

**FIPI**



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Industry**

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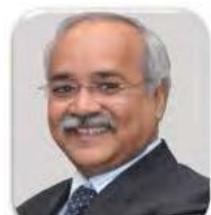
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# CONTENTS

<b>A Strategic Review on Gas Monetisation in India's Energy Transition: Case Studies from Indian Western to Eastern Fields</b>	<b>7 - 13</b>
<b>Reducing Natural Gas Flaring in India: Pathways, Policies, and Technology</b>	<b>14 - 18</b>
<b>Establishing a Gas Turbine Overhaul and Maintenance Centre in India Strategic Step Towards Sustainable Self-reliance and Operational Excellence</b>	<b>19 - 23</b>
<b>Making Gas Bankable Through Insurance: Pilot framework for India's 15% Gas Target</b>	<b>24 - 28</b>
<b>Navigating Recent Income Tax Rulings: Trends and Takeaways</b>	<b>29 - 32</b>

*In  
This  
Issue*

**DG's Page**

**Natural Gas**

**Finance**

**Events**

**New Appointments**

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From the Desk of the

## Director General

*Greetings from Federation of Indian Petroleum Industry (FIPI)!*

As the fiscal year 2025 closes, India stands out with significant strength, primarily driven by its position as the world's fastest-growing major economy and a rising force in global affairs. The key highlights include robust GDP growth, record exports, and advancements in technology and defense.

The energy sector is a critical component of India's growth story, with significant progress in clean energy and power capacity. The projections from BP's Energy Outlook suggest that India will account for about 12% of global primary energy demand by 2050, making it a crucial driver of global energy trends. This growth involves not only increased demand for oil and natural gas, but also for renewables which are rapidly expanding. Further, IEA projects that the oil demand is expected to grow from 5.5 mb/d in 2024 to 8 mb/d in 2035 as a result of rapid growth in car ownership, increasing demand for chemicals and aviation and a rise in the use of LPG for cooking.

India has significantly boosted oil and gas exploration efforts by opening 99% of its hitherto "No go" zone in offshore areas, streamlining regulations, offering new exploration blocks, and promoting domestic production to meet growing demand.

The government plans a major push in the downstream oil sector as well by expanding refining capacity to about 310 MMTPA by 2030 and increasing petrochemical integration. It is also aggressively promoting biofuels and green hydrogen to meet climate goals and reduce emissions in transport and heavy industries. As part of a strategy for energy security, the country has also diversified crude imports from over 40 countries.

In addition, driven by the motive of "One Nation, One Gas Grid" and with the aim to increase the availability of natural gas across the country, the government approved over 34,000 km of pipelines, of which about 25,000 km is operational as of mid-2025, thus augmenting the integrated gas network. The expansion of gas pipeline networks offers

enhanced access to clean, reliable, and affordable energy, improving household convenience, and reducing dependence on traditional fuels across rural areas.

In the renewables segment, it is overwhelming to see that Muft Bijli Yojana (under PM Surya Ghar) is progressing towards its goal of installing rooftop solar on one crore households by FY 2026-27, with over 25 lakh households (one-fourth of the target) benefiting as of late December 2025. The scheme is a demand-driven initiative offering subsidies and low-interest loans to grid-connected consumers across India.

As a result of strong policy support and other initiatives like the PM-KUSUM, and the development of large solar parks and wind corridors, India achieved historic milestone in power sector with country's total installed electricity capacity surpassing 500 GW as well as renewable generation exceeding 50% of demand. This is a significant step towards energy transition and commitment to clean, secure, and self-reliant energy future.

In storing surplus green power, Pumped Storage Projects (PSPs) that can help meet electricity demand during non-solar hours are coming up in a big way. As of now, a nationwide PSP potential of approximately 224 GW has been identified. Of this, 10 PSPs with a total capacity of around 7 GW have been commissioned, and 56 PSPs with a capacity of about 78 GW are at various stages of development. Further, the government's provision of budgetary support for enabling infrastructure and the notification of Renewable Consumption Obligations (RCOs) for Energy Storage Systems (ESS) are set to boost India's clean energy transition by improving viability and encouraging investment in the energy storage sector.

### FIPI: Quarterly activities (October-December 2025)

FIPI in association with Marine Solutionz and MSZ Offshore, organized the 7th Annual Technical

Seminar on Offshore Energy Logistics - Terminals, Transfers & Beyond on October 8-9, 2025, in New Delhi. The seminar emerged as a pivotal platform that united industry leaders, government representatives, and technology innovators to deliberate on the evolving dynamics of offshore energy logistics. It served as a distinguished forum for National and International marine logistics companies, OMCs, E&P operators, EPC contractors, shipyards, regulators, and technology providers to exchange insights and explore collaborative frameworks aimed at strengthening India's offshore energy ecosystem.

The Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC) 2025 was inaugurated on 3<sup>rd</sup> November 2025 in Abu Dhabi. The four-day event (3 - 6 November 2025) is the world's largest energy gathering, focusing on strategies for resilience, intelligence, and decarbonization across the value chain. The India Pavilion, coordinated by FIPI under the guidance of MoP&NG, showcased India's energy leadership, innovation, and collaboration on the global stage on the theme "Re-imagining Energy. Diverse Solutions. One Purpose." Leading Indian oil and gas companies, including ONGC, IOCL, BPCL, HPCL, OIL, GAIL, EIL, Nayara Energy and Petronet LNG Ltd showcased their technological capabilities and facilities in the India Pavilion.

FIPI in association with ICF as knowledge partner, organised a webinar on "National Policy on Geothermal Energy" on 19<sup>th</sup> November 2025. The webinar was conducted to provide an overview of India's Geothermal Policy, its implications for the energy landscape, and how global geothermal trends intersect with India's ambitions. The webinar also examined the potential impact on the Oil & Gas industry and explored strategic considerations for future energy integration.

FIPI in association with KPMG as knowledge partner, organised a webinar on "New Indian Labour Codes" on 12 December 2025. The webinar was conducted to decode the new Labour Codes and its key provisions and their implications, highlight open issues and clarifications, and outline immediate actions and next steps. The webinar was very well attended and was immensely appreciated for its content and clarity.

FIPI in association with EY organised a webinar on "Building Cyber Resilience in India Oil and Gas Sector: Defending against Modern threats & Strengthening Organisational Trust" on 23<sup>rd</sup> December 2025. The webinar was conducted to shed a light on cyber resilience in view of Indian regulations and industry best practices, and showcase practical steps to minimize operational disruptions arising out of cyber-attacks, thus providing collaborative approaches to cyber risk management. The webinar was appreciated by one and all and was very well attended working across the oil and gas value chain.

The 4th edition of India Energy Week (IEW) will take place from 27<sup>th</sup> – 30<sup>th</sup> January 2026 in Goa, under the patronage of MoP&NG, being organised by FIPI. The preparations are underway for organising this flagship energy event of the country. IEW serves as a platform to accelerate India's goals for a secure, sustainable, and affordable energy future, bridging policy with practice. It attracts policymakers, industry pioneers, and investors from around the world to foster international cooperation and creates opportunities for business growth, partnerships, and investment in India's rapidly expanding energy sector.

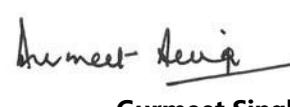
### Ongoing FIPI Studies

FIPI is coordinating a study by BCG for developing the Global Biofuels Alliance (GBA) under India's G20 presidency. The study aims to socialise biofuels, expand GBA's membership base, establishing its governance framework, and position it as a leading advocate for biofuels across major global platforms such as COP, IEW, and New York Climate Week etc. During the quarter, the engagement was focused towards establishing presence at COP30 where GBA launched a publication on Sustainable Aviation Fuel, Green fuel for blue skies and its Global Biofuel Champions Fellowship. GBA also hosted a ministerial discussion with the COP30 presidency and an official side event with the Clean Energy Ministerial along with hosting 10+ discussions at its pavilion in the green zone. The team also hosted Avinya, the startup competition which attracted over 160 applications in its third edition. Three rounds of evaluations were held including stakeholders from BCG, FIPI and designated jury to identify the top 5 winners of the session.

### Conclusion

At the advent of the new year, despite persistent global uncertainties, the outlook for India's economy remains remarkably robust. Prudent macroeconomic policies, recent tax reforms, and a focus on infrastructure development are expected to provide additional support to the economy, encouraging innovation and investment. The Indian oil and gas industry is also well prepared to service the fuelling needs of this ever-expanding economy. Oil and gas companies in India are poised for significant opportunities in the new year ahead. As we welcome the new year, I assure you that FIPI will lead the advocacy of industry issues, collaborating closely with all stakeholders, including the Government, to shape the growth narrative of India's oil and gas industry.

I wish you all the best and a very happy new year 2026!



Gurmeet Singh

## A Strategic Review on Gas Monetisation in India's Energy Transition: Case Studies from Indian Western to Eastern Fields



**Rajib Roy**

**Oil and Natural Gas Corporation Limited**

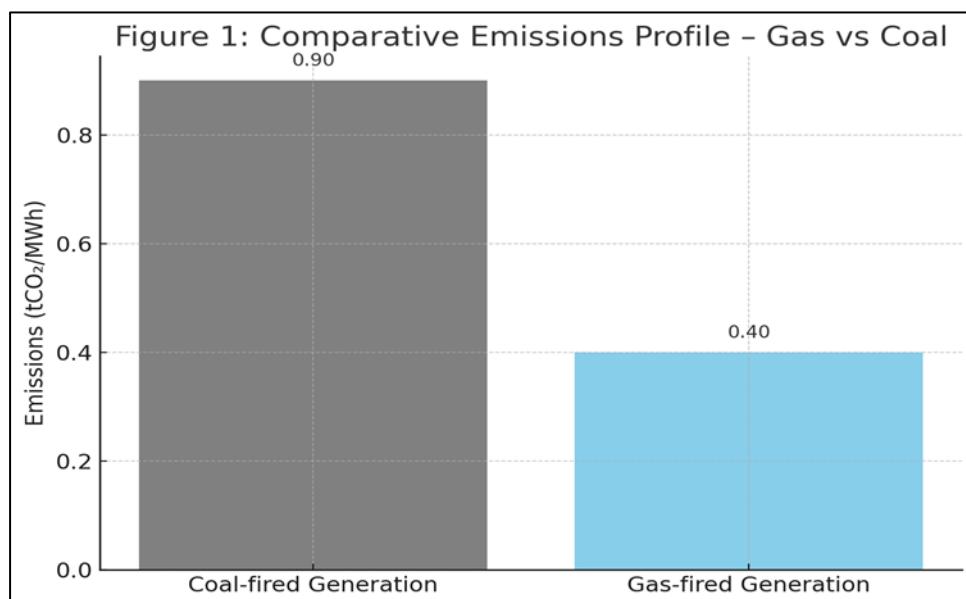
### Abstract

India's ongoing energy transition demands a careful balancing of renewable expansion with reliable and flexible fossil-based supply. Natural gas, as a transition fuel, has a vital role to play in supporting decarbonisation, enhancing energy security and enabling economic competitiveness. This paper analyses the commencement of production from ONGC's Chinnewala Tibba gas field in Rajasthan under the Discovered Small Fields (DSF) framework. The study employs a technical and economic evaluation, including production forecasts, gas pricing sensitivity, revenue modelling, and a comparative assessment of payback and net present value. Results suggest that while the project is modest in scale (~100,000 scm/d), its efficient execution under DSF-II demonstrates the economic viability of marginal gas fields and their contribution to India's energy transition. A comprehensive commercial analysis highlights expected revenues of ₹65 - ₹108 crore annually depending on gas pricing scenarios, with a payback period estimated at less than 2.5 years. Strategic implications extend beyond the field, demonstrating how similar marginal fields can complement India's natural gas expansion and support future integration with hydrogen blending and carbon abatement technologies.

### Introduction

India's long-term climate commitments, including net-zero by 2070, necessitate a fundamental transformation of the national energy basket. While renewables are expected to dominate capacity expansion, the intermittency of solar and wind highlights the continued need for a flexible and cleaner fossil fuel option. Natural gas, currently at 6–7% of the energy mix, remains well below the global average of 24% and far from India's stated ambition of 15% by 2030.

**Figure 1: Comparative Emissions Profile – Gas vs Coal**

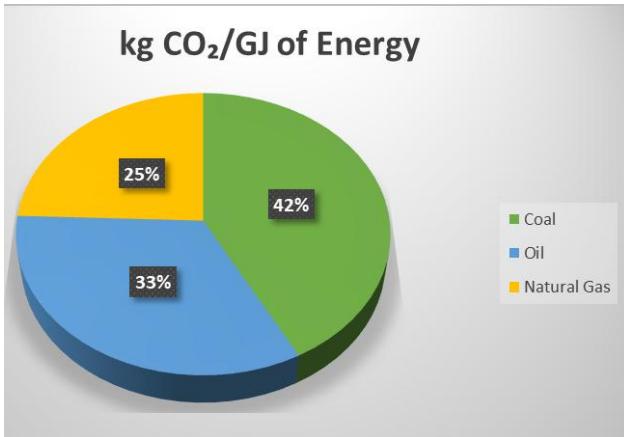


*(Bar chart showing emissions reduction in MtCO<sub>2</sub>e by replacing coal with gas-based generation)*

## Why Natural Gas is Bridge Fuel

The following data on carbon dioxide emissions per unit of energy for different fossil fuels:

- Coal: Approximately 95 kg CO<sub>2</sub>/GJ
- Oil: Approximately 75 kg CO<sub>2</sub>/GJ
- Natural Gas: Approximately 55 kg CO<sub>2</sub>/GJ



The figure shows that natural gas emits significantly less CO<sub>2</sub> compared to coal and oil, positioning it as a "bridge fuel" in the transition towards a lower-carbon energy system.

The Government of India's Discovered Small Fields (DSF) policy, initiated in 2015, created a pathway for monetisation of marginal reserves that were historically uneconomic under legacy terms. ONGC's commissioning of the **Chinnewala Tibba** gas field in Rajasthan in 2025 marks a notable milestone under this policy. The development is significant not only for its technical achievement in unlocking a stranded resource but also for its commercial and strategic contributions in reducing LNG import dependence and supplying regional power producers.

**Ashoknagar** represents ONGC's first gas discovery in West Bengal, initiated in 2017-18, heralding the state's emergence as a new energy destination. Located in the North 24 Parganas district, the discovery has been hailed as transformative for Eastern India's energy landscape. Unlike Chinnewala Tibba, which demonstrates small-field monetisation, Ashoknagar signifies a frontier opening with broader long-term implications for energy access, industrial growth and reduced dependence on coal in Bengal and Bihar. It also aligns with India's efforts to expand domestic gas availability and reduce LNG import dependence.

This paper investigates the technical parameters, economic outcomes and strategic value of Chinnewala Tibba & Ashoknagar monetisation. It also benchmarks the field's performance against comparable Indian and international marginal fields, providing a holistic perspective of its role in the broader energy transition.

## Methodology and Discussion

This study evaluates ONGC's Chinnewala Tibba development through the lenses of energy security, environmental performance and economic rationale. The analysis integrates reported production figures, prevailing natural gas prices under India's domestic pricing regime, and macroeconomic indicators to illustrate the broader implications of marginal field monetisation.

The methodology combines technical production estimation, commercial modelling and sensitivity analysis.

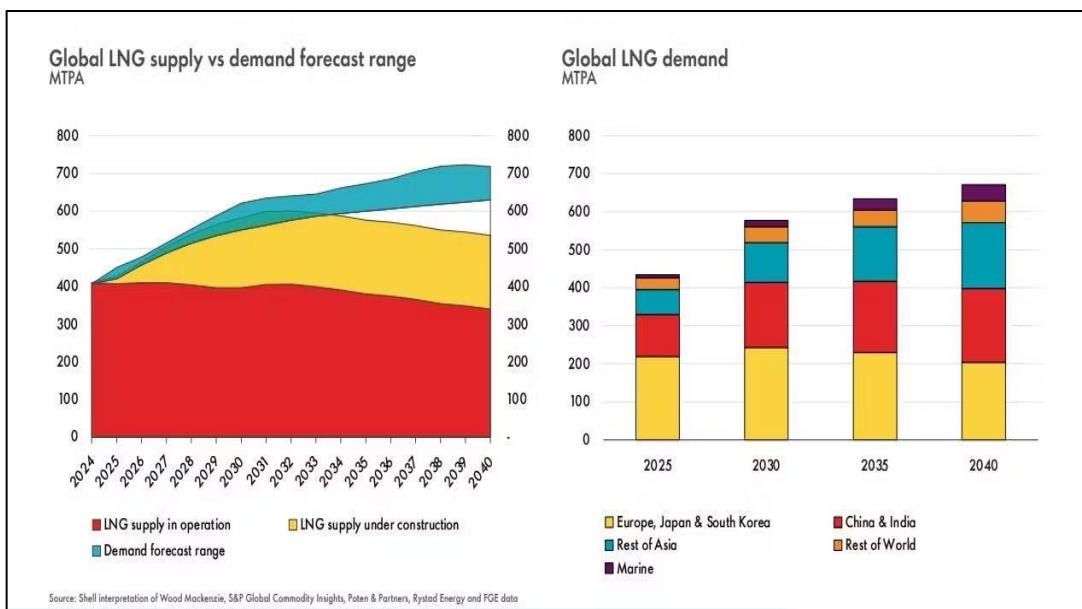
From an energy security perspective, monetising marginal gas assets directly enhances domestic production. The addition of roughly 70 million standard cubic metres (MMSCM) of gas annually strengthens local supply and partially offsets LNG imports. For a country where energy imports constitute more than 80% of crude oil requirements and nearly half of natural gas consumption, such incremental domestic production holds disproportionate strategic importance.

On the environmental front, gas development contributes to India's decarbonisation trajectory. Each unit of gas displaces higher-emission coal, enabling a reduction in the overall carbon intensity of the energy mix. Furthermore, gas-fired power plants provide essential flexibility for integrating renewable energy, supporting the grid during fluctuations in solar and wind generation.

## Economic Analysis

The economics of gas monetisation from small fields such as Chinnewala Tibba are shaped by three critical variables: capital expenditure (CAPEX), operating expenditure (OPEX), and realised gas prices under the Indian government's administered pricing mechanism. Small fields typically entail lower CAPEX due to limited surface infrastructure, yet they demand efficient reservoir management and cost optimisation to ensure commercial viability.

At current production levels of approximately 0.2 MMSCMD, annual output is estimated at 70 MMSCM. Under the domestic gas pricing formula effective in 2025, which pegs prices at roughly USD 6.5 per MMBtu for onshore fields, the gross annual revenue potential of Chinnewala Tibba is in the range of USD 16–18 million. Against a backdrop of moderate CAPEX and streamlined operations, the project demonstrates a positive cash flow outlook with a relatively short payback period.



Source: Shell interpretation of Wood Mackenzie, S&P Global Commodity Insights, Poten & Partners, Rystad Energy and FGE data

Beyond direct revenues, the project generates significant economic multipliers. Domestic gas production displaces LNG imports priced higher in the global spot market (often USD 10–12 per MMBtu), translating into foreign exchange savings for the economy. For India, where the LNG import bill exceeded USD 18 billion in 2023, even small-scale substitution delivers measurable macroeconomic benefits. Additionally, gas availability catalyses downstream industrial growth in sectors such as fertilisers, petrochemicals, and city gas distribution, creating broader economic spillovers.

From ONGC's perspective, gas monetisation under DSF enhances portfolio resilience. While large offshore projects often face long gestation periods and high financial risks, marginal onshore fields offer quicker monetisation, lower geological risk, and diversification benefits. They also strengthen ONGC's market credibility by demonstrating responsiveness to policy instruments designed to unlock stranded assets.

The methodology combines technical production estimation, commercial modelling and sensitivity analysis.

### Case Study 1: Chinnewala Tibba, Rajasthan

The Chinnewala Tibba gas field commenced production in mid-2025 under DSF-II, with an output of ~100,000 scm/d. Gas is evacuated through the Gamnewala GCS and supplied to the Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (RRVUNL), replacing coal-fired generation. The development showcases ONGC's ability to monetize marginal fields efficiently by leveraging existing infrastructure and market-linked pricing freedom under the DSF regime

### Policy and Commercial Context

The DSF policy introduced simplified approvals, marketing and pricing freedom, and revenue-sharing models, distinguishing it from legacy Production Sharing Contracts (PSCs). Importantly, operators are permitted to sell gas at market-linked prices, which improves project economics.

Gas pricing in India is bifurcated:

- Administered Price Mechanism (APM) Gas: linked to a formula under the Kirit Parikh Committee recommendations, with floor and ceiling bands.
- Non-APM/DSF Gas: enjoys marketing freedom, often linked to spot LNG or hub-based indices such as Henry Hub or Asian LNG benchmarks.

This distinction is crucial for Chinnewala Tibba, as market-linked pricing allows operators to capture upside during high LNG price regimes while ensuring base viability under conservative assumptions.

### Production Forecast

The Chinnewala Tibba field commenced with an output of ~100,000 scm/d. Converting to energy equivalent (1 MMBtu = 28.26 scm):

Gas Output (MMBtu/day) = 100,000 / 28.26 ≈ 3,538 MMBtu/day

Assuming 330 onstream days per year, annual production is ~1.17 million MMBtu.

**Table 1 – Chinnewala Tibba Gas Production Economics**

Parameter	Value / Estimate	Notes
Daily Production	0.2 MMSCMD	≈70 MMSCM/year
Gas Price (Administered, 2025)	USD 6.5 / MMBtu	Onshore formula
Annual Revenue Potential	USD 16–18 million	Based on calorific value
LNG Import Price (Spot, 2025)	USD 10–12 / MMBtu	Imported replacement
Forex Savings (per year)	USD 8–10 million	vs LNG imports
Payback Period (Est.)	3–4 years	Low CAPEX field

### Revenue Modelling

Revenues were calculated under different price scenarios: \$6, \$7, \$8 and \$10/MMBtu, reflecting both conservative and optimistic market conditions. Conversion to INR used an exchange rate of ₹83.5/USD.

#### Economic Indicators

The economics of gas monetisation from small fields such as Chinnewala Tibba are shaped by three critical variables: capital expenditure (CAPEX), operating expenditure (OPEX), and realised gas prices under the Indian government's administered pricing mechanism. Small fields typically entail lower CAPEX due to limited surface infrastructure, yet they demand efficient reservoir management and cost optimisation to ensure commercial viability.

At current production levels of approximately 0.2 MMSCMD, annual output is estimated at 70 MMSCM. Under the domestic gas pricing formula effective in 2025, which pegs prices at roughly USD 6.5 per MMBtu for onshore fields, the gross annual revenue potential of Chinnewala Tibba is in the range of USD 16–18 million. Against a backdrop of moderate CAPEX and streamlined operations, the project demonstrates a positive cash flow outlook with a relatively short payback period.

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From ONGC's perspective, gas monetisation under DSF enhances portfolio resilience. While large offshore projects often face long gestation periods and high financial risks, marginal onshore fields offer quicker monetisation, lower geological risk, and diversification benefits. They also strengthen ONGC's market credibility by demonstrating responsiveness to policy instruments designed to unlock stranded assets.

The analysis estimates:

- Annual Revenues under multiple pricing scenarios.
- Operating Expenditure (OPEX) assumed at 20% of revenues.
- Capital Expenditure (CAPEX) approximated at ₹150 crore for field development, processing, and evacuation infrastructure.
- Payback Period and Net Present Value (NPV) assuming a 10% discount rate.

### Results and Analysis

#### Revenue and Profitability

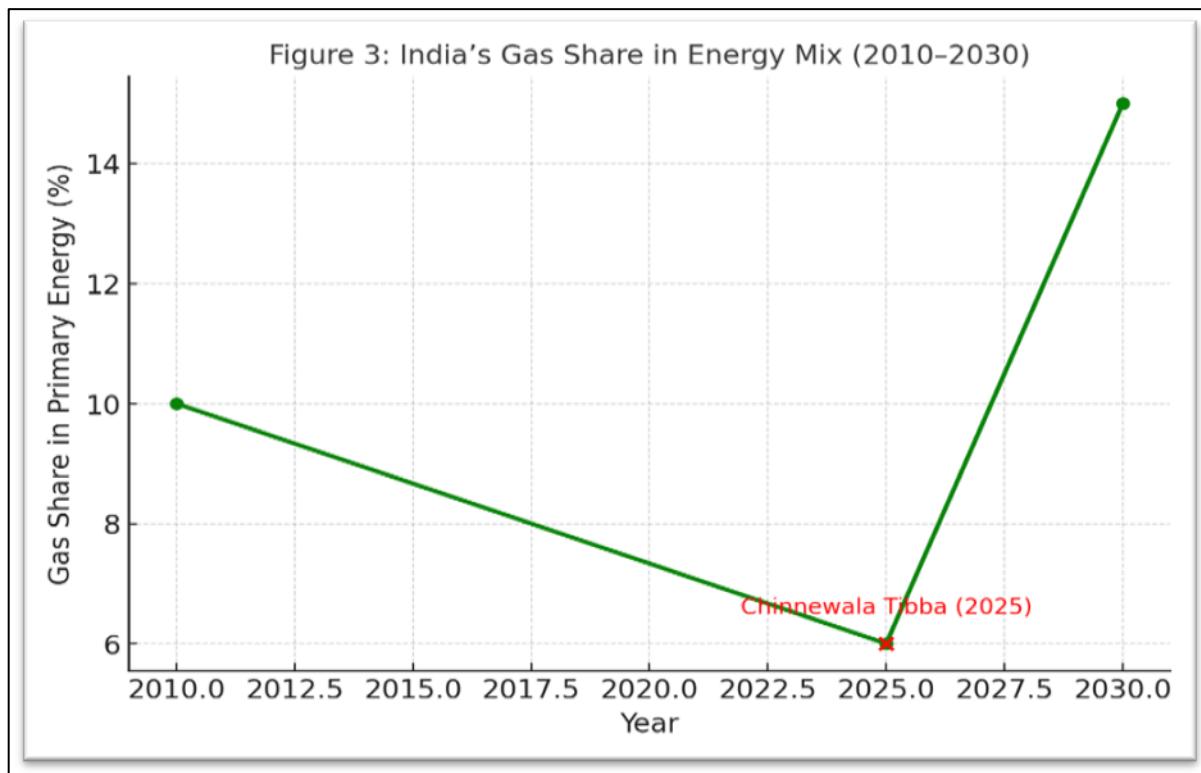
**Table 2: Revenue Scenarios**

Gas Price (US\$/MMBtu)	Daily Revenue (US\$)	Annual Revenue (₹ crore)	Net Cash Flow after OPEX (₹ crore)	Payback Period (yrs)	NPV@10% (₹ crore)
6	21,228	65	52	2.9	35
7	24,766	75	60	2.5	62
8	28,304	86	69	2.2	88
10	35,380	108	86	1.8	142

The Chinnewala Tibba development underscores the feasibility of monetising marginal gas assets under supportive policy frameworks. While the scale of production is small relative to India's total demand, the project exemplifies how a portfolio of similar marginal developments can cumulatively deliver significant results.

First, the project demonstrates that marginal fields can achieve commercial viability under the DSF regime, thereby validating government policy as an enabler of private and public sector investments. Second, it highlights the comparative cost advantage of domestic gas against imported LNG, reinforcing the economic case for accelerated monetisation. Third, it illustrates how gas production yields system-wide benefits through emissions reduction, industrial feedstock supply, and foreign exchange savings.

For ONGC, the Chinnewala Tibba field represents a strategically aligned investment; combining low-carbon benefits, financial viability and reputational positioning within the energy transition narrative. For India, it offers a replicable template that can be scaled across the DSF portfolio to deliver cumulative energy, environmental, and economic dividends.



### Case Study 2: Ashoknagar: India's Next Energy Destination

#### *Geological and Technical Significance*

Ashoknagar is ONGC's first onshore gas discovery in the Bengal Basin, representing a breakthrough after decades of exploration in this frontier region. The discovery proves the hydrocarbon potential of the basin and opens opportunities for further appraisal and development drilling.

#### **Production Potential**

Initial flows confirmed the presence of commercial gas, with potential for scale-up depending on appraisal outcomes. Unlike Chinnewala Tibba's marginal volumes, Ashoknagar's basin-opening nature suggests the potential for a multi-field cluster, supporting long-term regional supply.

#### **Commercial and Strategic Outlook**

Ashoknagar's proximity to Kolkata metropolitan area and eastern India's industrial corridor gives it a unique advantage. It can directly support:

- City Gas Distribution (CGD): expanding PNG/CNG access in West Bengal.
- Industrial Offtake: especially steel, cement, and fertilizer sectors transitioning away from coal.
- Power Generation: flexible gas capacity to complement renewable-rich states like Odisha and West Bengal.

## Economic Contribution

While detailed revenue figures will depend on full field development planning, early projections suggest Ashoknagar could anchor multi-hundred MMSCFD supply if appraisal drilling confirms basin-scale reserves. Even a modest 0.5–1 MMSCMD sustained flow would create annual revenues exceeding ₹400–800 crore at \$7–8/MMBtu, dwarfing smaller DSF projects like Chinnewala Tibba.

## Strategic and Environmental Impact

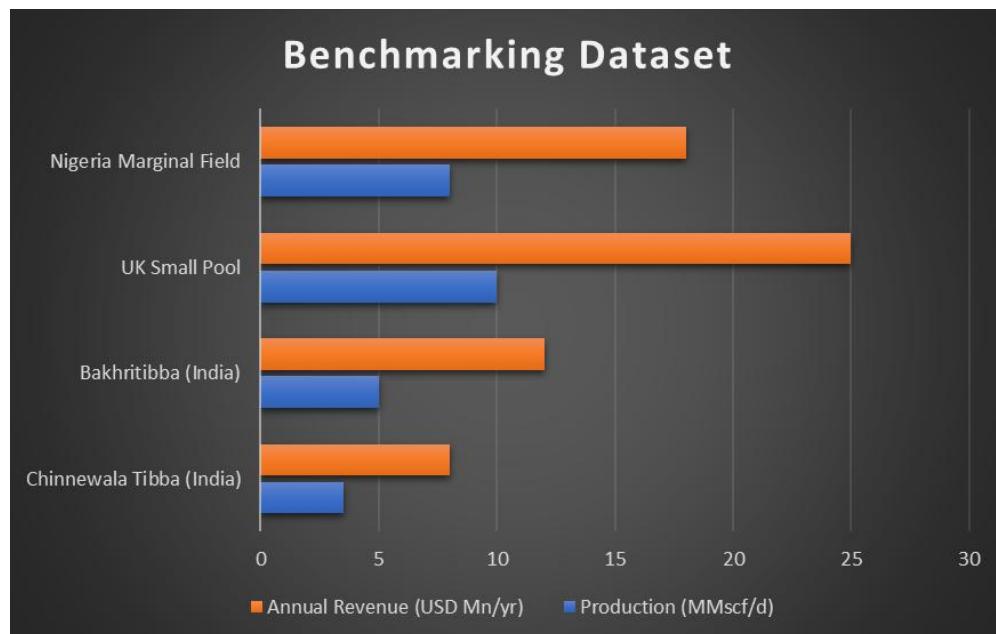
The gas is supplied to Rajasthan Rajya Vidyut Utpadan Nigam Limited (RRVUNL) for power generation, displacing coal-fired electricity. Annual gas supply equates to ~250–300 GWh of electricity. Assuming a coal displacement factor of 0.9 tCO<sub>2</sub>/MWh, the field potentially avoids ~0.15 MtCO<sub>2</sub>e annually.

Ashoknagar establishes West Bengal as a new energy frontier. Its role extends beyond local supply which provides:

- Diversification of India's gas geography away from western offshore dependency.
- Energy security for eastern states, reducing LNG reliance.
- Catalyst for new investments in gas infrastructure, including pipelines and CGD networks.

## Benchmarking

Comparative analysis places Chinnewala Tibba alongside Oil India's recently commissioned Bakhritibba gas field in Assam. Both projects illustrate the role of marginal fields in regional development and energy security. Internationally, the UK's North Sea "small pool" and Nigeria's marginal field program provide reference points where policy liberalisation enabled commercialisation of otherwise stranded assets.



## Discussion

From a technical standpoint, the project demonstrates company's ability to mobilise marginal reserves using existing infrastructure at Gamnewala GCS, lowering both CAPEX and execution risk. Economically, the project underscores the importance of pricing freedom: under APM, such marginal fields may not be viable, but DSF-linked market pricing ensures sustainability. Strategically, Chinnewala Tibba aligns with India's dual objectives of enhancing domestic supply and decarbonising its grid.

## Comparative Analysis: Rajasthan vs West Bengal

The comparative outcomes are summarized below:

**Table 3: Comparative analysis of Chinnewala Tibba and Ashoknagar gas developments**

Field	Region	Type	Strategic Role
Chinnewala Tibba	Rajasthan (Western India)	DSF marginal field	Provides gas to RRVUNL, displaces coal, modest revenues ₹65–108 cr/yr
Ashoknagar	West Bengal (Eastern India)	Frontier discovery	Potential new hub for Eastern gas supply, industrialization, reduced coal reliance

**A broader lesson** is that marginal fields, though modest individually, can collectively contribute significantly if aggregated under supportive policies. In the medium term, such gas flows may be blended with hydrogen (Hythane) for decarbonisation or linked with carbon capture and storage (CCS) projects to further reduce lifecycle emissions. Together, Chinnewala Tibba and Ashoknagar represent two ends of the monetisation spectrum: one small marginal field generating quick cash flows and one basin-opener with transformative potential.

Broader Economic Multiplier	
Category	Impact from Gas Monetization
Forex Savings	Reduced LNG imports (~USD 8–10m/year, Chinnewala Tibba)
Industry Support	Fertiliser, CGD, MSME industries
Employment	Direct + indirect jobs in Rajasthan & West Bengal
Emissions Reduction	50% lower CO <sub>2</sub> vs coal (per GJ)
Grid Flexibility	Gas turbines stabilise renewables

Their combined lessons are clear:

- Policy alignment matters: DSF and OALP terms have unlocked stranded and frontier resources.
- Economics are resilient: Chinnewala Tibba shows viability even under conservative prices; Ashoknagar holds significant upside potential.
- Strategic distribution: Monetisation in western and eastern India ensures balanced regional development.
- Future integration: Both fields can serve as anchors for hydrogen blending pilots and carbon capture initiatives.

## Conclusions

The Chinnewala Tibba field demonstrates the viability of monetising small gas reserves under India's DSF policy. Commercial analysis indicates annual revenues of ₹65–108 crore with payback periods below 3 years. Ashoknagar signals the emergence of India's next energy destination, with potential basin-scale development offering multi-fold economic impact and regional supply security.

From an economic perspective, the field demonstrates strong fundamentals: low breakeven costs, quick payback potential, and broader system-level benefits in terms of foreign exchange savings and industrial stimulus. Looking ahead, India's ability to replicate and scale such efforts will determine the extent to which natural gas can fulfil its transition role. The Chinnewala Tibba field demonstrates that even small-scale projects can carry disproportionate strategic weight in advancing national energy goals. For ONGC, it represents not just a production milestone but also a signal of commitment to global best practices in energy transition. For India, it reinforces the narrative that pragmatism, innovation, and policy support together can accelerate the journey towards a sustainable energy future.

## ONGC Portfolio Strategy



Together, these case studies illustrate how ONGC is leveraging both DSF and OALP policies to strengthen domestic production, reduce LNG import dependence and support decarbonisation.

Strategic contributions include displacement of coal in regional power generation, delivering ~0.15 MtCO<sub>2</sub>e annual emissions savings. Benchmarking indicates replicability across similar Indian marginal fields and alignment with global practices in the UK and Nigeria.

Future opportunities lie in integrating gas monetisation with hydrogen blending and CCS to further align with India's net-zero pathway. Future directions include linking these gas monetisation projects to CGD expansion, industrial decarbonisation and hydrogen economy pathways.

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## Reducing Natural Gas Flaring in India: Pathways, Policies, and Technology



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#### Introduction:

More than 160 years after the dawn of modern petroleum extraction, the sight of flames rising from flare stacks still defines oil and natural gas fields across the world. What began as a seemingly practical solution to dispose of unwanted gas has persisted into the present day, despite advances in technology and growing environmental awareness. In 2024, global gas flaring surged to 151 billion cubic meters, the highest level since 2007. The associated gas wastefully burned each year is equivalent to Africa's total annual gas consumption. 389 million tonnes of carbon dioxide equivalent (MMtCO<sub>2</sub>e) emissions, including 46 MMtCO<sub>2</sub>e in the form of unburnt methane, were released by flares in 2024. This practice is a major source of greenhouse gas emissions and a significant waste of a valuable energy resource.

Flaring occurs for a variety of technical, economic, and regulatory reasons.

- **Safety measures:** Flaring is sometimes a crucial safety procedure. Burning off excess gas releases pressure and prevents explosions and other dangerous accidents.
- **Associated gas:** Natural gas is often a byproduct of crude oil extraction. If a remote production site lacks pipelines or other infrastructure to transport the gas, it is simply burned off. For smaller or dispersed oil fields, it may be deemed uneconomical to make the necessary investments.
- **Market limitations:** Even if the infrastructure exists, there may not be a nearby market for the natural gas. Some countries with high flaring rates have underdeveloped or non-existent gas markets.

While natural gas flaring is a global issue, it is especially relevant in India, a nation facing the paradoxical challenge of wasting domestic gas while relying heavily on imported Liquefied Natural Gas (LNG).

Reducing and eliminating routine gas flaring offers substantial benefits for India's economy, environment, and energy security:

- **Economic value:** The waste from flaring represents a loss of potential revenue. Every cubic meter flared could otherwise be harnessed for fertilizer production, power generation, or city gas distribution, directly substituting costly imports.
- **Environmental improvement:** Capturing flared gas would reduce India's carbon footprint by minimizing the release of greenhouse gases like carbon dioxide and methane, which is a far more potent warming gas over the short term.
- **Enhanced energy security:** Curbing routine flaring could unlock significant savings in foreign exchange, enhance energy security, and create additional value streams for upstream operators.
- **Cleaner power and fuel:** The recovered gas could be utilized for cleaner power generation, thereby displacing electricity production from high-emission, coal-based thermal power plants. It can also be supplied to the rapidly expanding Compressed Natural Gas (CNG) network for vehicles, providing a cleaner alternative to gasoline and diesel.

This article explores India's flaring landscape, global best practices, and pathways to reduce flare losses through policy and technology interventions.

## Gas Flaring in India

India has set an ambitious goal to transform its energy landscape by increasing the share of natural gas in the national energy mix from approximately 6% today to 15% by 2030. While imported LNG currently meets over half of the country's gas demand, a significant portion of domestically produced natural gas continues to be lost through flaring each year.

According to the World Bank's Global Gas Flaring Tracker Report 2025, India flared approximately 1484 MMSCM (~4 MMSCMD or approximately 4% of domestic production) of natural gas in 2024, placing it among the top 20 gas-flaring nations globally. This represents a substantial volume, reflecting both offshore and onshore flaring activities, with major contributions from fields such as Bombay High, Nahorkatiya, Padmavati and Western Offshore-3

**Table 1 : Top 10 offshore fields with highest gas flaring statistics in 2024**

Field Name	Field Operator	Field Type	Flaring volume (MMSCM)
Bombay High	ONGC	OIL	290.28
Padmavati	ONGC	OIL	85.28
WO-3	ONGC	OIL	63.11
Vasai East	ONGC	OIL	43.5
Cluster 7	ONGC	OIL	42.31
D-1	ONGC	OIL	29.32
Panna & Mukta	ONGC	OIL	26.65
Heera	ONGC	OIL	19.13
B-193	ONGC	GAS	18.97
B-80	Hindustan Oil Expl	OIL	12.39

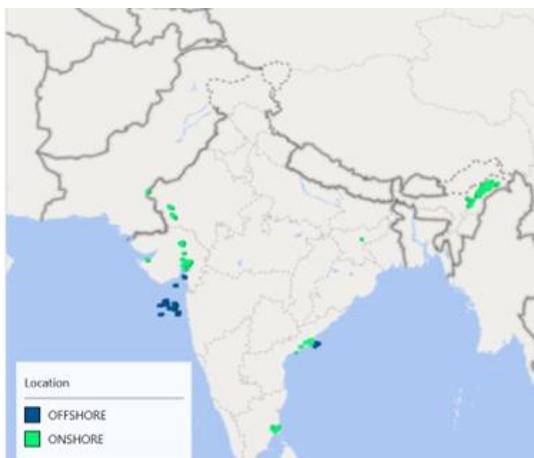
Source: Global gas flaring data, World bank group

**Table 2 : Top 5 onshore fields with highest gas flaring statistics in 2024**

Field Name	Field Operator	Field Type	Flaring volume (MMSCM)
Nahorkatiya	Oil India	OIL	93.98
Makum	Oil India	OIL	57.79
Nambar	ONGC	OIL	51.07
Geleki	ONGC	OIL	45.88
Baghjan	Oil India	OIL	42.8

Source: Global gas flaring data, World bank group

**Fig 1 : Location of gas flaring sites in India in 2024**



Despite improvements in gas utilization and recovery technologies, significant flaring persists, indicating both an economic loss and environmental challenge, especially given India's growing dependence on imported natural gas. Addressing flare-related waste is essential for achieving a sustainable and resilient gas infrastructure in India.

Source: Map prepared based on Global gas flaring data, World bank group)

## Global Initiatives

While there are no universally binding international laws that specifically regulate gas flaring, several organizations have established influential standards, initiatives, and best practices. These frameworks guide governments and oil and gas companies toward minimizing or eliminating flaring, improving environmental performance, and promoting energy efficiency.

- The World Bank's **Zero Routine Flaring by 2030 (ZRF)** initiative is a voluntary commitment within the oil and gas sector to end routine gas flaring in new and existing fields by 2030, encouraging investment in gas capture and utilization. Endorsers agree to report flaring data annually, which the World Bank monitors using satellite data.
- The **Global Methane Pledge (GMP)**, a broader initiative, involves over 150 countries aiming for a collective 30% reduction in global anthropogenic methane emissions by 2030 from 2020 levels. Flaring reduction is considered a key strategy within the fossil fuel sector to help meet GMP commitments.
- Several countries provide instructive examples of successful flaring reduction policies.
- **Norway**, a pioneer in this area, banned non-emergency flaring in 1971 and introduced a carbon tax on flaring and venting in 2015, achieving consistently low emissions levels.
- **Colombia** and several **U.S. states**, including Colorado and New Mexico, have prohibited routine flaring and implemented strict monitoring and enforcement measures, demonstrating the impact of strong regulatory frameworks.
- **European Union's Methane Regulation** mandates monitoring, reporting, and verification (MMRV) of methane emissions across the energy sector and, from 2030, will enforce methane intensity limits on imports, creating incentives for exporting countries to reduce flaring.

## Monitoring Gas Flaring: Indian Context

Unlike Norway or some U.S. states, India does not currently impose a national quantitative limit on annual flared gas volumes. Monitoring relies largely on reporting and satellite observations, and reduction targets are often voluntary or guided by policy incentives.

- **Contractual Reporting Obligations**

Under Production Sharing Contracts (PSCs) and Revenue Sharing Contracts (RSCs), operators must report exploration, production, and gas management activities, including flaring incidents, to the Directorate General of Hydrocarbons (DGH).

- **Policy Incentives under HELP**

The Hydrocarbon Exploration and Licensing Policy (HELP) supports efficient gas utilization by offering pricing and marketing freedom, making gas capture more commercially viable compared to flaring.

- **Satellite and Remote Monitoring**

Regulators and companies increasingly rely on satellite-based data and remote sensing, often in collaboration with the World Bank's Global Flaring and Methane Reduction (GFMR) initiative, to track flare volumes in real time and improve reporting accuracy.

- **Environmental Impact Assessments (EIAs)**

The Environment (Protection) Act, 1986 requires EIAs for oil and gas projects, mandating operators to outline how associated gas will be managed and flaring minimized.

- **Penalties for Non-Compliance**

Regulatory amendments, such as the Oilfields (Regulation and Development) Amendment Bill, 2024, have raised penalties for flaring violations, strengthening enforcement and promoting conservation.

For India to match global leaders, the next step is institutionalizing targets industry-wide and embedding them in production-sharing contracts, pipeline planning, and field development models.

Global Practice	Key Measure	Potential Lesson for India
<b>Norway</b>	Ban on non-emergency flaring; carbon tax on flaring/venting	Introduce stricter limits on routine flaring and explore economic incentives (e.g., tax or penalty) to discourage waste
<b>U.S. (Colorado, New Mexico)</b>	Prohibition of routine flaring; real-time monitoring; strict reporting and enforcement	Implement real-time monitoring of flares using sensors or satellite data, coupled with binding reporting requirements and penalties for non-compliance
<b>Colombia</b>	Mandatory flare reduction plans for operators	Require all upstream operators in India to submit flare reduction and gas utilization plans with clear timelines
<b>EU Methane Regulation</b>	Mandatory monitoring, reporting, verification (MMRV) and methane intensity limits on imports	Adopt standardized MMRV frameworks for domestic fields and set national flaring intensity targets, potentially linked to incentives for domestic use
<b>Satellite Monitoring (World Bank GGFR, NASA VIIRS)</b>	Independent flare verification	Encourage use of satellite data for independent verification of flare volumes, supplementing operator reporting

## Technological & Operational Solutions

Reducing flare loss is not just about regulation, it also requires practical, field-level solutions. Fortunately, a growing suite of technologies is now available to recover, utilize, or manage associated gas more efficiently.

### Offshore technologies:

- Flare Gas Recovery (FGRS/FGRU):** Use liquid-ring compressors or recovery units to capture low-pressure flare gas and recycle it into fuel, lift, or export systems.
- Gas Re却jection:** Re却ject associated gas into reservoirs for pressure maintenance or enhanced oil recovery (EOR) when export is limited.
- Platform Electrification / Gas-to-Power:** Use recovered gas to power onboard generators or microturbines, reducing diesel use and routine flaring.
- Small-Scale LNG / CNG:** Deploy modular LNG or CNG systems with shuttle tankers for remote sites lacking pipelines.

### Onshore technologies

- Centralized Gathering & Compression:** Build gas gathering networks and pipelines to transport gas to processing or grid facilities.
- Flare Gas Recovery & Vapor Recovery Units:** Install FGRUs/VRUs and mobile compressors at wellsites and plants to capture and reuse gas.
- Mobile / Modular Solutions:** Use skid-mounted micro-LNG or CNG trailers (“virtual pipelines”) for stranded or small fields, enabling fast, low-CAPEX deployment.
- Gas-to-Wire & Industrial Use:** Convert captured gas into electricity for operations, or use as feedstock for fertilizers, GTL, or local distribution.

While these technologies are adopted globally, for example in Nigeria (gas re却jection programs in offshore fields), Norway (platform electrification and zero routine flaring policies), Qatar (flare gas recovery units on LNG and offshore platforms), and the United States (onshore VRUs and CNG trailer solutions in shale plays) - India’s adoption of these technologies has been slow but is increasing.

Wider deployment, supported by financial incentives and policy mandates, could help operators recover significant value while meeting environmental standards.

By adopting a multi-pronged approach—combining regulation, incentives, and transparency—India can significantly reduce flaring while unlocking economic and environmental gains.

## Policy Recommendations for India

India has both the **technical capacity** and **economic rationale** to minimize flare losses. What is urgently required is a **structured policy framework** that aligns operators, regulators, and markets toward a common goal.

### 1. Set a National Flare Reduction Target

- Establish a nationwide zero routine flaring target by 2030, endorsed by the government vision and policy as a whole.
- Complement individual company pledges with a unified national mandate for accountability.

### 2. Mandatory Reporting and Transparency

- Standardize field-wise flare reporting across all operators, with disclosure on public platforms.
- Incorporate **satellite-based validation** to ensure accuracy, credibility, and public transparency.

### 3. Embed Flare Reduction in Production

#### Sharing Contracts

- Make flare minimization an explicit condition in future Production Sharing Contracts (PSCs) and Environmental Clearances (ECs).
- Impose penalties or deterrents for avoidable flaring while allowing flexibility for genuine safety-related events.

### 4. Incentives for Flare Gas Recovery Projects

- Offer accelerated depreciation, tax benefits, or carbon credit eligibility for investments in Flare Gas Recovery Units (FGRUs), micro-LNG, or gas-to-power solutions.
- Recognize flare reduction projects as eligible under carbon markets and ESG frameworks.

### 5. Support for Small and Remote Fields

- Launch a dedicated scheme—modeled on the SATAT Bio-CNG program—to promote mobile and modular flare recovery solutions.
- Facilitate aggregation models where small operators pool volumes for shared infrastructure.

### 6. Alignment with Climate Goals

- Integrate flaring reduction commitments into India's **Nationally Determined Contributions (NDCs)** and methane action plans.
- Position flare minimization as both a **climate action** and an **energy security** measure.

## Conclusion

A comprehensive framework with clear targets, transparency, contractual enforcement, incentives, and climate alignment will enable India to accelerate flare reduction, improve gas utilization, and enhance its position as a responsible energy producer. A coordinated strategy involving **policy, technology, and infrastructure** can transform flared gas into a usable energy resource while advancing India's climate goals. The pressing requirements can be summarized as follows:

### Regulatory mechanisms

- **Strengthen policy mandates** aligned with the World Bank's *Zero Routine Flaring by 2030* initiative.
- **Incentivize investments** in flare gas recovery, micro-LNG, and CNG solutions through tax benefits and faster approvals.
- **Enable transparent monitoring** via satellite-based flare detection and mandatory reporting.

### Incentives for Gas Producers (ONGC, OIL, private operators)

- **Adopt global best practices** such as reinjection, VRUs, and modular LNG/CNG for stranded gas fields.
- **Integrate gas-handling facilities** in new project designs, avoiding costly retrofits later.
- **Collaborate with technology providers** for pilots in offshore and remote onshore locations.

### Incentives to Pipeline Operators to

- **Expand gathering infrastructure** to connect smaller or stranded fields to trunk pipelines.
- **Offer system-use gas purchase mechanisms** to monetize small flare streams.
- **Promote shared facilities** (compression hubs, tie-ins) to reduce duplication of infrastructure.

### Incentives for Power & Industrial Sector to

- **Absorb captured associated gas** through gas-to-wire projects, replacing diesel gensets in remote regions.
- **Facilitate local offtake** by fertilizer, petrochemical, and small industries to utilize flare gas as feedstock.
- **Encourage distributed power models** where flare gas is used for captive generation.

### Establishing a Collaborative Approach

- Establish **joint industry-government taskforces** to align regulatory support, infrastructure planning, and technology adoption.
- Promote **public-private partnerships (PPPs)** to fund flare reduction projects with long-term offtake guarantees.

# Establishing a Gas Turbine Overhaul and Maintenance Centre in India

## Strategic Step Towards Sustainable Self-reliance and Operational Excellence



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### Abstract

India's natural gas infrastructure is expanding rapidly, driving increased reliance on gas turbines for compression, power generation, and process operations across the oil and gas sector. Currently, the overhaul and maintenance of these critical assets remain heavily dependent on Original Equipment Manufacturers (OEMs) and overseas facilities, leading to high costs, long turnaround times, and foreign exchange outflow.

The proposed Joint Venture (JV) is going to be the India's first state-of-the-art **Gas Turbine Overhaul and Maintenance Centre**. This initiative aligns with the national vision of Atmanirbhar Bharat and the PSU transformation agenda under Operational Excellence and Sustainable Asset Management. The paper examines the techno-commercial rationale, strategic policy alignment, and sustainability implications of the proposed JV while positioning it as a model for future PSU-global partnerships aimed at enhancing India's energy security and industrial resilience.

### 1. Introduction

Gas turbines are the workhorses of India's energy ecosystem. They power natural gas compressor stations, petrochemical plants, refineries, and power generation units across the country. As India continues to expand its natural gas grid and petrochemical capacity, the reliability and efficiency of gas turbines have become central to operational continuity.

The country's largest natural gas companies, operates a fleet of gas turbines that play a critical role in sustaining pipeline throughput and ensuring energy delivery to diverse industrial and domestic consumers. However, periodic overhauls and

maintenance of these turbines are currently outsourced to overseas OEM facilities, primarily in Europe, the Middle East, or North America.

This dependence results in extended downtime, high logistics costs, and significant foreign exchange expenditure. The lack of an indigenous, certified overhaul centre also limits opportunities for local capability building and technology absorption.

Recognising these challenges, a collaborative venture with an established global leader in the repair and overhaul of industrial gas turbines, the proposed JV represents a strategic convergence of India's energy sector priorities—self-reliance, sustainability, and technological modernization.

### 2. Current Scenario and Problem Statement

#### 2.1 Dependence on OEM Facilities

Most of India's installed gas turbine base comprises units from international OEMs such as Rolls-Royce, Solar, Siemens, and GE. Overhauls for these machines are typically routed to OEM-approved facilities abroad. A single major overhaul can take 6–9 months including logistics, customs clearance, and offshore repair duration.

This dependency leads to three systemic issues:

- **High cost of service: OEM pricing is often premium-linked and non-negotiable.**
- **Extended equipment downtime: Each overhaul cycle causes significant production or transmission loss.**
- **Foreign exchange outflow: Millions of dollars are spent annually on overseas servicing.**

## 2.2 Infrastructure Gap in India

India lacks a certified, full-scope gas turbine overhaul centre capable of handling core engine disassembly, hot-section refurbishment, component balancing, and performance testing. Domestic repair facilities are limited to partial maintenance or auxiliary component repair. This gap constrains both PSUs and private operators in managing lifecycle costs effectively.

## 2.3 Strategic Vulnerability

The absence of indigenous overhaul capacity creates vulnerability during global disruptions—whether pandemic-related logistics bottlenecks or geopolitical restrictions. A domestic centre would enhance India's strategic autonomy and resilience in maintaining its energy infrastructure.

## 3. Concept of the Joint Venture

The proposed JV aims to create a world-class Gas Turbine Overhaul and Maintenance Centre within India, leveraging the complementary strengths.

### 3.1 Vision and Objectives

**Vision:** To establish a self-reliant, sustainable, and globally benchmarked facility for gas turbine overhaul and life-cycle support services in India.

#### Objectives:

- Build indigenous technical capability and infrastructure.
- Reduce overhaul turnaround time and cost.
- Foster technology transfer and skill development.
- Support PSUs and private operators with reliable, localized service solutions.

### 3.2 Technology Partnership

The gas turbine overhaul services bring over three decades of proven expertise in industrial gas turbine repair and refurbishment, supporting multiple OEM fleets globally. Through this JV, will provide:

- Technical know-how and process transfer.
- Training for Indian engineers and technicians.
- Certification of overhaul procedures to international standards.
- Access to advanced diagnostic and performance testing systems.

### 3.3 Operational Model

The center will be designed as a hub-and-spoke model, with the main overhaul facility supported by

satellite service nodes near major gas compressor and power generation clusters. It will offer:

- Core engine overhauls.
- Hot-section refurbishment.
- Component balancing and alignment.
- On-site maintenance, borescope inspections, and predictive diagnostics.

## Techno-commercial Rationale

### 4.1 Economic Advantage

The primary commercial driver for this JV is cost optimization. Current overseas overhaul costs are elevated by transportation, insurance, and customs duties. A domestic facility could deliver:

- **30–40% cost savings** per overhaul compared to OEM overseas service.
- **50–60% reduction** in turnaround time (from ~8 months to ~3 months).
- **Foreign exchange conservation** of ₹200–300 crore annually across Indian PSUs and private operators.

### 4.2 Investment and Infrastructure

The JV will require an estimated **capital investment of ₹400–500 crore**, covering:

- Specialized workshops and test cells.
- Tooling and precision balancing equipment.
- Training and certification infrastructure.
- Digital diagnostic and data management systems.

The India Partner contribution would primarily include land, utilities, and operational management support, while the foreign partner would contribute proprietary technology, process design, and skill transfer.

### 4.3 Market Potential

India's combined installed base of industrial gas turbines exceeds **350 units**, with nearly 40% reaching mid-life overhaul stage within the next five years. This presents an addressable domestic market of over **₹2,000 crore per annum**. The JV can also cater to regional demand from South Asia, the Middle East, and Southeast Asia, positioning India as a regional overhaul hub.

### 4.4 Financial Viability

- A preliminary techno-economic analysis indicates:
- **Payback period:** 4–5 years.
- **Internal Rate of Return (IRR):** 15–18%.
- **Breakeven throughput:** ~15–20 engine overhauls per year.

Such figures highlight the project's sustainability both as a commercial venture and as a strategic investment in national capability.

## 5. Strategic policy alignment

The JV is fully aligned with India's evolving energy and industrial policy frameworks.

### 5.1 Atmanirbhar Bharat and Make in India

The JV directly supports the *Atmanirbhar Bharat* mission by substituting imports with indigenous capability, promoting local manufacturing of components, and building technical autonomy.

### 5.2 PSU Governance and Operational Excellence

As part of broader *Operational Excellence* program, the initiative exemplifies best practices in PSU governance—joint decision-making, transparent cost benchmarking, and sustainable asset management. It also contributes to the Government of India's *PSU Transformation Agenda* emphasizing innovation, partnership, and global competitiveness.

### 5.3 Energy Security and Infrastructure Resilience

By establishing local overhaul capability, the JV strengthens India's energy security posture. In the event of supply-chain disruptions or external shocks, critical assets can be maintained within national borders, ensuring uninterrupted gas transmission and power operations.

## Sustainability and Lifecycle Value

### 6.1 Circular Economy Principles

The JV embraces sustainability through the **repair-reuse-refurbish** model. Instead of discarding high-value components, the centre will restore and extend their operational life, reducing material waste and environmental footprint.

### 6.2 Carbon Footprint Reduction

Local overhaul eliminates the need for overseas logistics—saving thousands of tonnes of CO<sub>2</sub> emissions per annum from air freight and marine transport. Advanced coating technologies and fuel-efficiency optimization further contribute to decarbonisation of the turbine fleet.

### 6.3 Responsible Asset Utilization

Lifecycle extension and predictive maintenance lead to improved fuel efficiency and reduced unplanned outages, aligning with ESG (Environmental, Social, and Governance) objectives and national sustainability commitments.

## 7. Sustainability and Lifecycle Value

A critical dimension of the JV is **human capital development**. The foreign service provider participation will facilitate structured training programmes for Indian engineers, technicians, and quality professionals.

- **Training Framework:** Classroom and hands-on training modules in turbine assembly, hot-section metallurgy, and performance testing.
- **Certification:** Joint certification by ensuring global standards compliance.
- **Institutional Linkages:** Potential collaboration with IITs and skill development councils to expand the technical ecosystem.
- This will not only empower PSU employees but also generate a skilled workforce to serve India's growing gas and power sectors.

## 8. Digital integration and predictive maintenance

The JV plans to integrate digital diagnostics and condition-based monitoring technologies for continuous asset health assessment. Leveraging global experience with data analytics, the system will employ:

- Real-time performance monitoring.
- Vibration and temperature trend analysis.
- AI-based fault prediction models.

Such digital tools will transform maintenance from reactive to predictive, enhancing reliability and lowering lifecycle cost.

## 9. Future Roadmap and Scalability

### 9.1 Expansion Scope

Once operational, the centre can expand into adjacent domains:

- Overhaul of other OEM turbine types.
- Compressor and auxiliary equipment repair.
- Component manufacturing under license.
- Collaboration with defence and marine sectors for turbine applications.

### 9.2 Regional Service Export

With its geographic and cost advantage, India can become a **regional service hub** for gas turbine users in South Asia, the Middle East, and Southeast Asia, providing competitive overhaul solutions and generating export revenue.

### 9.3 Integration with PSU Ecosystem

The model can be replicated across PSUs for other high-value assets—compressors, pumps, and rotating machinery—fostering inter-PSU cooperation and economies of scale.

## Future roadmap and scalability

### 10.1 Joint Venture Governance

The JV will be structured under transparent corporate governance principles:

- Balanced Board representation.
- Defined performance KPIs.
- Annual third-party audits and sustainability reporting.

### 10.2 Risk Identification and Mitigation

Risk	Mitigation Strategy
Technology transfer delays	Phased implementation with milestone reviews
Market underutilization	Multi-sector client engagement (PSUs + private)
Cost escalation	Joint procurement and cost benchmarking
Regulatory approvals	Early engagement with statutory bodies (DPIIT, MoPNG)

This ensures both strategic and financial stability through the project lifecycle.

## 11. Policy Implications and Industry Impact

The success of this JV could influence broader policy frameworks:

- Encourage more **PSU-global partnerships** in high-technology domains.
- Establish India as a **centre of excellence for turbine maintenance**.
- Support **FIPI's mission** of promoting energy efficiency, innovation, and collaboration within the petroleum and natural gas industry.
- It will also set a benchmark for integrating sustainability, skill development, and technology localization into PSU project governance.

## 12. Financial viability analysis based on your base-case assumptions

### 1. Key Input Parameters

Parameter	Value
Initial Investment (CAPEX)	₹500 crore
Depreciation (Straight-line, 15 years)	₹33.33 crore/year
Corporate Tax	25%
Fixed Operating Cost (OPEX)	₹50 crore/year
Variable Cost per Overhaul	₹3 crore
Average Revenue per Overhaul	₹30 crore
Throughput	50 overhauls/year
Analysis Period	15 years

### 2. Annual Operating Financials

Item	Calculation	Value (₹ crore/year)
<b>Total Revenue</b>	$50 \times 30$	<b>1,500</b>
<b>Variable Cost</b>	$50 \times 3$	<b>150</b>
<b>Fixed OPEX</b>	—	<b>50</b>
<b>EBITDA</b>	$1,500 - 150 - 50$	<b>1,300</b>
<b>Depreciation</b>	—	<b>33.33</b>
<b>EBIT</b>	$1,300 - 33.33$	<b>1,266.67</b>
<b>Tax (25%)</b>	$25\% \times 1,266.67$	<b>316.67</b>
<b>Net Income</b>	$1,266.67 - 316.67$	<b>950.00</b>
<b>Operating Cash Flow (Net Income + Depreciation)</b>	$950 + 33.33$	<b>983.33</b>

### 13. Interpretation

- The proposed **Joint Venture Overhaul Centre** shows exceptionally strong viability.
- Even at **15–20 overhauls per year**, the project remains highly profitable (with over 70% margins).
- The model confirms a **robust internal rate of return (IRR)** and rapid payback, which supports **PSU sustainability and capital efficiency objectives**.
- With steady annual throughput beyond 15–20 engines, the facility will contribute to:
  - Significant foreign exchange savings (import substitution),
  - Self-reliance in turbine overhaul capability, and
  - Creation of high-skill employment and industrial ecosystem in India.

### Project Viability

Metric	Result	Interpretation
<b>Simple Payback Period</b>	<b>≈ 1 year</b>	The initial ₹500 crore investment is recovered in the first year due to high throughput and profitability.
<b>IRR (approx.)</b>	> 100% (very high)	Returns are well above benchmark due to exceptional operating margin.
<b>Break-even Throughput (EBITDA = 0)</b>	<b>~1.85 overhauls/year</b>	Only two overhauls per year are needed to cover operating expenses.
<b>Break-even Throughput (OCF = 0)</b>	<b>~1.44 overhauls/year</b>	When depreciation and taxes are included, breakeven occurs at around 1.5 overhauls/year.

#### 14. Conclusion

The proposed **Joint Venture** to establish a Gas Turbine Overhaul and Maintenance Centre in India represents a forward-looking convergence of technology, policy, and sustainability. By combining operational experience with specialized expertise, the venture promises to deliver tangible economic, environmental, and strategic value.

It addresses long-standing industry challenges—foreign dependency, cost inefficiency, and skill gaps—while aligning seamlessly with India's national priorities of *Atmanirbhar Bharat*, *make in India*, and *Net-Zero Transition*.

Beyond commercial returns, the initiative exemplifies the evolving role of PSUs as innovation leaders and nation builders. It redefines the governance paradigm for future joint ventures by balancing profitability with sustainability, global collaboration with local empowerment, and technology with purpose.

This paper underscores that the path to sustainable industrial excellence lies not in isolation, but in intelligent partnerships that combine global capability with Indian ingenuity.

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#### 16. SGT-A05 (Industrial 501)



## Making Gas Bankable Through Insurance: Pilot framework for India's 15% Gas Target



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### The Paradox

India's natural gas share is falling! **Not Rising.** Despite expanding pipeline infrastructure, growing LNG import capacity, and policy support for cleaner industrial fuels, gas declined from 6.3% to 6.0% of the energy mix in just one year (**Source: PNGRB report - Pathways to Increase Share of Natural Gas from 6% to 15%, July 2024.**) The infrastructure is ready. The policy intent is clear. So why aren't MSMEs or other price sensitive sectors like Power/Fertilizers switching?

The answer isn't technical - **it's commercial.** Industrial consumers face two crushing uncertainties: volatile gas prices that can erase cost advantages overnight, and demand fluctuations that trigger take-or-pay penalties.

For a metal fabricator currently using furnace oil at Rs. 12,000/ton, switching to gas at Rs. 7,000/ton sounds attractive - until they consider, what happens if prices spike to Rs. 10,000/ton or production drops 30%. That risk barrier keeps them locked into conventional fuels, even when gas is cleaner, more efficient, and aligned with India's 2030 climate goals. The solution exists. It's tested globally. And it's surprisingly simple: INSURANCE!!

### What if Gas Consumers Could Buy Certainty?

Imagine an MSME or a Power Plant signing a gas contract with two guarantees: **1)** their maximum price is capped regardless of market movements, and **2)** if their offtake falls below threshold contracted volume, they receive compensation. This isn't hypothetical. **Weather derivatives and Parametric (Index Based) insurance products** have de-risked energy transitions in India and mature markets for over a decade.

On the **Chicago Mercantile Exchange**, US's diverse derivative marketplace - Weather futures volumes are up 20 folds since 2019. **European utilities** routinely hedge temperature driven demand swings. **Japanese industrial** consumers buy LNG supply contracts with **embedded price collars** (Floor & Ceiling). **In India**, the Pradhan Mantri Fasal Bima Yojna, demonstrates the model's scalability: Since 2016, this index & weather-based agriculture insurance has settled ₹1.3 lakh crore in claims (**Source: IANS, August 2025**), using rainfall and yield triggers, demonstrating that parametric triggers work at massive scale.

Energy markets are simpler: gas prices and metered volumes offer cleaner data than monsoon patterns, making industrial gas insurance technically easier than farm coverage. Indian gas markets too can adapt this model. By **combining physical gas contracts with Insurance products regulated under IRDAI**, we create a hybrid framework where price spikes and volume shortfalls are financially covered. The consumer pays a premium for predictability. The insurer underwrites defined, measurable risks. The result: Gas becomes commercially stable and financially bankable.

### How the Framework Works

The insurance linked gas model involves five parties in a coordinated structure:

- The Industrial Consumer** purchases gas under a standard Gas Sale & Purchase Agreement (GSPA) but simultaneously buys an insurance policy covering two triggers:
  - Price cap protection:** If gas prices exceed a predetermined ceiling (e.g., \$10/MMBtu); **the insurer pays the excess.**
  - Volume shortfall cover:** If offtake falls below a threshold (e.g., 90% of contracted volume); **the insurer compensates for the shortfall.**

2. **The Gas Marketer/Trader** sources gas from producers and **facilitates the insurance arrangement**. This expands their addressable market by lowering the adoption barrier for reluctant or risk-averse consumers. The marketer's existing contracts (Gas Supply Agreement with producer, Gas Transportation Agreement with pipeline) remain unchanged.
3. **The Pipeline Transporter** provides operational services gas delivery, metering, scheduling and critically verifies consumption data that triggers insurance payouts. Their role adds data validation, **but no new financial exposure**. The Gas Transportation Agreement (GTA) includes data-sharing provisions with insurers.
4. **The Insurance provider** designs the Index-based product, underwrites the exposure, and manages claims. As an IRDAI-regulated entity, they bring professional risk assessment and pooling capabilities. Trigger events (price exceeding cap, volume below threshold) are objective and verifiable through transporter data, minimizing disputes. While, premiums are determined based on modelled probability of trigger events, historical price (unavailable in India scenario) and demand variability, and reinsurance costs, ensuring that coverage remains actuarially sound while affordable for consumers.
5. **The Gas Producer** supplies to the marketer under existing Gas Supply Agreements. Their commercial relationship remains standard; no new risks, just expanded market opportunity as adoption increases.



This model simply transfers risk without role disruption. The transporter stays operational. The marketer stays commercial. The insurer absorbs the volatility risk that currently prevents adoption. Each party does, what they do best.

#### Illustration: The Numbers Game

Consider a metal fabrication industry currently using furnace oil at Rs. 12,000/ton steel output. They plan to switch to natural gas, contracting 1000TJ annually (~950,000 MMBtu) at a baseline price of **\$8.75/MMBtu** (Rs.700/MMBtu).

### Their concerns:

- If gas prices rise above \$10.63/MMBtu (Rs. 850/MMBtu), their cost advantage disappears
- If production demand drops and they only consume ~750,000 MMBtu instead of 950,000 MMBtu, they face capacity charge inefficiencies.

### The insurance solution:

Risk Type	Price Risk	Volume Risk
Trigger	Price > \$10.63/MMBtu	Offtake (90%) < 900 TJ (~850,000 MMBTU)
Coverage	<b>Insurer pays:</b> (Actual Price - \$10.63) x Volume	<b>Insurer pays:</b> Rs. 20,000 per TJ shortfall
Annual Premium	Rs. 49.88 Lakh (considering 20% probability of price difference & 3.5% premium/loading factor)	Rs. 900,000 (considering 30% probability of volume risk & 1.5 premium)
<b>Total Premium</b>	Rs. 50.78 Lakhs or Rs. 5.63/MMBtu or \$ 0.067/MMBtu	

**Year-end scenario:** Actual average price hits \$11.25/MMBtu at actual offtake of 900 TJ. \$0.62 above the cap.

### Insurance payouts:

- **Price cap protection:** \$0.62/MMBtu x Rs.80/\$ x 850000 MMBtu = Rs. 4.22 Crore
- **Volume shortfall protection:** NIL (no trigger)
- **Total Payout:** Rs. 4.22 Crore

### Result:

- Since the offtake was exactly at the 90% threshold (900 TJ), the volume shortfall coverage was not triggered, but the price protection alone provided substantial value.
- The consumer effectively pays only \$10.63/MMBTU (Rs. 850/MMBtu) despite market prices of \$11.25/MMBtu (Rs. 900/MMBtu). Their Rs. 50.78 lakh premium delivers Rs. 4.22 crore in protection.
- This showcases an 8.35:1 return in this scenario, i.e., **for Every Rs. 1 Spent on premium generated Rs. 8.35 in protection.**

### Key/Likely Outcome:

- The Metal Fabrication Unit can even commit to fuel-switching capex (burner conversion, pipeline spur, storage) with predictable maximum input costs.
- Investors/Banks become willing to finance projects when fuel cost risk is capped. The MSME switches to gas. MSMEs with cumulative potential of additional 15-20 mmscmd demand can accelerate the growth trajectory. India moves closer to its 15% target.

### Concept Framework & Key Critical Success Factors/Actions

However, to scale and make this framework work, following four elements must align:

1. **Regulatory Clarity:** Since the concept/idea involves regulators from insurance (IRDAI), Derivatives (SEBI) and gas sector (PNGRB), a hybrid structure is suggested, involving **1) Price Component** – structured as a SEBI regulated commodity derivative, potentially exchange traded, similar to the once available in global markets and within India (Natural Gas futures trade on MCX); **2) Volume Component** – structured as an index based IRDAI regulated insurance product, similar to weather insurance products available globally and within India (Pradhan Mantri Fasal Bima Yojna).

This approach keeps each component within established regulatory boundaries while allowing bundled offering through insurance brokers.

However, an immediate action is required to create a joint IRDAI-SEBI-PNGRB working group along with Industry players to clear regulatory pathway enabling pilot launch without classification uncertainties, because without this no insurer will invest in product development.

**2. Data Infrastructure:** Index-based payout triggers requires credible and auditable data, with transparent reference indices (like APM prices, LNG prices or hub-based indices). Thus, the transporter is required to maintain its metering system to provide real time daily consumption data including verified access to Insurer and dispute resolution protocol, while integrating with PNGRB's planned access code framework.

In this regard, the gas regulator, PNGRB may start with including mandatory data sharing provisions in the standard GTA templates with clear protections for transporters. Furthermore, Industry bodies like FIDI may convene working groups to model contract templates ready for regulatory submissions, which shall drive commercial alignment faster than government committees.

**3. Premium Economics & Re-insurance:** Insurance premiums play an important role in this concept. Unlike typical insurance products like car, term-life etc, where accidents are independent, gas price hikes affect all consumers simultaneously, which may create massive co-related payouts requiring substantial reinsurance capacity. Thus, India's insurance corporations and international re-insurers must be involved.

This requires immediate government intervention and deliberations to support and mitigate such possible co-related risks, to make the product insurable at reasonable premiums, while demonstrating commercial viability, because if pilot succeeds in converting even 5% of India's MSME or price sensitive sector to gas, subsidy pays for itself through environmental benefits and industrial competitiveness gains.

**4. Un-ethical & immoral Possibilities:** What prevents a consumer to deliberately reduce consumption post insurance, to collect volume shortfall payments. Thus, it is imperative that verification measures are in place to ascertain that the demand reduction was market driven similar to force majeure situation and not in any way situational. Further, contrary to the standardly available No Claim Bonus, experience based premium pricing may be applicable for serial Under/Over utilizers, along with a maximum annual payout limit per consumer, like IDV in case of a car insurance.

### A Possible Implementation Pathway

Regulatory Framework	Pilot Demonstration	Market Development	Scale-Up Enablers
<ul style="list-style-type: none"> <li>IRDAI approval for index-based energy price insurance products</li> <li>Standardized trigger definitions and data validation protocols</li> <li>Clear guidelines on insurer-transporter data sharing arrangements</li> </ul>	<ul style="list-style-type: none"> <li>Launch in 2-3 industrial clusters with willing MSME participants.</li> <li>Partner with established gas marketers and pipeline operators</li> <li>Independent evaluation to refine product design and pricing</li> </ul>	<ul style="list-style-type: none"> <li>Develop standardized contract templates through industry forums</li> <li>Build insurer capacity and risk assessment expertise</li> <li>Explore re-insurance options for risk distribution</li> </ul>	<ul style="list-style-type: none"> <li>Digital platforms for price discovery &amp; enrollment.</li> <li>Integration with project finance and bank lending criteria</li> <li>Continuous product innovation based on market feedback</li> </ul>

The vision of this suggested pathway is - when industrial gas consumers routinely include price and volume insurance in their procurement decisions, just as they insure property and equipment - India's energy transition accelerates organically. The goal isn't a government program, but a **self-sustaining market mechanism** that de-risks fuel switching.

### Opportunity & Conclusion

This isn't just policy - it's commercial opportunity:

- For Gas Marketers:** Differentiate through risk-mitigated contracts, access previously un-addressable MSMEs, increase throughput and margins on facilitation.
- For Pipeline Operators:** Higher utilization rates, data monetization opportunities, with no new financial risk.
- For Insurers:** New product line in growing energy transition space with measurable risks, and a Rs. 400 - 500 crore annual addressable market (calculated if 1,000 MSMEs@ 40-50 lakh annual premium each)

At the end, India has the infrastructure to deliver natural gas. It has the policy commitment to increase its share. What it lacks is commercial confidence at the consumer level. Insurance bridges that gap.

The framework outlined here, index-based products covering price and volume risks, delivered through regulated insurance markets, isn't revolutionary - It's proven in weather derivatives, agricultural insurance, and energy hedging globally. India can implement this with its innovation, systematic and clear regulatory classification & government support during proof of concept.

Even The math works: Rs. 50 lakh premium protecting Rs. 4.22 crore exposure. The structure works: five parties, clear roles, no disruption. The precedent exists: CME weather futures, European energy derivatives, Japanese supply insurance. The regulatory pathway is feasible: hybrid IRDAI-SEBI structure with PNGRB data standards.

What's needed now is action. Industry body like FIFI can catalyze the industry consortium. IRDAI-SEBI can provide regulatory clarity. Government/Regulators can fund the pilot. India could be enrolling its first insured MSME/Industry. This could be standard practice. And, by 2030, it could be a key enabler for the 15% gas share target.

The question isn't whether insurance can de-risk gas adoption. Globally, it does. The question is whether India will act on this opportunity-or watch gas share continue declining despite billion-dollar infrastructure investments. **The choice is ours!**

## Navigating Recent Income Tax Rulings: Trends and Takeaways



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#### Introduction

In today's changing tax environment, a paradigm shift is noted in how income tax laws are interpreted by tax authorities and their expectations from businesses. Courts and tax authorities are increasingly focusing on the actual substance of transactions rather than just their formal structure. For oil and gas companies operating in India, there are several ways to set up their business. They can choose to establish subsidiaries, branch offices, project offices, joint ventures, Limited Liability Partnerships (LLPs), or representative offices. For instance, branch offices act as extensions of foreign companies, in certain cases handling marketing, trading and other operations. On the other hand, project offices are setups designed for specific contracts or projects. Joint ventures, which often involve partnerships with local firms, help share resources and manage risks by tapping into local expertise.

As these companies engage in cross-border transactions and expand their presence in different regions, understanding and complying with tax regulations becomes crucial. The complexities of international taxation, especially in an evolving regulatory landscape, require businesses to stay informed about recent tax rulings and their potential impacts. This article will explore ongoing debates around tax structures and the implications for profit taxation in India.

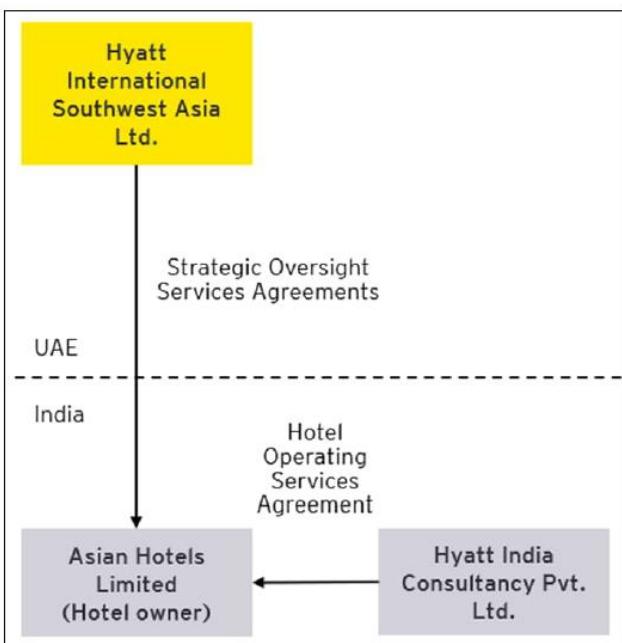
#### A. Hyatt International Southwest Asia Ltd [TS-954-SC-2025], ruling dated 24 July 2025

##### Background and ruling overview

A recent case involving Hyatt International Southwest Asia Ltd ('Hyatt') highlights an important concept known as Permanent Establishment ('PE') in international tax law. A foreign company is

typically not taxed on its business profits if it does not have a PE in India. Generally, under a tax treaty, PE is determined to be in India if business of foreign company is conducted from a place of business in India with some permanence and control over such place of business in India. In case of service transactions, PE is deemed to be in India if the stay of employees of foreign company is in India for more than specified day as specified in the tax treaty.

In this case, Hyatt, based in the UAE, provided consultancy services to hotels in India through agreements with individual hotel owners (I Co). Further, Hyatt India provided hotel operating services to the same hotel owners as shown in the below chart:



Hyatt was providing strategic oversight and guidance to I Co and was determining various aspects of the conduct of Indian business right from human resources procurement, guest admittance, use of premises, pricing, sales and marketing, reservations and operating bank accounts of such I Co. The said agreement was valid for 20 years extendible by another 10 years. Hyatt was entitled to strategic fees based on a percentage of room revenues and other income from hotel operations. Hyatt took a position that such payments are not taxable in India as it does not have a fixed place of business in India, hotel of I Co is not under its control and duration of stay of employees of Hyatt were below the threshold prescribed under the tax treaty.

The SC clarified that PE determination is fact-specific and has no straitjacket formula. Each case depends on contractual terms, business model, and conduct. In this case, the nature of control was so high that the Indian hotel itself was the place of business for Hyatt resulting into a fixed place PE. With respect to service PE, the Supreme Court noted that the criteria to determine the presence in India should be the duration of the agreement and not the number of days of stay of such employees in India on individual basis.

### Practical Insights and Takeaways

The aforesaid judgement of Supreme Court is fact specific, however, the principles laid down can be applied in different situations as per the understanding of the fact pattern. This may create a need to review the existing structures of foreign Multinational Corporations operating in India. Some of the examples are discussed hereunder.

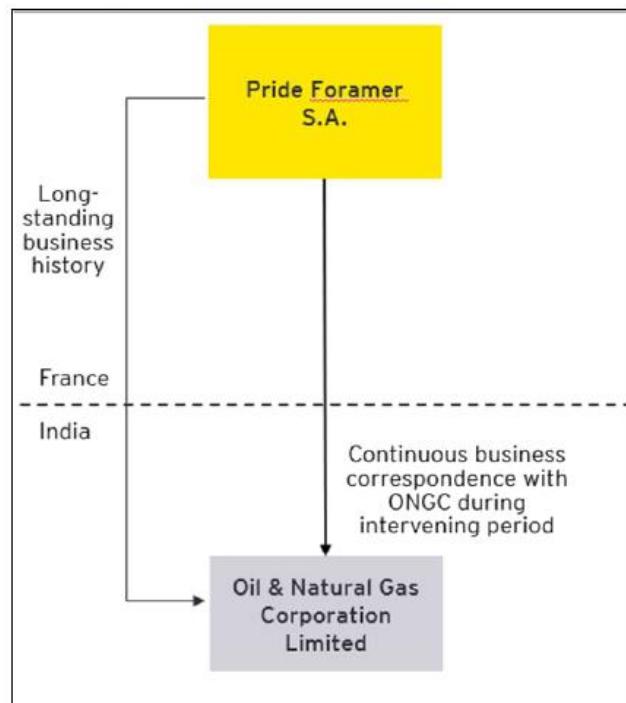
1. In a wholly owned subsidiary structure or a joint venture structure, it becomes necessary to examine the level of operational control which the foreign company exercises over such structures. For example, in case of captive Research & Development centres or Global Capability Centres set up in India, the foreign shareholder may act as both shareholder as well as customer. In this situation, it is necessary to examine whether the control of foreign company is in excess what a normal customer will have.
2. Foreign company may have long term service arrangements or secondment agreements. It is necessary to evaluate whether the service PE criteria laid down by the Supreme Court can extend to such arrangements

Thus, it becomes very important to evaluate whether the existing structures would be impacted by the decision of the Supreme Court. Sometimes, even when the structures do not create a PE as per the fact pattern, it is a documentation which is a key to prove that the structure really aligns basis the commercial realities. Thus, it is necessary to examine both – the structure as well as the documentation and then devise a roadmap to maintain such documentation.

### B. Pride Foramer S.A. [2025 INSC 1247], ruling dated 17 October 2025

#### Background and ruling overview

The case of Pride Foramer S.A. deals with the concept of business connection under Indian tax law. In the given case, the taxpayer, a non-resident oil drilling company, had a long term 10-year contract with ONGC but later the company faced a slowdown in active contracts. Despite this, the company continued to communicate with ONGC and incurred various expenses during the intervening period. The only income received by the company was interest on income-tax refund during the said period. However, the company filed its return of income showing no income by claiming deduction of business expenditure and setting off against unabsorbed depreciation. The Indian Tax Authority argued that the taxpayer was not conducting any business during the intervening period and did not have a PE in India and accordingly, it could not be considered as carrying on business in India in order to claim deductions for business expenses and set off unabsorbed depreciation.



The Supreme Court noted that though the taxpayer failed to procure any contract during the intervening period, it had carried out continuous business correspondences with ONGC and even had an unsuccessful bid during the said period. The Court emphasized that it is the intention to carry on the business which is significant and mere failure to obtain a business contract by itself would not be a determining factor to hold that the company had ceased its business activities in India. The Court ruled that ongoing activities, such as correspondence and bids, can establish a business connection, allowing the taxpayer to deduct expenses and unabsorbed depreciation.

While the Supreme Court's judgment is tailored to the specific facts of the case, the principles established can be adapted and applied to various scenarios based on the interpretation of the underlying fact pattern. Further, it is imperative to note that the transition to online bidding processes may introduce complexities in asserting a business connection in India.

### Practical Insights and Takeaways

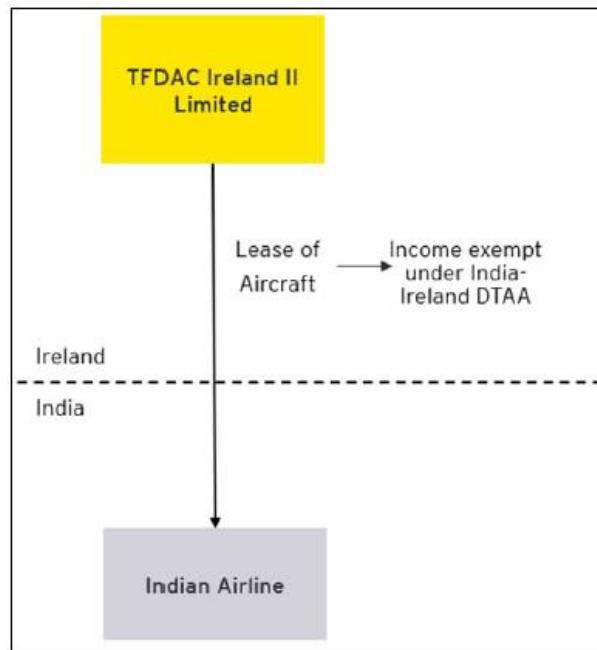
1. **Understanding Business Connection:** The principles established by the Supreme Court ruling may indicate that regular communication and engagement with Indian entities can create a business nexus, even in the absence of active contracts in India. For instance, if a foreign company's branch office in India is closed but the company continues to make offshore sales to Indian customers, can it be argued that the foreign company has a business connection in India. Business presence in India may lead to profit attribution in India. Further, any person having business connection in India may be required to comply with withholding tax rules and filing of Corporate Tax Return in India along with preparation of accounts and conduct of tax audit.
2. **Treaty Considerations:** Another important aspect to consider is the impact of tax treaties on business operations in India, particularly regarding the potential for treaty protection under Article 5. If the company is based in a non-treaty jurisdiction, it may lack treaty protection, making it imperative to assess whether activities in India could trigger a business connection and associated tax obligations.

#### C. TFDAC Ireland II Limited [ITA No.1198/Mum/2025], ruling dated 13 August 2025

##### Background and ruling overview

The Mumbai Tribunal's ruling in the case of TFDAC Ireland II Limited focuses on the implementation of Multilateral Instrument (MLI) provisions. The MLI is an international treaty developed by Organisation for Economic Co-operation and Development (OECD) to facilitate implementation of tax treaty-related measures to combat base erosion and profit shifting. It introduces various provisions aimed at enhancing tax treaty integrity, including measures to prevent treaty abuse, improve dispute resolution, and ensure that tax treaties are aligned with the latest international tax standards. The taxpayer, an Irish company, leased aircraft to an Indian airline and claimed that the income was exempt under the India-Ireland DTAA. However, the Tax Authority denied these treaty benefits, citing the Principal Purpose Test (PPT) under the MLI which is a tax measure designed to prevent treaty abuse. Under the PPT, a

tax benefit under a tax treaty will not be granted if it is reasonable to conclude that obtaining that benefit was one of the principal purposes of such arrangement or transaction.



The Tribunal ruled that the MLI cannot be enforced without a specific notification under Indian tax law. The Tribunal emphasized that a separate notification is necessary for implementing MLI provisions, and without it, these provisions cannot be enforced. This decision highlights the importance of having clear domestic legal processes for applying international treaty changes and reminds businesses to stay informed about the legal framework that affects their operations.

### Practical Insights and Takeaways

1. **Travel to Higher Courts:** There is a possibility that the decision of the Tribunal would be challenged before the Higher Courts. This could pave the way for further legal interpretation and a potential re-evaluation of the application of the Multilateral Instrument (MLI) provisions and the Principal Purpose Test (PPT), which may have significant implications for future cases involving treaty benefits.
2. **Commercial considerations while establishing operations in a particular jurisdiction:** Several commercial considerations must be carefully evaluated while deciding business models. Key factors to be considered include the selection of the jurisdiction, operational status of the company, strength of the workforce, and identification of the beneficial owner of the transaction, etc. Commercial considerations are essential to determine whether a company is eligible for tax treaty benefits.

3. Treaty benefits subject to facts of the case: An important takeaway from the ruling is that tax treaty benefits will be contingent upon addressing specific questions and criteria. This underscores the necessity for taxpayers to thoroughly evaluate their arrangements and ensure compliance with the relevant provisions, as the entitlement to such benefits may hinge on detailed scrutiny by tax authorities.
4. Scrutiny by Tax Authorities: Tax authorities are increasingly scrutinizing the foundations and jurisdiction of transactions to apply the PPT, even when a valid Tax Residency Certificate (TRC) has been submitted. This underscores the importance for businesses to remain vigilant in their tax compliance efforts. Companies should ensure that their transactions are supported by substantial commercial rationale to mitigate risks associated with the PPT and maintain thorough documentation. This approach will help demonstrate the legitimacy of business operations and defend against potential challenges from tax authorities.

### III. Conclusion

As the tax landscape in India evolves, businesses need to stay alert and proactive in their tax planning. Understanding recent income tax rulings and their

implications helps organizations navigate compliance challenges and optimize their structures to reduce tax liabilities. The recent rulings emphasize the importance of substance over form in tax compliance, highlighting the need for strong documentation and transparency in taxpayer behaviour.

To adapt to this changing environment, companies should assess their operations, engage with tax consultants, and ensure compliance with both domestic and international tax obligations. Implementing effective tax strategies, maintaining clear documentation, and fostering open communication with stakeholders are essential steps. By doing this, businesses can position themselves for success in a complex and competitive global market.

*The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. The views and opinions expressed herein are those of the author.*

## **India Pavilion: Best International Pavilion Award at the ADIPEC 2025 - India: Reimagining Energy. Diverse Solutions. One Purpose**

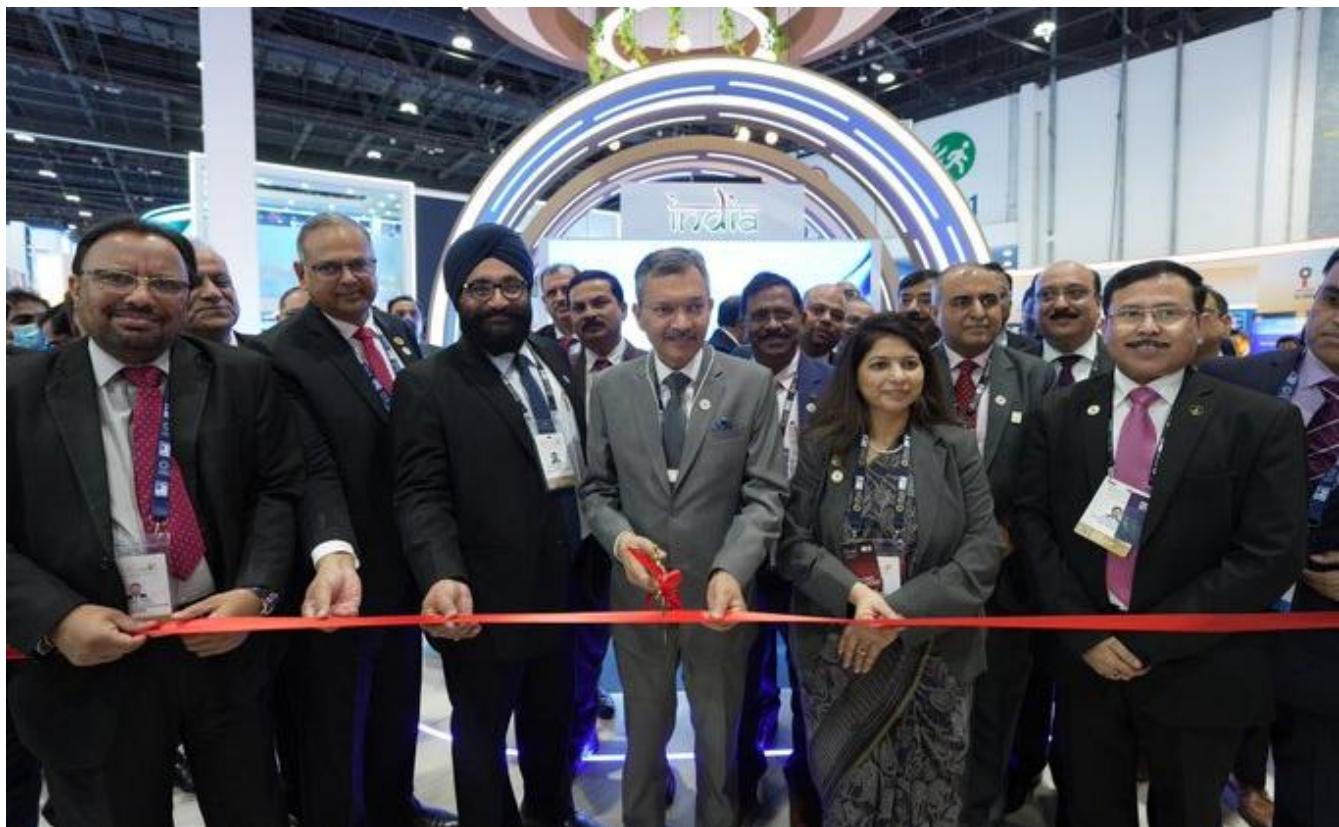
The Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC) 2025 was inaugurated on 3rd November 2025 at Abu Dhabi. The four-day event (3 - 6 November 2025) is the world's largest energy gathering, focusing on strategies for resilience, intelligence, and decarbonization across the value chain.

At the Opening Ceremony, His Excellency Dr Sultan Ahmed Al Jaber, UAE Minister of Industry and Advanced Technology and ADNOC Managing Director and Group CEO, delivered the opening address before an audience of global leaders, where he called for a balanced and inclusive approach to meeting the world's growing energy demand that embraces reinforcement of energy sources, not replacement.

HE Dr. Sultan called for policy pragmatism, embrace of artificial intelligence (AI), capital investment, and infrastructure development to optimises energy, attract capital, and advance technology to enable progress.

The India Pavilion, coordinated by Federation of Indian Petroleum Industry (FIPI) under the guidance of Ministry of Petroleum and Natural Gas, showcased India's energy leadership, innovation, and collaboration on the global stage on the theme "Reimagining Energy. Diverse Solutions. One Purpose".

Leading Indian oil and gas companies, including ONGC, IOCL, BPCL, HPCL, OIL, GAIL, EIL, Nayara Energy and Petronet LNG Ltd showcased their technological capabilities and facilities in the India Pavilion.



*The India Pavilion, with theme "India: Reimagining Energy. Diverse Solutions. One Purpose", was inaugurated by Dr. Deepak Mittal, Ambassador of India to the UAE in the presence of eminent energy leaders*

India Pavilion was honoured with the Best International Pavilion Award at the ADIPEC 2025 - a proud recognition of India's growing leadership, innovation, and collaboration in the global energy landscape. This achievement reflects the collective excellence of India's leading energy enterprises and their commitment to powering a sustainable future.

The pavilions were inaugurated by Dr. Deepak Mittal, Ambassador of India to the UAE, in the presence of eminent energy leaders. Dr. Mittal highlighted the deepening energy partnership between the two nations and also noted enthusiasm among participants for the India Energy Week to be held in January 2026 in Goa, calling it symbolic of the growing synergy between ADIPEC and India Energy Week.



*Shri Pankaj Jain, Secretary, Petroleum visited the India Pavilion and interacted with senior leaders from Indian oil and gas companies*

Showcasing the collective strength of India's leading energy companies at the Pavilion highlighted India's technological excellence, innovative capabilities, and unwavering commitment towards India's vision of balancing growth with sustainability while contributing to the global energy transition. During his visit, Dr. Mittal interacted with representatives from each participating organization and lauded their efforts in driving innovation, enhancing energy security, and strengthening India's global energy partnerships.

Shri Pankaj Jain, Secretary, Ministry of Petroleum & Natural Gas, Govt. of India visited the India Pavilion 2025 and interacted with senior leadership from Indian oil and gas companies, appreciating their efforts in showcasing India's technological and sustainable energy advancements.



Dr. Daniel Yergin, Vice Chairman of SP Global and a renowned energy expert, visited the India Pavilion and interacted with Shri Pankaj Jain, Secretary, Ministry of Petroleum and Natural Gas & other industry leaders. Appreciated India's efforts towards driving innovation, sustainability, and collaboration in the global energy landscape.

India has established a strong presence this year, reflecting its growing role in the global energy transition. The India Pavilion, organized across multiple sections by the Federation of Indian Petroleum Industry (FIPI), the Confederation of Indian Industry (CII), and the Indian Chamber of Commerce (ICC), brings together over 150 companies showcasing advancements in renewables, digital solutions, and low-carbon technologies.

The conference features 2,250 exhibitors, including 54 national and international oil companies, alongside 30 country pavilions. Record-breaking 239,709 attendees from 172 countries gathered at ADIPEC 2025, 45+ ministers and policymakers and 1,800+ speakers from energy, finance and technology explored the future of energy under the theme 'Energy. Intelligence. Impact.'

The ADIPEC 2026 will take place from 2-5 November 2026, with expanded focus on the resilience and energy security in driving sustainable global growth.



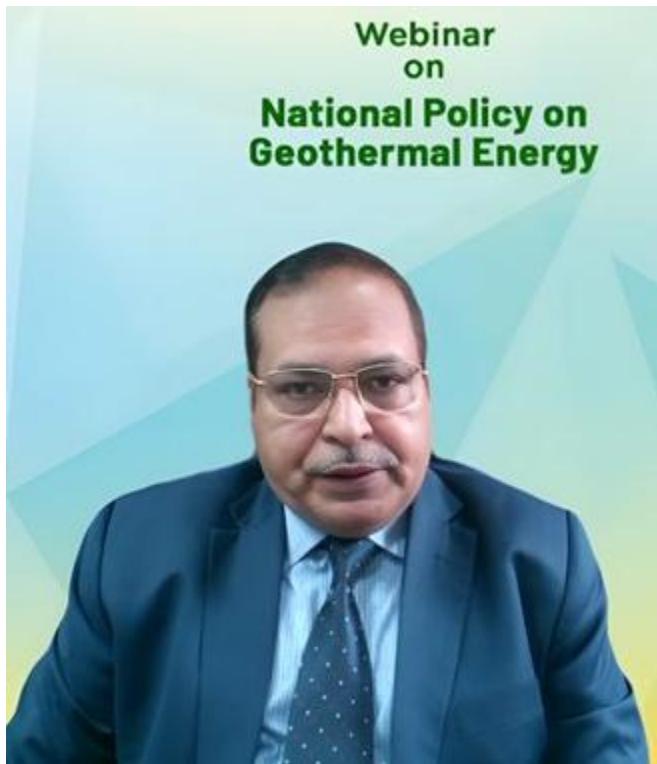
*Team FIPI honoured to host India's Ambassador to the UAE, Dr. Deepak Mittal, at the India Pavilion during ADIPEC-2025*



*Proud Moment for Team FIPI and the Team of Partnering Companies as the India Pavilion received the Best International Pavilion Award at ADIPEC-2025*

## Webinar on National Policy on Geothermal Energy'

Federation of Indian Petroleum Industry (FIPI), in association with ICF as knowledge partner, organised a webinar on '**National Policy on Geothermal Energy**' on 19th November 2025. The webinar was conducted to provide an overview of India's Geothermal Policy, its implications for the energy landscape, and how global geothermal trends intersect with India's ambitions. The webinar also examined the potential impact on the Oil & Gas industry and explore strategic considerations for future energy integration.



Mr. Vivekanand, Director (Finance, Taxation & Legal), FIPI began the session with the opening remarks. He said that with the need to combat climate change and become environmentally sustainable, the oil and gas industry today, is transitioning towards more clean energy initiatives and opportunities. Among technologies that oil and gas companies seem particularly well-suited to capitalize on are deployment of key renewable options such as offshore wind, solar, & green hydrogen. Another such area of diversification is Geothermal energy. He said that there is strong synergy between geothermal energy and the oil and gas sector in terms of same geology, reservoir engineering, and subsurface modelling. Further, it also provides a leverage to the oil and gas players to utilize their idle/abandoned oil & gas wells. He then highlighted the global geothermal landscape mentioning the total installed capacity as 15 GW with leading countries being US, Indonesia, and the Philippines. In Iceland, geothermal energy accounts for approximately 25-30% of its total electricity generation and uses geothermal resources extensively for the purpose of space heating.

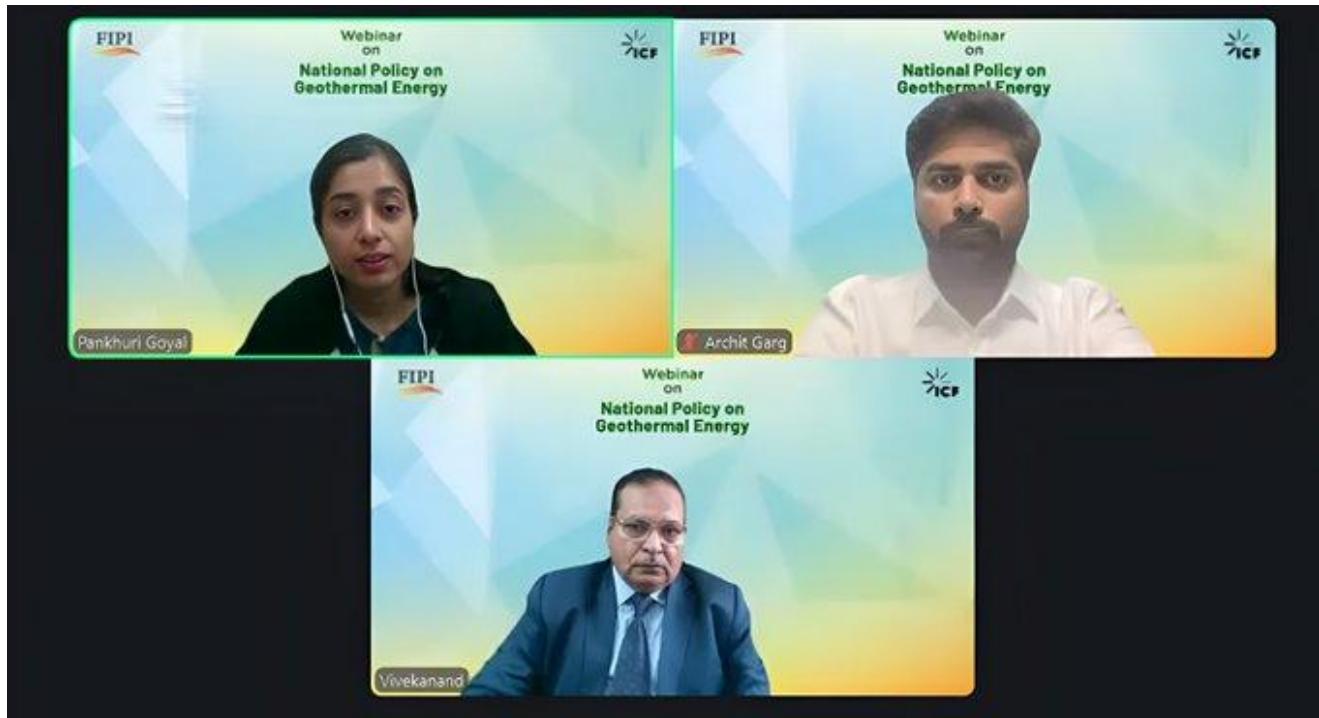
Mr. Archit Garg, Assistant Director, ICF in its presentation covered that the policy framework on India's national policy on geothermal energy introduces various enabling instruments such as viability gap funding, physical incentives, land and tenure clarity, and a streamlined permit pathway, which includes, exploration permits up to lease time of 30 years. States have been empowered to enable single window clearances and there is a 100% foreign direct investment allowance being provided. He highlighted that geothermal energy provides a 24/7 domestic baseload capacity and ensures a firm capacity which reduces import dependence and complements solar and wind for India.

Further, Mr. Puneet Goyal, Director (Oil & Gas), ICF mentioned that in New Zealand, the underlying idea of using geothermal heat for direct industrial or agricultural processes is practiced and this could act as a relevant consideration for India in developing their geothermal energy policies. Further, he said that New Zealand's significant investment in R&D activities in developing supercritical geothermal power could offer valuable expertise for India.

Talking about the national geothermal data repository, established by MNRE, he said that its purpose is to centralize all geothermal exploration and resource data, making it easier for developers to conduct research and plan projects.

Last but not the least, he concluded by saying that with an estimated potential of 10 gigawatts (GW) of geothermal energy, it can support India's 500 GW non-fossil fuel target by providing firm, low-carbon baseload power. He said that unlike intermittent sources like solar and wind, geothermal offers continuous, 24/7 power, making it an asset for grid stability and energy independence especially in remote regions like Ladakh and the North east. However, he stressed that the contribution of geothermal will depend on the outcomes of pilot projects and the successful implementation of the new policy measures.

The presentations were followed by a Q&A session wherein various queries posted by participants were well addressed by Mr. Garg.



*Mr. Puneet Goel, Director (Oil & Gas), and Mr. Archit Garg, Assistant Director at ICF India, shared valuable expert insights. Their detailed presentation provided participants with a comprehensive understanding of the newly launched policy, breaking down its key provisions and explaining its significance in India's evolving clean energy landscape*

Lastly ICF team was complimented for making a presentation covering various aspects of geothermal energy, global geothermal trends, key highlights of India's geothermal policy and its objectives and strategic implications for the Oil & Gas sector. As environment is a critical issue globally, the role of geothermal becomes a valuable tool in the global fight against climate change. FIPI thanked the participants from the energy industry for their active participation during the event.

## FIPI Committee Meeting on Safety, Health & Environment Committee Meeting - November 27, 2025

### ***Presentation on Enhanced Fire Fighting Facilities (EFFF)***

Mr. Subodh Bajpai, ED (HSE), Indian Oil Corporation Limited, outlined the evolution of emergency firefighting preparedness from the ERC concept, initiated by the M.B. Lal Committee under the Ministry of Petroleum and Natural Gas after the 2009 Jaipur fire. While ERCs were designed to handle Level-3 disasters, challenges such as long mobilisation time, high costs, and logistical constraints, along with improved safety systems at installations, led to a review of the framework. Consequently, Enhanced Fire Fighting Facilities (EFFF) emerged as a localized, risk-based, and cost-effective model, enabling faster response times and reliable firefighting capability with significantly lower capital and operating expenditure.

### ***Presentation on Road Transport & Safety***

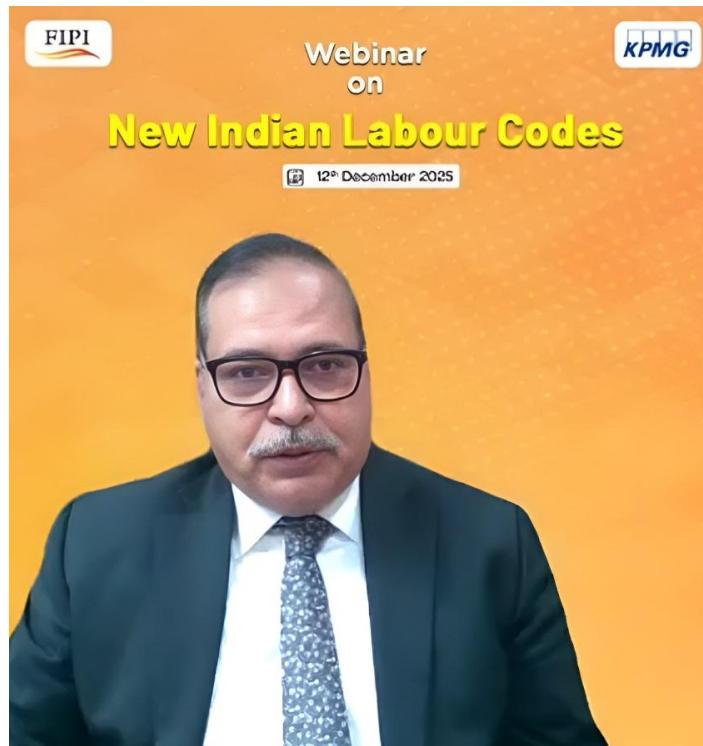
Mr. Swapnil Kamulkar, Head (Road Transport), CoE, Shell, presented a comprehensive overview of Road Transport & Safety, highlighting road transport as one of the highest-risk activities in the oil and gas value chain, largely driven by human factors, fatigue, and unsafe driving behaviours. The presentation emphasized the role of strong leadership, a robust safety culture, and uniform safety standards for both company-owned and contractor-operated fleets, supported by systematic incident reporting and learning. It further outlined the adoption of IOGP 431 and IOGP 365 as the foundation of an effective Road Transport Safety Management System, covering journey management, driver competency, and fitness. The use of technologies such as IVMS/GPS, speed limiters, and fatigue detection systems, along with stringent vehicle safety and maintenance standards, was highlighted as critical to achieving zero fatalities and safeguarding people, assets, and organisational reputation.

## Webinar on new Indian Labour Codes

Federation of Indian Petroleum Industry (FIPI), in association with KPMG in India as knowledge partner, organised a webinar on 'New Indian Labour Codes' on 12 December 2025. The webinar was conducted to decode the new Labour Codes; its key provisions and their implications, highlight open issues and clarifications, and outline immediate actions and next steps.

Mr. Vivekanand, Director (Finance, Taxation & Legal), FIPI began the session with the opening remarks. He said that India's economy is growing currently at a robust rate of 6.5 per cent, driven by the strong performance of the services, manufacturing, and construction sectors, that positions India as the fastest-growing large economy globally. He mentioned about the report from India's Ministry of Labor and Employment stating significant job growth, with employment reaching 64 crores in 2023-24, adding nearly 17 crore jobs over six years and projected that another 7 crores will be added in the next six years. He also cited the recent report from Manpower Group that talked about India's strong job market, with a high Net Employment Outlook (NEO) of 52 per cent for 2026, second only to Brazil, signaling significant employer confidence in hiring. In this regard, he welcomed the recent labour reforms that has amalgamated Labour Codes into four categories namely - Wages, Social Security, Industrial Relations and Occupational Safety, Health & Working Conditions, replacing the

29 obsolete labor laws with a uniform, modern regulatory environment. Therefore, it is expected that these labor reforms will have a positive impact on key Indian government initiatives like Viksit Bharat and Make in India and would foster economic growth, development, and self-reliance.



Ms. Parizad Sirwalla, Partner and National Head, Global Mobility Services, Tax – KPMG in India said that India's four new Labour Codes became effective nationwide on 21 November 2025, with the stated objective of transforming workplace culture, enhancing transparency and strengthening social security for all workers. She said that the codes aim to strengthen women's participation and equality in the workforce through several provisions and ensure minimum standards for health and safety. She then highlighted that the process of consolidating numerous existing laws into four comprehensive Labour Codes was a multi-year effort that began well before they were finally passed. The Code on Wages was enacted in 2019 and the rest three were enacted in 2020, but since labour is a concurrent subject in India's Constitution, extensive consultations with states and other stakeholders for each of these codes was required before it could be finally notified.

Ms. Manisha Dharnidharka, Chartered Accountant, then talked about the key change in the labour law as recognition of the new category of workers namely- gig workers, platform workers, home-based workers, fixed-term employees, unorganised workers; which have now been well defined under the law. This is done to keep pace with the changing business dynamics, especially post-

COVID and to provide the government a base to be able to extend Social Security benefits to them. Further, she talked about other changes such as- women employees allowed to work from home post maternity leave by mutual agreement; employee centers to be replaced with career centers; usage of AADHAR in actual enforcement of Social Security schemes; for fixed-term employees, gratuity will be given to them on a pro-rata basis after completing one year of service; for unorganised workers, welfare schemes covering social security, injury, housing, education, etc. will be notified.

For the next code on Occupational Safety and Health Code (OSH), Ms. Manisha talked about the difference between a worker and an employee. She said that a worker is a subset of an employee and includes only non-managerial or non-administrative or non-supervisory staff (earning wages below the specified threshold of 15000/18000 per month as the case may be). Since certain provisions are applicable only to workers, the employers thus need to identify carefully whether they classify him as a worker or an employee. Further, she said that the contract labour cannot be employed in core activities of the organisation with few exceptions such as contract labor can be employed if the normal functioning of the establishment is such that it is ordinarily done through a contractor, activities do not require full time workers, to cater to any sudden increase of volume of work, in services such as sanitation, security, canteen, housekeeping, courier, transport etc. Also, under OSH Code, principal employer remains liable for the health and safety benefits etc. of the contract labour. She then highlighted key changes under OSH Code- for instance- the workers can carry forward up to only 30 days of unavailed leave; provision of creche facilities with establishments wherein 50 or more workers/employees are engaged; free annual health checkup for specified employees; a safety committee is mandated for establishments with specified thresholds of workers; issuance of appointment letters has been made mandatory. Many provisions driving inclusivity include- that women are allowed to work now before 6.00a.m. and after 7.00p.m., after due consent and subject to safety measures. Further protective equipment like safety gear needs to be obtained wherever women are employed in hazardous processes, including appropriate facilities.

Moving on to the last code, which is the Industrial Relations Code, Ms. Manisha said that the key change here includes introducing a concept of negotiating Union or Council for an establishment having multiple registered trade unions. Also, Industrial Tribunals are to be constituted in place of court of inquiry, Board of Conciliation, and labour courts. Further the new Code has increased the threshold of workers to 300 for obtaining the consent of government in case of layoff, retrenchment, etc. In Industrial Relations Code, Industrial Establishments employing 20 or more workers are now required to form grievance redressal committee to investigate grievances. It needs to have an equal representation of workers and employees.

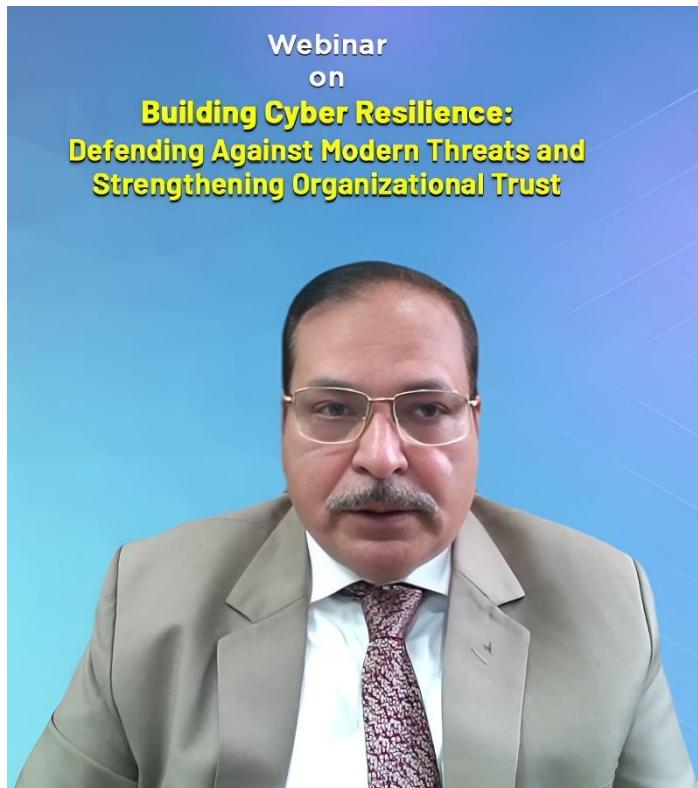
Lastly, Ms Parizad concluded by saying that every organisation needs to evaluate the impact of these new Labour Codes vis-a-vis on their compensation structure, the HR policy, the contractor arrangements, and various compliance and statutory frameworks. They will need to evaluate the financial implications in detail, relook at the payroll and compliances based on the new definition of wages, modify the existing vendor and contractor arrangements considering principal employer provisions, and relook at the health, safety work policies. She said that the codes are thus designed to create a balanced relationship between the employees and the employers, to encourage collaborative agreements and foster a productive work environment.

Ms. Parizad and Ms. Manisha, then conducted the Q&A session and provided their views and opinions on various queries posted by participants.

Lastly, FIPI complimented the speakers for an elaborate presentation on the topic covering provisions and their implications and highlighting the key norms in the Labour Code. FIPI also thanked the participants from the energy industry for their active and interactive participation during the event. The webinar was very well attended and was immensely appreciated for its content and clarity.

## Webinar on Building Cyber Resilience in India's Oil & Gas Sector: Defending Against Modern Threats & Strengthening Organizational Trust

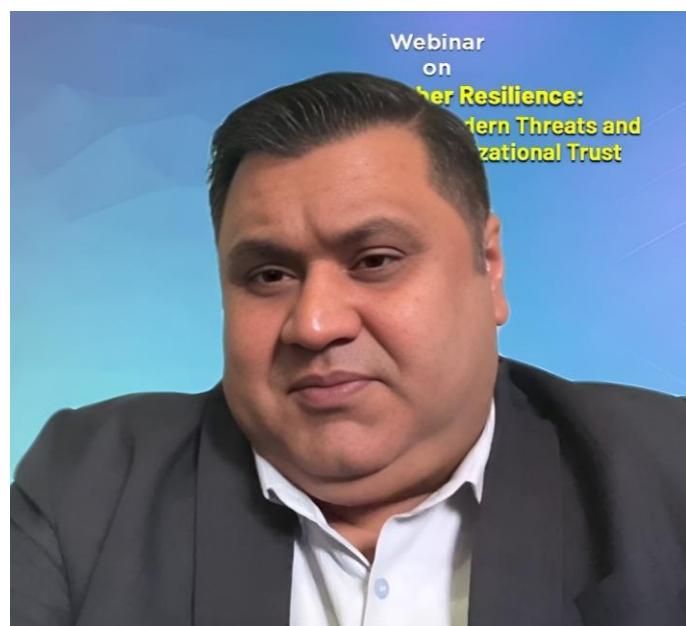
Federation of Indian Petroleum Industry (FIPI) in association with EY organised a webinar on Building Cyber Resilience in India Oil and Gas Sector: Defending against Modern threats & Strengthening Organisational Trust on 23rd December 2025. The webinar was conducted to shed a light on cyber resilience in view of Indian regulations and industry best practices, and showcase practical steps to minimize operational disruptions arising out of cyber-attacks, thus providing collaborative approaches to cyber risk management. The webinar was appreciated by one and all and was very well attended by 70 professionals working across the oil and gas value chain.



Mr. Vivekanand, Director (Finance, Taxation & Legal), FIPI began the session with the opening remarks. He said that cybersecurity has moved beyond just being an IT concern to a strategic business priority. He mentioned that we are living in an era where the question is no longer if an organisation will face cyber threat, but when. He further stated that in 2025, the global cost of cybercrime is projected to hit approximately \$10.5 trillion annually, resulting from AI-Powered phishing to sophisticated Supply Chain attack. In the Indian context, according to Cisco 2025 Cybersecurity Readiness Index, only about 7% of organisations (from 4% last year) in India are adequately prepared to defend against modern cyber-threats. This demonstrates that despite an improvement from last year, cybersecurity preparedness remains low as hyper-connectivity and AI introduce new complexities for many practitioners. In this context, he mentioned the significance of cyber resilience today as it helps companies to anticipate, withstand, and rapidly recover from inevitable cyberattacks, preventing catastrophic downtime, data loss, and reputational damage, thereby maintaining business continuity and customer trust.

Mr. Akshay Tiku, Partner, EY India began his address by presenting case studies on recent cyber-attacks (Suncor Energy, 2023; Halliburton, August 2024) which mainly happened due to lack of security controls as well as supply chain vulnerability within the organisation. In the Indian context, he cited the report from Data Security Council of India (DSCI) that mentioned approximately 369 million malware detections during the reporting period which meant about 702 malwares were detected every minute. Further, ransomware attacks on the oil and gas industry increased by 935% between April 2024 to April 2025. He therefore mentioned that while digitalization increases cyber vulnerabilities, the solution is not to halt progress but to strengthen security.

He then talked about the rapid digital adoption within oil and gas sector as IoT and AI are being deployed to reduce operational expenses. The historical maintenance logs and real-time data are fed into AI algorithms to detect machine failure. Also, digital twins are used to simulate drilling scenarios to increase efficiency by 10-20%. So, the need of the hour is to keep cybersecurity in pace to tackle cyber threats such as - ransomware attacks, phishing attacks, etc. He also mentioned that air gap between IT and OT is a myth as real time data feeding exists from OT systems into the cloud increasing the convergence of IT & OT.



He then talked about the reasons behind Oil & Gas as a primary target of cyber-attacks. Since energy is foundation layer for all other sectors and any disruption creates a force multiplier, affecting the entire economy. For instance, in 2025, 50% of ransomware attacks in 2025 were aimed at critical sectors, one of which is energy. Secondly, because of legacy debt which means that while IT assets are refreshed every 5 to 6 years, OT assets have a 15–20-year life cycle, therefore many of refineries are still running on legacy systems that are difficult to monitor & patch, thus creating a vulnerability for attackers. Another reason is geopolitical weaponization where there is rise of gray zone cyber warfare such that energy sector is primarily targeted. Lastly, ransomware ROI paradox wherein the global ransomware attacks against critical industries like energy has surged by 34%. Therefore, the need of the hour is to improve cyber resilience by focusing on cyber visibility, monitoring, business continuity, and recovery.

He mentioned 4 strategies to redefine cyber resilience. The organisations need to anticipate by using AI driven threat intelligence to foresee attacks before they happen; withstand by ensuring critical-OT functions continue; recover and restore systems via immutable backups; and adapt by feeding lessons from near-misses back into the systems to evolve defences.

He then talked about the human firewall wherein he mentioned that 20% of the organizations surveyed by IBM in the year 2025 suffered a breach due to use of shadow AI; 68% of the breaches are caused due to a human element and 4,151% increase in phishing attacks since advent of ChatGPT in 22. Therefore, with Gen AI, it has become easier to do a phishing attack on an organization. So, the need of the hour is human firewall, i.e. turning vulnerability into strength. This includes- targeted training and awareness sessions for operators, engineers, and maintenance staff; training sessions need to be done to detect QR code phishing, deepfake impersonality smishing, and other emerging threats; run phishing simulations or tabletop exercises specifically for OT scenarios; train employees on acceptable and responsible use of AI in sensitive networks and environments; and vendor training to ensure third parties comply with organizational security policies.

Lastly, he spoke about the regulatory landscape defined in India. The Indian Computer Emergency Response Team (CERT-In) has introduced significant directives such as -an annual audit, where every public and private organization must undergo a third-party cybersecurity audit annually by a CERT-In certified auditor; legal obligation on account of the organization to report cyber incidents classified as ransomware, data breach, or unauthorized access within 6 hours of detection; the National Critical Information Infrastructure Protection Centre (NCIIPC) has designated oil and gas assets as CII, which is Critical Information Infrastructure, so there are many compliances pertaining to cyber security; Vulnerability Disclosure which is the mandatory participation in the Responsible Vulnerability Disclosure Program for Industrial Systems, and lastly, failure to implement reasonable security safeguards as part of the DPD Act has financial penalty up to 250 crores.

Mr. Tiku, then conducted the Q&A session and provided his views and opinions on various queries posted by participants.

Lastly, FIPI complimented the EY team for an elaborate presentation on the topic covering recent case studies and lessons drawn from cyber incidents in the oil & gas sector; insight into Indian regulations and industry best practices with respect to cyber resilience; & discussed the practical steps to minimize operational disruptions arising out of cyber-attacks. FIPI also thanked the participants from the energy industry for their active and interactive participation during the event.

## NEW APPOINTMENTS

### Mr. S. G. Venkatesh assumes charge as Director (Technical), CPCL



Mr. S. G. Venkatesh has assumed charge as Director (Technical) of Chennai Petroleum Corporation Limited (CPCL) on 05 January 2026.

Mr. Venkatesh brings with him extensive experience in refinery and petrochemical operations, having been associated with Indian Oil Corporation Limited (IndianOil) in senior technical and leadership roles, including responsibilities at the corporate level in the petrochemicals domain. His professional journey encompasses technology management, operational excellence, and downstream project execution, all of which are integral to CPCL's technical and operational landscape. His rich experience is expected to further strengthen CPCL's strategic capabilities and execution framework.

Mr. S. G. Venkatesh, is a **B.Tech** (Chemical Engineering) Graduate. He joined IndianOil in 1995 and brings with him over 29 years of experience across Technical Services, Operations, and Health, Safety & Environment (HSE) functions.

# Member Organizations

S.No	Organization	Name	Designation
1	Adani Welspun Exploration Ltd.	Mr. Arvind Hareendran	Sr. Vice-President (Exploration)
2	ASAP Fluids Pvt. Ltd.	Mr. Vivek Gupta	Managing Director
3	Axens India (P) Ltd.	Mr. Siddhartha Saha	Managing Director
4	Baker Hughes, A GE Company	Mr. Neeraj Sethi	Country Leader
5	Bharat Petroleum Corporation Ltd.	Mr. Sanjay Khanna	Director (Refineries) with Additional Charge of Chairman & Managing Director
6	Bliss Anand Pvt. Limited	Mr. Vikas Anand	Managing Director
7	BP Exploration (Alpha) Ltd	Mr. Kartikeya Dube	Head of Country, bp India
8	Cairn Oil & Gas, Vedanta Ltd	Mr. Rakesh Agiwal	Chief Policy and Regulatory Officer
9	Central U.P. Gas Ltd.	Mr. Rajib Lochan Pal	Managing Director
10	Chandigarh University	Mr. Satnam Singh Sandhu	Chancellor
11	Chennai Petroleum Corporation Ltd.	Mr. H. Shankar	Managing Director
12	CSIR- Indian Institute of Petroleum	Dr Harender Singh Bisht	Director
13	Decom North Sea	Mr. Will Rowley	Interim Managing Director
14	Dynamic Drilling & Services Pvt. Ltd.	Mr. S.M. Malhotra	President
15	Engineers India Ltd.	Ms. Vartika Shukla	Chairman & Managing Director
16	Ernst & Young LLP	Mr. Rajiv Memani	Country Manager & Partner
17	ExxonMobil Gas (India) Pvt. Ltd.	Mr. Monte Dobson	Chief Executive Officer
18	FMC Technologies India Pvt. Ltd.	Mr. Arjun Kumar Rumalla	Managing Director
19	GAIL (India) Ltd.	Mr. Sandeep Kumar Gupta	Chairman & Managing Director
20	GSPC LNG Ltd.	Mr. Sanjay Sengupta	Chief Executive Officer
21	Goa Natural Gas Private Limited	Mr. Mohd Zafar Khan	Chief Executive Officer
22	Hindustan Petroleum Corporation Ltd.	Mr. Vikas Kaushal	Chairman & Managing Director
23	HPCL Mittal Energy Ltd.	Mr. Prabh Das	Managing Director & CEO
24	IIT (ISM) Dhanbad	Prof. Sukumar Mishra	Director
25	IMC Ltd.	Mr. A. Mallesh Rao	Managing Director
26	Indian Gas Exchange Ltd.	Mr. Rajesh Kumar Mediratta	Managing Director & CEO
27	Indian Oil Corporation Ltd.	Mr. A S Sahney	Chairman
28	Indian Strategic Petroleum Reserves Ltd.	Mr. L.R. Jain	CEO & MD
29	IndianOil Adani Ventures Ltd.	Mr. Anubhav Jain	Managing Director
30	Indradhanush Gas Grid Ltd.	Mr. Subrata Das	Chief Executive Officer
31	Indraprastha Gas Ltd.	Mr. Kamal Kishore Chatiwal	Managing Director
32	International Association of Drilling Contractors: IADC	Mr. Jason McFarland	President
33	International Gas Union	Mr. Milton Catelin	Secretary General

# Member Organizations

S.No	Organization	Name	Designation
34	IPIECA	Mr. Brian Sullivan	Executive Director
35	Jindal Drilling & Industries Pvt. Ltd.	Mr. Raghav Jindal	Managing Director
36	Lanzatech Pvt. Ltd.	Dr. Jennifer Holmgren	Chief Executive Officer
37	Larsen & Toubro Ltd.	Mr. S.N. Subrahmanyam	CEO & Managing Director
38	Lummus Technology LLC	Mr. Leon de Bruyn	President & Chief Executive Officer
39	Mangalore Refinery & Petrochemicals Ltd.	Mr. M Shyamprasad Kamath	Managing Director
40	Marine Solutionz Ship Management Private Limited	Mr. Sumit Kumar	Director
41	MIT World Peace University Pune	Mr. Rahul V. Karad	Executive President
42	Nayara Energy Ltd.	Mr. Prasad K. Panicker	Executive Chairman
43	Numaligarh Refinery Ltd.	Mr. Bhaskar Jyoti Phukan	Managing Director
44	Oil and Natural Gas Corporation Ltd.	Mr. Arun Kumar Singh	Chairman & CEO
45	Oil India Ltd.	Dr. Ranjit Rath	Chairman & Managing Director
46	Petronet LNG Ltd.	Mr. Akshay Kumar Singh	Managing Director & CEO
47	Petronet MHB Ltd.	Mr. Sudhir Kumar	Managing Director
48	Pipeline Infrastructure Ltd.	Mr. Akhil Mehrotra	Chief Executive Officer
49	Rajiv Gandhi Institute of Petroleum Technology	Prof. Harish Hirani	Director
50	Reliance BP Mobility Ltd.	Mr. Akshay Wadhwa	Chief Executive Officer
51	Reliance Industries Ltd.	Mr. Mukesh Ambani	Chairman & Managing Director
52	S&P Global Commodity Insights	Mr. Anupam Bagri	President
53	Seros Energy Private Limited	Mr. Devashish Marwah	CEO (Seros Well Services)
54	Shell Companies in India	Ms. Mansi Madan Tripathy	Country Chair
55	Siemens Ltd.	Mr. Guilherme Vieira De Mendonca	CEO (Siemens Energy - India)
56	SLB	Mr. Lalit Aggarwal	Managing Director
57	South Asia Gas Enterprise Pvt. Ltd.	Mr. Subodh Kumar Jain	Director
58	Sun Petrochemicals Pvt. Ltd.	Mr. Padam Singh	President
59	THINK Gas Distribution Pvt. Ltd.	Mr. Abhilesh Gupta	Managing Director & CEO
60	Topsoe India Private Limited	Mr. Alok Verma	Managing Director
61	TotalEnergies Gas and Power Projects India Pvt. Ltd.	Dr. Sangkaran Ratnam	Country Chair
62	University of Petroleum & Energy Studies	Dr. Ram Sharma	Vice-Chancellor
63	VCS Quality Services Pvt. Ltd.	Mr. Shaker Vayuvegula	Director
64	World Biogas Association	Ms. Charlotte Morton OBE	Chief Executive
65	World LP Gas Association	Mr. James Rockall	CEO & Managing Director



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