PPAC Monthly Reports

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**Abstract**

India's energy evolution is telling alongside a continued structural requirement on oil and natural gas, raising serious concerns concerning energy security and conversion readiness. Despite rapid expansion in renewable capacity, oil and gas remain central to India's production, refining, and consumption framework, yet systematic assessments using recent official data are limited. This study examines India's oil and gas supply–demand balance during **2024–25** using monthly secondary data published by the **Petroleum Planning and Analysis Cell (PPAC)**. The analysis employs a descriptive and comparative approach to evaluate trends in domestic crude oil production, refinery throughput, petroleum product output and exports, crude oil and LNG imports, and sectoral natural gas consumption. The findings indicate that while India's refining capacity and petroleum product production remain robust, dependence on imported crude oil and LNG continues to be high. Petroleum product exports coexist with elevated import reliance, underscoring India's position as a major refining hub rather than a self-sufficient energy producer. The study highlights the persistent importance of oil and gas in India's energy system and suggests that transition strategies must balance diversification goals with short-term energy security and supply-stability considerations.

***Keywords:*** oil and gas balance, import dependence, petroleum products, natural gas and LNG, energy transition in India

## 1. Introduction (Revised and Strengthened)

India's energy transition is progressing in an environment where oil and natural gas continue to play a central role in sustaining economic growth and meeting essential consumption needs. Despite rapid expansion in renewable energy capacity and policy commitments toward decarbonisation, fossil fuels accounted for more than half of India's total primary energy consumption in recent years, with petroleum products remaining indispensable for transport, industry, and logistics (International Energy Agency [IEA], 2023). As the world's third-largest energy consumer and a major oil importer, India's exposure to global oil and gas market developments remains structurally high.

A defining feature of India's energy landscape is the coexistence of **high import dependence** with **significant domestic refining capacity**. While domestic crude oil and natural gas production have grown only modestly, India has developed one of the world's largest and most complex refining sectors, enabling substantial exports of petroleum products even as crude oil imports remain elevated. According to official estimates, India imports over four-fifths of its crude oil requirement, making energy security highly sensitive to external supply conditions and price volatility (Ministry of Petroleum and Natural Gas [MoPNG], 2024).

Recent global developments—including geopolitical tensions, supply disruptions, and increased volatility in energy markets—have further underscored the strategic importance of understanding national oil and gas balances. These factors have reinforced the need for granular, short-term assessments that capture evolving supply, processing, and trade dynamics rather than relying solely on annual aggregates (World Bank, 2024). Monthly official data therefore offer valuable insights into how India manages energy demand and external dependence during periods of transition.

Against this backdrop, the present study analyses India's oil and gas supply–demand balance during **2024–25**, using monthly data published by the **Petroleum Planning and Analysis Cell (PPAC)**. By examining trends in domestic production, refinery throughput, petroleum product output and trade, crude oil and LNG imports, and sectoral natural gas consumption, the paper provides an evidence-based assessment of India's continued reliance on oil and gas and discusses its implications for energy security and transition preparedness.

**2. Data Sources and Methodology (with data, charts, and sources)**

**2.1 Data sources**

This study uses **secondary data** from the **Petroleum Planning & Analysis Cell (PPAC), Ministry of Petroleum & Natural Gas, Government of India**, drawn from the following uploaded PPAC publications:

1. **Snapshot of India's Oil & Gas Data: Monthly Ready Reckoner (October 2025)** (core dataset for monthly + FY + April–October indicators).
2. **Monthly Natural Gas Reports (Sept 2025 and Oct 2025)** (gas production, LNG imports, total consumption, sectoral patterns).

**.2 Methodology (how data are analysed)**

- **Approach:** descriptive and comparative analysis using PPAC monthly and cumulative indicators (FY totals + month values + April–October values).
- **Time scope:** 2024–25 and operational comparison points around **October 2025** and **April–October**.
- **Outputs:** structured tables + visual charts (bar charts and pie charts) to show (i) oil import dependence, (ii) refining/processing scale vs domestic production, and (iii) gas supply reliance on LNG.

**2.3 Tables with data**

**Table 1. Key Oil Indicators (India, October 2025)**

| Indicator | Oct 2025 value | Unit |
|---|---|---|
| Crude oil production in India (includes condensate) | 2.3 | MMT |
| Crude oil imports | 21.1 | MMT |
| Total crude processed | 22.5 | MMT |
| Petroleum products production | 24.2 | MMT |
| Petroleum products (POL) exports | 5.1 | MMT |
| Petroleum products (POL) imports | 4.3 | MMT |

**Source (crude production, crude imports, petroleum production, POL exports/imports):** PPAC Ready Reckoner "Crude oil, LNG and petroleum products at a glance".

**Source (total crude processed):** PPAC Ready Reckoner "HS/LS crude oil processing" table (total crude processed for October).

**Table 2. Import intensity of India's crude processing (October 2025)**

| Item | Value |
|---|---|
| Total crude processed (MMT) | 22.5 |
| Indigenous crude processed (MMT) | 2.0 |
| Imported crude processed (MMT) | 20.5 |
| **Share of imported crude in processing (%)** | **91.1%** |

**Source (indigenous crude processing + imported crude processing):** PPAC Ready Reckoner "Self-sufficiency in petroleum products" (Oct values).

**Source (total crude processed):** PPAC Ready Reckoner "HS/LS crude processing" (Oct total).

**Table 3. Key Natural Gas Indicators (India, October 2025)**

(From PPAC Ready Reckoner highlights)

| Indicator | Oct 2025 value | Unit |
|---|---|---|
| Gross natural gas production | 2,954 | MMSCM |
| LNG imports | 2,807 | MMSCM |
| Total natural gas consumption (incl. internal) | 5,722 | MMSCM |

**Source:** PPAC Ready Reckoner (highlights + gas summary).

**2.4 Figures / charts (with data + sources)**

I have generated the required charts from the tables above.

**Figure 1. Crude production vs crude processed (Oct 2025)**

**Data source:** crude production from PPAC at-a-glance table ; crude processed from PPAC crude processing table

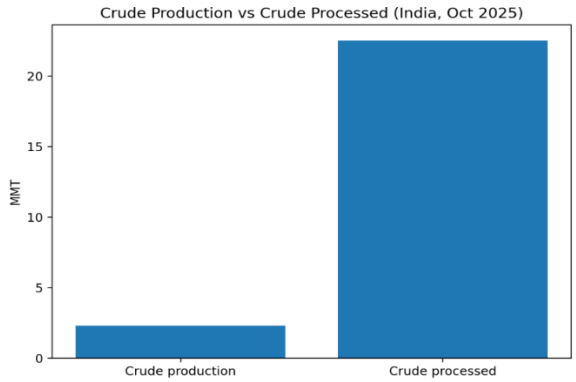


**Figure 2. Share of indigenous vs imported crude in total processing (Oct 2025) — pie chart**

**Data source:** indigenous crude processing from PPAC self-sufficiency table ; total crude processed from PPAC crude processing table

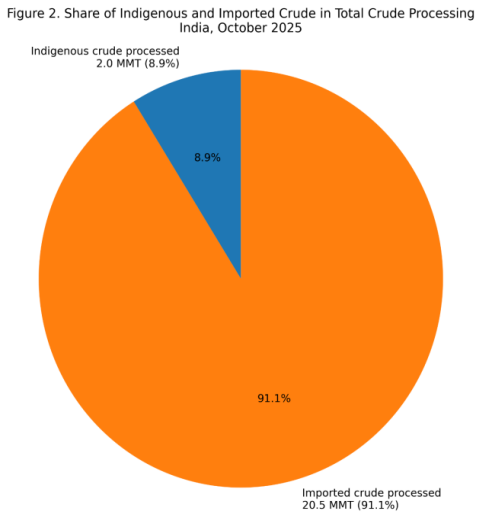

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**Figure 3. POL exports vs POL imports (Oct 2025)**

**Data source:** PPAC at-a-glance table (POL exports and POL imports for October).

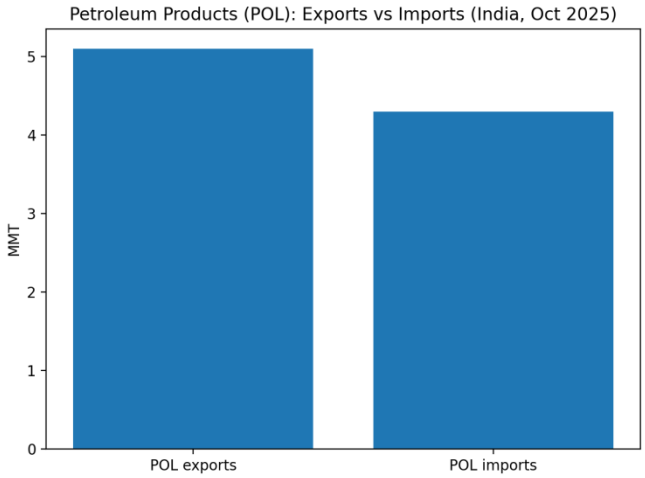
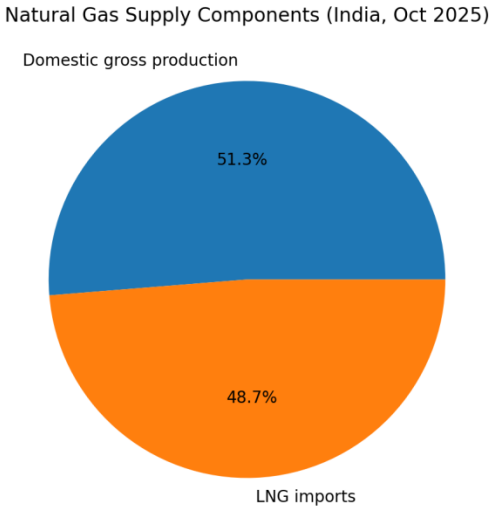



**Figure 4. Natural gas supply components: domestic production vs LNG imports (Oct 2025) — pie chart**

**Data source:** PPAC Ready Reckoner gas highlights.




### 2.5 Short limitations statement

The analysis is based on PPAC monthly statistics and focuses on descriptive patterns in supply, processing, trade, and gas availability. Price dynamics and causal estimation are outside the scope of the current dataset and method.

## 3. Oil Balance in India (2024–25): Domestic Production, Processing, and Import Dependence

India's oil balance during **2024–25** reveals a persistent structural gap between limited domestic crude oil availability and a large, refinery-led petroleum system. PPAC data for October 2025 show that **domestic crude production remains modest**, while **refinery throughput is high**, resulting in a heavy reliance on imported crude to sustain operations.

### Domestic production vs processing.

Domestic crude oil production (including condensate) in October 2025 stood at **2.3 MMT**, whereas **total crude processed** by refineries reached **22.5 MMT**. This disparity underscores the scale mismatch between upstream supply and downstream capacity. As depicted in **Figure 1**, refinery activity is an order of magnitude larger than indigenous production, confirming that India's refining strength does not translate into upstream self-sufficiency.

**Import dependence in processing.**

The composition of refinery feedstock further clarifies the extent of dependence. **Figure 2** shows that **imported crude constituted about 91.1%** of total crude processed in October 2025, with **indigenous crude accounting for only 8.9%**. This high share of imported feedstock indicates that short-term energy security remains closely tied to external crude markets, notwithstanding diversification of import sources.

**Implications for the transition period.**

The observed oil balance has two immediate implications. First, India's ability to maintain stable petroleum product supply in the near term is contingent on uninterrupted access to international crude oil. Second, while refining capacity enables value addition and export earnings, it does not mitigate exposure to global supply shocks at the upstream level. During the energy transition, this configuration implies that policies aimed at resilience—such as strategic reserves, import diversification, and efficiency gains—remain critical alongside longer-term efforts to expand non-fossil alternatives.

Overall, the 2024–25 evidence confirms that **India's oil economy is refinery-centric and import-dependent**, a structural reality that shapes energy security considerations during the transition phase.

*Sources:* Petroleum Planning and Analysis Cell (PPAC), *Monthly Ready Reckoner* and *Monthly Crude Oil Reports*, October 2025.

**4. Petroleum Product Production and Trade: Output Structure, Exports, and the Refining-Hub Paradox**

India's petroleum product balance in **2024–25** reflects a distinctive **refining-hub paradox**: strong output and exports of refined products coexist with high dependence on imported crude oil. PPAC data for **October 2025** indicate that refineries operated at scale, producing **24.2 MMT** of petroleum products, led by transport fuels.

**Output structure.**

Product-wise production shows a clear concentration in middle distillates. **High Speed Diesel (HSD)** and **Motor Spirit (MS)** together constitute the majority of output, followed by **Aviation Turbine Fuel (ATF)** and **LPG**. This configuration aligns with domestic transport demand and export market preferences, and it reflects refinery configurations optimized for diesel yields.

**Exports versus imports of products.**

Trade data reinforce India's position as a net exporter of refined fuels. In **October 2025**, petroleum product exports amounted to **5.1 MMT**, while product imports were **4.3 MMT**. **Figure 3** illustrates this surplus, confirming that refining capacity enables India to supply external markets even as it imports crude oil as feedstock.

**Export composition and markets.**

Diesel dominates exports, followed by other refined products and ATF, mirroring global demand patterns for middle distillates. Cumulatively (April–October 2025), export volumes remain substantial, underscoring consistent refinery utilization and competitiveness in international product markets.

**Policy and transition implications.**

The refining-hub model delivers foreign-exchange earnings and scale efficiencies, but it does not reduce upstream vulnerability. Because exports are contingent on imported crude, supply disruptions or price volatility in crude markets can quickly transmit to refinery operations and product availability. During the transition period, this paradox highlights the need to complement refining strength with measures that enhance resilience—such as diversified crude sourcing, strategic reserves, logistics robustness, and incremental efficiency gains—while longer-term diversification toward non-fossil energy continues.

*Sources:* Petroleum Planning and Analysis Cell (PPAC), *Monthly Ready Reckoner* and *Monthly Reports on Production, Import and Export of Petroleum Products*, October 2025.

**5. Natural Gas and LNG: Availability, Import Dependence, and Sectoral Consumption (2024–25)**

Natural gas plays a critical complementary role in India's energy system during the transition period, particularly for fertilisers, city gas distribution (CGD), power generation, and refinery operations. PPAC data for **September–October 2025** indicate that, similar to crude oil, India's natural gas balance is characterised by **substantial import dependence**, primarily through LNG.

**Supply composition.**

In **October 2025**, **gross domestic natural gas production** amounted to **2,954 MMSCM**, while **LNG imports** stood at **2,807 MMSCM**, bringing **total gas consumption (including internal use)** to **5,722 MMSCM**. This near parity between domestic production and LNG imports underscores the structural importance of imported gas in meeting India's demand. **Figure 4** visually demonstrates that LNG accounts for almost half of total gas availability, reinforcing India's exposure to global gas markets.

**Sectorial consumption patterns.**

PPAC's monthly gas reports show that **fertilisers and CGD** remain the largest consumers of natural gas, followed by **power generation** and **refineries**. These sectors are highly sensitive to supply continuity, making LNG imports essential for maintaining operational stability. The prominence of CGD also reflects policy-driven expansion of piped natural gas and compressed natural gas usage in urban areas.

**Implications for energy security and transition.**

The gas balance highlights a dual challenge. On one hand, natural gas supports cleaner combustion relative to coal and oil and thus acts as a transition fuel. On the other hand, high reliance on LNG exposes India to international price volatility and supply disruptions. The 2024–25 evidence suggests that while gas contributes to diversification within fossil fuels, it does not eliminate external dependence. Consequently, policies aimed at enhancing domestic production, expanding storage and regasification capacity, and securing diversified LNG sourcing remain vital during the transition phase.

Overall, India's gas profile mirrors its oil experience: **demand growth outpaces domestic supply**, necessitating sustained engagement with global energy markets even as longer-term decarbonisation goals advance.

*Sources:* Petroleum Planning and Analysis Cell (PPAC), *Monthly Natural Gas Production, Availability and Consumption Reports*, September and October 2025.

**6. Discussion: Implications for Energy Security and Transition Preparedness**

The analysis of India's oil and gas balance during **2024–25** highlights a consistent structural pattern: **strong downstream capacity coupled with high upstream import dependence**. The evidence from PPAC data shows that domestic crude oil production contributes only a small fraction of refinery feedstock, while imported crude dominates processing. Similarly, in the natural gas segment, LNG imports account for nearly half of total gas availability. These patterns underscore that, in the short to medium term, India's energy security remains closely tied to developments in global oil and gas markets.

From an energy security perspective, India's large and complex refining system provides operational flexibility and export capability, but it does not insulate the economy from external supply shocks. Refining strength enables value addition and export earnings, yet it simultaneously amplifies exposure to crude oil supply disruptions. In the case of natural gas, reliance on LNG introduces additional vulnerabilities related to global price volatility and shipping constraints, particularly during periods of geopolitical tension.

In the context of the energy transition, the findings suggest that oil and gas will continue to play a stabilising role in meeting India's energy demand even as renewable capacity expands. Transition strategies therefore need to be **sequenced and calibrated**, recognising that rapid displacement of oil and gas is neither feasible nor desirable in the short run. Policy emphasis on strategic petroleum reserves, diversified import sourcing, enhancement of domestic exploration, and infrastructure resilience remains critical for managing transition risks.

**7. Conclusion**

This paper addressed the critical issue of India's continued dependence on oil and natural gas during the energy transition, focusing on the supply–demand balance, import reliance, and downstream strength in the period **2024–25**. Despite sustained policy emphasis on renewable energy and diversification, India's energy system remains structurally anchored in oil and gas, raising important concerns for energy security and transition preparedness.
The analysis revealed a pronounced mismatch between limited domestic crude oil and natural gas production and a large, refinery-centric downstream sector. Imported crude accounted for more than ninety percent of refinery processing, while LNG contributed nearly half of total natural gas availability. At the same time, India emerged as a major exporter of petroleum products, particularly diesel, underscoring its role as a global refining hub rather than an upstream energy producer. These findings confirm that India's short-term energy stability is closely tied to global oil and gas markets.
The results highlight that India's energy transition must proceed alongside continued engagement with international energy markets. Refining capacity and gas infrastructure provide operational resilience, but they do not eliminate exposure to external supply shocks and price volatility. Policy efforts therefore need to balance decarbonisation objectives with pragmatic energy-security considerations, including import diversification, strategic reserves, and infrastructure resilience.
The study is limited to descriptive analysis using official monthly data and does not incorporate price dynamics, environmental externalities, or long-term transition modelling. Additionally, sector-specific behavioural responses and regional variations are beyond the scope of the present analysis.
Future research may extend this analysis by integrating price pass-through effects, fiscal implications, and environmental dimensions of oil and gas dependence. Longitudinal studies combining energy balance data with policy and market indicators would further enrich understanding of India's transition trajectory.
In conclusion, the evidence from 2024–25 demonstrates that oil and natural gas remain indispensable to India's energy system during the transition period. Recognising and managing this dual reality—pursuing decarbonisation while safeguarding energy security—will be essential for ensuring a stable, resilient, and orderly transformation of India's energy economy.

**References:**

1. International Energy Agency. (2023). *World energy outlook 2023*. International Energy Agency. https://www.iea.org/reports/world-energy-outlook-2023
2. Ministry of Petroleum and Natural Gas. (2024). *Basic statistics on Indian petroleum and natural gas 2023–24*. Government of India. https://mopng.gov.in/en/statistics/basic-statistics
3. Petroleum Planning and Analysis Cell. (2025a). *Snapshot of India's oil & gas data: Monthly ready reckoner (September 2025)*. Ministry of Petroleum and Natural Gas, Government of India. https://www.ppac.gov.in
4. Petroleum Planning and Analysis Cell. (2025b). *Snapshot of India's oil & gas data: Monthly ready reckoner (October 2025)*. Ministry of Petroleum and Natural Gas, Government of India. https://www.ppac.gov.in
5. Petroleum Planning and Analysis Cell. (2025c). *Monthly natural gas production, availability and consumption report (September 2025)*. Ministry of Petroleum and Natural Gas, Government of India. https://www.ppac.gov.in
6. Petroleum Planning and Analysis Cell. (2025d). *Monthly natural gas production, availability and consumption report (October 2025)*. Ministry of Petroleum and Natural Gas, Government of India. https://www.ppac.gov.in
7. Petroleum Planning and Analysis Cell. (2025e). *Monthly review of petroleum sector performance (September 2025)*. Ministry of Petroleum and Natural Gas, Government of India. https://www.ppac.gov.in
8. Petroleum Planning and Analysis Cell. (2025f). *Monthly review of petroleum sector performance (October 2025)*. Ministry of Petroleum and Natural Gas, Government of India. https://www.ppac.gov.in

9. Petroleum Planning and Analysis Cell. (2025g). *Monthly report on indigenous crude oil production, crude oil import and processing, and petroleum product production and trade (September 2025)*. Ministry of Petroleum and Natural Gas, Government of India. https://www.ppac.gov.in
10. Petroleum Planning and Analysis Cell. (2025h). *Monthly report on indigenous crude oil production, crude oil import and processing, and petroleum product production and trade (October 2025)*. Ministry of Petroleum and Natural Gas, Government of India. https://www.ppac.gov.in
11. Petroleum Planning and Analysis Cell. (2025i). *Special focus: Natural gas market developments and LNG trends in India*. Ministry of Petroleum and Natural Gas, Government of India. https://www.ppac.gov.in
12. World Bank. (2024). *Commodity markets outlook: Energy markets and global price volatility*. World Bank. https://www.worldbank.org/en/research/commodity-markets