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Strategic Advisory Report

Industrial Impact of Natural Gas Supply Cut

Focus: Petrochemicals

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India’s Import Landscape

HS271111 corresponds to Liquefied Natural Gas (LNG) under the broader category of petroleum gases and other gaseous hydrocarbons. LNG is a critical energy input for several sectors in India, including fertilizers, petrochemicals, chemicals, ceramics, glass, textiles, and steel (particularly Direct Reduced Iron units). As domestic natural gas production remains insufficient to meet demand, India relies heavily on imports to ensure energy security and industrial continuity.

Over the past five years, India’s imports of HS271111 have shown significant fluctuations, reflecting global energy market volatility, demand recovery after the pandemic, and geopolitical developments affecting LNG supply chains.

Table: India’s import value of HS271111 (in US\$ billions)

India’s Top Importers 2024	2020	2021	2022	2023	2024
Qatar	3.34	4.76	8.54	6.53	6.50 (43%)
United States of America	0.83	2.07	1.75	1.43	2.57 (17%)
United Arab Emirates	0.79	1.50	2.85	2.23	1.74 (11%)
Angola	0.60	0.63	0.56	0.45	1.07 (7%)
Oman	0.38	0.74	1.03	0.45	0.81 (5%)
Nigeria	0.90	0.85	1.00	0.42	0.81 (5%)
India’s Total Imports of HS2711	7.91	12.08	17.77	13.26	15.21

Source: International Trade Centre

India’s LNG import basket is moderately concentrated, with Qatar accounting for around 43% of imports in 2024, making it the dominant supplier. Other important suppliers include the United States, United Arab Emirates, Angola, Oman, and Nigeria.

Two structural patterns emerge from the data:

- Strong Dependence on Middle Eastern Suppliers: A substantial share of LNG imports originates from the Middle East (Qatar, UAE, and Oman). This increases exposure to geopolitical tensions in the region.
- Growing Diversification: Imports from the United States and African suppliers such as Angola and Nigeria have increased, reflecting efforts to diversify sourcing and reduce regional concentration risk.

Despite diversification efforts, the Middle East remains a crucial node in India’s LNG supply chain due to geographic proximity, established long-term contracts, and competitive pricing.

Given the scale of LNG imports and the concentration of suppliers in the Middle East, a prolonged regional conflict could have several consequences for India:

- Short-term price increases due to market uncertainty and higher freight costs
- Supply disruptions or shipment delays, particularly from Qatar and other Gulf suppliers
- Greater reliance on alternative suppliers, such as the United States and African exporters
- Increased volatility in domestic gas availability, affecting energy-intensive industries

Impact Assessment

The petrochemical industry relies on natural gas and its derivatives both as a feedstock and as a process fuel. Liquefied Natural Gas (LNG) imports play an important role in supplementing domestic gas availability, particularly in gas-deficit economies. Any disruption in LNG supply, such as those arising from geopolitical tensions, supply chain interruptions, or export restrictions, can therefore have direct operational and economic implications for petrochemical production.

Why will disruption occur?

- LNG serves as a major source of ethane, propane, and butane, which are critical feedstocks for steam cracking units used to produce basic petrochemicals such as ethylene and propylene.
- Natural gas is widely used as an energy source for high-temperature furnaces and reactors in petrochemical manufacturing. Steam crackers, reformers, and other process units require consistent heat supply, and any interruption in gas supply can directly affect plant operations.

Where technical bottlenecks appear

- Steam cracking units that depend on ethane or propane may face shortages of these feedstocks, leading to reduced throughput or temporary shutdowns. While some facilities have the flexibility to switch to alternative feedstocks such as naphtha, this transition is not always immediate and may reduce operational efficiency.
- Many petrochemical complexes produce hydrogen through steam methane reforming (SMR), which uses natural gas as the primary input. Reduced gas supply can constrain hydrogen availability, affecting downstream processes such as hydrocracking, hydrotreating, and aromatics production.

Expected disruption intensity

- Production levels could decline due to reduced gas allocation or higher feedstock costs. Facilities that rely heavily on ethane or propane extracted from LNG streams are particularly vulnerable.
- In cases where plants can switch to alternative feedstocks such as naphtha or LPG, production may continue but at higher operating costs and lower efficiency. This can reduce profit margins and increase the price of downstream petrochemical products.

Analytical Approach

The analysis evaluates four gas supply disruption scenarios — 10%, 20%, 30%, and 40% reductions in natural gas supply. The petrochemical sector is assumed to have 20% gas dependency, reflecting the partial role of natural gas in energy consumption and feedstock requirements across petrochemical production processes.

Production impact is estimated by applying the proportional relationship between gas dependency and supply disruption. The resulting production loss percentage is then applied to the sector's revenue baseline to estimate the potential economic impact.

The petrochemical sector's estimated average revenue is ₹11,22,40,50,55,666.67, which serves as the reference value for calculating revenue losses across scenarios.

Scenario Analysis

Under a 10% gas supply disruption, the petrochemical sector would experience an estimated 2% production impact, resulting in revenue losses of approximately ₹224.48 crore. At this level, most petrochemical plants may continue operations with minor adjustments to fuel sources or operational efficiencies.

If gas supply declines by 20%, production impact rises to 4%, leading to estimated revenue losses of ₹448.96 crore. While production processes may still continue, operational costs could increase as firms shift to alternative energy sources.

In the case of a 30% supply disruption, production impact increases to 6%, translating into estimated losses of approximately ₹673.44 crore. At this stage, supply disruptions may begin affecting downstream chemical and plastic manufacturing industries.

Under a 40% gas supply disruption, production impact could reach 8%, resulting in estimated revenue losses of approximately ₹897.92 crore. Although the sector’s gas dependency is moderate, the large economic size of the petrochemical industry results in significant financial exposure under severe disruption scenarios.

Scenario	Gas Supply Cut	Gas Dependency	Production Impact	Revenue (₹)	Estimated Revenue Loss (₹)
Scenario 1	10%	20%	2%	112,240.50 crores	224.48 crores
Scenario 2	20%	20%	4%		448.96 crores
Scenario 3	30%	20%	6%		673.44 crores
Scenario 4	40%	20%	8%		897.92 crores

Strategic Implications

The analysis indicates that while the petrochemical sector has lower direct dependency on natural gas compared to other heavy industries, its large economic scale amplifies the financial impact of supply disruptions. Gas supply volatility can also affect feedstock availability, operational costs, and downstream chemical supply chains.

Disruptions in petrochemical production may have cascading effects on multiple manufacturing industries, including plastics, packaging, automotive components, synthetic fibres, and consumer products.

Conclusions

A structured impact assessment reveals the following insights:

- Petrochemicals, with comparatively lower gas dependency (20%), experience more modest production losses. However, due to the sector’s large economic scale, even small disruptions translate into significant absolute losses — ranging from ₹224 crore to ₹898 crore across the same scenarios.

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Following our sectoral engagements, we invite industry leaders to connect with MFS for a customised impact assessment report tailored to their specific operations. Our assessment provides clear, actionable intelligence to support urgent decision-making during the ongoing gas supply constraints. Your customised report will answer:

- **What proportion of your production is at risk?** Quantified impact based on your plant configuration, dependency levels, and process sensitivity.
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