FIPI

The Journal of

Federation of Indian Petroleum Industry

Voice of Indian Oil & Gas Industry

January - March 2026
Vol. 25 Issue - 1

Governing Council

Chairman

Arun Kumar Singh
Chairman & CEO
Oil and Natural Gas Corporation Ltd.

Co-Chairman

A S Sahney
Chairman
Indian Oil Corporation Ltd.

Vice-Chairman

Sarthak Behuria
Chairman
Reliance BP Mobility Ltd.

Members

Praveen M. Khanooja
Additional Secretary,
MoP&NG
C&MD (Addl. Charge)
Engineers India Ltd.

Deepak Gupta
CMD & Director (Projects)
GAIL (India) Ltd.

Vikas Kaushal
CMD, Hindustan Petroleum
Corporation Ltd.

Prabh Das
MD & CEO,
HPCL Mittal Energy Ltd.

Sanjay Khanna
CMD
Bharat Petroleum Corporation Ltd.

Dr. Ranjit Rath
CMD
Oil India Ltd.

Ashay Kumar Singh
MD & CEO
Petronet LNG Ltd.

Prasad K Panicker
Executive Chairman
Nayara Energy Ltd.

Kartikeya Dube
Head of Country
bp India

Noor Khan
Director and Head – Government
Relations, Policy and Advocacy
Shell Companies in India

Vishal Chopra
Chief Policy & Regulatory Officer
Cairn Oil & Gas, Vedanta Ltd.

Prof. Sukumar Mishra
Director
IIT (ISM) Dhanbad

Dr. Harender Singh Bisht
Director, CSIR-Indian
Institute of Petroleum

Gurmeet Singh
Director General, FIPI
Member Secretary
(upto 31st March 2026)

V. Satish Kumar
Director General, FIPI
Member Secretary

CONTENTS

In This Issue

Editorial Board

Edited, Designed & Published by:

Federation of Indian Petroleum Industry (FIPI)

J-105, Tower-J, First Floor, World Trade Centre, Nauroji Nagar, New Delhi-110029

Tel. No.: 91-11-40886000, Fax No.: 91-11-40886019

E-mail: dg.sectt@fipi.org.in, Website: www.fipi.org.in

From the Desk of the

Director General

Greetings from Federation of Indian Petroleum Industry (FIPI)!

The world today is facing one of the most serious geopolitical and economic challenges in decades. Since February 2026, intensified conflict between Iran, the United States, and Israel has disrupted global trade and energy markets. The crisis has had significant impacts on the global economy, trade, investments, and inflation. One of the most striking effects of this war is on energy supply and oil prices. A large portion of the world's oil and natural gas passes through the critical Strait of Hormuz, which has seen severe disruptions because of the conflict. This has caused a sharp rise in oil prices — with Brent crude climbing well above US $100 per barrel, putting pressure on inflation and economic growth worldwide.

India is the third largest importer, fourth largest refiner, and fifth largest exporter of petroleum products globally. The country maintains a secure position regarding its oil and crude supply, with 5.3 million tonnes of Strategic Petroleum Reserves (SPR) providing roughly 9.5 days of coverage. Further, India is focusing towards diversification of its energy sources through non-Middle Eastern suppliers. The move maintains stable, and affordable energy for Indian consumers despite Middle East tensions.

In the natural gas segment, the Government has notified the Natural Gas (Supply Regulation) Order to ensure the equitable distribution of natural gas amid supply disruptions caused by the conflict in the Middle East, which has impacted LNG shipments through the Strait of Hormuz. The priority status for natural gas allocation has been granted to domestic PNG, transport CNG, LPG production, and essential pipeline operations.

In the upstream segment, the newly introduced Petroleum and Natural Gas Rules 2025, establish one unified petroleum lease for all upstream activities, replacing the previous system of multiple licenses for exploration, development, and production. This is aimed at boosting domestic energy production, increasing ease of doing business and providing stable, long-term leases, thus making India a more attractive place for energy investment. Further, India launched its 10th Open Acreage Licensing Policy (OALP-X) round in February 2025, offering 25 exploration blocks across 13 sedimentary basins. The bid deadline has been extended to May 29, 2026, to attract more participants under newly liberalized upstream rules.

Hon'ble Prime Minister, Shri Narendra Modi during IEW 2026 mentioned that India aims to raise investments in the oil and gas sector to $100 billion by the end of this decade. A core pillar of this strategy is to position India as a premier global refining hub. This includes increasing the country's crude oil refining capacity from approximately 260 MMTPA to above 300 MMTPA by 2030. Refineries across India are increasingly focusing on integration with petrochemical production by strengthening product diversification with high-value feedstocks alongside fuels. These developments highlight India's strategy to not only meet rising domestic fuel demand but also enhance global competitiveness in refining and petrochemicals, while moving toward cleaner and more secure energy pathways.

I am overwhelmed to mention that India has surpassed 1 lakh petrol pumps, cementing its position as the world's third-largest fuel retail network behind the US and China. Driven by state-owned OMCs, the network doubled from 2015, driven by rising vehicle demand, and rural expansion.

The electric vehicle market in India is continuing strong growth, fuelling demand for more battery production and infrastructure. Significant customs duty exemptions on lithium-ion cells and key inputs introduced in the Union Budget 2026 to support domestic battery manufacturing and reduce import dependence, are a welcome step in this direction.

In the renewables segment, it is overwhelming to see that India marked a record-breaking year in its clean energy journey in 2025, with non-fossil fuel

installed capacity rising to 266.78 GW. This represents a 22.6% increase over 2024, when non-fossil capacity stood at 217.62 GW. This progress strengthens India's pathway towards energy security, climate responsibility, and a self-reliant green economy, while moving steadily towards the national target of 500 GW of non-fossil energy capacity by 2030.

FIPI: Quarterly activities (January-March 2026)

Building the remarkable success of its previous three editions, India Energy Week 2026 (IEW'26), the flagship energy event of Government of India, was held under the patronage of the Ministry of Petroleum and Natural Gas, organised by FIPI, from 27th to 30th January, 2026 at ONGC ATI, Goa.

Over the week, the premier global energy conclave spotlighted India's pivotal role in the worldwide energy ecosystem, bringing together policymakers, business leaders, innovators, and investors to forge practical solutions for a secure, sustainable, and affordable energy future.

From high-level ministerial sessions and CEO roundtables to dynamic technical discussions and an expansive exhibition of transformative technologies, India Energy Week 2025 served as a powerful catalyst for strategic partnerships, groundbreaking innovations, and investment across the energy value chain. The event showcased rapid progress in biofuels, green hydrogen, and digital technology, with key initiatives aimed at achieving net-zero goals through energy security. The large-scale global energy gathering brought together over 75,000 energy professionals, 700+ exhibitors, and participants from more than 120 countries.

The event recognized the emerging Indian startups delivering innovative, technology-driven solutions for the energy sector under the AVINYA challenge; international challenge recognised startups advancing upstream technology under the VASUDHA challenge; and awarded institutes under HACKATHON challenge by recognising innovative problem-solving in energy technology. The closing ceremony concluded with the prestigious FIPI Annual Awards that recognised companies and individuals for excellence across exploration, production, refining, innovation, and gas distribution.

On 3rd February, 2026, FIPI organized its flagship Post Budget analysis session. The session was organized with EY as the knowledge partner. The Budget session was attended by 160 participants (virtually) and was appreciated in terms of content by everyone. The objective of the session was to analyse the recently presented Union Budget and weigh the impact of the Budget on the economy and India's oil and gas industry. The session was attended by many senior dignitaries from across the industry. Post budget, FIPI represented some issues of the industry members to the concerned authorities including Ministry of Finance & Ministry of Petroleum & Natural Gas (MoP&NG).

On 16th March, 2026, FIPI in collaboration with American Petroleum Institute (API) organized a webinar on "An overview of API standardization and certification''. The webinar provided an overview of the API standards process and certification programs and underscore how API collaborates with experts and partner organizations globally to promote global industry safety and interoperability including personal certifications. The webinar was attended by 80 participants (virtually) and was appreciated by everyone.

On 17th March, 2026, FIPI, in collaboration with S&P Global Energy, organized a webinar on "LNG at the Crossroads: Fundamentals and Pricing Evolution,", bringing together industry experts to deliberate on the rapidly evolving global LNG market scenario. The event underlined that the current geopolitical developments have brought LNG markets to a critical juncture and thus arises the need for deeper understanding of market fundamentals, pricing evolution, and global interlinkages, particularly between Asian and European markets, to enable informed decision-making by stakeholders. The webinar received strong participation and engagement from across the oil and gas industry.

On 18th March, 2026, FIPI with EY as the knowledge partner organized a webinar on "Oilfield Equipment Leasing- a permissible activity in GIFT City''. The webinar provided an overview of GIFT City with a specific focus on Oilfield Equipment leasing and the associated tax incentives. The session also explored how structuring operations within GIFT City can foster an effective ecosystem for oil and gas players, including upstream companies and service providers. The webinar attracted active involvement and participation from entities across the oil and gas 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.

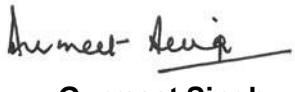
At IEW, support was extended to GBA in hosting 3 thematic sessions at the GBA pavilion, organization of a leadership roundtable and panel by GBA. A microsite on SAF was launched and a whitepaper on Investments in Sustainable Biofuels was presented.

Conclusion

Despite global headwinds, India's economic fundamentals remain resilient. Its growth rates continue to be among the fastest in the world, supported by a large and youthful workforce, strong domestic consumption, and structural reforms that enhance competitiveness. In conclusion, India's management strategy combining diversification, macro-economic prudence, and long-term planning is helping the nation navigate turbulent times. By balancing immediate defense against external shocks with forward-looking reforms, India is working to sustain growth and maintain stability in an uncertain global economic climate.

I wish to announce that I have completed my tenure at FIPI with a great sense of satisfaction and will retire on 31st March 2026. I feel honoured to be part of this esteemed organisation, always striving to serve our members and foster growth in the Indian oil and gas sector. I would take this opportunity to inform that Mr. V. Satish Kumar, former Director (Marketing) of IOCL will assume the position of Director General of FIPI. I am confident that, under his able leadership, FIPI will continue to progress and address the challenges faced by our industry. I would like to acknowledge the support I received from the officials of MoP&NG, the Governing Council, and all FIPI members, including my dear colleagues during my tenure at FIPI.

I extend my best wishes to everyone!



Gurmeet Singh

Coal to Chemical - Aligning Country's Energy Security with Proactive Strategy

Papia Mandal
General Manager

Engineers India Limited

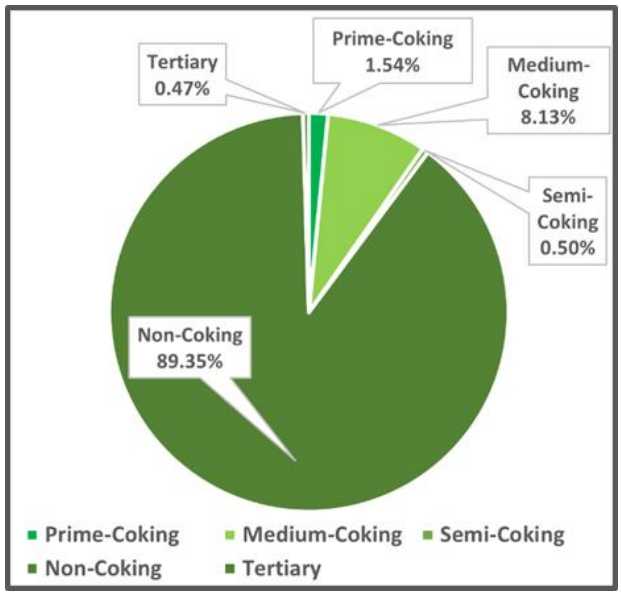
Background

As the world's fastest growing major economy, India stands at crossroads, to balance the demands of a burgeoning population along with an ambitious vertical growth trajectory. To secure its position as the third largest global economic power, the nation needs to fundamentally reshape its energy security strategy. Beyond merely shifting the energy mix, India is navigating the complex challenge of decoupling industrialization and its energy requirements from fossil fuel dependence. By leveraging digital revolutions to promote efficiency, and consistent efforts to widen the energy basket, the country is pursuing phenomenal growth, while simultaneously ensuring that the environment is preserved. The strategy focuses on upswing marked by infrastructure development, industrial growth, and indigenisation through the 'Make in India' initiative, all while ensuring long-term sustainability along with consistent gains in GDP and per capita income.

Significance of Coal for the Country

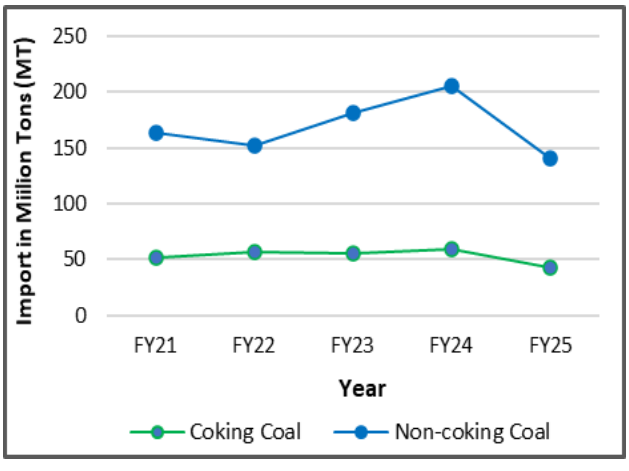
The country being short of Fossil fuel and Natural gas reserves, coal has remained the major contributor of energy source over the decades. Coal based power however, has been under pressure on account of environmental considerations, and though additional coal-based power capacity is being implemented frugally, yet it remains the major source of power generation in the country. While the nation possesses abundant coal reserves (Exhibit-1), the high ash content of domestic supplies poses significant handling and processing challenges.

Exhibit-1: Quality-wise Coal Reserves (In %age)



Consequently, blending with high-quality imported coal is required to optimize performance and meet technological requirements. This is particularly essential for the advanced gasification process, where it is necessary that the ash content in the coal is well below 25%, to be supported by appropriate technologies for coal to chemicals or power solutions. Similarly, for steel production blast furnaces requires to be fed with large quantities of coking coal with iron ore, which is primarily imported from Australia, USA and other countries (Exhibit-2).

Exhibit-2: Coal Import Dependency from FY 21-25 (In Million Tons)



Data Source: Ministry of Coal

With the shift of energy mix more towards renewable sources, though the renewable energy contribution in the total energy basket is quite frail, the traditional thermal energy derived from domestic coal is at a jeopardy; specially, because of the reason that, coal-based processes emit substantial amount of CO_2.

While renewable energy sources gain a significant share in the energy basket of the country, it must be contended that, coal shall remain the backbone of power generation, needed to cater to the burgeoning demand of a population of 1.47 billion. Presently, Coal caters to 55% of the country's energy need and about 75% of total generated electricity.

During this transition, certain other avenues have emerged as potential use for the domestic coal that are not only, economically viable but also, more sustainable. Since, the country has huge agricultural base, the demand for fertiliser along with other chemicals and synthetic natural gas, for various other purposes, is substantial. Coal to Chemicals in this connection gains significance to meet the domestic Fertiliser and Natural gas requirements, while additionally producing methanol, ethanol, DME etc. too. All these could additionally play a significant role in rationalising the energy import bill of the country. It is important to note that, India remains heavily dependent on fertilizer imports; furthermore, the nation's domestic production capacity relies almost entirely on imported natural gas. This landscape could be fundamentally transformed by the strategic utilization of coal as a feedstock for chemical production, reducing import dependencies.

Import Substitution Significance and Policy Intervention

Presently, the country is heavily dependent on imports of oil and gas needs. As per the target set by our Honourable Prime Minister during his speech on 75th Independence Day, India needs to be energy independent before its 100 years of independence.

Towards achieving import independence, various initiatives have been taken by Govt. of India.

- *National Coal Gasification Mission:* Govt. of India's National Coal Gasification Mission aims to achieve 100 million ton (MT) of coal gasification by the year 2030.

- *Financial Incentive Scheme for Coal Gasification Projects:* In line with Govt. of India's initiative launched in January 2024, a total budgetary outlay of INR 8500 Cr has been approved to accelerate the adoption of coal gasification technology.

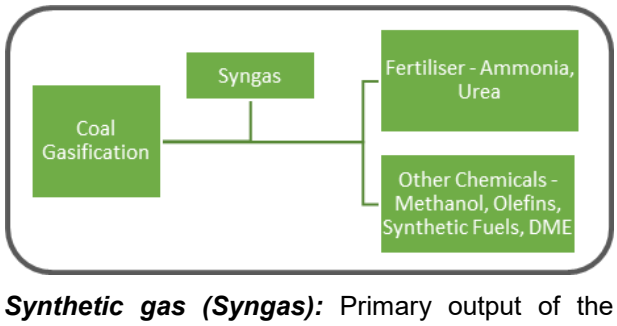
- *Union Budget 2026-27:* Current Union budget also signals major push for coal gasification for the country, through massive financial incentives, viability gap funding etc. to promote coal and lignite gasification projects.

- *New Chemical Parks:* Another initiative of current union budget, wherein specialised plug-and-play industrial clusters are designed for fostering sustainable and high-value manufacturing targeted towards bulk chemicals, petrochemicals, speciality chemicals and fertilisers.

The Core Technology – Coal Gasification

Unlike traditional combustion, in coal gasification coal is broken into its chemical constituents, in the presence of high-temperature and high-pressure environment, with controlled amount of oxygen and steam. Syngas produced as part of the Gasification process is further used for production of various fertilisers and other chemicals (Exhibit-3).

Exhibit-3: Coal Gasification – Downstream Products



Synthetic gas (Syngas): Primary output of the coal gasification process is syngas or synthetic gas, which is a combination of Hydrogen (H_2) and Carbon Monoxide (CO). Further, the raw syngas is cleaned to remove impurities like sulphur and CO_2.

Coal to Fertilisers: One of the most important applications of Coal-to-Chemical is production of fertilisers. For this purpose, Nitrogen is extracted from Air, which reacts with H_2, available in syngas, to produce Ammonia (NH_3). Ammonia is

further reacted with CO_2, obtained from coal gasification, to produce Urea $(NH_2)_2CO$, which is world's mostly used solid nitrogen-based fertiliser. Studies reveal that the cost of production of Fertiliser through the gasification route is the least expensive. The fact that coal is available significantly in India brings obvious advantages of utilisation of indigenous resource, reduction/ elimination of fertiliser-import and directional reduction in import of natural gas, all of it is a win-win for the Nation.

Coal to Chemical: Apart from fertiliser, syngas can be processed into a variety of high-value chemicals such as:

- *Methanol (CH_3OH):* this is used as a base for plastic, paints, fuel additives and also acts as solvent for many bulk drugs. Besides it can be used as a blending in the gasoline pool.

- *Ethanol (C_2H_5OH):* Another downstream product from syngas, obtained through coal gasification. Under the National Policy on Bio Fuel, 5% ethanol is blended with petrol, which is known as First-Generation Ethanol blended petrol (EBP). And further, it is now being blended to the extent of 20% ethanol blended petrol, also known as E20. Accordingly, in the current year about 1016 Cr Litre of Ethanol is needed for blending with petrol.

- *Olefins:* Presently, olefins are produced from natural gas and naphtha. The country being deprived of adequate reserve, both the feedstocks are grossly import dependent. About 45% of natural gas requirement is fulfilled through import. Naphtha is produced from crude oil, which is imported up to about 82% of its requirement. Alternatively, coal-driven methanol can be further converted to ethylene and propylene, which are considered to be the building blocks for petrochemicals.

- *Synthetic Fuels:* Syngas is converted to liquid hydrocarbons such as jet fuel or liquid diesels.

- *Di-Methyl Ether (DME):* At Present, insignificant amount of DME is produced in the country. DME is an eco-friendly aerosol propellent and a substitute of cooking LPG or diesel alternative. Blending of DME in the LNG pool can reduce import requirement of LNG. DME can be produced from methanol or directly from syngas.

- *Acetic Acid (CH_3COOH):* Acetic acid, commonly known as Vinegar, can be produced by carbonylation of methanol obtained as a downstream product of coal gasification. Thus, low cost of methanol is imperative to make acetic acid competitive.

Environmental and Economic Challenges

While there is immense potential of converting coal into various high-valued chemicals, including fertilisers, primarily through coal gasification technique, there are certain environmental as well as economic challenges in implementation of the same. The technology for coal gasification hitherto has been a subject of discussion, as it is highly dependent on the quality of coal. Indian coal quality has been an issue as it is laden with high ash. This warrants either the coal to be washed to remove the ash or to blend it with good quality of coking coal. Over a period of time though, the gasification technology has matured and is beginning to transform the coal to chemical dynamics. China is already setting the trend!

Environmental Challenges

- *Water intensity* – The process requires huge amount of water, which poses concerns especially in the water-scarce regions.

- *Greenhouse Gas Emissions* – The process coal gasification, when not integrated with CCUS, emits substantial amount of greenhouse gases, which could be a potential threat to environment.

Economic Challenges

- *High CAPEX* – High capital investment is needed to set up coal gasification plant and further integration to chemical or fertiliser plants.

- *Low-Grade Coal Issues* – Though India has coal reserves in abundance, most of the coal domestically available has high ash content. Which is not suitable for conventional gasifiers and reduces efficiency or alternatively increases OPEX.

- *Technology Gap* – In absence of indigenous technology, suitable for high-ash coals, many a times expensive solutions need to be imported. This not only, increases import bill but also, become highly dependent on volatile FOREX rates.

- *Long-Term Viability* – Due to its high OPEX and dependability of downstream industries to make it environment-friendly and sustainable, coal gasification initiatives are found to be difficult. A comprehensive feasibility study is required, to determine if the revenue generated from coal gasification products justifies the substantial CAPEX and OPEX associated with the facility.

Coal Gasification Adoption - Global Dynamics

Competitive dynamics behind adoption of coal gasification is primarily concentrated in Asia-Pacific regions.

- *China* – Some of the driving forces behind coal-to-chemical growth in China are (i) availability of coal in abundance (about 94% of total fossil energy resources is constituted by coal); (ii) towards achieving net-zero target, coal is expected to phase out from its power sector, thus, channelizing domestically available coal in other revenue stream is need of the hour; (iii) amongst all the coal-consuming industries, coal-to-chemical has maximum potential for profitability; (iv) further in line with its emission goal, Chinese Govt's initiatives excludes consumption of "raw material energy", which creates coal-to-chemical an inevitable choice, which is also supported by the chemical industry's economics.

- *India* – Some of the driving forces behind coal-to-chemical growth in India are, (i) coal is the most abundant fossil fuel in India, with declining popularity of power generation from coal, channelizing coal towards other revenue stream has gained impetus. (ii) apart from import of crude oil and natural gas, the country also imports substantial number of products derived from crude oil and natural gas such as ammonia, DME, methanol, olefins, etc. Reduction of import dependence has also provided fillip to produce chemicals from domestically available coal. (iii) country's huge agricultural base needs significant amount of urea, coal gasification has tremendous potential for fertiliser sector. At one side it provides H_2 and in another side it generates CO_2, both of which are integral components of urea or other fertilisers.

- *United States* – Some of the primary reasons that enhances coal prospects in United States are, (i) import of oil could be replaced with coal-driven fuels. (ii) synthetic fuel derived from coal gasification can be further converted to gaseous fuel or some intermediate product, that can be upgraded and used as substitutions to natural gas, hydrogen, ammonia, or other chemicals.

- *South Africa* – Some of the primary reasons that enhances coal prospects in South Africa are, (i) electricity demand for South Africa is increasing at a galloping speed. Though, there is a push in the country to adopt non-fossil fuel electricity generating technologies, abundant coal reserves and its low cost coupled with enhanced electricity demand has cemented coal as a preferred energy source.

Path Forward

Over the decades, coal had been perceived primarily as a feedstock for thermal power plants. Though, coal-driven electricity had remained backbone for Indian growth and development; renewable source of energies has also gained momentum, coal gasification due to lack of maturity of gasification technology has not gained as much momentum hitherto.

The entire value chain of coal, as shown in Exhibit-4, has not yet been fully realised as a potential asset. In spite of certain initial challenges, coal driven chemicals and fertilisers can bring an economic shift for India.

To leverage maximum benefit from these initiatives, following area may be focused on,

- *Integrated Carbon Capture, Utilization, and Storage (CCUS)* – Coal gasification plants need to be integrated with Fertiliser or Chemical plant or CCUS, to realise full potential of the initiative and make it a sustainable solution.

- *Water-Lean Technologies* – To address water scarcity related concerns recycling of water, Zero Liquid Discharge (ZLD) etc. to be promoted.

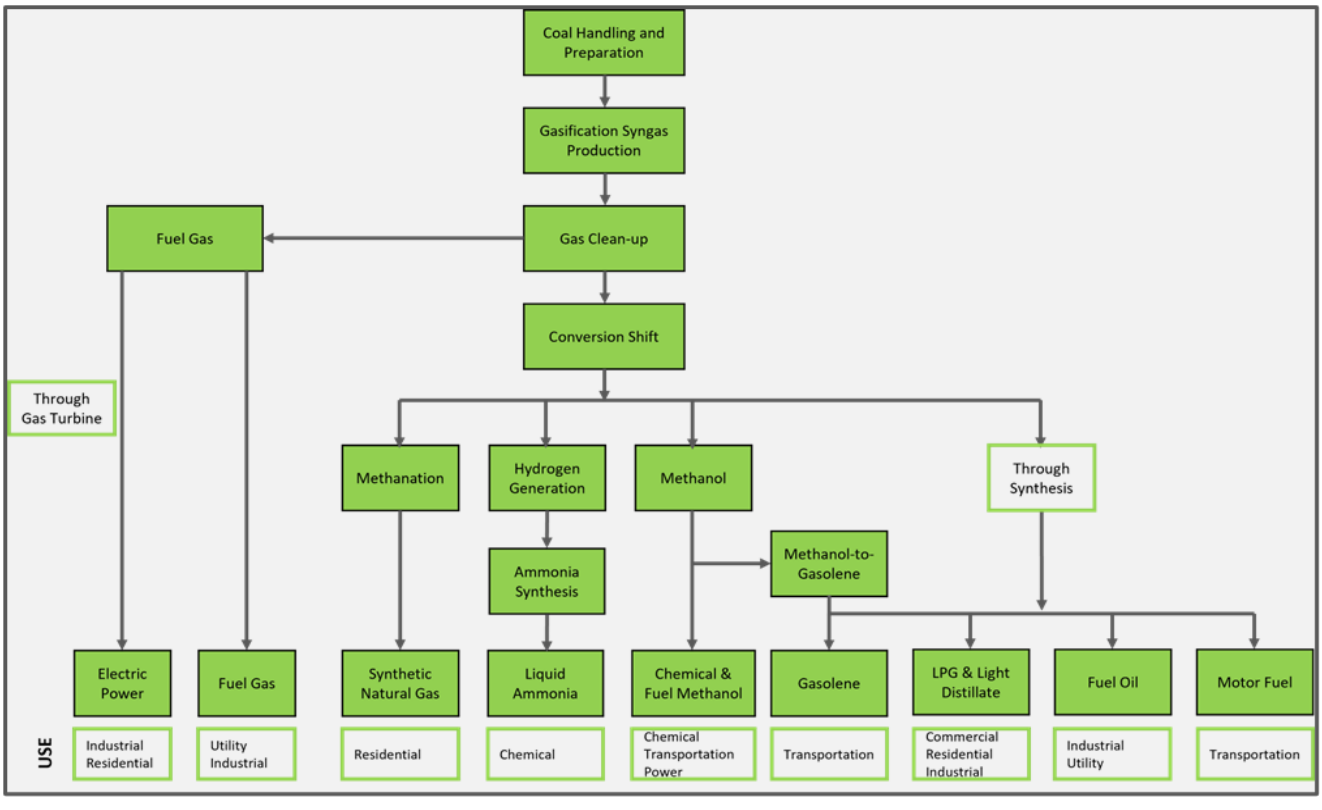
- *Ash Valorisation* – High-ash slag waste derived from the coal gasification can be processed to convert it to revenue stream such as manufactured sand (M-Sand), additives or other building materials.

- *Poly-generation Models* – Rather than producing just one chemical, multiple products such as hydrogen, ammonia, urea, olefins etc., based on market price and demand, can be produced to maximise profitability and reduce payback period of investment.

- *Scaling Indigenous Technology* – Indigenous technologies suitable to high-ash coal to be designed.

- *Policy-Driven De-risking* – Incentive driven policies such as Viability Gap Funding (VGF) or direct capital subsidy to reduce initial investment burden, Production Linked Incentives (PLI) in terms of tax rebate or cash incentives for every tons of "clean" chemical produced. Revenue Share Rebates or offering discount on coal feedstock to be used for gasification, rather than direct burning can be promoted, to change mindset of various stakeholders and adopt this technology, as an economic solution rather than mere compulsion.

Exhibit-4: Entire value chain of the process



Data Source: https://coal.gov.in/sites/default/files/ncgm

References

https://coal.gov.in/sites/default/files/ncgm
https://energyandcleanair.org/analysis-chinas-coal-to-chemicals-growth-risks-climate-goals
https://www.indianchemicalnews.com/opinion/coal-to-chemicals
https://www.osti.gov/biblio
https://researchspace.csir.co.za/items

Economic Scenario and Outlook for Crude Oil Market

Narattam Chakraborty
Marketing Department

Mangalore Refinery & Petrochemicals Limited

A.) Global Economic Scenario:

Though robust AI boost in the US, easing inflation in Eurozone and positive economic sentiments in China and India supported global economy amid recurrent volatility, however, the outset of war in Middle-East from 28th Feb and its subsequent advancement, left entire world within a shadow of uncertainty and unpredictability.

Global GDP growth for 2025-26 is expected to be between 3.0% (as per World Bank) & 3.2% (as per IMF), representing a slight slowdown from 2024 levels, on account of trade tensions, high inflation in some areas and geopolitical uncertainty. While emerging markets in developing nations and low-income countries remained to be the strong contributors, advanced countries will maintain a moderate growth of average 1.5%, during the said period.

A.1) Salient Economic Figures for 2025-2026:

Parameter	Remarks*
Global GDP	3.0 - 3.2%
GDP of Developed Nation	1.5%
GDP of Emerging Market in Developing Nations (EMDE)	4.1-4.4%
GDP of Asia / India	5.9% / 6.7%
GDP of USA	1.8%
GDP of Euro Zone	1.2%
**Values mentioned are average and tentative in nature.*	

The IMF projects global GDP to grow by 3.3% for 2026 (2.9% by Goldman Sachs) and 3.2% for 2027. Global inflation is anticipated to hold the figure of 3.8% and 3.4% in 2026 and 2027 respectively.

Following chart from IMF depicts the growth projection for some of the major economies:

World Economic Outlook Growth Projections

(Real GDP, annual percent change)	ESTIMATE 2025	PROJECTIONS 2026	2027
World Output	**3.3**	**3.3**	**3.2**
Advanced Economies	**1.7**	**1.8**	**1.7**
United States	2.1	2.4	2.0
Euro Area	1.4	1.3	1.4
Germany	0.2	1.1	1.5
France	0.8	1.0	1.2
Italy	0.5	0.7	0.7
Spain	2.9	2.3	1.9
Japan	1.1	0.7	0.6
United Kingdom	1.4	1.3	1.5
Canada	1.6	1.6	1.9
Other Advanced Economies	1.8	2.0	2.1
Emerging Market and Developing Economies	**4.4**	**4.2**	**4.1**
Emerging and Developing Asia	5.4	5.0	4.8
China	5.0	4.5	4.0
India	7.3	6.4	6.4
Emerging and Developing Europe	2.0	2.3	2.4
Russia	0.6	0.8	1.0
Latin America and the Caribbean	2.4	2.2	2.7
Brazil	2.5	1.6	2.3
Mexico	0.6	1.5	2.1
Middle East and Central Asia	3.7	3.9	4.0
Saudi Arabia	4.3	4.5	3.6
Sub-Saharan Africa	4.4	4.6	4.6
Nigeria	4.2	4.4	4.1
South Africa	1.3	1.4	1.5
Memorandum			
Emerging Market and Middle-Income Economies	4.3	4.1	4.1
Low-Income Developing Countries	4.6	5.1	5.1

Source: IMF, World Economic Outlook Update, Jan 2026 Data

Following are certain of the major influencers, in deciding the trajectory for global economy, in coming years:

Strength / Opportunities	Weakness / Threat
US: Strong AI & Data centre investment **(Fig1),** Fiscal Supports / Interest cuts / Wage growth and sustained consumer spending. Calming US import tariff **(Fig 2)**, inflation drop w.r.t Personal Consumption Expenditure (PCE) **(Fig3)**, US GDP to remain between 1.8% - 2.8% in 2026. EU: Easing Inflation, Fiscal support, Employment in Infrastructure and defence. China: Accommodative Policy driven by positive sentiment in Chinese real estate industry, potential for economic revival, abundancy for Rear-Earth elements, capability to produce highly tech goods in larger volumes and access to emerging markets. The Purchase Manager Index (PMIA) has shown considerable stability for most of the economies (Fig4).	Geo-political uncertainties, war and possibilities of supply chain disruptions. Tariff uncertainty, Trade tension, Uncertainty and delay in US trade deal. Exchange rate fluctuation, liquidity crisis in market, potential inflation. Price volatility, doubt in long- term business outlook, uncertainty in business decisions and conservative purchase. Climate Change.

Fig 1: US Spending in "AI" & Other Sectors:

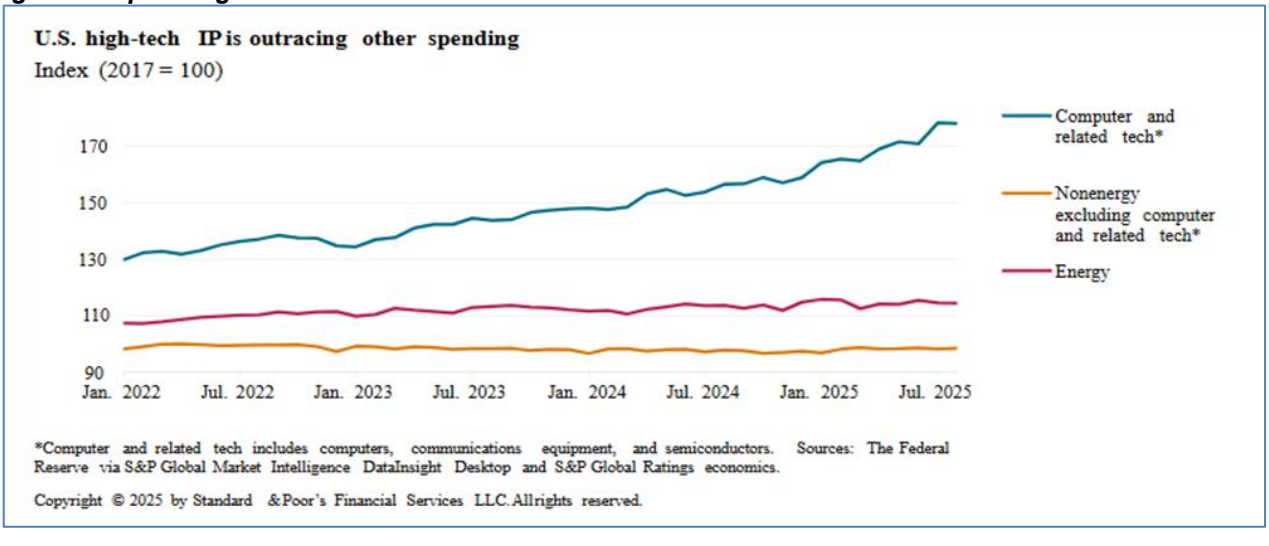


Fig 2: Stability in US Import Tariff:

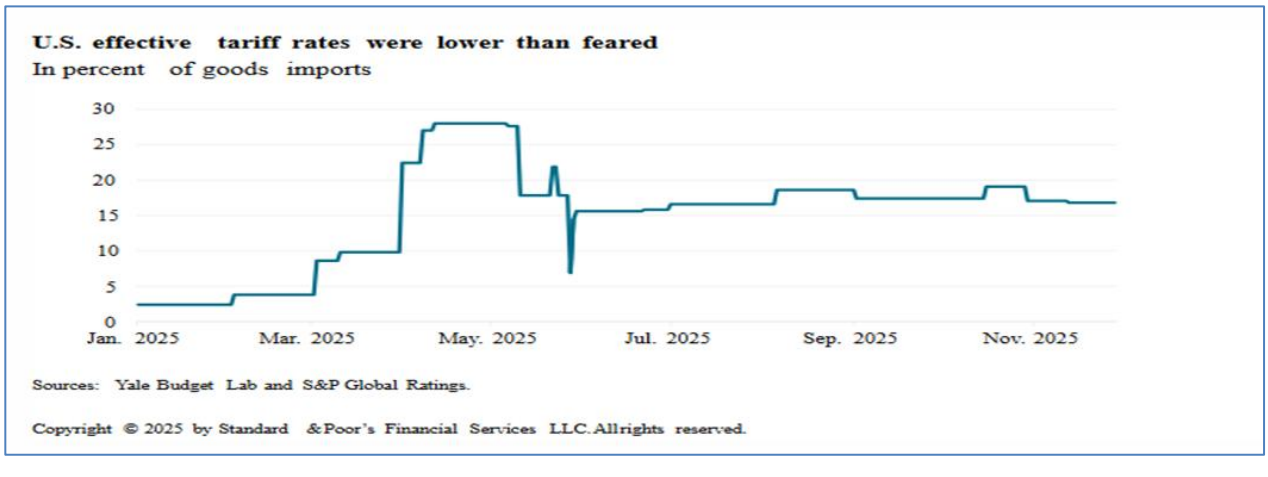
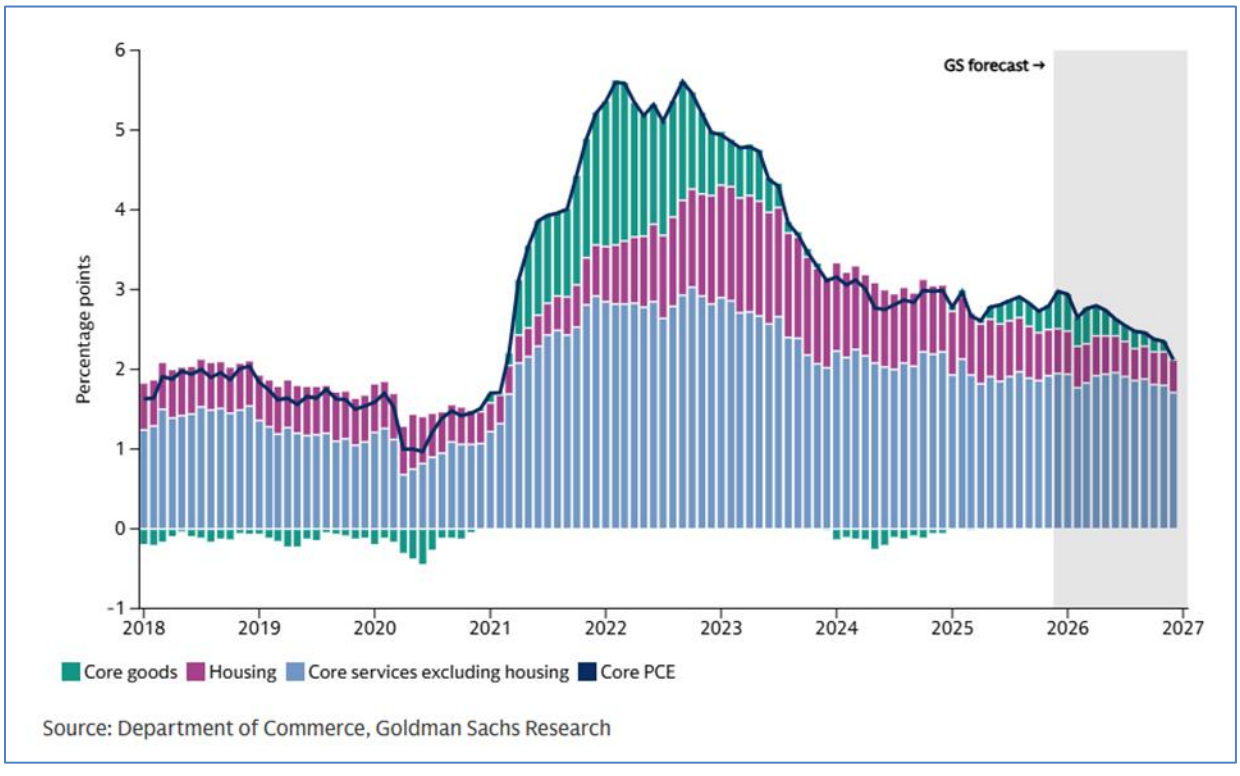


Fig 3: Contribution of Personal Consumption Expenditure (PCE) in US Inflation:



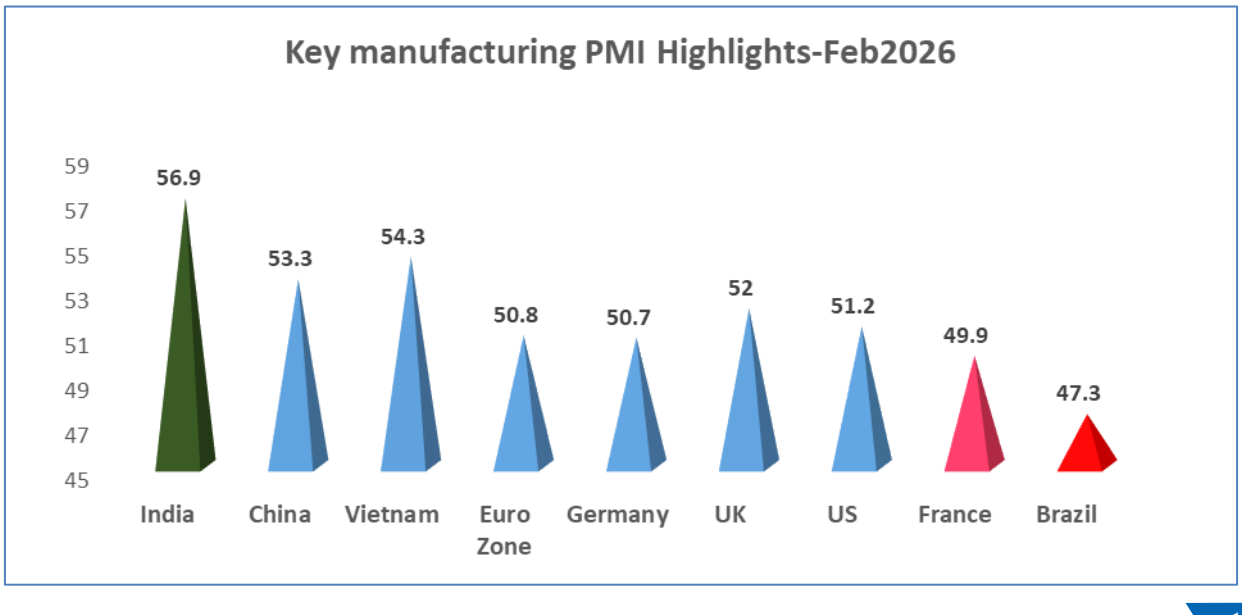
The US economist estimates that inflation, pertaining to their "Core Personal Consumption Expenditures" will fall from 3% in 2025 to 2.2% in 2026, with stability in tariff terms.

In Europe, economy predicted to grow 1.3% in 2026-27 with higher fiscal spending, most likely in Germany, to boost the economy. Spain is likely to register best growth figure of between 2.4-2.6% in 2026-27. Average household income of European countries are expected to increase by an average of 1.5% in 2026. However, higher energy price, regulatory burden and competition in export markets are to be the major growth headwinds for the continent.

For China, growth prospect remains optimistic between 4.5-4.8% in 2026-27. Abundancy for rear earth elements, capability to produce highly tech goods in bigger volumes, access to emerging markets, backed with their supportive government policies will boost the growth.

In UK, there is likely to be a trade-off between weakening labour market and reduced inflammatory pressure in 2026, with expected growth of between 1% - 1.5%.

Fig 4: Manufacturing PMI – Feb 2026:



Global Purchasing Managers' Index (PMI) data shows strong expansion in India and China.

Anyhow, continued accelerated unrest in Western Asia added a lot of unreliability in global economic outlook from the end of February. The US-Israel-Iran conflict, which commenced from 28th of Feb, engulfed most of the Persian Gulf, pushed crude oil & LNG price higher and key refined products, such as diesel and jet, spiralled out of control.

The situation worsen as ship movements were disrupted through the Strait of Hormuz, the 21-mile wide waterway, accounting for around 30% of overall global sea borne crude movement. Iran controls the northern coast of Strait of Hormuz, in which military and naval exercises, pushed energy price to record high, amid disruption for movement of fuel tankers, through it.

Fig5: The Strait of Hormuz

Red Arrow: Towards Europe via Red Sea
Yellow Arrow: Towards SA, SEA, FEA, Australia etc. via Arabian Sea, Indian Ocean etc.

Fig6: Significant drop in oil transit through the Strait of Hormuz

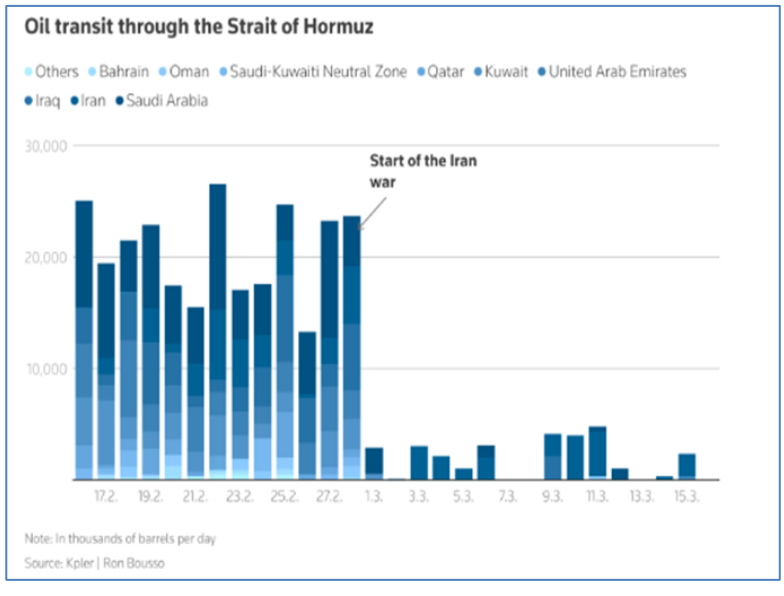
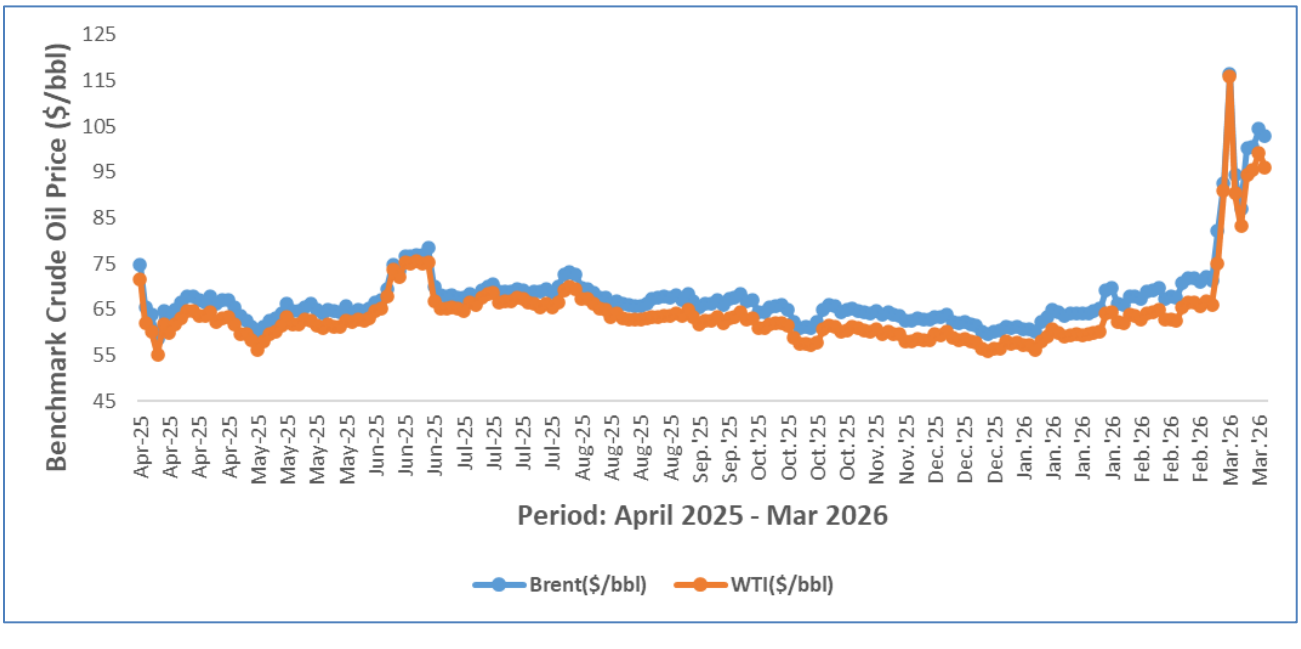


Fig 7: Trend for Crude Oil Price



The World Uncertainty Index (WUI), which is a quarterly measure, tracking economic and political uncertainty across globe, reached an unprecedented all-time high of 106,862 in Feb 2026, surpassing all previous peaks.

B) Certain Influencers of Global Crude Oil Market:

Tension aggravated in global crude oil supply and energy market remained anxious, as the Middle-East war was in its third week, while writing this report. There were significant disruptions in the passage of crude oil and gases through Strait of Hormuz, voyage route for ships carrying 30% of global crude oil requirement and Energy and commodity analysts at Wood Mackenzie are speculating that crude oil might touch $200/bbl in coming days, if the situation does not improve quickly. Middle East war has already discontinued global oil supply by 7.4-8.2 million barrels per day. The release of 400 million barrels recently pledged by 32 IEA members over a 12-month period would only cover approximately 1.1 mb/d of that shortfall, potentially leaving global markets in a huge deficit, as per Standard Chartered estimate.

Though the International Energy Agency (IEA) has stated, that the organization is ready to release more oil stocks if needed, however, sustained attacks on major oil terminals and gas fields in gulf countries affected and postponed the IEA's decision of releasing sufficient amount stocks from the strategic reserves.

As per Oil price Intelligence report, there are only two bypassing routes that avoid the Strait of Hormuz, namely;

(a)Saudi Arabia's 5 million b/day East-West pipeline and

(b) The UAE's 1.5 million b/day Habshan-Fujairah conduit.

While Saudi Aramco speed up loadings from its Red Sea coast to 3 million bbl/day, but still well below from its 7 million bbl/day export rate, before the war. However, news of attack in Samref refinery at Yanbu on Saudi Arabia's Red Sea Coast added uncertainty about continuity of its operation.

The UAE's main evacuation route might see further disruptions, as Fujairah export terminal was struck repeatedly, forcing national oil company ADNOC to suspend loadings.

Though, earlier both Israel and Iran largely avoided targeting any energy assets, however, Israel attach on Iran's South Pars field and subsequently Iran's retaliation in attacking world's largest "Gas to Liquid conversion facility (i.e.LNG)" at Ras Laffan in Qatar, marked a transition toward long lasting capacity destruction and harbinger of long term supply disruption.

Additionally, while writing this report, anxiety further intensified as US threatened to hit and obliterate various Iranian power plant, if Tehran does not reopen the Strait of Hormuz within stipulated timeframe.

In another development, after Iraq failed to persuade the Kurdish Regional Government to resume exports of crude from the country's south via the Kirkuk-Ceyhan pipeline, is planning to restart a long-halted pipeline that bypasses Kurdish territory. As on 22nd of March, Iraq has declared force majeure on all oilfields developed by foreign oil companies. The crude production at Basra Oil Company has been cut to 900,000 bpd from 3.3 million bpd.

Daily exports of crude and products from the Arab Gulf have plunged by 60% since the onset of US-Iran war, with the previous flow of more than 25 million bbl/day shrinking to just 9.7 million bbl/day (as per mid of march), tightening global oil markets (refer Fig 6 above).

As per intelligence report, Kuwait's long-mooted $7 billion midstream infrastructure farm-out deal might be in halt, after Australian investment fund, Macquarie, decided to withdraw from bidding, amid uncertain geopolitical situation in Middle East.

Amid supply crisis, Chinese refineries, Sinopec and CNPC, are reported to resume imports of seaborne Russian crude after a four-month-long hiatus, driven by US sanctions. As per Oil Price Intelligence report, in order to mitigate the impact of supply disruption, Japan too is planning for Russian crude after a long gap of almost three years.

US average retail diesel prices have jumped above $5 /gallon for the first time since December 2022 and Canada's oil producers are planning to ramp up output by a collective 23.6 million barrels, as the country presently has no strategic petroleum reserves.

Amid war and supply bottleneck, the price gap between Brent and WTI has widened to almost $15-18/bbl (generally ranging between $4-6/bbl) hardly experienced in last 10-12 years. A widening Brent-WTI spread generally signifies that international oil (Brent) is becoming significantly more expensive than U.S. oil (WTI). This price delta normally reflects higher global geopolitical risks, supply bottlenecks for both Brent and U.S. crude, relative oversupply and lesser consumption of oil in the U.S. market compared to the rest of the world etc.

Frequent warfare between Russia and Ukraine too, kept tension in global energy market escalated. In February, Hungary discontinued diesel shipments to Ukraine in a response of halting Russian oil transit to Hungary, by Ukraine, through Druzhba pipeline. Slovakia was has heard to be affected by supply disruption.

As per reliable source, Hungary was looking to move Russian oil through Croatia via the Adriatic pipeline. However, Croatia has voiced reservations in such practise, as increasing transit of Russian crude through Croatia's territory, may fetch political scrutiny for Zagreb (i.e. Croatia Capital).

According to Reuters, Venezuela's state-controlled PDVSA has been negotiating with its existing joint venture partners Chevron, Repsol and Maurel & Prom to expand their acreage beyond what been already allocated to them.

C) Economic Outlook Of India:

India's economic outlook remained robust, with GDP growth for 2025-26 projected at approximately 7.4%–7.6 %, driven by strong domestic consumption, GST and Income tax reforms, increased Government capex, manufacturing boost and special focus towards investment and development to sectors, driven by creativity, culture, and intellectual properties to generate economic value, jobs, and development (i.e. the "Orange Economy"). Amid persistent external volatilities, India recorded 7.8% growth in Q3-2025-26.

Projected Growth in 2026:

Sector	Projected Growth in 2026 (%) – (Average Value)
Manufacturing	9.0%
Construction	7.0%
Service	9.1%
Agriculture	3.1%

The RBI has kept the repo rate unchanged at 5.25% in March 2026, promoting strategic support towards development. Additionally budget of 9% has been allocated in Capex, to augment the infrastructural activities in country.

India's CPI inflation eased significantly, averaging 1.7% between April and December 2025, with slight rise to 2.75% and 3.2% in January & February 2026 respectively, amid global volatility.

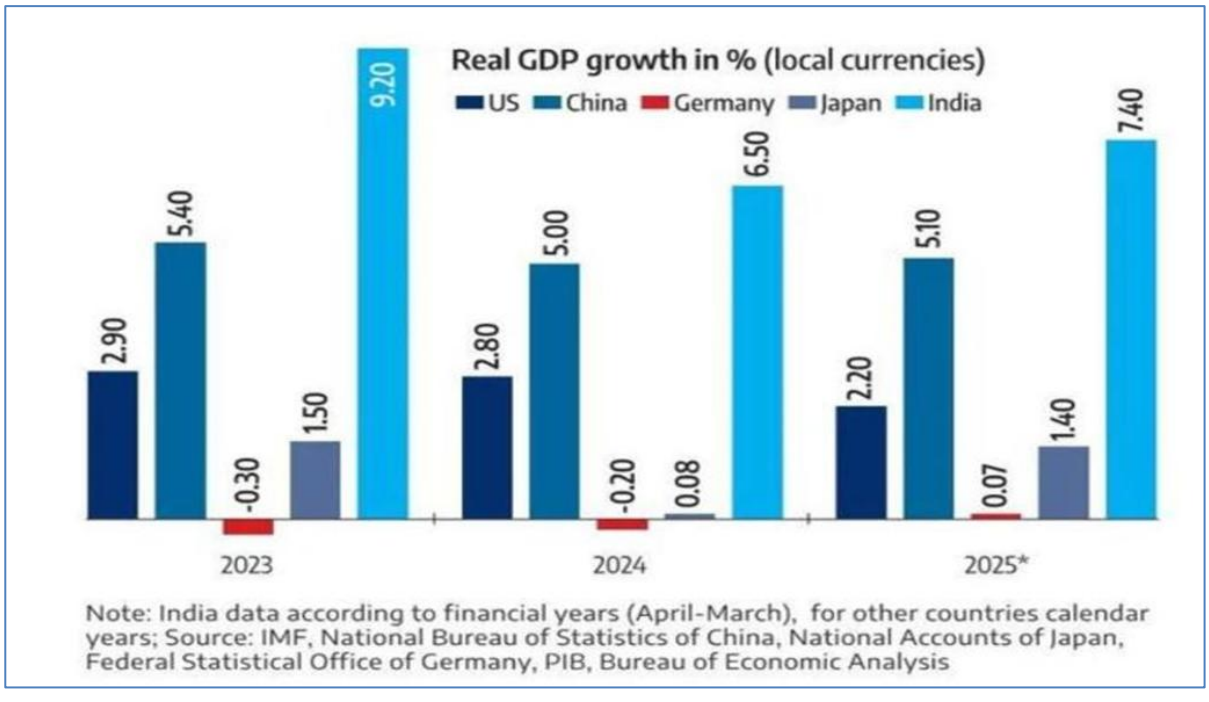
India's foreign exchange (forex) reserves reached a record high of $728.49 billion for the week ending February 27, 2026, according to RBI data. This increase driven by a significant rise in gold reserves reinforced the country's external stability.

Key Indian Economic Figures for FY 2025-26:

Parameters	Values / Remarks
GDP (refer Fig 7 below)	Growth of 7.4%
Nominal GDP (refer Fig 8 below)	346 Lakh crore
Nominal GDP Growth	Growth of 8.6%
GVA Growth	Growth of 7.3%

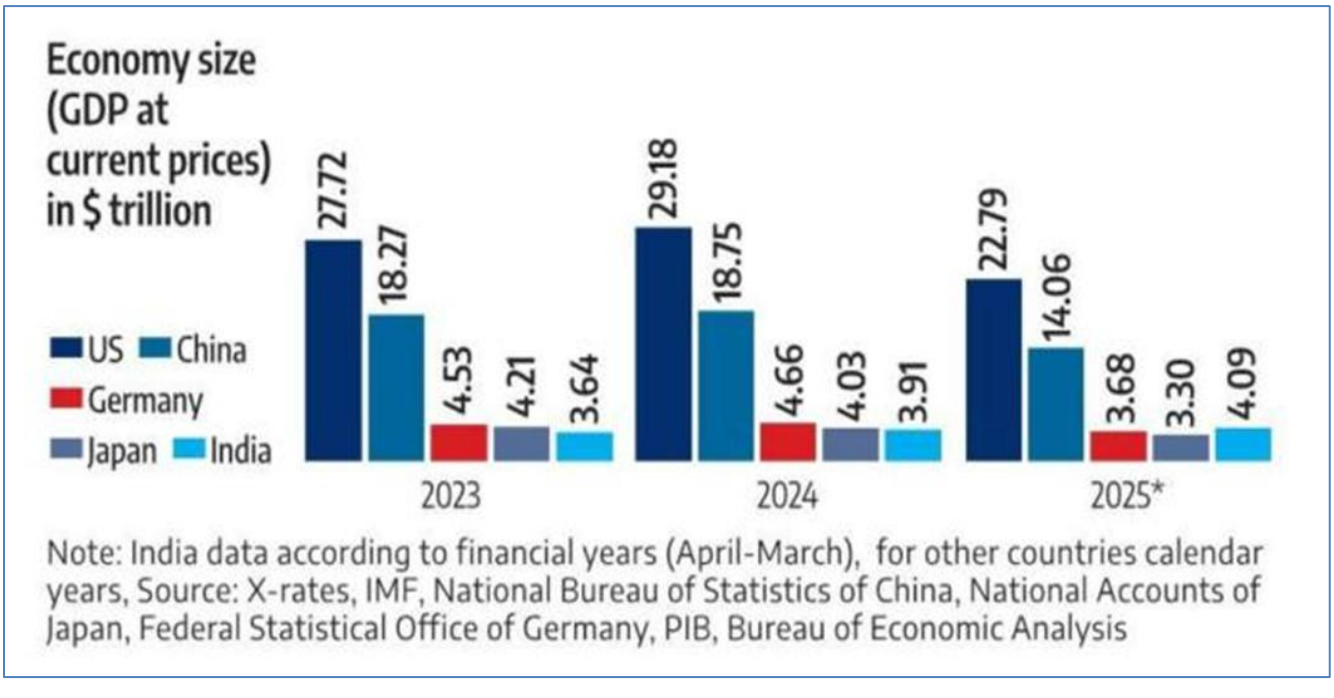
Values are tentative.

Fig 8: GDP of Some Major Economies in 2025-26:



Indian GDP is estimated to grow by 7.4% in FY 2025–26, up from 6.5% in the previous year.

Fig 9: Sizes of Some Major Economies in 2025-26:



Indian nominal GDP expected to reach approximately ₹345 lakh crore ($4.3–$4.5 trillion) in 2026.

Indian Economic outlook for 2026-27 remains upbeat, with around 6.8-7.2% growth projection by Goldman Sachs and Deloitte. With strong private investment and rural consumption, India is likely to maintain its position of fastest growing economy in 2026-27 as well.

CPI Inflation projections for Q1 and Q2 of 2026-27 have been marginally upward modified by RBI to 4% and 4.2% respectively, amid increase in price for precious metal which contribute about 60-70 of basis points. However, the risks are seemed to be mild, with projected values are very near of targeted value of 4%.

In addition to traditional industries, Artificial Intelligence and Machine learning, Renewable energies, Ecommerce, Electric vehicles, Fintech are likely to register significant growth in 2026-27.

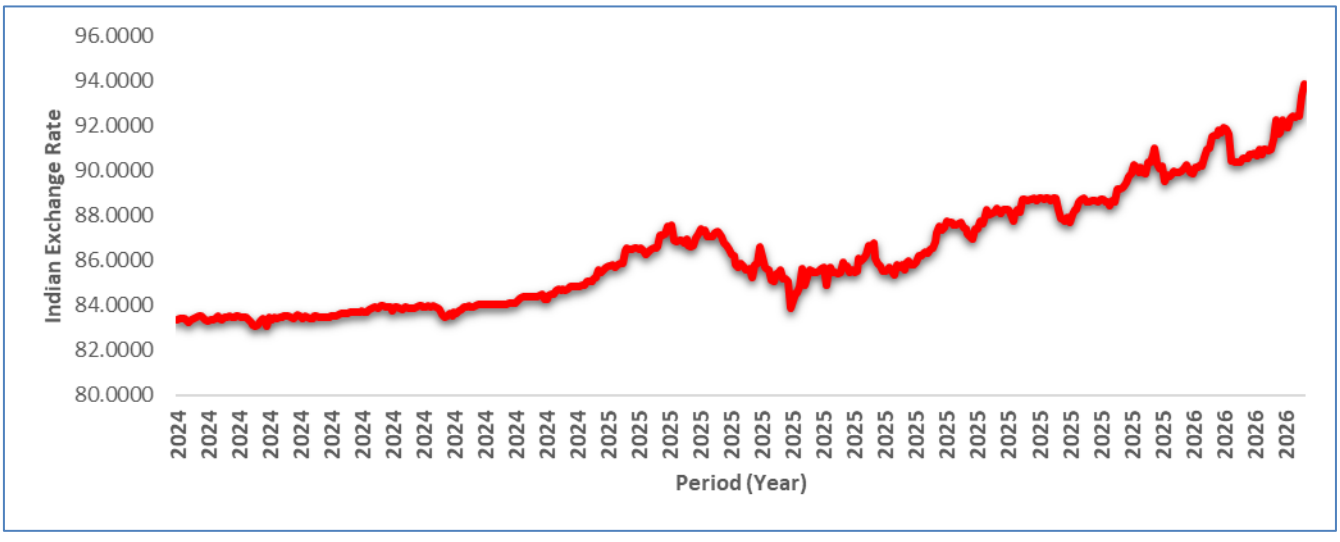
D) Near Term Outlook of India – Steps Toward Crisis Management:

The balance between economic growth and inflationary pressures places the globe in a complex position in the middle of Middle East conflict.

India is dependent on imports for around 86% of its crude oil needs and 50 % of natural gas requirements. Roughly 30% of crude oil and 60% of gas requirement of India, find their transit via the Strait of Hormuz.

Over last few years, in spite of significant volatility in its exchange rate, amid multiple external factors, Indian economy has shown a lot of resilience in maintaining its growth.

Fig10: Indian Exchange Rate with USD (Apr.'24 - Mar.'26)



Source: RBI

Under proper advice and guidance from GOI, efficient measure were been taken to ensure uninterrupted and relevant supply of petrol, diesel, ATF in the country. Non-Hormuz crude sourcing has increased to approximately 70%, up from 55% in pre-war situation. All domestic refiners in maintaining highest possible capacity utilization and maximizing LPG production have taken collaborative initiative.

Additional quantity of Kerosene was allocated by GOI, as an alternative of domestic LPG.

India has diversified its LNG/LPG sourcing, beyond the Middle East, by increasing imports from the U.S, Canada, Norway, Algeria, and Russia.

Amid Middle East tensions, these strategies have ensured stable energy supply through new and diversified sources, mitigating potential shortages and reducing reliance on traditional suppliers. Nevertheless, strategic diplomacy and efficient negotiation and logistics efforts by GOI ensured recurrent and safe arrival of Indian-flagged LPG tankers (e.g. Shivalik, Nanda Devi) in the country, amid war and maritime disruption in Middle East, precisely through “Strait of Hormuz”.

India seemed to remain the point of point of attraction in upcoming years. Already the world’s fourth largest economy, India is charting a confident course toward becoming the third largest by 2030, with a projected GDP of (≥) USD 7.3 Trillion.

Brownfield Retrofit of Diesel Hydrotreaters for Renewable Diesel and SAF: A Practical Engineering Framework for Refinery Decarbonization

Tania Guha
Senior Manager

Engineers India Limited

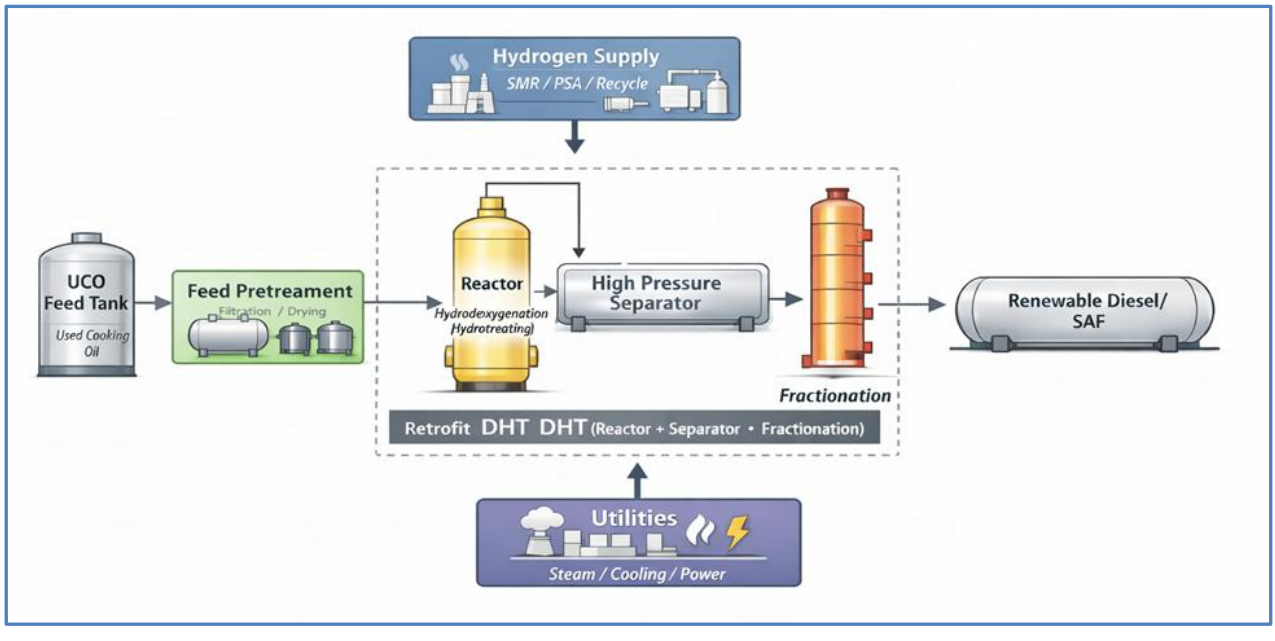
Refineries worldwide are evaluating pathways to reduce carbon intensity while preserving the value of existing assets. Among the most practical options is the brownfield repurposing of diesel hydrotreaters for the production of renewable diesel and Sustainable Aviation Fuel (SAF). However, retrofit feasibility depends on multiple interacting factors including hydrogen availability, reactor operability, utilities integration, and feedstock handling capability. This paper presents a structured engineering approach for evaluating renewable fuel integration in existing refinery units. A Refinery Retrofit Readiness Index (RRRI) is introduced as a practical screening tool that enables comparison of retrofit opportunities, identification of limiting systems, and prioritization of investments under capital constraints. Analysis indicates that brownfield retrofits can achieve substantial lifecycle carbon-intensity reductions with targeted modifications, while phased implementation reduces technical and financial risk. Hydrogen management emerges as a key limiting factor in many scenarios, highlighting the importance of system-level planning. The results demonstrate that refinery decarbonization can be achieved through practical, incremental steps rather than large-scale asset replacement, making brownfield retrofits a viable pathway for energy transition in emerging refining economies.

1. Industry Context and Engineering Decision Challenge

Most refineries currently in operation, including in India, were designed for processing fossil feedstocks yet are expected to remain operational well beyond 2040. At the same time, increasing pressure to reduce lifecycle carbon emissions, evolving fuel specifications, and emerging demand for Sustainable Aviation Fuel (SAF) are driving refiners to evaluate pathways for producing low-carbon fuels within existing infrastructure. Replacing refinery assets with entirely new facilities is capital-intensive and therefore difficult to implement at scale in the near term. As a result, refinery operators are increasingly confronted with a practical engineering and investment question: **Can existing hydroprocessing units be repurposed to produce renewable fuels safely, economically, and with minimal modification?** Diesel hydrotreaters represent promising candidates for such retrofits. The operating conditions required for hydrodeoxygenation of renewable feedstocks are broadly similar to those used in conventional hydrodesulfurization, enabling potential reuse of high-pressure reactors, recycle gas compressors, and fractionation facilities. However, renewable feed processing introduces technical challenges, including increased hydrogen demand, higher reactor temperature rise, catalyst compatibility considerations, feed pretreatment requirements, and utilities integration constraints that must be evaluated under realistic refinery conditions. In many refineries, retrofit decisions are based on preliminary technical assessments or isolated economic evaluations that may not fully capture refinery-wide constraints. Hydrogen network limitations, utilities margins, and feedstock logistics can significantly influence feasibility but are rarely evaluated in a structured manner during early project screening. This study evaluates the feasibility of repurposing diesel hydrotreaters for renewable diesel and Sustainable Aviation Fuel production under brownfield conditions typical of medium-complexity Indian refineries. In addition to technical and techno-economic assessment, a

structured screening framework—the Refinery Retrofit Readiness Index (RRRI)—is proposed to support practical decision-making by integrating hydrogen availability, operability constraints, utilities capacity, and feedstock readiness into a single evaluation methodology. By combining engineering analysis, operational considerations, and decision-support tools, this work provides refinery engineers, planners, and investors with a practical approach for evaluating and prioritizing renewable fuel retrofit opportunities. The findings suggest that brownfield retrofits may represent one of the most practical near-term pathways for large-scale deployment of low-carbon fuels in emerging refining economies.

Figure 1. Retrofit DHT for renewable diesel and SAF production



2. Practical Retrofit Challenges in Renewable Feed Processing

Although diesel hydrotreaters provide a technically attractive starting point, processing renewable feedstocks introduces several operational and design challenges that must be evaluated carefully.

2.1 Hydrogen Demand and Network Constraints

Renewable feedstocks such as used cooking oil and non-edible vegetable oils typically require higher hydrogen consumption due to hydrodeoxygenation reactions. Simulation and benchmarking indicate hydrogen demand increases of approximately 8–15% compared with conventional diesel hydrotreating service. In many Indian refineries, hydrogen networks already operate close to capacity, with limited spare compressor or header margins. Consequently, even moderate increases in hydrogen demand can create bottlenecks or operating constraints, making refinery-wide hydrogen balance evaluation essential for retrofit feasibility.

2.2 Reactor Thermal Behaviour

Renewable feeds often exhibit higher heat release during reaction, resulting in increased adiabatic temperature rise across catalyst beds, typically in the range of 15–25% compared with conventional service. This affects quench requirements, catalyst life, and temperature control margins. In existing units, limited thermal margins may restrict throughput or require optimization of quench distribution and monitoring strategies.

2.3 Feed Pretreatment and Operability

Renewable feeds may contain contaminants, oxygenates, and trace metals that can accelerate catalyst deactivation or cause fouling. Feed pretreatment and blending strategies are therefore critical for maintaining operational reliability. In addition, variability in feed composition can affect reactor stability, particularly in units originally designed for narrow feed quality ranges.

3. Evaluation Methodology

To assess the feasibility of repurposing diesel hydrotreaters for renewable fuel production under realistic refinery conditions, a structured evaluation methodology was adopted integrating process simulation, hydrogen network assessment, and techno-economic analysis.

3.1 Process Simulation

Steady-state process simulations were performed to estimate hydrogen consumption, heat release, product yields, and reactor temperature profiles under renewable feed processing scenarios.

Operating conditions were selected to represent typical diesel hydrotreater service in medium-complexity refineries, allowing comparison with conventional operation and identification of thermal and hydrogen constraints.

3.2 Hydrogen Network Assessment

A refinery-wide hydrogen balance was developed to evaluate header capacity, compressor utilization, recovery efficiency, and purge losses. Scenarios were examined for hydrogen recovery optimization, operating adjustments, and partial integration of low-carbon hydrogen sources to assess refinery-wide feasibility and identify potential bottlenecks.

3.3 Techno-Economic Evaluation

Capital and operating costs were estimated considering equipment reuse, incremental modifications, hydrogen consumption, and feed pretreatment requirements. Economic performance was evaluated using indicative capital indices, operating cost sensitivities, and payback estimates to compare retrofit scenarios with typical grassroots renewable fuel facilities.

This integrated methodology enables assessment of retrofit feasibility under practical operating constraints while capturing the interactions between process performance, hydrogen availability, and economic viability.
A comparative evaluation of brownfield retrofit and grassroots renewable fuel facilities is summarized in Table 1, highlighting differences in capital intensity, implementation timelines, hydrogen requirements, and carbon reduction potential.

Table 1. Comparative evaluation of brownfield retrofit and grassroots renewable fuel facilities

Parameter	Brownfield Retrofit	Grassroots Facility	Practical Implication
Capital investment	Moderate (reuse of major equipment)	High (new units required)	Retrofit reduces upfront investment risk
CAPEX index (grassroots = 100)	45–65	100	Significant capital savings
Implementation timeline	1.5–3 years	4–6 years	Faster deployment
Hydrogen requirement	+8–15% over base	High (dedicated hydrogen supply)	Hydrogen availability becomes key constraint
Carbon reduction potential	60–80%	70–90%	Retrofit achieves substantial reductions
Technical complexity	Moderate	High	Easier integration
Integration with existing refinery	High	Limited	Retrofit leverages existing infrastructure
Financial performance	IRR 15–20% (typical estimates)	Often longer payback	Improved project economics
Operational risk	Moderate	Higher during startup	Retrofit benefits from known equipment

The analysis indicates that brownfield retrofits of diesel hydrotreaters can achieve lifecycle carbon-intensity reductions of approximately 60–80%, depending on hydrogen sourcing and feedstock selection. Retrofit feasibility is highly site-specific and governed primarily by hydrogen availability, reactor thermal margins, utilities integration, and feedstock logistics. Among these, hydrogen management consistently emerges as the principal limiting factor rather than reactor hardware capability. In several scenarios evaluated, improvements in hydrogen recovery or purge optimization significantly enhanced retrofit feasibility without major capital investment. These findings demonstrate that retrofit decisions require a refinery-wide perspective rather than evaluation of individual units in isolation, underscoring the need for structured screening methodologies such as the Refinery Retrofit Readiness Index.

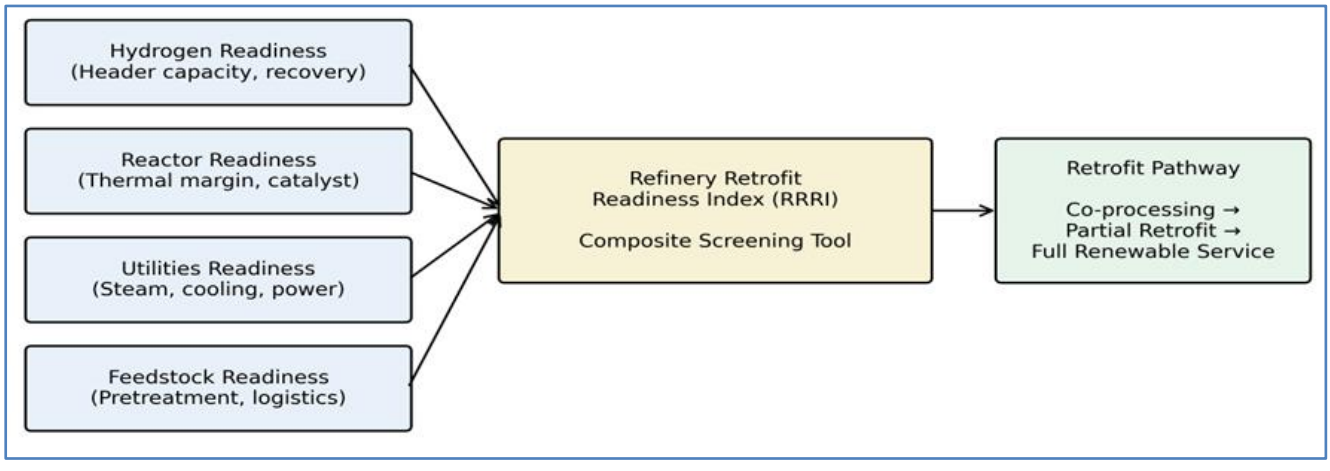
5. A Practical Screening Tool: Refinery Retrofit Readiness Index (RRRI)

5.1 Need for a Structured Screening Framework

Retrofit feasibility depends on multiple interdependent factors, including hydrogen availability, reactor operability, utilities capacity, and feedstock handling . In practice, decisions are often based on preliminary

technical assessments or isolated economic evaluations, which may not fully capture refinery-wide constraints. A structured screening framework is therefore required to compare retrofit opportunities, identify limiting factors early, and support prioritization of investments and phased implementation.

Figure 2. RRR Framework for Evaluating Refinery Retrofit Readiness and Guiding Implementation Decisions



5.2 Formulation of the RRRI

The Refinery Retrofit Readiness Index (RRRI) is defined as a weighted composite index representing the readiness of a refinery or processing unit for renewable fuel integration:

$$RRRI=(wH)*H+(wR)*R+ (wU)*U+ (wF)*F$$

where
H = Hydrogen system readiness
R = Reactor and unit operability readiness
U = Utilities and integration readiness
F = Feedstock handling readiness

and $$wH +wR +wU +wF=1$$

In preliminary screening, equal weighting provides a transparent baseline. During detailed studies, weights may be adjusted to reflect refinery-specific constraints; for example, hydrogen readiness may be assigned higher weight where hydrogen systems operate near capacity. This flexibility allows the RRRI to be adapted to different refinery configurations while maintaining a consistent evaluation methodology.

5.3 Parameter Definition and Scoring Methodology

Each parameter is evaluated using readily available refinery operating and design data. Table 2 summarizes the evaluation criteria and typical indicators used in assessing retrofit readiness.

Table 2. Refinery Retrofit Readiness Index (RRRI) scoring framework

Parameter	Evaluation Criteria	Typical Indicators
Hydrogen readiness	Availability of spare capacity, recovery efficiency	Header pressure margins, compressor utilization
Reactor readiness	Thermal margins, catalyst compatibility	Temperature rise, quench capacity
Utilities readiness	Steam, cooling water, fuel gas margins	Utility load vs design capacity
Feedstock readiness	Pretreatment capability, logistics	Storage, filtration, supply reliability

Each parameter is scored on a five-level scale, as shown in Table 3.

Table 3. RRRI scoring scale

Score	Readiness Level	Interpretation
0	Not feasible	Major equipment replacement required
1	Low readiness	Extensive modifications required
2	Moderate readiness	Significant debottlenecking required
3	High readiness	Minor modifications required
4	Very high readiness	Ready with minimal changes

This scoring approach enables rapid preliminary evaluation while retaining sufficient resolution for practical screening.

5.4 Parameter Interpretation

Hydrogen readiness is typically the most critical factor, as hydrogen availability often limits achievable renewable feed ratios. Reactor readiness reflects thermal margins, catalyst compatibility, and quench capability, which determine safe operating limits. Utilities readiness considers steam, cooling water, and fuel gas margins, while feedstock readiness reflects pretreatment capability, storage, and supply reliability. These parameters together provide a refinery-wide view of retrofit feasibility rather than a unit-level assessment.

5.5 Worked Illustrative Example

To demonstrate application of the RRRI methodology, an illustrative refinery case was evaluated using equal weighting of the readiness parameters. The scores represent a typical medium-complexity refinery configuration.

Table 4. Example RRRI calculation for an illustrative refinery case

Parameter	Score
Hydrogen readiness	2.5
Reactor readiness	3.5
Utilities readiness	3.0
Feed readiness	2.0
Overall RRRI	**2.75**

Interpretation:

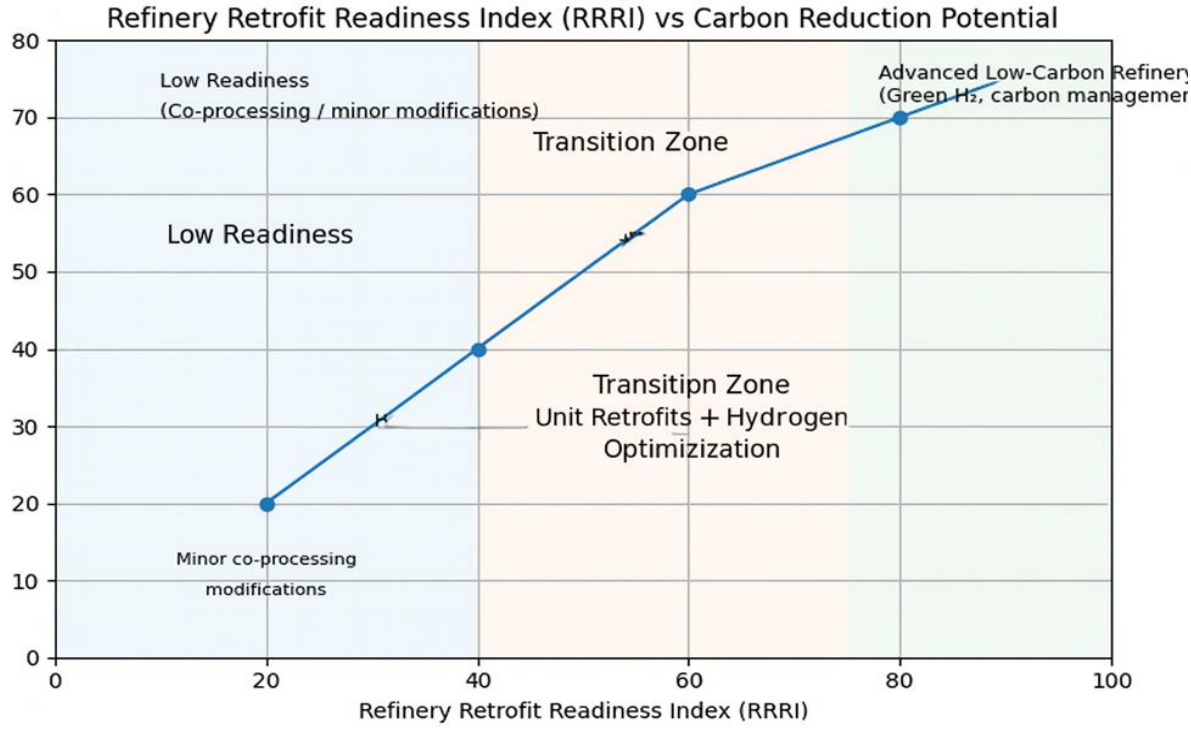
RRRI < 2.0 → Low retrofit readiness
RRRI 2.0–3.0 → Moderate readiness
RRRI > 3.0 → High readiness

An RRRI of 2.75 indicates moderate readiness, suggesting phased implementation beginning with limited co-processing and followed by targeted debottlenecking and gradual capacity expansion.

5.6 Practical Significance of RRRI

The RRRI provides a practical basis for comparing retrofit opportunities, identifying limiting systems, and planning phased implementation. Unlike purely economic screening tools, it incorporates operational constraints that often determine real-world feasibility.

The index can also be recalculated during project development to track improvements in hydrogen recovery, utilities integration, and feedstock handling, providing a measurable indicator of project maturity and readiness for scale-up.



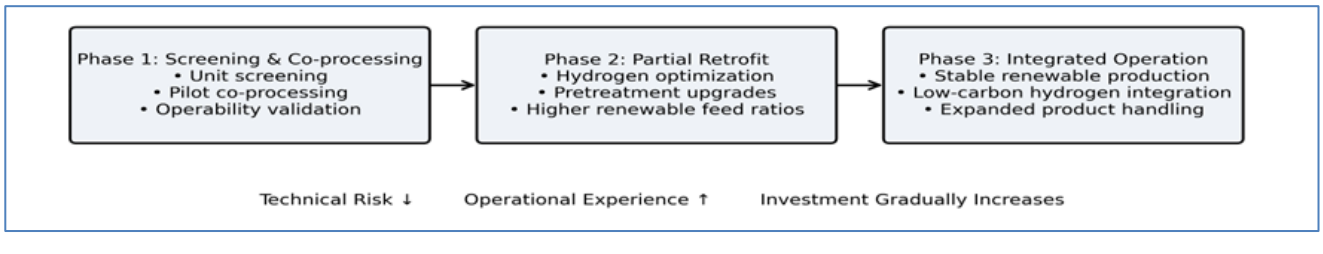
6. Sensitivity Analysis and Key Economic Drivers

Economic and technical feasibility of brownfield renewable fuel integration is strongly influenced by a limited number of variables. Among these, hydrogen cost and availability were found to be the dominant sensitivity parameters in most evaluated scenarios. Hydrogen contributes significantly to operating cost in hydrodeoxygenation processes, and even modest increases in hydrogen price can materially affect project economics. In sensitivity scenarios evaluated, variations in hydrogen cost produced larger impacts on internal rate of return than comparable variations in feedstock cost or utilities pricing. This observation has important practical implications. In refineries where hydrogen recovery efficiency can be improved or purge losses reduced, relatively small operational improvements may significantly enhance retrofit economics without requiring major capital expenditure. Feed pretreatment cost and catalyst life were also identified as secondary sensitivity factors, particularly when processing lower-quality renewable feedstocks. These findings indicate that hydrogen system optimization should be considered a priority step in retrofit planning, often preceding major capital investment decisions.

7. Renewable Fuel Retrofit Roadmap

Implementation of renewable fuel production in existing refineries is most effective when carried out through a structured, phased approach that reduces technical risk while allowing progressive operational learning. A practical roadmap may be considered in three phases.

Figure 3. Phased Pathway for Renewable Fuel Integration in Existing Refinery Units



Phase 1: Screening and Pilot Co-Processing

This phase involves screening candidate units and conducting limited co-processing trials, including hydrogen network evaluation, reactor thermal and catalyst assessment, and feedstock pretreatment studies. Low-percentage co-processing enables validation of operability, monitoring of catalyst behaviour, assessment of product quality, and identification of hydrogen or utilities bottlenecks, while requiring relatively low capital investment.

Phase 2: Partial Retrofit and Capacity Expansion

Following confirmation of feasibility, refiners may proceed to partial retrofit involving targeted modifications such as improvements in hydrogen recovery, expansion of pretreatment facilities, and optimization of reactor quench systems. At this stage, renewable feed ratios can increase and economic performance becomes more predictable as operational experience reduces uncertainty.

Phase 3: Integrated Renewable Fuel Operation

In the final phase, renewable fuel processing may be expanded to higher feed ratios or dedicated service. By this stage, feed logistics and hydrogen management strategies are established, enabling stable operation. Further developments may include integration of low-carbon hydrogen, catalyst optimization, and expansion of product handling facilities.

Benefits of a Phased Approach: A staged implementation pathway reduces technical and financial risk, enables progressive optimization of hydrogen and utilities systems, and improves investor confidence through performance validation. For many Indian refineries, this represents a practical route to renewable fuel integration.

Role of RRRI in Implementation Planning

The Refinery Retrofit Readiness Index can support both screening and progress tracking across implementation phases. Improvements in hydrogen recovery, utilities flexibility, and feedstock handling translate into higher readiness scores, providing a measurable indicator of project maturity.

9. Conclusions

Decarbonizing existing refinery infrastructure while maintaining economic viability remains a major challenge, particularly in emerging economies where large-scale asset replacement is not practical in the near term. This study demonstrates that repurposing diesel hydrotreaters for renewable diesel and Sustainable Aviation Fuel production is technically feasible under realistic brownfield conditions.

The analysis shows that hydrogen system capacity is typically the primary constraint, while reactor thermal behaviour, catalyst compatibility, and feed pretreatment requirements can be managed through appropriate design and operational adjustments. Brownfield retrofits can significantly reduce capital investment compared with grassroots facilities while achieving substantial reductions in lifecycle carbon intensity.

A key contribution of this work is the Refinery Retrofit Readiness Index (RRRI), which provides a structured framework for evaluating retrofit feasibility by integrating hydrogen availability, operability constraints, utilities capacity, and feedstock readiness. The phased implementation approach further demonstrates how renewable fuel integration can be achieved progressively, reducing technical risk and supporting informed investment decisions.

Brownfield retrofits therefore represent a practical and scalable pathway for integrating low-carbon fuel production while preserving the value of existing refinery assets. **The energy transition in refining will be shaped not only by new technologies, but by how effectively existing assets are adapted—and brownfield retrofits offer one of the most immediate pathways to achieve this.**

References:

[1] *International Energy Agency, The Future of Petrochemicals and Refining in a Low-Carbon Transition (IEA Publications, 2020).*
[2] *IATA, Sustainable Aviation Fuel Roadmap (International Air Transport Association, 2022).*
[3] *ASTM International, ASTM D7566 – Standard Specification for Aviation Turbine Fuel Containing Synthesized Hydrocarbons (ASTM, latest edition).*
[4] *European Committee for Standardization, EN 15940 – Paraffinic Diesel Fuel from Synthesis or Hydrotreatment – Requirements and Test Methods (CEN, latest edition).*
[5] *European Committee for Standardization, EN 15940 – Paraffinic Diesel Fuel from Synthesis or Hydrotreatment – Requirements and Test Methods (CEN, latest edition).*

Converting FCC Decant Oil to Hard Carbon Anodes for Sodium-Ion Batteries: A Computational Proof-of-Concept

Bosco Chiramel
Senior Engineer

Hindustan Petroleum Corporation Limited,

Abstract

Sodium-ion batteries (SIBs) are emerging as a cost-effective alternative to lithium-ion batteries for grid storage applications. A critical bottleneck is the availability of affordable hard carbon anodes with appropriate interlayer spacing for sodium-ion intercalation. This computational study demonstrates that FCC decant oil, a petroleum refinery by-product available at over 2 million tons per year in India alone, can be converted to battery-grade hard carbon through controlled sulfur-crosslinking. The empirical correlation framework, calibrated against 16 literature benchmarks (MAE = 2.28%), validated five key claims: sulfur crosslinks effectively prevent graphitization (Hindrance Index = 3.91), 23.0% of the process parameter space yields suitable hard carbon, temperature dominance (|r| = 0.935) governs the process, and ten lab-ready conditions were identified. Techno-economic analysis shows production costs of $1,073/ton with 79.7% gross margin, representing a significant cost advantage over biomass and coal routes.

Introduction

The global energy storage market is undergoing rapid transformation driven by renewable energy integration and electric vehicle adoption. While lithium-ion batteries currently dominate, concerns over lithium supply chain concentration, cost volatility, and geopolitical risks have intensified interest in sodium-ion batteries (SIBs). Sodium is approximately 1,000 times more abundant than lithium in the Earth's crust, offering a compelling value proposition for stationary grid storage.

The SIB market is projected to reach $2.7 billion by 2030, growing at 40% CAGR. However, a critical bottleneck remains: the anode material. Sodium ions are too large to intercalate into graphite's narrow interlayer spacing (0.335 nm). Hard carbon, with expanded interlayer spacing of 0.37 nm or greater, provides the necessary structure for reversible sodium storage. Current hard carbon production relies primarily on biomass precursors or coal-tar pitch, with market prices exceeding $5,300/ton.

Fluid catalytic cracking (FCC) decant oil emerges as a promising alternative precursor. This heavy aromatic fraction, a by-product of petroleum refining, is characterized by high aromatic content (>80%), significant sulfur content (3–8 wt%), and trace metals (Ni, V). Indian refineries produce over 2 million tons per year of FCC decant oil, currently utilized primarily as low-value fuel oil. A key insight of this work is that **FCC decant oil's high aromaticity (>85%) causes rapid graphitization without intervention**, producing d_{002} values of 0.355–0.360 nm at 1000°C — well below the 0.37 nm threshold. The sulfur content, typically considered a liability, serves as an asset by forming crosslinks that maintain the expanded interlayer spacing required for sodium-ion batteries.

Methodology

An empirical correlation framework was developed integrating: (1) a feedstock characterization model representing Indian FCC decant oil characteristics (5 wt% sulfur, 200 ppm Ni/V, >85% aromaticity), (2) empirical d_{002}, BET, and yield correlations calibrated against 16 literature benchmarks from petroleum-derived and

aromatic precursors (2015–2026), and (3) a 200-condition Latin Hypercube Design of Experiments spanning key process parameters: carbonization temperature (800–1500°C), sulfur content (3–8 wt%), pre-oxidation crosslink fraction (0–1), and metal loading (100–500 ppm).

The d_{002} model captures four physically-grounded effects: (a) exponential decay of structural disorder with carbonization temperature, scaled by precursor aromaticity; (b) sulfur-induced lattice strain from thiophenic C–S– C bridges, diminishing above 1000°C as sulfur volatilizes; (c) pre-oxidation crosslink resistance to graphitization; and (d) metal-catalyzed graphitization by Ni/V. The crosslink fraction maps to laboratory conditions: xl=0.4 corresponds to 300°C for 8h in air (Li 2024), xl=0.6 corresponds to 350°C for 8h in air (Wang 2025).

Results and Discussion

The structure prediction model was validated against 16 literature benchmarks, achieving mean absolute error of 2.28%. The Hindrance Index calculation yielded a mean value of 3.91, confirming that FCC decant oil's sulfur content, combined with pre-oxidation crosslinking, effectively prevents graphitization under the identified process conditions.

Of 200 simulated conditions, 46 (23.0%) fell within the target range of 0.37–0.40 nm interlayer spacing with BET surface area below 20 m²/g (Figure 1). The optimal process window spans carbonization temperature 1050–1500°C with pre-oxidation crosslink fraction above 0.3. Ten conditions were identified passing all validation gates (Table 1). The critical role of crosslinking is illustrated in Figure 2: without crosslinking, FCC decant oil graphitizes below the Naintercalation threshold at temperatures above 900°C; with sulfur crosslinking and pre-$^{+}$ oxidation, d_{002} remains in the target zone across the entire optimal temperature range

Figure 1: Goldilocks Process Window for Hard Carbon Synthesis from FCC Decant Oil via Sulfur-Crosslinking

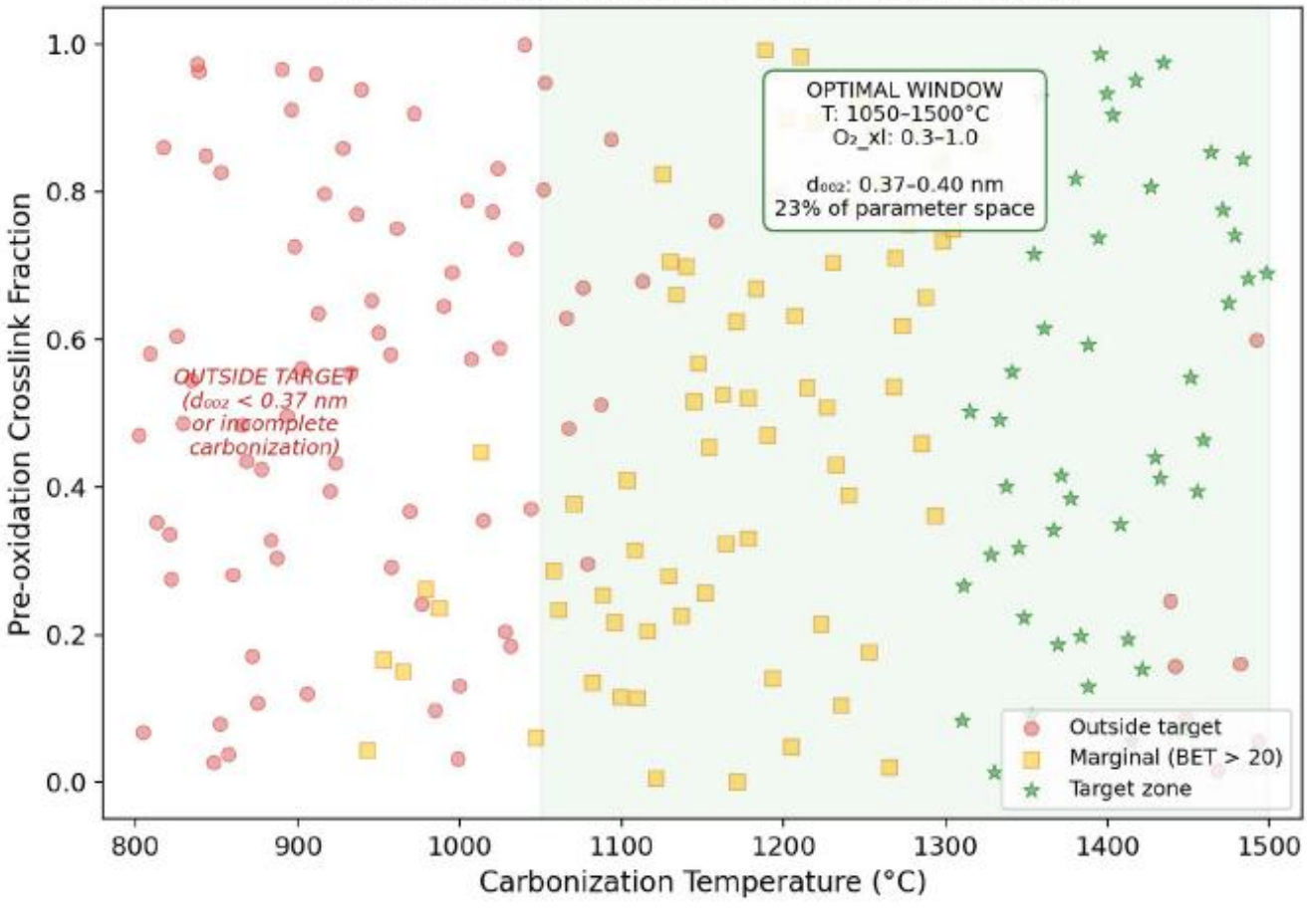
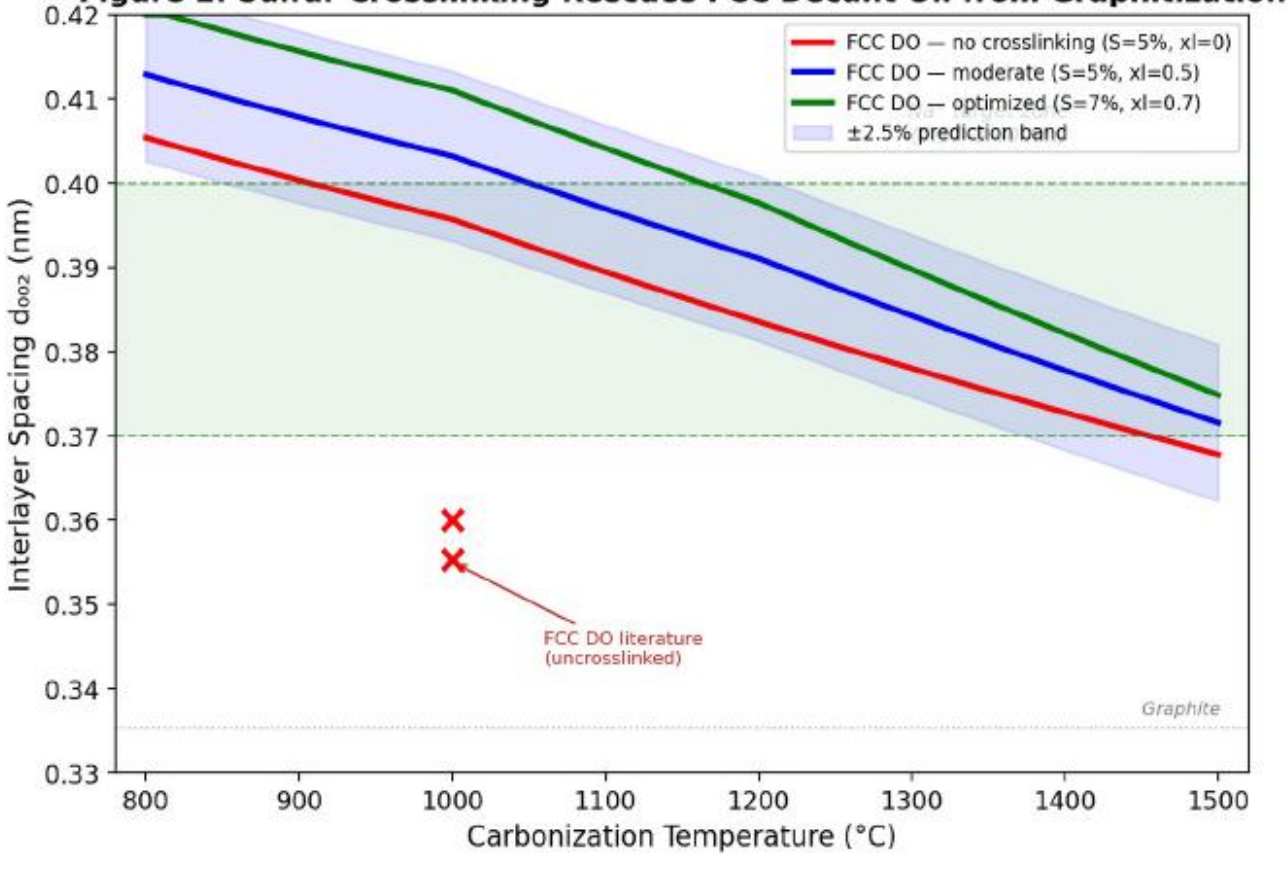


Table 1: Top 5 Lab-Ready Conditions

Rank	T (°C)	S (wt%)	Crosslink	d_{002} (nm)	BET (m^2/g)	Yield (%)
1	1487.0	7.9	0.68	0.373	10.4	43.7
2	1446.0	7.8	0.07	0.371	10.4	41.8
3	1478.0	7.8	0.74	0.377	10.9	44.2
4	1474.0	6.4	0.65	0.375	10.9	42.8
5	1455.0	5.5	0.40	0.375	11.0	41.4

Figure 2: Sulfur Crosslinking Rescues FCC Decant Oil from Graphitization



Techno-Economic Analysis

Production cost for a 1,000 ton/year facility was estimated at $1,073/ton for the FCC route, compared to $1,886/ton for biomass routes and $2,267/ton for coal routes (Table 2). At market price of $5,300/ton for battery-grade hard carbon, the FCC route achieves gross margin of 79.7% with simple payback of approximately 4 months.

Table 2: Production Cost Comparison ($/ton)

Market Price: $5,300/ton | 1,000 ton/year facility

Cost Component	FCC Route	Biomass	Coal
Feedstock	150	250	180
Energy	144	180	220
Labor + Maintenance	60	70	80
Capital + Overhead	129	160	200
Raw Total	483	660	680
Carbon Yield	45%	35%	30%
TOTAL	**1,073**	**1,886**	**2,267**
Gross Margin	**79.7%**	**64.4%**	**57.2%**

Note: Total costs per ton of hard carbon product; includes yield losses from carbonization process.

Proposed Validation Roadmap

A four-stage experimental validation program is proposed totaling $37,500 over 12 weeks: Stage 1 (Weeks 1–2, $2,500) covers feedstock characterization; Stage 2 (Weeks 3–4, $8,000) involves carbonization trials with XRD, BET, and SEM characterization; Stage 3 (Weeks 5–8, $12,000) encompasses electrochemical testing; Stage 4 (Weeks 9–12, $15,000) addresses scale-up to 100g batches and pouch cell validation.

Conclusions

This computational proof-of-concept demonstrates that FCC decant oil represents a viable, cost-competitive precursor for hard carbon anode production. The key insight is that FCC decant oil's high aromaticity causes rapid graphitization without crosslinking (d_{002} ≈ 0.355 nm), but sulfur crosslinks and pre-oxidation stabilization rescue the material into the target range (d_{002} = 0.37–0.40 nm). The sulfur content, typically considered a liability in petroleum processing, serves as an asset.

The techno-economic case is compelling: production cost of $1,073/ton yields 79.7% gross margin versus market price of $5,300/ton. With over 2 million tons per year of FCC decant oil produced in India alone, successful validation would establish a significant domestic supply chain for sodium-ion battery materials, transforming a refinery by-product into a high-value material for the energy transition.

Acknowledgments

The author thanks colleagues at Hindustan Petroleum Corporation Limited for technical discussions on FCC decant oil properties and refinery operations. This work was conducted as independent research; views expressed are solely those of the author.

References

1. Hwang, J.Y., et al. (2017). Sodium-Ion Batteries: Present and Future. Chemical Society Reviews, 46(12): 3529-3614.
2. Stevens, D.A. and Dahn, J.R. (2000). High Capacity Anode Materials for Rechargeable Sodium-Ion Batteries. J. Electrochem. Soc., 147(4): 1271-1273.
3. Bommier, C. et al. (2015). New Mechanistic Insights on Na-Ion Storage in Nongraphitizable Carbon. Nano Letters, 15(9): 5888-5892.
4. Dou, X. et al. (2019). Hard Carbons for Sodium-Ion Batteries. Materials Today, 23: 87-104.
5. Qie, L. et al. (2015). Sulfur-Doped Carbon with Enlarged Interlayer Distance. Advanced Science, 2(12): 1500195.
6. Kumar, S. et al. (2017). Indian Refinery FCC Operations. Petroleum Sci. Tech., 35(8): 780-786.
7. Li, W. et al. (2024). Pre-oxidized pitch-based hard carbon for SIBs. J. Energy Storage, 108: 114995.
8. Wang, L. et al. (2025). Oxygen-crosslinker effect on asphalt-based hard carbon. Adv. Energy Mater., 15: 2403084.
9. Wu, X. et al. (2025). Sulfur-doped petroleum coke-derived carbon. Ind. Eng. Chem. Res., 64(36): 17732.
10. ACS Omega (2025). FCC slurry oil derived pitch. DOI: 10.1021/acsomega.5c01743.

GIFT City: India's Emerging Global Financial Centre

Neetu Vinayek
Partner

Hiten Sutar
Partner

Archana Karnani
Senior Manager

Manasvi Chheda
Manager

Ernst & Young LLP

I. Introduction

In the rapidly evolving world of finance, new hubs are emerging to drive innovation and growth. One such beacon in India is the Gujarat International Finance Tec-City, widely known as GIFT City. Located in the Gandhinagar district near the Ahmedabad-Gandhinagar metropolitan area in Gujarat, GIFT City is India's first operational greenfield smart city and international financial services centre (IFSC), offering a platform for both inbound and outbound investments.

Promoted by the Government of Gujarat, this ambitious project aims to create a global financial hub that can compete with established centres like Singapore, Malaysia and Dubai. It offers unique advantages such as Special Economic Zone (SEZ) benefits, tax incentives, and access to India's vast and dynamic market. It benefits from a robust regulatory framework governed by the International Financial Services Centres Authority (IFSCA), which combines the powers of major financial regulators to ensure transparency and ease of doing business.

With over 1000 entities now registered, the IFSC is contributing significantly to India's economic growth, positioning itself as a magnet for global capital and cross-border financial services.

II. Business avenues in IFSC at GIFT City

As a booming business hub for international and domestic operations, GIFT City is rapidly emerging as the preferred business destination for a host of industries across Banking, Insurance, Capital Markets, Funds, Global In-house Centres, Fintech, Aircraft Leasing, Foreign University, Finance companies, Ship Leasing, and Ancillary Services.

Recently, on 12 January 2026, IFSCA issued a notification recognizing "Oilfield Equipment" as a financial product in IFSC. It includes operating leases, including hybrids of operating and financial leases, for "Oilfield Equipment" as a permissible activity to foster an effective ecosystem for oil and gas players from GIFT City. The detailed framework for Oilfield Equipment leasing that will provide guidance to undertake such leasing activities is expected to be notified soon.

III. Taxation and Regulatory Framework

Taxation and regulatory is a critical factor influencing the decisions of businesses and investors. IFSC at GIFT city recognizes this by providing comprehensive tax benefits to its units. Further, to foster a supportive framework that encourages growth and success, Budget 2026 has brought extension in the tax holiday period and lower rate of taxes for the non-tax holiday period making IFSC at GIFT city an appealing destination for enterprises looking to thrive in a competitive global market.

Here's a detailed look at key tax benefits and regulatory framework that shape the operations of the IFSC.

Tax Holiday:

GIFT IFSC offers 100% income tax exemption for a period of 20 years out of initial 25 years as per Budget 2026 compared to the earlier tax exemption for a period of 10 out of 15 years. The flexibility is granted to GIFT IFSC units to select any 20 consecutive years within the initial 25-year block.

Concessional tax rate for non-tax holiday period:

Budget 2026 proposed that the eligible income shall be taxed at 15% in the non-tax holiday period as compared to normal tax rates which were applicable earlier.

Minimum Alternate Tax (MAT):

Companies established as units in GIFT IFSC are subject to MAT at a rate of 9% of book profits. However, companies opting for the concessional rate of tax are not liable to pay MAT.

Interest Income Exemption:

Interest paid to non-residents on money lent to GIFT IFSC units is not subject to taxation, making it a highly appealing prospect for investors.

Dividend income:

Concessional withholding tax rate of 10% is applicable on dividends paid to non-resident shareholders.

Goods and Services Tax (GST) and Customs Exemption:

Units within GIFT IFSC, as well as services providers in GIFT IFSC / SEZ units and offshore clients, are given exemptions / relaxations under the GST and Customs regulations.

Exemption from FEMA Regulations:

Any financial institution or its branch operating from the IFSC at GIFT City is treated as a 'person resident outside India'. Furthermore, the provisions of the Foreign Exchange Management Act or any regulations made thereunder shall not apply to a financial institution or branch of a financial institution set up in IFSC at GIFT City, unless there is a specific and express provision to that effect in IFSC regulations or other regulations.

Key Exemptions under the Companies Act, 2013

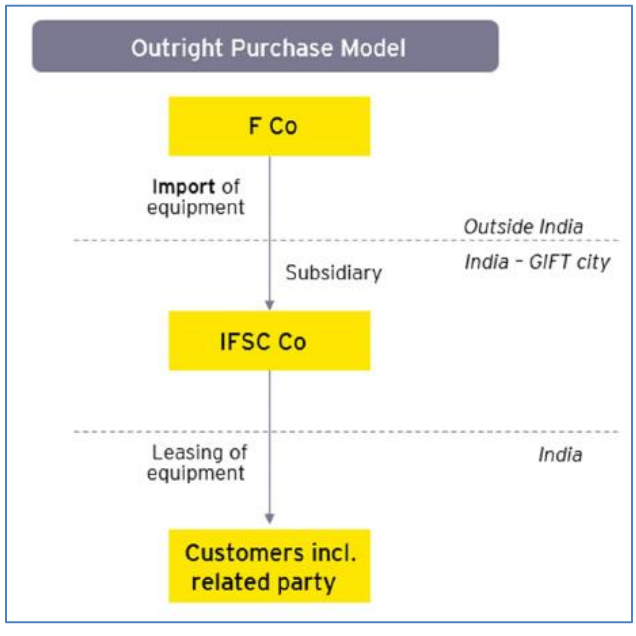
a) Corporate Social Responsibility (CSR) provisions are not applicable for 5 years from the date of commencement of business

b) GIFT IFSC companies can adopt the same financial year as their holding companies without requiring any prior approval

c) Internal audit is applicable only if provided in the Articles of Association (AOA)

IV. Illustrative structure for oilfield equipment leasing

For the purpose of understanding the conduct of operations from GIFT City, we have illustrated below a sample structure of undertaking Oilfield Equipment leasing from GIFT City:



Key Considerations

A. Direct Tax

IFSC Co enjoys a tax holiday for 20 consecutive years within its first 25 years of operation. Once this tax holiday period ends, IFSC Co will be subject to a corporate tax rate of 15%, along with a MAT rate of 9%. However, if the company opts for the concessional tax regime, which has an effective tax rate of 25.17%, MAT will not apply. Additionally, dividends paid by the IFSC Co to F Co are taxed at a concessional rate of 10%. Further, any interest income earned by F Co from loans extended to the IFSC Co is completely exempt from tax.

B. Indirect Tax

IFSC Co benefits from exemptions on both Basic Customs Duty and GST. If IFSC Co leases equipment to customers located elsewhere in India (outside the IFSC unit), this leasing is also exempt from Basic Customs Duty, provided the customer presents a certificate from the licensee or operator. Similarly, GST on the value of the leased equipment is exempt under similar conditions. However, the IFSC Co is required to charge GST on the lease charges billed to customers in India. The customers can claim this GST as input tax credit, which they can then use to offset their output GST liability in the normal course of their business.

C. Real and economic presence

Considering recent rulings by Indian judicial authorities, it has become crucial for entities incorporated in GIFT City to ensure they maintain genuine business substance. This involves real operational presence, decision-making capabilities

within the IFSC jurisdiction. Equally important is the need to maintain comprehensive and adequate documentation that supports and verifies the entity's substantive presence and operations.

V. Concluding thoughts

GIFT City represents a significant milestone in India's ambition to become a major player in the global financial arena. Its strategic location, favourable business climate, and steady development position it well to attract increased investment and innovation. As the city continues to grow, it holds the promise of transforming the financial services sector in India and beyond, making it a key area to watch in the coming years.

Realizing GIFT City's full potential will require strong collaboration between the government, businesses, and international partners. Companies having a presence in GIFT city can help promote its advantages. Further, expanding office spaces, attracting international universities, and welcoming more global enterprises will further enhance its appeal. The ecosystem is also evolving beyond traditional banking and capital markets. It now includes advisory, compliance, asset servicing, legal, and other support services—helping create a well-rounded and competitive environment that can stand alongside established financial hubs across Asia and the Middle East.

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 Energy Week 2026

India Energy Week (IEW) 2026 with the theme of **"Energizing Growth. Securing Economies. Enriching Lives"** was virtually inaugurated by Hon'ble Prime Minister of India Shri Narendra Modi through a pre-recorded video message on 27th January 2026. The event held under the patronage of the Ministry of Petroleum & Natural Gas (MoP&NG) and organized by the Federation of Indian Petroleum Industry (FIPI), IEW 2026 took place at ATI ONGC, Goa from January 27-30, 2026. As India's premier international energy platform, India Energy Week 2026 convened global energy leaders, ministers, policymakers and innovators to advance dialogue on energy security, resilience and inclusive growth, against the backdrop of a rapidly evolving global energy landscape, the event reinforced India's leadership in shaping a balanced and pragmatic energy transformation.

Hon'ble Prime Minister of India Shri Narendra Modi addressed the gathering through the virtual mode at the inaugural session of India Energy Week 2026

IEW 2026 showcased India's reform-driven energy model that seeks to balance economic growth, climate responsibility, and consumer protection. The event witnessed participation from over 75,000 energy professionals, 600 exhibitors, 500 speakers across 110 conference sessions, and 6,200 delegates representing more than 120 countries.

During the Opening Ceremony, Hon'ble Prime Minister through video message highlighted that India Energy Week has, in a very short span of time, emerged as a global platform for dialogue and action, Prime Minister remarked that today India is a land of immense opportunities for the energy sector. He underlined that India is one of the world's fastest growing economy, which means the demand for energy products in the country is continuously rising. He emphasized that India also offers excellent opportunities to meet global demand. He also remarked that India is among the top five exporters of petroleum products in the world, with export coverage extending to more than 150 countries. He stated that this capacity of India will be of great benefit to all. He further stressed that the Energy Week platform is an excellent place to explore partnerships and extended his best wishes to all participants.

Prime Minister stated that before moving ahead with his remarks, he wished to highlight a major development. He mentioned that just yesterday, a significant agreement was signed between India and the European Union, which people across the world are calling the "mother of all deals." Shri Modi emphasized that this agreement brings immense opportunities for India's 140 crore plus people and millions across European nations. He underlined that it stands as a remarkable example of coordination between two of the world's largest economies. The Prime Minister highlighted that the agreement represents nearly 25% of global GDP and about one-third of global trade. He remarked that beyond trade, the deal strengthens the shared commitment to democracy and the Rule of Law.

Hon'ble Prime Minister also pointed out that the free trade agreement with the EU will complement the agreements with Britain and European Free Trade Association (EFTA), thereby reinforcing both trade and global supply chains. He extended warm congratulations to India's youth and all citizens for this achievement, and also conveyed his best wishes to those engaged in sectors such as textiles, gems and jewellery, leather, and footwear, noting that the agreement will prove highly beneficial for them. The Prime Minister stressed that this trade deal will not only boost manufacturing in India but also expand the services sector further. He affirmed that the free trade agreement will strengthen global business and investor confidence in India.

Emphasizing that India is actively working on global partnerships across every sector, he also remarked that in the energy sector alone, there are vast investment opportunities across different areas of the energy value chain. He highlighted that India has significantly opened up its exploration sector and referred to the deep-sea exploration initiative known as the Samudra Manthan Mission. He stated that by the end of this decade, India aims to raise investments in the oil and gas sector to 100 billion dollars, with a target of expanding the scope of exploration to one million square kilometers. The Prime Minister noted that more than 170 blocks have already been awarded, and the Andaman and Nicobar basin is emerging as the next hydrocarbon hope.

Underlining that several reforms have been undertaken in the exploration sector, including reducing the No-Go areas, he added that suggestions received during previous editions of India Energy Week have been incorporated into changes in Acts and Rules. He affirmed that companies investing in the exploration sector are certain to see increased profitability.

Shri Hardeep Singh Puri, Minister of Petroleum & Natural Gas, in his keynote address at the event highlighted India's steady and resilient progress towards energy security, self-reliance and climate justice under the leadership of Hon'ble Prime Minister Shri Narendra Modi. He noted that India Energy Week has rapidly evolved into a trusted global forum, bringing together policymakers, producers, consumers, technology providers and investors to navigate a period of unprecedented transition and volatility in the global energy system.

Shri Puri emphasised that the global energy transition is fundamentally about "energy addition" rather than replacement, underscoring the need for sustained investment across oil, gas, biofuels, green hydrogen, LNG and clean cooking fuels. He outlined India's reforms-driven approach to ensuring availability, affordability and sustainability. The Minister highlighted the opening of large sedimentary basins for exploration, successive Open Acreage Licensing Policy (OALP) and Discovered Small Fields (DSF) bidding rounds, along with continued policy reforms to attract global investors. He added that India's rapid expansion of LPG coverage, clean cooking access and diversified energy mix reflect the country's commitment to inclusive growth and equitable energy access.

Hon'ble Minister of Petroleum & Natural Gas Shri Hardeep Singh Puri at the Ministerial Panel Session of India Energy Week 2026

During IEW 2026, India entered into several strategic agreements and Memorandums of Understanding (MoUs) with the objective of strengthening energy security, diversifying supply sources, and promoting innovation within the oil and gas sector. Some of the agreements and MoUs signed were:

1. India and Canada signed a Joint Statement on Energy Cooperation, marking a major reset in bilateral energy engagement with the launch of a renewed India–Canada Ministerial Energy Dialogue. Both sides agreed to deepen collaboration across LNG, LPG, crude oil, refined fuels, clean energy and critical minerals, recognising India as the world's fastest-growing major energy market and Canada as a reliable global energy supplier.

2. IndianOil signed a MoU with Engie Energy Marketing India Pvt Ltd. marking an important step towards strengthening the engagement across the LNG and natural gas value chain. The MoU provides a structured framework for IndianOil and ENGIE to jointly explore opportunities in LNG and natural gas trading, with a particular focus on the Asia-Pacific region. It also opens avenues for cooperation in areas such as financial risk management for gas portfolios, capacity building, gas distribution networks, power trading and energy transition initiatives.

3. Oil and Natural Gas Corporation Limited (ONGC) and Reliance Industries Limited signed a strategic MoU aimed at sharing offshore infrastructure and resources to unlock operational efficiencies, optimise assets and strengthen India's offshore exploration and production ecosystem. The collaboration marks a significant step toward fostering cooperation between India's public and private energy majors, enabling better utilisation of offshore facilities, reduced costs and faster development of hydrocarbon resources.

4. Oil India Limited (OIL), TotalEnergies and Numaligarh Refinery Limited (NRL) signed a MoU to enhance collaboration across the liquefied natural gas (LNG) value chain, with a focus on strengthening energy security in North-East India. The MoU establishes a structured framework for strategic engagement among the three organisations, enabling discussions on LNG sourcing, logistics, infrastructure alignment and asset mobilisation. The collaboration aims to ensure reliable and competitive LNG supplies to support OIL and NRL's operational and growth requirements in the region, while leveraging TotalEnergies' global LNG expertise.

5. Hindustan Petroleum Corporation Limited (HPCL) and Indian Gas Exchange Limited (IGX) entered into a strategic MoU to improve access to HPCL's LNG regasification infrastructure at Chhara, Gujarat, and promote greater market-based participation in India's natural gas sector. As part of the collaboration, IGX will create a digital, market-driven platform for transparent booking of regasification services at HPCL's Chhara LNG Terminal. HPCL will make available its storage and regasification capacities on the platform in predefined quantities and timeframes, enabling wider access for market participants.

6. Bharat Petroleum Corporation Limited (BPCL), has signed a non-binding MoU with Rossari Biotech Limited. Under the MoU, BPCL and Rossari Biotech will explore opportunities for strategic collaboration in downstream petrochemical value creation. The potential partnership is aligned with BPCL's upcoming refinery–petrochemical complex at Bina, Madhya Pradesh, which is expected to significantly enhance BPCL's petrochemical footprint.

7. GAIL (India) Limited, signed a long-term charter agreement with Mitsui O.S.K. Lines Ltd (MOL), Tokyo, for the LNG carrier "GAIL BHUWAN." The collaboration strengthens cooperation in LNG shipping and energy logistics. The agreement is a milestone under India's 'Maritime Amrit Kaal Vision 2047,' reinforcing the country's maritime and energy supply chain capabilities.

8. Petronet LNG Limited (PLL) and Mahanagar Gas Limited (MGL) have entered into a Master Agreement under which PLL will undertake procurement of LNG cargoes and supply Regasified Liquefied Natural Gas (RLNG) to MGL, strengthening India's city gas distribution ecosystem.

9. Engineers India Limited (EIL), signed a strategic collaboration agreement with technology leader Honeywell. The partnership aims to synergize EIL's world-class engineering and project execution capabilities with Honeywell's global technological expertise to deliver advanced, efficient, and environmentally compliant solutions for the refining sector.

10. Petronet LNG Limited (PLL) signed a MoU with Indian Oil Corporation Limited (IOCL) to strategically collaborate on the development of 25 Compressed Bio-Gas (CBG) plants across India, marking a significant step towards accelerating the country's transition to sustainable energy. By jointly developing CBG infrastructure, PLL and IOCL aims to contribute meaningfully to India's green energy roadmap and net-zero goals, while also supporting the Government of India's Sustainable Alternative Towards Affordable Transportation (SATAT) initiative.

To showcase India's growth trajectory and key achievements, several thematic zones and pavilions were established, highlighting advancements, transformative technologies, and strategic collaborations shaping the nation's sustainable energy future. The zones and pavilions are as follows:

Thematic Zones & Pavilions showcased during India Energy Week 2026

1. **Hydrogen Zone:** Hosted by Oil India Limited (OIL), this zone showcased cutting-edge hydrogen technologies and solutions shaping India's low-carbon future. The zone brings together innovations across hydrogen production, storage and utilisation, offering visitors a comprehensive view of pathways that are powering clean energy transitions globally.

2. **Biofuels Zone:** Hosted by Indian Oil Corporation Limited (IOCL), the Biofuels Zone showcased breakthroughs across bioethanol, biodiesel and biogas, highlighting how sustainable biofuels are supporting decarbonisation across transport, industry and rural economies.

3. **Renewable Energy Zone:** Hosted by Hindustan Petroleum Corporation Limited (HPCL), the Renewable Energy Zone focused on solar, wind and hybrid solutions propelling India's clean energy transformation, demonstrating technologies driving resilience, affordability and large-scale energy access.

4. **LNG Ecosystem Zone:** Hosted by Petronet LNG Limited (PLL), the LNG Ecosystem Zone explored the LNG value chain from liquefaction to end-use, highlighting infrastructure, storage solutions and emerging technologies contributing to a lower-emissions future.

5. **Make In India Zone:** Hosted by Engineers India Limited (EIL), the Make In India Zone celebrated Indian engineering and manufacturing excellence, highlighting homegrown capabilities strengthening India's energy ecosystem across the value chain.

6. **City Gas Distribution Zone:** Hosted by GAIL, the City Gas Distribution Zone showcased the networks and innovations driving India's gas-based economy, demonstrating how CGD is delivering cleaner and more efficient energy to homes, vehicles and industries.

7. **Petrochem Zone:** Hosted by Oil and Natural Gas Corporation Limited (ONGC), the Petrochem Zone showcased advanced technologies and processes enabling next-generation manufacturing, industrial diversification and sustainable materials innovation.

8. **India Net-Zero Zone:** Hosted by Bharat Petroleum Corporation Limited (BPCL), The India Net-Zero Zone spotlighted technologies and partnerships accelerating India's pathway towards a sustainable, carbon neutral future.

9. **Sustainable Aviation Zone:** Hosted by Indian Oil Corporation Limited (IOCL), The Sustainable Aviation Fuel Zone explored next-generation fuel solutions transforming aviation. The zone highlighted sustainable aviation fuels, hydrogen propulsion and efficiency technologies supporting the pathway towards net-zero flight.
10. **Digitalization & AI Zone:** Hosted by Oil and Natural Gas Corporation Limited (ONGC), The Digitalisation & AI Zone highlighted how artificial intelligence, automation, data analytics and IoT are transforming energy systems through smart grids, predictive analytics and real-time monitoring.
11. **Nuclear Zone:** Hosted by World Nuclear Zone, The Nuclear Zone highlighted the role of nuclear technologies in delivering safe, reliable and carbon-free power. The zone showcased innovations in advanced reactor design, small modular reactors (SMRs) and supporting systems that strengthen long-term energy security.
12. **The Sustainable Mobility Pavilion:** Hosted by the Society of Indian Automobile Manufacturers (SIAM), The Sustainable Mobility Pavilion served as a prominent platform for showcasing cutting-edge advancements in automotive technology. Featuring state-of-the-art vehicle models from leading Original Equipment Manufacturers (OEMs), it highlighted innovative mobility solutions designed to enhance sustainability, operational efficiency, and overall user experience within the rapidly evolving transportation landscape.

To foster young talent and support aspiring entrepreneurs in the energy sector, FIPI organized a series of competitions during IEW 2026. The major competitions and their outcomes are outlined below:

1. **Avinya Energy Startup Challenge:** The Avinya Energy Startup Challenge is designed to promote Indian Startups in the energy sector, with a focus on innovation, socio-economic impact, sustainability, diversity and alignment with the vision of “Atmanirbhar Bharat”. The initiative received an overwhelming response, attracting 161 nominations from domestic startups. Following a rigorous evaluation process, five startups were selected as winners and were honoured with trophies and certificates. The winning startups and their respective positions are:

    i. **First Position:** Minimines Cleantech Solutions
    ii. **Runner-up:** Ossus Biorenewables
    iii. **2nd Runner-up:** Tranzmeo IT Solutions
    iv. **3rd Runner-up:** Rezlytix Technologies
    v. **4th Runner-up:** Petrobot Technologies

Avinya Energy Startup Awards distribution at India Energy Week 2026

2. **Vasudha Oil & Gas Overseas Startup Challenge:** Vasudha Oil & Gas Overseas Startup Challenge invited nominations from global upstream sector startups to showcase innovative solutions across diverse categories including, Seismic & Non-Seismic Exploration, Digital & Artificial Intelligence Interventions, Measurement & Compliance of ESG Goals, CCUS & CO2 based EOR technologies, and Geothermal Energy exploration & Utilization. The challenge received 20 applications from across, out of which, two were selected as winners following a rigorous evaluation process. These winning startups were honoured with trophies and certificates. The winners are:

   i. **First Position:** Senergetics B.V., The Netherlands
   ii. **Runner-up:** Resermine Inc., USA

Vasudha Oil & Gas Overseas Startup Challenge Awards distribution at India Energy Week 2026

3. **Hackathon Challenge:** A Hackathon Challenge was conducted among Indian Institutes of Technology (IITs) and other premier institutes. In-total 7 institutes participated namely, IIT Delhi, IIT Bombay, IIT Guwahati, IIT Roorkee, IIT (ISM) Dhanbad, RGIPT and IIPE, Visakhapatnam. The hackathon was centred on the theme "Empowering Innovation in the Energy Sector," addressing critical energy sector challenges focussing on the following areas: AI-based Exploration, Energy Efficient Processes in Oil & Gas Production & Refining, Hydrogen Economy, and Circular Economy in the Energy Sector. The winning institutes were honoured with trophies and certificates. The winners are:

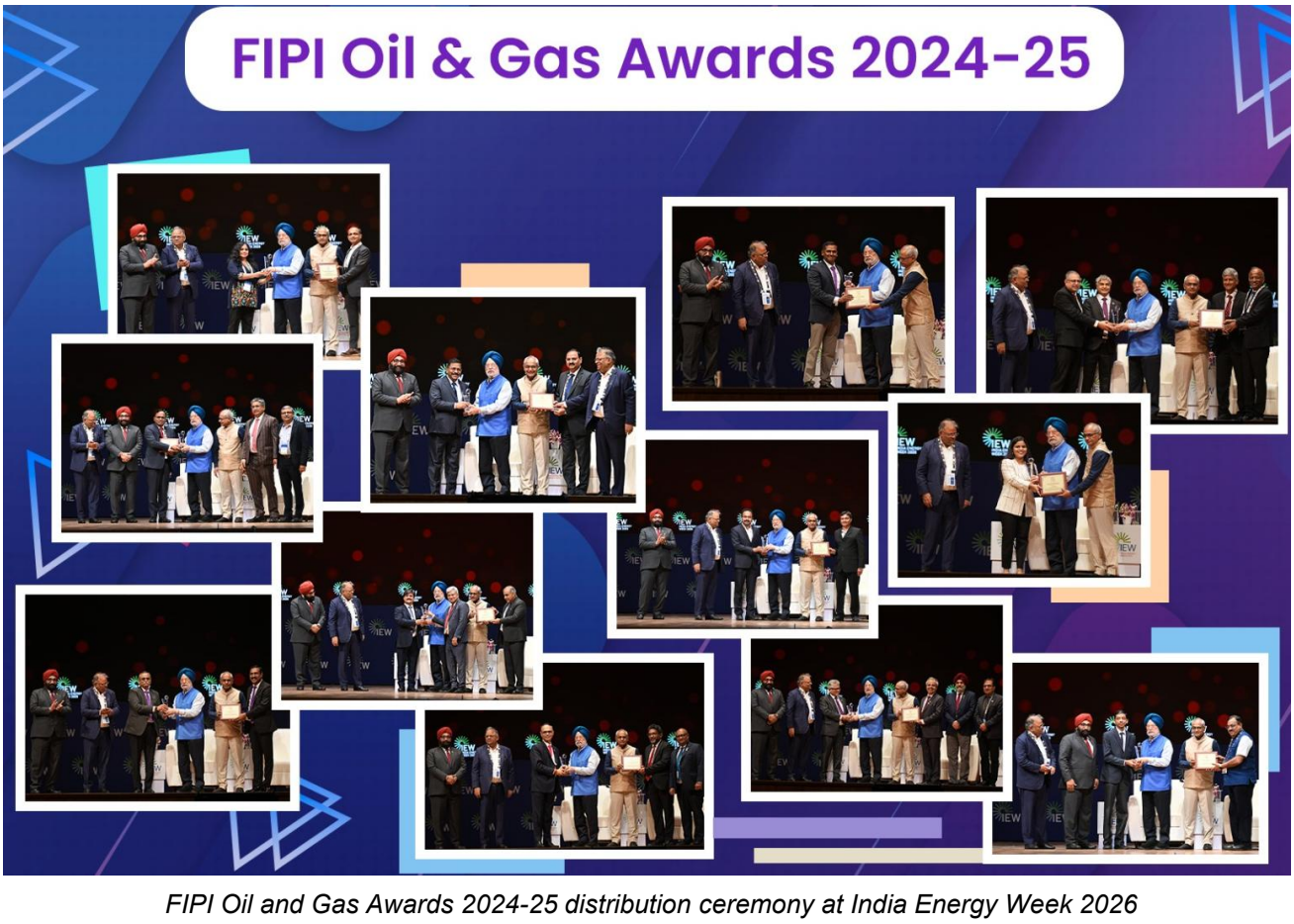
   i. **First Position:** IIT-Bombay; on 'AI Based Exploration'
   ii. **Runner-up:** IIT-Delhi; on 'Circular Economy'

Hackathon Challenge Awards distribution at India Energy Week 2026

4. **R&D Challenge:** FIPI invited its Student Chapters to present their most innovative Research & Development (R&D) projects, before a distinguished audience comprising national and international participants, VIPs, government officials, and senior industry leaders at IEW 2026 Exhibition at Goa. A total of 8 projects were submitted by seven Student Chapters namely RGIPT, IIPE-Visakhapatnam, IIT(ISM)-Dhanbad, IIT-Guwahati, UPES-Dehradun, Dibrugarh University, PDEU-Gandhinagar. The presentations on the projects, made by the Student Chapters, were evaluated by the eminent Jury and the following best 4 R&D projects were selected to showcase during IEW 2026:

    i. **PDEU, Gandhi Nagar:** Predictive Maintenance of Sucker Rod Pump Using Internet of Things.
    ii. **RGIPT, Amethi:** Python-Based Image Processing Approach for Pendant Drop Interfacial Tension Determination Under HPHT Reservoir Conditions.
    iii. **IIPE, Visakhapatnam:** Development of a Machine Learning Model based on Experimental Investigations to Quantify Formation Damage caused by Drilling and Completion Fluids in Indian Oilfields.
    iv. **Dibrugarh University:** Development of AI-Enabled Sorbent Technologies for Sustainable Oil Spill Remediation.

FIPI also conferred its Annual Awards during India Energy Week (IEW) 2026, where the awardees were felicitated by the Hon'ble Minister of Petroleum and Natural Gas and the Secretary, Ministry of Petroleum and Natural Gas. The FIPI Annual Awards recognise excellence across the oil and gas value chain, honouring organisations and professionals for their exemplary performance in areas such as operational efficiency, innovation, safety, sustainability, and digitalisation. The awards serve as a platform to showcase best practices and promote a culture of continuous improvement within the industry.



FIPI Oil and Gas Awards 2024-25 distribution ceremony at India Energy Week 2026

Eminent professors, including Padma Shri Prof. G.D. Yadav, Chairman, The Scientific Advisory Committee (SAC) of MoP&NG, Emeritus Professor of Eminence, ICT, Mumbai; Dr. Ashish Lele, Director, CSIR- Pune and Member, SAC; Prof. Shantanu Roy, Director, IIT Delhi - Abu Dhabi; Prof. Harish Hirani, Director, RGIPT; and Prof. Sukumar Mishra, Director, IIT (ISM), Dhanbad were also invited to share their rich experience and insights during the technical sessions of India Energy Week (IEW) 2026. Their valuable contributions significantly enriched the deliberations, bringing academic depth and practical perspectives to the discussions. The technical conference sessions were widely appreciated by participants for their relevance and quality. Attendees greatly benefited from these knowledge-sharing engagements, which enhanced the overall impact of the conference.

As part of the FIPI Student Chapter Initiative, the FIPI facilitated the participation of 20 students and 10 faculty members at IEW 2026. In addition, leading Indian oil & gas majors invited 500 students from various colleges and universities across Goa, pursuing graduate and post-graduate in disciplines such as Engineering, Geology, Chemistry, Business Management, Environmental Management, Finance, Information Technology and Renewable Energy etc. to attend the technical sessions of IEW 2026. This initiative provided a valuable platform for aspiring professionals to engage with industry experts, exchange ideas, and gain insights into current, emerging, and future trends shaping the global energy sector.

Furthermore, for the first time at IEW 2026, FIPI introduced a Direct Registration facility for students and faculty through the IEW website on a first-come, first-served basis. Approximately 200 entries were shortlisted by FIPI for complimentary registration to the technical sessions during the event.

FIPI Student Chapters participants along with the FIPI team at India Energy Week 2026

FIPI also participated as an exhibitor at IEW 2026, where it set up a dedicated stall to showcase its key initiatives and contributions to the energy sector. The stall prominently featured a range of informative infographics highlighting FIPI's core competencies, major advocacy areas, and policy interventions. It also displayed its flagship publications, including the Economic and Policy Report, Quarterly Journals, and Annual Report, along with various studies undertaken for the benefit of member and partner organizations. The stall attracted substantial footfall from diverse segments of the event, facilitating meaningful interactions and exchange of ideas. In particular, it generated significant interest and discussions among students and young professionals, reflecting FIPI's growing outreach and relevance within the emerging talent pool in the energy sector.

IEW 2026 was widely appreciated for its scale, seamless organization, and thoughtfully curated sessions, attracting significant participation from across the energy ecosystem. The event stood out as a premier platform fostering collaboration among policymakers, industry leaders, and investors, while enabling meaningful exchanges of ideas, exploration of synergies, and the initiation of strategic partnerships.

Glimpse of FIPI Stall at IEW 2026

FIPI Annual Awards 2024-25: A Glimpse of Winners

The oil and gas sector plays a pivotal role in supporting India's economic growth, energy security, and industrial development. As one of the largest energy consumers in the world, India continues to expand its exploration, production, refining, and distribution capabilities to meet rising energy demands while transitioning towards a more sustainable energy future. It is also one of the eight core industries of India, meaning it has a strong multiplier effect on sectors such as transportation, fertilizers, power generation, and manufacturing.

In recognition of outstanding achievements and best practices within the industry, the Federation of Indian Petroleum Industry (FIPI) instituted the prestigious FIPI Annual Awards in 2007 to celebrate excellence across various segments of the petroleum and natural gas value chain. These awards acknowledge organizations and professionals who demonstrate excellence in areas such as operational efficiency, innovation, safety, sustainability, and digitalisation.

By honouring exemplary contributions, the FIPI Annual Awards aim to inspire continuous improvement, encourage knowledge sharing, and strengthen the overall competitiveness of India's oil and gas sector. The ceremony of FIPI Annual Awards 2024-25 were held during the renowned India Energy Week 2026 at the ONGC ATI, Goa. The winners of the FIPI Awards were felicitated by the Hon'ble Minister of Petroleum and Natural Gas and the Secretary, Ministry of Petroleum and Natural Gas.

A glimpse of the Award categories and the respective winners is presented below: -

Exploration Company of the year:-

Oil & Natural Gas Corporation Limited

The FIPI Oil & Gas Exploration Company of the Year Award 2025 was conferred upon Oil and Natural Gas Corporation Limited in recognition of its excellence and leading performance in reserve accretion through an efficient and sustainable exploration process.

ONGC demonstrated a strong and consistent exploration performance across Indian sedimentary basins, driven by a strategic focus on enhancing reserves and optimizing costs. The company drilled a significant number of exploratory wells with a notable success rate, resulting in multiple hydrocarbon discoveries across key basins. Its robust exploration strategy, supported by advanced seismic acquisition and data interpretation, had enabled improved prospect identification and resource conversion.

A key highlight of ONGC's performance was its effective management of finding costs, ensuring cost-efficient exploration while maintaining high success rates. The company also expanded its exploration footprint through the acquisition of new exploratory blocks, both independently and through partnerships, thereby strengthening its long-term resource base.

Oil & Gas Production Company of the year (More than 1 MTOE):

Oil India Limited

The FIPI Oil & Gas Production Company of the Year (More than 1 MMTOE) Award 2025 was conferred upon Oil India Limited in recognition of its excellence in oil and gas production through efficient, sustainable, and cost-effective operations, leveraging advanced recovery technologies.

Oil India Limited demonstrated strong operational performance by maintaining stable and efficient production levels while optimizing production costs ($/BOE). The company's focused approach towards cost management, coupled with the adoption of improved operational practices, ensured enhanced productivity and economic efficiency across its producing assets.

A key highlight of its performance was the increased capital expenditure directed towards Improved Oil Recovery (IOR) and Enhanced Oil Recovery (EOR) projects, enabling better reservoir management and higher recovery factors from mature fields. These initiatives, supported by the deployment of advanced technologies, contributed significantly to sustaining and augmenting production levels.

Oil & Gas Production Company of the year (Less than 1 MTOE):

Sun Petrochemicals Private Limited

The FIPI Oil & Gas Production Company of the Year (Less than 1 MMTOE) Award 2025 was conferred upon Sun Petrochemicals Private Limited in recognition of its excellence in oil and gas production through efficient, sustainable, and cost-effective operations.

The company demonstrated commendable performance by maintaining optimized production levels while effectively managing production costs ($/BOE). Its focused operational approach and prudent cost control measures had enabled enhanced efficiency and competitiveness in a challenging operating environment.

A key highlight of Sun Petrochemicals' performance was its emphasis on innovation for environmental gains, adopting practices and technologies that minimize environmental impact while ensuring sustainable production. The company also initiated new projects aimed at augmenting production, reflecting its forward-looking strategy and commitment to resource optimization. Additionally, the company upheld high standards of safety, ensuring reliable and incident-free operations through robust systems and a strong safety culture.

Best Managed Project of the year:

Shell Companies in India (representing PMT JV)

The FIPI Best Managed Project of the Year Award 2025 was conferred upon Shell Companies in India (representing the PMT JV) in recognition of excellence in executing the "Tapti Decommissioning Project"—India's first offshore decommissioning project, implemented by the PMT Joint Venture comprising ONGC, RIL, and Shell plc.

The project stood as a benchmark in project management excellence, demonstrating robust cost management and efficient utilization of resources while adhering to stringent budgetary controls. Through meticulous planning and execution, the project achieved key milestones within defined timelines, reflecting strong schedule management and coordination among multiple stakeholders.
A defining feature of the project was its unwavering focus on safety, ensuring adherence to the highest standards and best practices throughout the decommissioning process. The implementation of milestone-based project management frameworks enabled effective monitoring, timely decision-making, and seamless execution of complex offshore activities.

Refinery of the year:

Reliance Industries Limited – SEZ Refinery

The FIPI Refinery of the Year Award 2025 was conferred upon Reliance Industries Limited – SEZ Refinery, Jamnagar, in recognition of its excellence in refinery operations, achieving significantly higher performance in production, operational efficiency, and energy conservation, while demonstrating a strong commitment to sustainability, emissions control, and continuous improvement in specific water consumption.

The refinery exhibited outstanding production efficiency, supported by optimized operations and advanced process integration, resulting in superior throughput and reliability. Its ability to effectively manage operating costs further reflected strong financial discipline and operational excellence.

A key highlight of its performance was the continuous improvement in energy consumption, supported by focused initiatives and strategic capital expenditure towards modernization and technological upgrades. These efforts enhanced overall efficiency and strengthened long-term operational capabilities. The refinery also achieved notable progress in reducing specific water consumption and specific carbon emissions, reinforcing its commitment to environmental sustainability and responsible operations.

Oil Marketing Company of the year:

Hindustan Petroleum Corporation Limited

The FIPI Oil Marketing Company of the Year Award 2025 was conferred upon Hindustan Petroleum Corporation Limited in recognition of its excellence in achieving record-breaking operational throughput, pioneering customer-centric digital initiatives, expanding its market presence, promoting the Pradhan Mantri Ujjwala Yojana, and advancing sustainable energy solutions.

HPCL demonstrated strong financial and operational performance, reflected in improved revenue per unit of sales, a notable increase in domestic market share, and sustained growth in overall sales volumes. The company also expanded its retail footprint with a significant increase in the total number of retail outlets and enhanced tankage capacity, strengthening its supply chain and distribution network. The Company made considerable strides in operational efficiency, including improved sales per employee and effective customer grievance redressal systems, ensuring enhanced service quality and customer satisfaction. Its focus on digital transformation through innovative customer-centric initiatives has further streamlined operations and improved user experience.

In line with its commitment to sustainability, the company actively invested in biofuels and made significant progress in the Ethanol Blending Programme. It also expanded new energy-based facilities such as EV charging stations, hydrogen, and compressed biogas (CBG) infrastructure at retail outlets. Additionally, HPCL played a vital role in promoting LPG access and increasing per capita consumption among PMUY beneficiaries.

Pipeline Transportation Company of the year:

Bharat Petroleum Corporation Limited (BPCL)

Bharat Petroleum Corporation Limited was honoured with the prestigious 'Pipeline Transportation – Company of the Year' award at the FIPI Annual Awards. This recognition highlighted BPCL's leadership in operational excellence, safety, and reliability across its extensive pipeline network, supporting India's energy infrastructure. Not only did BPCL achieve the highest ever throughput and the highest ever CO_2 reduction; it was also among the first in the industry to implement the Pipeline Integrity Management system (PIMS). Moreover, all its pipelines were equipped with the Pipeline Intrusion Detection System PIDS), thereby enhancing pipeline safety and integrity.

The company showcased its dedication to operational excellence by enhancing operational efficiency, achieving performance in leakage prevention & pipeline downtime reduction, and committing to sustainable operations.

Young Achiever of the year (Female):

Ms. Vanashree Mhatre, Pipeline Infrastructure Limited (PIL)

Vanashree Mhatre demonstrated leadership qualities in her 9 years' working in PIL under operations and maintenance, specializing in hydrocarbon flow measurement, custody transfers systems, and metering within oil & gas pipeline operations. Ensuring compliance with API, AGA, and ISO standards, and proficiency in SCADA, PLC, and data acquisition, she was instrumental in executing projects with measurement solutions that minimize losses, enhance safety & efficiency, and cost-effectiveness.

Her efforts also added to transport revenue of the PIL & improvement in "Unaccounted for Gas" parameters.

Spearheading onboarding of 4 new customers on PIL and ensuring seamless gas delivery within tight deadlines, she demonstrated significant impact across metering accuracy, revenue growth & stakeholder confidence. Her innovative contributions cemented her recognition as a FIPI young achiever (Female) in the oil and gas sector.

Young Achiever of the year (Male):

Mr. Karthick R, Mangalore Refinery & Petrochemicals Limited (MRPL)

Karthick R was leading the high-impact team in research, development & innovation at MRPL's Innovation Centre, which was honoured the "Best Innovation Award" from the Government of India for three consecutive years, a distinction bestowed following rigorous evaluation conducted by MoPNG's Scientific Advisory Committee.

From initiating proof-of-concept research on Gradual Olefins Aromatics technology (GOAT), to developing an AI/ML driven application that predicts carbon class distribution of heavy naphtha streams, he was instrumental in converting concepts into tangible industrial outcomes.

Environmental stewardship has been a central theme in his innovation journey. The Deodoring Unit (DeoU), a novel photocatalytic oxidation process eliminates odorous refinery off- gases, thus improvement of HSE performance. His contributions extend beyond company, impacting the oil and gas field at large, linked with themes of sustainability and innovation and thus was awarded the FIPI young achiever (Male) in the oil and gas sector.

City Gas Distribution Company of the year:

Indraprastha Gas Limited (IGL)

IGL is the India's largest CNG distribution company pioneering the supply clean fuels like CNG and PNG beginning in Delhi. Since its inception, IGL has expanded its footprint to 33 districts across four states of Delhi, Uttar Pradesh, Haryana, and Rajasthan. The company sets industry benchmarks in infrastructure, efficiency, customer technology, and safety, making it a reference point for the entire CGD business in India.

The award recognized the leading performance of IGL in expanding the pipeline network, achieving significant growth in CNG stations & PNG connections and overall sales volume, as well as ensuring safety standard within the organisation.

Innovator of the year:

Joint Winner

Indian Oil Corporation Limited (IOCL) – IV-IZOMaxCAT: Indigenous Light Naphtha Isomerization Technology

IOCL's state-of-the-art- R&D Centre is among Asia's best downstream petroleum research, delivering cutting-edge technologies, catalysts, and additives. The Centre has driven innovation in lubricants, refining, petrochemicals, pipelines, and in advancing in solar, hydrogen, bioenergy, CCU and nanotechnology.

The IV-IZOMaxCAT: Indigenous Light Naphtha Isomerization Technology is the 1st Indigenously developed noble metal-based environmentally benign catalyst technology to produce high quality isomerate, used as a blending component in BS-VI gasoline. The catalyst has been successfully commercialised at the IOCL BGR Isomerization unit, with a feed capacity of 153 kTA, in July 2024.

Mangalore Refinery & Petrochemicals Limited (MRPL)- Deodoring Unit (DeoU) – Technology for Odourless Process Industries

MRPL operated a 15 MMTPA refinery with advanced secondary processing units, and high flexibility to process a wide range of crude oils, producing quality petroleum products such as naphtha, LPG, Motor Spirit, Kersoene, ATF, sulphur, Bitumen, and its Novolen gas phase polypropylene plant produces range of homopolymer grades.

The Deodoring Unit (DeoU) process technology is a pioneering solution for mitigating odor in refinery off-gas streams through a photocatalytic oxidation approach. A patent application was filed in August 2018 and the technology was granted patent protection in September 2023. The DeoU was successfully commissioned in October 2023, and has provided odor reduction efficiency of 85-90% for two years. This achievement underscores MRPL's commitment to sustainable innovation, offering refining sector a cost- effective scalable, and environmentally responsible solution for odor abatement.

14th Annual Convention of FIPI Student Chapters

The 14th Annual Convention of FIPI Student Chapters was successfully held on March 28, 2026, at IIT (ISM) Dhanbad. The Convention was centred on theme, ***"Emerging Role of AI in unlocking India's Hydrocarbon Potential".***

The event witnessed participation of around 150 students representing 10 Student Chapters, including IIT (ISM) Dhanbad; IIT Guwahati; JNTUK Kakinada; MIT World Peace University (MIT-WPU), Pune; Indian Institute of Petroleum and Energy (IIPE), Visakhapatnam; Rajiv Gandhi Institute of Petroleum Technology (RGIPT), Jais Amethi; University of Petroleum and Energy Studies (UPES), Dehradun; Osmania University, Hyderabad; Dibrugarh University, Assam; and Pandit Deendayal Energy University (PDEU), Gandhinagar.

The convention commenced with the rendition of the IIT (ISM) Anthem, followed by the ceremonial lighting of the lamp by distinguished dignitaries, marking the formal inauguration of the event. Prof. Vikas Mahto, HoD, Petroleum Engineering, IIT (ISM), Dhanbad welcomed the gathering. In his welcome address, he emphasized the importance of such platforms in fostering academic collaboration and strengthening industry–academia engagement. He highlighted the role of the Convention in promoting innovation, facilitating knowledge exchange, and preparing students with the requisite skills to navigate the evolving energy landscape, while also contributing to their holistic professional development.

The Federation of Indian Petroleum Industry (FIPI) successfully organized the 14th Annual Convention of FIPI Student Chapters at IIT (ISM) Dhanbad.

Following the welcome address, opening remarks were delivered by Mr. Deb Adhikari, Director (Exploration & Production), FIPI; a special address by Prof. Partha Sarthi Das, Dean (R&D), IIT (ISM) Dhanbad and a keynote address by the Chief Guest, Mr. Lalit Aggarwal, Managing Director, SLB South Asia. In their addresses, the distinguished speakers shared valuable insights into the evolving landscape of the oil and gas sector, highlighting key trends, pressing challenges, and emerging opportunities driven by Artificial Intelligence (AI). They underscored the transformative role of AI in reshaping the industry, driving innovation, enhancing operational efficiency and promoting sustainable practices. The speakers also emphasized the growing importance of stronger industry-academia collaboration in nurturing talent and accelerating research and development.

Prof. Vikas Mahto, Head of the Department of Petroleum Engineering, IIT (ISM) Dhanbad; Mr. Deb Adhikari, Director (Exploration & Production), FIPI; Prof. Parthasarthi Das, Dean (R&D), IIT (ISM) Dhanbad and Mr. Lalit Aggarwal, Managing Director, SLB South Asia, addressed the bright and promising students of the FIPI Student Chapters at IIT (ISM), Dhanbad.

Furthermore, they highlighted how the strategic integration of AI and advanced technologies can play a pivotal role in unlocking India's vast hydrocarbon potential, paving the way for a more resilient, efficient and future-ready energy sector.

The distinguished Jury Panel comprising eminent academicians and industry leaders, Mr. Samarendra Roychaudhury, Director (Strategy & Business Development), Antelopus Selan Energy Limited; Mr. R.K. Singh, AI & Innovation Factori Manager, SLB India; Prof. Kumar Hemant Singh, Department of Earth Sciences, Indian Institute of Technology, Bombay; and Mr. Sunil Kumar Singh, GM (GP-S), GEOPIC-ONGC delivered insightful addresses to an audience of bright and aspiring students. Drawing from their extensive professional experience, the panel members provided a comprehensive perspective on the evolving dynamics of the oil & gas sector. They discussed emerging technologies, operational complexities and strategic priorities shaping the industry today, while emphasizing the importance of innovation, adaptability and continuous learning for young professionals entering this domain.

A key highlight of their address was the growing significance of AI in transforming the oil & gas landscape. The jury members elaborated on how AI-driven solutions are enhancing exploration accuracy, optimizing production processes, improving predictive maintenance and enabling data-driven decision-making. They further shed light on how the integration of AI and digital technologies is instrumental in overcoming existing challenges and unlocking India's vast hydrocarbon potential.

Mr. Sunil Singh, an eminent geophysicist nominated by ONGC, delivered an insightful presentation highlighting the transformative role of Artificial Intelligence in hydrocarbon exploration and production. He elaborated on how advanced AI-driven technologies are enhancing efficiency, optimizing resource extraction, and improving decision-making in the energy sector. Emphasizing its strategic significance, he underscored the contribution of AI in strengthening the nation's energy security.

The distinguished Jury Panel comprising eminent academicians and industry leaders, Mr. Samarendra Roychaudhury, Director (Strategy & Business Development), Antelopus Selan Energy Limited; Mr. R.K. Singh, AI & Innovation Factori Manager, SLB India; Prof. Kumar Hemant Singh, Department of Earth Sciences, IIT, Bombay; and Mr. Sunil Kumar Singh, GM (GP-S), GEOPIC- ONGC, delivered an insightful addresses

Subsequently, the participating Student Chapters delivered presentations aligned with the convention theme. The presentations delivered were insightful and thought-provoking, reflecting a deep understanding of the evolving energy landscape. They highlighted the transformative role of advanced technologies, particularly AI, in strengthening India's exploration and production (E&P) capabilities. Through their perspectives, the students demonstrated how AI-driven solutions such as data analytics, predictive modeling and automation, can significantly enhance the efficiency, accuracy and speed of hydrocarbon exploration. They also emphasized the potential of these technologies in optimizing resource utilization, reducing operational risks and improving decision-making processes across the value chain.

FIPI Student Chapters delivered presentations on the convention theme "Emerging Role of AI in unlocking India's Hydrocarbon Potential" and highlighted the transformative role of advanced technologies, particularly AI, in strengthening India's exploration and production (E&P) capabilities

After meticulous evaluation and deliberation by the Jury, the results were declared. IIT Guwahati was declared the winner and received a trophy and a cash prize of Rs. 50,000, while Dibrugarh University emerged as the runner-up and awarded a trophy and a cash prize of Rs. 25,000. As a special commendation, MIT-WPU, Pune was declared as a second runner-up.

Earlier the Student Chapters annual activities during 2025-26 were evaluated through virtual mode presentations by a jury panel comprising of Mr. Deb Adhikari - Director (E&P), FIPI and Mr. DLN Sastri - Former Director (Oil Refining & Marketing), FIPI.

FIPI Student Chapters presented a comprehensive overview of their year-long activities including technical and strategic events, insightful article and paper presentations, industrial visits, and meaningful initiatives aimed at community development. The chapters also demonstrated strong engagement in research and innovative R&D activities, contributing to knowledge creation and industry-relevant solutions.

Based on the jury's evaluation of the online presentations, IIT (ISM) Dhanbad and Dibrugarh University emerged as Joint Winners. The winners received a trophy along with a cash prize of Rs. 50,000 each during the Annual Convention event at IIT (ISM) Dhanbad.

As a token of appreciation, Mr. Deb Adhikari, Director (E&P), FIPI, felicitated all participants by presenting certificates, while the student office bearers and the faculty coordinator of the host chapter were honoured with mementoes.

The event concluded with a formal vote of thanks delivered by Prof. Archana, Faculty Coordinator of the FIPI Student Chapter IIT (ISM) Dhanbad. She conveyed her sincere appreciation to the distinguished dignitaries, the FIPI Management and the organising team, and the participants for their valuable contributions. Special acknowledgment was extended to the dedicated student volunteers of IIT (ISM) Dhanbad for the excellent arrangements and coordination. Their collective efforts were instrumental in ensuring the seamless and successful conduct of the Annual Convention.

IIT Guwahati, Dibrugarh University, and MIT-WPU, Pune emerged as winner, runner-up and second runner-up respectively, for their outstanding presentations on "Emerging Role of AI in Unlocking India's Hydrocarbon Potential."

IIT (ISM), Dhanbad and Dibrugarh University, Assam were declared joint winners of the prestigious "Best Chapter Award 2025" in recognition of their exceptional performance and impactful contributions throughout the year

Webinar on Oilfield Equipment Leasing- a permissible activity in GIFT City

Federation of Indian Petroleum Industry (FIPI), in association with EY as knowledge partner, organized a webinar on **'Oilfield Equipment Leasing- a permissible activity in GIFT City'** on 18th March, 2026. The webinar provided an overview of GIFT City with a specific focus on Oilfield Equipment leasing and the associated tax incentives. The session also explored how structuring operations within GIFT City can foster an effective ecosystem for oil and gas players, including upstream companies and service providers. The session witnessed participation of 70 professionals across the oil and gas value chain and was appreciated by everyone for its content and understanding.

Mr. Deb Adhikari, Director (E&P), FIPI began the session with the opening remarks. He mentioned that as India is heavily dependent on crude oil imports, accounting for approximately 87% of its crude oil consumption, the country relies on imported oilfield equipment for its domestic oil and gas production needs. The outright purchasing of such equipment can be capital-intensive. Leasing offers an efficient solution, enabling companies to access high-quality equipment without upfront costs, thereby improving cash flow and operational flexibility. He mentioned that Indian companies on an average are investing approximately USD 3-5 bn of their budget for E&P activities and about 60% is spent for importing the costly equipment and technologies.

He further said that oilfield equipment leasing, a newly enabled and permitted financial activity in GIFT city, regulated by the International Financial Services Centers Authority (IFSCA) allows entities to lease high-value assets such as rigs, offshore vessels, wellhead equipment's, compressors, and specialized service units to Indian operators, supporting the energy sector by facilitating cost-effective access to cutting-edge oilfield equipment through leasing arrangements. He said that globally, many developed economies like the European countries and U.S. as well as some Asian countries like Malaysia, have successfully adopted leasing models to optimize costs, enhance efficiency, and gain access to the latest technological advancements.

Ms. Neetu Vinayek, Partner, EY said that with the current situation, energy markets are navigating through intense geopolitical volatility, driving a strong focus on energy independence, and increased exploration and production (E&P) to secure economic growth. She said that the global oilfield equipment market is estimated to be valued at USD 249 billion in 2026 and is projected to reach USD 282 billion by 2031. Based on the size of the market, it is estimated that the Asia-Pacific oilfield equipment market is experiencing significant growth, driven by surging energy demand in India and China, with the oilfield equipment rental sector emerging as a preferred, cost-effective model. Thus, to address the high energy demand and growing oil exploration activities in India and the wider Asia-Pacific region, the International Financial Services Centers Authority (IFSCA) has officially expanded its leasing framework within GIFT City (Gujarat International Finance Tec-City) to include oil field equipment, with the regulation coming into effect in January 2026. The transformation of GIFT City into a major global financial hub can be seen from the entities that are surging from approximately 129 to over 1100 by the end of 2025.

She then mentioned that under IFSC, the ecosystem comprises of a robust mix of financial institutions acting as a gateway for international capital. It includes- Banking Units, International Exchanges, Funds & Asset Management, Insurance Companies & Intermediaries. Under the permissible activities, she mentioned that leasing and financing are firmly established for aircraft and ships, and Oil Field Equipment has been adding as a notification in January 2026.

Mr. Hiten Sutar, Partner EY said that the International Financial Services Centre (IFSC) in India, particularly at GIFT City, is designed as a specialized, tax-neutral zone that acts as a global financial hub, physically located in India but operating under international regulatory frameworks. With the industry facing high capital-intensive demands, enabling oilfield equipment leasing has been a critical focus to reduce upfront cash flows and offer alternative financing models to the oil and gas industry. He said that the IFSCA issued this notification that formally recognises the operating lease, including any hybrid of operating and financial lease, in respect of oilfield equipment as a financial product. Further he said that under the notification, the equipment should be in the table provided in notification number 3 of 2017 of Central Tax (Rate), of 2017. He said that the framework would provide specific rules for operational, financial, and personnel requirements for entities setting up in the IFSC.

He then discussed the comprehensive list, as per Notification No. 3/2017, which covers essential items for upstream, midstream, and downstream operations, including- Survey & Exploration (Land/marine seismic equipment, vessels, and ROVs), Drilling & Production (Rigs, pipes, and wellhead equipment), Support & Logistics: Helicopters, marine support vessels, and diving equipment, Safety & Infrastructure: Fire-fighting systems, cathodic protection, and storage tanks, etc.

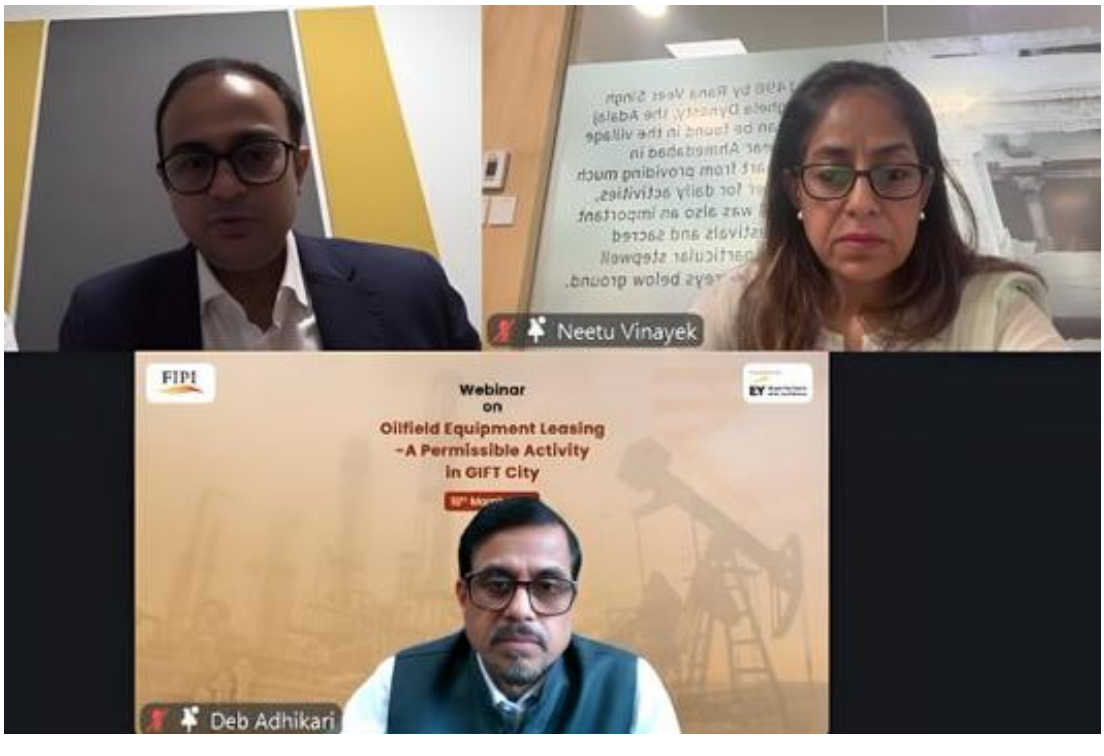
He then mentioned the steps to be taken in future such as draft framework will be published, public comments will be invited, submission for comments from stakeholders, and then, the final framework will be issued. Further, he mentioned the example of a ship leasing framework, to explain a typical framework under IFSCA in GIFT City. The permitted legal forms of presence for conducting ship leasing business includes Company, Limited Liability Partnership (LLP), Branch, and a Trust. Also, the applicant shall be located in Financial Action task Force (FATF) complaint jurisdiction, and Minimum Owned Funds requirement is around $200,000 for operating lease and $3 million for financial lease. Also, there is a requirement of maintenance of books of accounts, records, and documents, and, those should be in freely convertible foreign currency. Further, they should also furnish the annual auditor financial statement confirmation compliance with the IFSCA regulatory authority.

He then talked about the taxation aspects which are typically applicable to GIFT City. He said that the government has agreed that there should be a tax holiday of 20 years out of first 25 years of operation and in the years where the tax holiday is not taken by the GIFT city undertaking, the tax rate should be 15%. Further, the IFSC units have to pay Minimum Alternate tax at 9%, especially applicable to structures such as LLP. Further, he mentioned about the additional benefits which are available to the non-resident for ships and aircraft includes, viz, exemption for royalty income, dividends to non-resident taxable at 10% and capital gains on transfer of shares by non-resident exempt from tax. The indirect tax benefits include- the import of goods, is exempt from basic custom duty. Further no IGST on value of goods imported for authorized operations by IFSC company.

Lastly, he concluded by saying that an entity needs a thorough analysis of existing business model to evaluate the new business model in IFSC; then examine the framework that is to be issued for Oilfield equipment leasing and evaluate the optimum structure for leasing of oilfield equipment that can be adopted in IFSC.

Ms. Neetu Vinayek and Mr. Hiten Sutar, then conducted the Q&A session and provided their views and opinions on various queries posted by participants.

Lastly, FIPI complimented the EY team for an elaborative presentation on the Oilfield Equipment leasing. FIPI also thanked the participants from the energy industry for their active and interactive participation during the event.



Webinar on "LNG at the Crossroads: Fundamentals and Pricing Evolution"

The Federation of Indian Petroleum Industry (FIPI), in collaboration with S&P Global Energy, organized a webinar on "LNG at the Crossroads: Fundamentals and Pricing Evolution," on March 17, 2026, bringing together industry experts to deliberate on the rapidly evolving global LNG market scenario.

The webinar commenced with a Welcome Address by Mr. P. S. Ravi, Director (Downstream), FIPI, who set the context for the session by emphasizing the growing importance of LNG in India's energy mix. He highlighted that LNG plays a crucial role not only as a transition fuel but also as a key pillar for ensuring energy security and sustainability.

Mr. Ravi underlined that the current geopolitical developments have brought LNG markets to a critical juncture, impacting both producers and consumers alike. He stressed the need for deeper understanding of market fundamentals, pricing evolution, and global interlinkages, particularly between Asian and European markets, to enable informed decision-making by stakeholders.

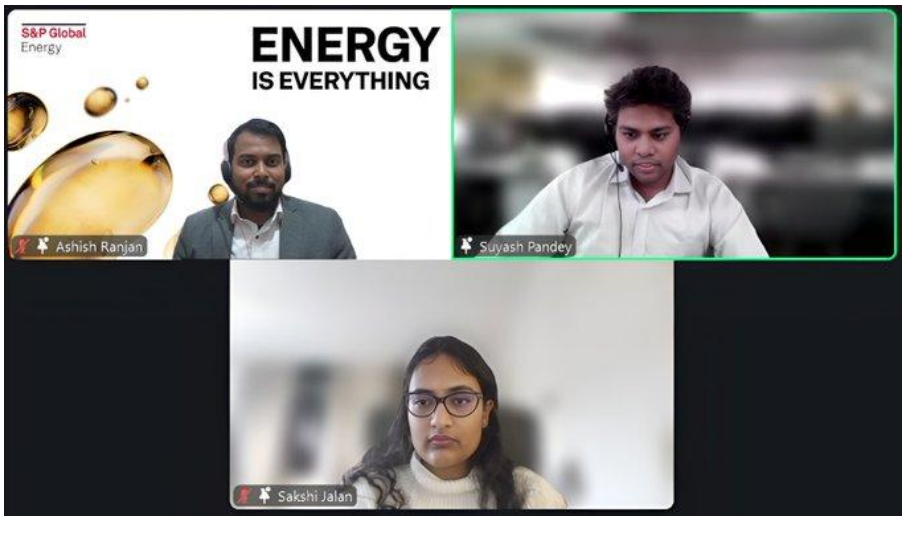
He also welcomed the experts from S&P Global Energy and expressed confidence that their insights would provide valuable clarity to participants navigating the ongoing market uncertainties.

Mr. Ashish Ranjan, LNG Analyst at S&P Global Energy, presented an overview of global LNG market fundamentals and highlighted the impact of geopolitical tensions on supply. He noted that nearly 83 million tonnes per annum (MTPA), equivalent to about 17% of global LNG trade, has been impacted due to disruptions in the Middle East. His analysis underscored that Asia—particularly South Asia—is most exposed, given its high dependence on LNG supplies from Qatar and the UAE.

Mr. Suyash Pandey, Senior Pricing Specialist, discussed the evolution of LNG pricing and contracting, with a specific focus on India. He highlighted the sharp increase in spot LNG prices and regional price spreads, driven by competition between Asia and Europe for limited cargoes. It was noted that Indian buyers are increasingly relying on spot procurement and paying premiums to secure cargoes, while also facing logistical and timing challenges in sourcing alternative supplies from regions such as West Africa and the United States.

Ms. Sakshi Jalan, Global LNG Engagement Lead at S&P Global Energy, highlighted the critical role of Europe in the global LNG ecosystem. She noted that Europe accounts for approximately 30% of global LNG demand and around 40% of spot market demand, making it a key competitor for LNG cargoes.

She emphasized that Europe's low gas storage levels and the need to replenish inventories during the upcoming summer injection season will significantly increase LNG demand. It is estimated that Europe may require up to 160 additional cargoes to restore storage levels, thereby intensifying competition with Asian markets.



She further highlighted that Europe's strong reliance on flexible US LNG supplies enables it to respond quickly to price signals, adding further pressure on global LNG availability.

Key Takeaways

- The webinar brought out several important insights:
- The current situation represents a major global LNG supply disruption with far-reaching implications
- South Asia, including India, is highly exposed due to dependence on Middle Eastern supplies
- Price volatility and competition for cargoes are expected to persist in the near term
- Europe's storage requirements will continue to drive global demand and pricing trends
- India's response is focused on prioritization, demand management, and diversification of supply sources

Interactive Q&A and Conclusion

The session concluded with an interactive Q&A, where participants raised queries on LNG price outlook, supply recovery timelines, alternative sourcing options, and long-term implications for energy security.
The experts noted that even if disruptions ease, market normalization may take several weeks, and prices are expected to remain elevated in the near term.

In his closing remarks, FIPI thanked S&P Global Energy and the distinguished speakers—Mr. Ashish Ranjan, Mr. Suyash Pandey, and Ms. Sakshi Jalan—for their insightful presentations. The strong participation and engagement reflected the relevance of the topic, and FIPI reaffirmed its commitment to organizing more such knowledge-sharing sessions on critical energy issues.

FIPI Post Budget Analysis 2026

The Union Budget for the year 2026-27 was announced by the Hon'ble Finance Minister of India, Smt. Nirmala Sitharaman on 1st February, 2026. Keeping up with FIPI's long tradition, FIPI organized its flagship FIPI Post Budget Analysis 2026 session on 3rd February, 2026 with EY as the knowledge partner. The Budget session was attended by 160 participants (virtually) and was appreciated in terms of content by everyone. The objective of the session was to analyze the recently presented Union Budget and weigh the impact of the Budget on the economy and India's oil and gas industry. The session was attended by many senior dignitaries from across the industry.

In his opening remarks, Mr. Vivekanand, Director (Finance, Taxation and Legal), FIPI, welcomed all the panelists during the budget analysis session organized by FIPI. He said that the Union Budget 2026-27 presented by the Hon'ble Finance Minister is a growth-oriented budget as the Indian economy is expected to grow in the range of 6.8% - 7.2% for FY 2027. He said that the inflation outlook remains benign, supported by favorable supply side conditions and the gradual pass-through of GST rate rationalization. Further, the FTA signed earlier with the EU, and announcement of US trade agreement also promises future growth opportunities for India.

He mentioned that the budget encompasses coordinated fiscal, monetary, and structural policies which have reinforced macroeconomic stability while supporting investment, consumption, and inclusion. Some of the noteworthy developments announced in the Budget include a massive increase in public capex to ₹12.2 lakh crore in FY2026-27, reiterating the commitment to stay on the course of fiscal consolidation with projected fiscal deficit of 4.3% and projection of a decline in the debt- to- GDP ratio at 55.6% in FY 2027. Being a Yuva Shakti–driven Budget, it emphasizes strengthening of domestic manufacturing, scaling high-growth services, and recognizing MSMEs as a vital engine of growth. Further, he highlighted that the Budget framework introduced several promising initiatives for the energy sector, focusing on accelerating India's transition to net-zero such as a proposed outlay of ₹20,000 crore over the next five years in promoting Carbon Capture Utilization and Storage (CCUS), extension of basic customs duty exemption on capital goods used for manufacturing lithium-ion cells for batteries, exemption of custom duty from imports of sodium antimonate used in the manufacture of solar glass, extending the existing basic customs duty exemption on imports of goods required for nuclear power projects till 2035, and excluding the entire value of biogas while calculating central excise duty on biogas-blended compressed natural gas.

Setting the context for the session, Ms. Neetu Vinayek, Partner, EY, presented the results of the pre-budget survey that was conducted by FIPI prior to the release of Union Budget 2026-27. The survey showed that most of the respondents were of the view that budget would bring in favorable reforms through extension of basic custom duty exemption on imports for Oil & Gas sector, allocation of significant funds to enhance energy security, as well as ensuring a higher push to public and private investment especially in emerging technologies like AI and digital innovation. This proved in sync with the budget announcement of customs duty exemptions and improved infrastructure investment to support energy transition.

Mr. Hiten Sutar, Partner EY highlighted the corporate tax amendments. He said that there were no changes in corporate tax rates for domestic and foreign companies. However, with respect to Minimum Alternate Tax (MAT) provisions, it is proposed that MAT rate be reduced to 14% of book profit from existing 15%. Also, it is proposed that tax paid under MAT provisions be made final tax in the old regime and no new MAT credit may be allowed. Further, if any domestic company is going under new regime from 01 April 2026, then MAT credit can be can be set-off to the extent of 25% of tax liability and the balance can be carried forward and set-off in subsequent years subject to 25% restrictions in each of the subsequent years. This is also subject to overall limit of 15 years immediately succeeding the tax year in which the tax credit first became allowable. . So, this provision, he said, encourages companies to move from old regime to new regime.

He then pointed out the extension in tax holiday period for units set up in Gift City. Currently, any unit which was set up in GIFT City's International Financial Services Centre (IFSC), has an option of claiming tax holidays for 10 years, which is 100% tax relief. It is now proposed that the tax holiday is to be extended to 20 years and when the company is not in the tax holiday period, the tax rate will be 15%,. In terms of buyback tax, currently buyback is taxed as deemed dividend in the hands of recipient shareholders, and with an entitlement of capital loss for the cost of share bought back, but now it is proposed to treat buyback as capital gains in the hands of shareholders. He said that if this capital gains are in the hands of domestic promoter entities, then the capital gains tax rate would be 22% and in case of other promoters, the tax rate would increase to 30%.

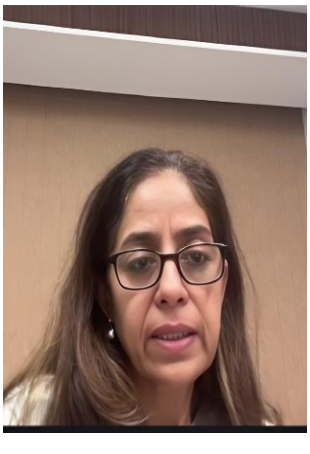
Ms. Uma Iyer, Partner, EY highlighted the provisions made under the indirect tax. Talking about GST proposals, she said that the place of supply for intermediary services will be governed by the default rule under Section 13(2) of the IGST Act, which is the location of the recipient of services. Further, intermediary services provided to a foreign service recipient will qualify as export of services and thus be classified as zero-rated supplies. This means no 18% GST will be applicable on such services. Also, she said that post sale discount value deductible subject to GST credit note is being issued. Further, it is proposed that the Government may empower an existing Authority (which also includes a Tribunal) as the National Appellate Authority for Advance Rulings, which will be an interim authority to resolve any of these AAR-related disputes when there are conflicting decisions.

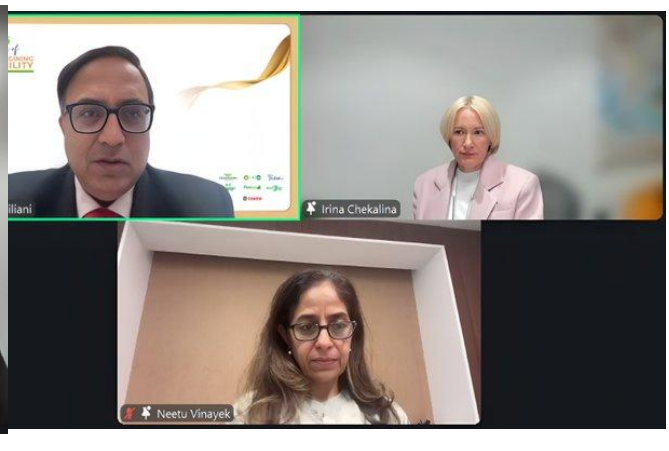
The presentation on budget was followed by 'Panel Discussion on Union Budget 2026-27, focusing on the outcome for oil and gas companies in the Union budget. The panel comprised of Mr. Vinod Tahiliani, CFO, RBML and Ms. Irina Chekalina, Director of Finance, SLB India, Bangladesh & Sri-Lanka. The panel discussion was moderated by Ms. Neetu Vinayek, Partner, EY.

The panelists were of the view that the Union Budget 2026-27 is strategically designed for long-term stability and growth by bolstering domestic fundamentals, particularly through increased infrastructure capital expenditure and enhanced manufacturing competitiveness in a volatile global environment. Further, the panelists highlighted that the Indian government has recognized the importance of GCCs and they have transitioned from cost-focused back-office units into strategic, innovation-driven, and value-adding hubs for many organizations in India.

Further, the panelists were of the view that the GST Council's decision to hike the tax rate on exploration, mining, and drilling services from 12% to 18% is set to increase upstream costs for oil and gas companies and exacerbate the burden of stranded taxes because the final products—crude oil and natural gas—remain outside the GST net, preventing input tax credit (ITC) offset. Lastly, they were of the view that the industry is indeed navigating a shift between maintaining its capital-intensive core and adopting digital intelligence/ AI for non-core or supporting business processes and as such AI bringing in this space more about augmenting human expertise to enhance safety and efficiency.

Ms. Uma Iyer and Ms. Neetu Vinayek from EY conducted the Q&A session and provided their views and opinions on various queries posted by participants. In the concluding remarks, FIPI thanked all the panelists and the subject matter experts for providing their insights on the Union Budget 2026-27 and its implications on the oil & gas industry and the economy.





NEW APPOINTMENTS

Mr. Deepak Gupta assumes charge as Chairman & Managing Director, GAIL

Mr. Deepak Gupta assumed charge as Chairman and Managing Director of GAIL (India) Limited on 1st March 2026.

Mr. Deepak Gupta, a Mechanical Engineer from Delhi College of Engineering, has more than 35 years of deep & diverse experience across Oil & Gas value chain. He brings comprehensive blend of technical, strategic & board level leadership. His expertise spans Project & Construction Management, Contracts & Global Procurement, Technology Selection, Business Development, Operations & Maintenance.

Mr. Gupta joined GAIL as Director (Projects) in February 2022 and is leading the execution of multiple high impact initiatives encompassing Natural Gas & LPG Pipelines, Gas Processing Units, critical SCADA infrastructure, Green Energy initiatives to achieve Net-Zero goals, setting national benchmark for Clean Energy adoption. He also oversees O&M of vast network of more than 20,000 km of Natural Gas and LPG Pipelines, Compressor Stations and Process Plants. Under his leadership, GAIL completed Dabhol Breakwater Project of Konkan LNG Limited (subsidiary of GAIL) enabling all weather operations. He has pioneered many digital transformation initiatives enhancing operational agility & transparency in business areas.

Earlier, as a Board member of GAIL JVs viz. Chairman of Talcher Fertilizers Ltd. (India's maiden Coal Gasification based Fertilizer Complex), Director- ONGC Petro-additions Limited (OPaL) & South-East Asia Gas Pipeline Company Limited (SEAGP) and former Chairman of Green Gas Limited and Maharashtra Natural Gas Limited, he has played a pivotal role in strategic goal setting, stakeholder alignment, corporate governance, future-ready business planning.

During his career spanning 32 years at Engineers India Limited previously, he led many large cross- functional teams to execute landmark Projects under complex & challenging conditions viz. world's largest single-train Dangote Refinery & Petrochemical Complex at Nigeria, HMEL's Mega Petrochemical Complex at Bathinda, GAIL's Petrochemical expansion at Pata. He also led the first greenfield refinery project in Mongolia, contributing significantly to India's global energy diplomacy.

A thought leader and prolific writer, Mr. Gupta, has authored several technical papers/articles on critical packages and fast-tracking project execution. His ideas on project acceleration, digitization and excellence have been institutionalized as best practices.

.

Introduction of New Member Organizations of FIPI

Multi Commodity Exchange of India Ltd. (MCX)

The Multi Commodity Exchange of India Ltd. (MCX) is India's leading commodity derivatives exchange and the largest commodity options exchange globally (FIA, 2025). Since commencing operations in 2003, MCX has established a dominant position, accounting for approximately 98% of the total value of commodity futures traded in FY 2024–25. With a pan-India presence, the Exchange plays a pivotal role in the commodity market ecosystem by enabling efficient price discovery and robust risk management. Its product suite spans bullion, energy, base metals, and agri commodities, along with sectoral commodity indices, where it commands over 99% market share in key segments such as bullion, base metals, and energy.

MCX has also demonstrated strong global standing in energy options. As per FIA rankings, MCX Crude Oil Options (100 bbl) secured the top global position in both CY 2024 and CY 2025, while Natural Gas Options (1,250 Mmbtu) consistently ranked second. The mini contracts have shown notable growth, with Crude Oil Mini Options improving from rank 6 to 3, and Natural Gas Mini Options advancing from rank 13 to 7, supported by significant growth in market participation.

The Exchange's advanced technology framework ensures high availability and resilience across critical systems, enabling seamless trading operations. Its infrastructure supports fast order execution, real-time risk management, market surveillance, and efficient data dissemination. Backed by strong technological capabilities and strategic alliances with global exchanges and trade associations, MCX continues to strengthen its position as a key pillar of India's commodity markets.

AG&P Pratham City Gas Private Limited

AG&P Pratham City Gas Private Limited is a leading player in India's City Gas Distribution (CGD) business. They hold 19 CGD licenses awarded by the Petroleum & Natural Gas Regulatory Board (PNGRB) under the aegis of Ministry of Petroleum and Natural Gas (MoPNG) to exclusively develop CGD infrastructure and provide natural gas across 49 Districts in the 10 states of Andhra Pradesh, Bihar, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Punjab, Rajasthan, Uttar Pradesh and Tamil Nadu. Our CGD network will supply Compressed Natural Gas (CNG) for use in vehicles as well as Piped Natural Gas (PNG) to domestic households, commercial establishments and industries. Over the next few years, our network will comprise ~24,000 inch-km of steel pipelines, 2000+ CNG stations catering to the needs of more than 100 million customers and cover 324,000 square kilometres.

AG&P Pratham City Gas Private Limited has the largest Foreign Direct Investment (FDI) in greenfield CGD business in India. Our marquee investors include I-Squared Capital, and the Japanese consortium of OSAKA Gas, JOIN, Sumitomo Corporation and Konoike Transport.

AG&P Pratham City Gas Private Limited have been recognized for their efforts on various industry forums for their contributions across all business practices – Safety, ESG, Marketing, CRM, Procurement, Sustainability and Risk Management.

Introduction of New Member Organizations of FIPI

dDriven Solutions: The Enterprise AI for the Hydrocarbon Value Chain

dDriven is an India and Singapore based Industrial AI company serving Fortune 500 clients across the hydrocarbon value chain.

Effectiveness of any AI/ML initiative depends fundamentally on the quality of its underlying data. Metrics like Refinery Yield, EII, and GRM — or the optimal Coil-Out-Temperature at each crude change — draw simultaneously from crude assay and recipe data, process historians, maintenance records, quality labs, scheduling, and logistics. Without a live, unified data foundation, organisations default to a fragile ecosystem of spreadsheets, emails, and shift handover notes — preventing digital initiatives from ever scaling.

dDriven was founded in 2017 by Partha Ray, whose four-decade career spans plant-floor commissioning of drives and control systems to building transnational digital businesses across Asia. In 2005, he made a prescient move — creating one of Asia Pacific's earliest real-time IT/OT analytics ventures within a global conglomerate, an intrapreneurial bet that became a flagship digital capability. dDriven is the culmination of that journey: rare dual expertise — the instincts of a practising engineer and the acumen of a technology entrepreneur — embedded into a platform company.

UNLSH, dDriven's no-code IT/OT platform, builds an Enterprise Data Twin — a continuously-updated, unified foundation connecting market data, SAP, MES, plant historians, and IoT. Once established, it powers any downstream use case — dashboards, ML models, or autonomous AI Agents — without rebuilding the data layer each time. UNLSH is deployed across petrochemical complexes, refineries, and oil & gas facilities, including India's largest private sector conglomerate and a leading PSU refinery. www.ddriven.io

SNF Flopam India Pvt. Ltd.

SNF Flopam India Pvt. Ltd. is the Indian subsidiary of the SNF Group, the global leader in polyacrylamide-based polymers used across the Oil & Gas, water treatment, mining, agriculture and industrial sectors. With operations in more than 150 countries, SNF delivers sustainable and high-performance polymer solutions that support efficient and environmentally responsible operations.

In India, SNF Flopam India operates a major manufacturing facility in Gandhidham, Gujarat, spread across 117 acres, dedicated to producing polyacrylamide-based chemicals for diverse market needs. This facility ensures consistent product availability and supports the growing requirements of Indian industries.

For the Oil & Gas sector, SNF supplies a wide range of high-performance polymers for drilling, cementing, Chemical Enhanced Oil Recovery (EEOR), water shut-off, fracking, pipeline operations and produced water treatment. These solutions help improve well performance, increase recovery efficiency, and reduce operational challenges.

SNF polymers are widely used in mining, mineral processing, and various industrial applications, including solid–liquid separation, wastewater treatment, and process optimization.

SNF Flopam India offers strong technical support through field assistance, laboratory analysis, and product optimization services. The fully established Regional SNF Technical Centre (RSTC) further enhances our capabilities in application testing, product development, and rapid customer support.

With a strong focus on safety, quality, and sustainability, SNF Flopam India continues to be a trusted partner to leading companies across the energy and industrial sectors.

Member Organizations

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

Member Organizations

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

* w.e.f. April 2026

FIPI

Federation of Indian Petroleum Industry

J-105, Tower-J, First Floor, World Trade Centre,
Nauroji Nagar, New Delhi-110029