



Roundtable on 'Oil and Gas Sector in India during Changing Times'

 **20th May 2026**

 **India International Centre in Delhi**

Precursor to

BCC&I
AIDING BUSINESS
SINCE 1833
Present

19th Environment and Energy Conclave

Energy Security for Atmanirbhar Bharat
in a Changing Geopolitical Landscape

 **10th September 2026**  **Le Meridien, Delhi**



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INTRODUCTION

The Bengal Chamber of Commerce and Industry (BCC&I) successfully hosted a Roundtable on '**Oil and Gas Sector in India during Changing Times**' on **20th May 2026** at the **India International Centre, Delhi**. This Roundtable was presented as a **precursor to the 19th Edition of our Environment and Energy Conclave to be held on 10th September at Le Meridien, Delhi**.

It brought together industry leaders, domain experts, senior policymakers and relevant stakeholders from the Oil and Gas ecosystem to deliberate on the evolving landscape of India's energy sector amidst global transitions and emerging challenges.

It served as an important platform for exchanging ideas and perspectives on the future direction of India's oil and gas sector and reinforced the need for collaborative approaches to ensure energy security, sustainability and resilience in a rapidly changing global environment.

KEY TAKEAWAYS FROM ROUNDTABLE

A. ENERGY SECURITY

1. **Develop strategic natural gas storage infrastructure** - A strong recommendation emerged around creating underground strategic gas reserves using depleted oil and gas fields, aquifers and salt caverns. India has significant geological potential and that gas storage would strengthen energy security, reduce volatility and improve crisis preparedness.
2. **Diversify energy import sources as well as supply corridors** – India has traditionally focused on securing the cheapest supplies but not diversified transport routes. Future of energy security should therefore include diversification of suppliers, shipping corridors, contract structures and benchmark pricing mechanisms.
3. **Accelerate domestic exploration and production to reduce import dependence** - With India importing nearly 89% of crude oil and more than half of its gas requirements, experts recommended expanding domestic exploration, especially offshore assets, while leveraging new reforms, open acreage policies and the **Samudra Manthan** initiative.

B. ENERGY ACCESSIBILITY, INFRASTRUCTURE AND MARKET DEVELOPMENT

4. **Prioritize evacuation and transmission infrastructure for renewable integration** – It was observed that renewable generation capacity is increasing but evacuation infrastructure and grid synchronization remain inadequate, leading to stranded power and curtailment. Investment in transmission systems, storage and smart grid technologies was recommended.

5. **Use AI, digital systems and energy storage for grid balancing** - The roundtable recommended integrating artificial intelligence, machine learning and digital management tools for dynamic demand-supply balancing while simultaneously expanding storage solutions to address renewable intermittency.
6. **Promote a diversified cooking-energy transition model** - Rather than relying on a single solution, participants recommended a multi-fuel approach combining electricity, LPG and piped natural gas (PNG). Urban and high-density areas were identified as priority zones for PNG expansion while allowing gradual electrification where feasible.
7. **Create policy frameworks that ensure investment viability** - Participants stressed that energy transition projects require commercially viable returns. Regulatory and policy mechanisms should therefore improve investor confidence, enable reasonable returns, encourage private participation and accelerate implementation in emerging sectors such as green fuels and gas infrastructure.

C. SUSTAINABILITY AND NET-ZERO TRANSITION

8. **Reassess long-term oil and gas investments through a “Net Zero Cost” framework** – It was emphasized that future investments in LNG terminals, refineries, gas infrastructure and fossil-fuel assets should be evaluated against India’s 2070 net-zero pathway to avoid stranded assets and costly closures later. It was suggested adopt a least-cost transition approach before approving long-life investments.
9. **Scale up green hydrogen and bioenergy ecosystems beyond incentives** - There was broad agreement that India can become a global leader in green hydrogen but incentives alone are insufficient. Participants recommended addressing project execution bottlenecks, developing hydrogen clusters/hydrogen valleys and accelerating deployment in hard-to-abate sectors such as steel, cement, refineries and power.
10. **Expand indigenous green molecules including biogas and bio-methane** - The discussion highlighted biogas/CBG as an important pathway for rural development, import reduction and energy diversification. Greater emphasis was recommended on renewable methane, agricultural waste utilization and domestic green fuel ecosystems.

POTENTIAL CHALLENGES TO BE ADDRESSED

1. **Risk of Stranded Assets and Transition Costs Remains Unresolved** - While several discussions supported expanding oil, gas and LNG infrastructure for energy security, concerns were also raised that large long-life investments may become economically unviable as India progresses toward its 2070 net-zero target. The discussion highlighted that future decommissioning costs, asset under-utilisation and transition liabilities were not yet adequately addressed in planning frameworks.

- 2. Green Hydrogen Ambitions Face Execution and Commercial Viability Challenges** - Although green hydrogen was widely recognised as a major opportunity area, participants noted that project implementation remains slow despite incentives and policy support. Questions remain around cost competitiveness, infrastructure readiness, demand creation and large-scale deployment in hard-to-abate sectors, indicating that commercial viability is still evolving.
- 3. PNG and Gas Expansion May Face Economic and Infrastructure Constraints** - The recommendation for wider PNG and gas adoption was accompanied by concerns regarding high capital expenditure requirements, long gestation periods and uneven geographic feasibility. Expansion may be more practical in dense urban areas, while universal deployment across all regions may remain challenging.
- 4. Renewable Growth Alone Does Not Address Grid and Storage Bottlenecks** - The discussion acknowledged that rapid renewable capacity additions are not automatically translating into reliable energy delivery. Constraints related to transmission infrastructure, evacuation systems, storage technologies and intermittency management continue to affect integration, suggesting that generation targets alone may not ensure energy transition outcomes.
- 5. Urban-centric Energy Planning May Overlook Regional Realities** - Participants cautioned that many transition discussions are often framed around metropolitan consumption patterns and industrial clusters. However, India's energy transition pathway will need differentiated approaches considering rural populations, affordability, varied fuel-use behaviour and regional socio-economic conditions. A uniform transition strategy may therefore have limitations.

SUMMARY

The roundtable on “Oil and Gas Sector in India during Changing Times” examined the evolving role of the sector in the context of global energy transition, rising domestic demand, energy security concerns and emerging technological developments. The deliberations highlighted that India's energy pathway differs from many developed economies due to its developmental priorities, expanding economy and increasing energy requirements. Participants emphasised that India must balance energy accessibility, affordability, sustainability and economic growth while progressing toward its long-term climate commitments.

- **Energy Security** – Energy security emerged as a central theme of the deliberations, with participants highlighting India's continued dependence on imported crude oil, LNG and LPG and the potential risks arising from geopolitical disruptions and supply-chain vulnerabilities. The discussions underscored the need to broaden the concept of energy security beyond fuel availability to include diversification of import sources and supply corridors, expansion of strategic petroleum and natural gas reserves, development of resilient logistics networks and acquisition of overseas energy assets. Participants also emphasized the importance of strengthening domestic exploration and production through greater investment in offshore resources, advanced seismic studies, data-driven exploration and technological innovation to reduce long-term import dependence and enhance national energy resilience.

- **Energy Accessibility, Infrastructure and Market Development** - The roundtable highlighted the critical role of infrastructure, technology and market development in ensuring reliable and affordable energy access. Participants discussed the need for significant investments in transmission networks, renewable energy evacuation systems, energy storage and smart-grid technologies to support a rapidly evolving energy mix. Natural gas was viewed as an important transition fuel with discussions covering city gas distribution, industrial applications and household consumption, while acknowledging infrastructure and affordability challenges. The deliberations also emphasized the importance of indigenous manufacturing, localisation, skill development and industrial ecosystem creation. Emerging technologies such as artificial intelligence, digitalisation and advanced analytics were identified as important enablers for exploration, operational efficiency, grid management and future energy planning.
- **Sustainability and Net-Zero Transition** - Participants examined the pathways required to align India's energy future with its long-term climate commitments and Net Zero 2070 target. The discussions emphasized the need to evaluate future energy investments through a long-term transition lens while ensuring affordability and energy security. Renewable energy integration, grid preparedness and energy storage were identified as critical enablers of decarbonisation. Considerable attention was also given to green hydrogen, compressed biogas (CBG), renewable methane and other low-carbon fuels as complementary solutions for reducing emissions across hard-to-abate sectors. The deliberations concluded with recognition that India's energy transition must remain inclusive and balanced, reflecting the country's diverse socio-economic realities and ensuring that sustainability objectives are pursued alongside developmental and energy-access priorities.

SOME GLIMPSES OF THE ROUNDTABLE



(L-R) **Mr. Kamal Kishore Chatiwal**, Managing Director, Indraprastha Gas Limited, **Dr. Kaustav Nag**, Additional Director General (Exploration), Directorate General of Hydrocarbons, Ministry of Petroleum & Natural Gas, Govt. of India, **Dr. Ajay Shankar**, Former Secretary, Department of Industrial Policy and Promotion, Govt. of India and Mentor, The Delhi Council, BCC&I, **Mr. Asim Prasad**, Executive Director (Corporate Strategy Planning, Advocacy & Corporate Affairs), GAIL (India) Limited, **Mr. Rajesh Kumar Mediratta**, Managing Director & CEO, Indian Gas Exchange and **Mr. Ajay Kumar**, General Manager- Production, Oil and Natural Gas Corporation (ONGC).



(L-R) **Mr. Manas Majumdar**, Partner, Lead Fuels & Resources, Oil & Gas Sector Leader, PwC India and **Mr. Raman Jha**, Executive Director, PwC India

SOME GLIMPSES OF THE ROUNDTABLE



SPEAKERS

Shri Ajay Shankar , Former Secretary, Department of Industrial Policy and Promotion, Govt. of India and Mentor, The Delhi Council, BCC&I, chaired the session.
Mr. Ajay Kumar , General Manager - Production, Oil and Natural Gas Corporation (ONGC)
Mr. Asim Prasad , Executive Director (Corporate Strategy, Planning, Advocacy & Corporate Affairs), GAIL (India) Limited
Mr. Kamal Kishore Chatiwal , Managing Director, Indraprastha Gas Limited
Dr. Kaustav Nag , Additional Director General (Exploration), Directorate General of Hydrocarbons
Mr. Manas Majumdar , Partner, Lead Fuels & Resources, Oil & Gas Sector Leader, PwC India
Mr Rajesh Kumar Mediratta , Managing Director & CEO, Indian Gas Exchange
Mr. Raman Jha , Executive Director, PwC India

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Mr. Randhir Kumar , Head – Marketing, HPCL Biofuels Ltd
Mr Satendra Mohan , Chief General Manager (P), ONGC
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Mr. Swastik Mohanty , Senior Manager – Marketing, Brahamaputra Crackers & Polymer Ltd

Mr. Vikas Choukse, General Manager (DLO – Delhi Liaison Office), Chennai Petroleum Corporation Limited

Mr. Vineet Goyal, General Manager, Cosmic Petrochem

Ms. Kanika Khandelwal, Senior Project Consultant Economic Development Advisory, Ernst & Young LLP

ANNEXURE

Detailed Deliberations of the Roundtable on “Oil and Gas Sector in India during Changing Times”



Shri Ajay Shankar, Former Secretary, Department of Industrial Policy and Promotion, Govt. of India and Mentor, The Delhi Council, BCC&I

Shri Shankar emphasized that India’s energy transition should be approached through both immediate energy security concerns and the long-term commitment to achieve net zero emissions by 2070, announced by the Prime Minister at Glasgow and reaffirmed in India’s communication to the UNFCCC. He highlighted that future investments in the oil and gas sector must account for the eventual decline in fossil fuel dependence and avoid creating stranded assets.

His address advocated accelerated electrification in cooking and mobility, reassessment of existing natural gas expansion strategies and stronger strategic planning by energy companies. He also underlined the importance of India’s Green Hydrogen Mission, green manufacturing opportunities and industrial transformation. Stressing that development and climate goals are increasingly converging, he argued that the transition to net zero should be seen not only as an environmental necessity but also as an opportunity for industrial advancement, technological leadership and positioning India as a major player in the emerging global green economy.

- Shri Shankar stated that India’s energy planning should be guided by two major boundary conditions: the immediate challenges related to energy security and economic disruptions, and the long-term commitment to achieve **net zero emissions by 2070**, announced by the Prime Minister at **Glasgow** and reiterated in India’s communication to the **UNFCCC**. He emphasized that net zero would ultimately require significant reduction in fossil fuel dependence.
- He cautioned against excessive reliance on **carbon capture, utilisation and storage (CCUS)**, observing that these technologies can only provide marginal solutions because global carbon emissions are too large for long-term storage and utilisation remains limited to specific industrial applications. He proposed evaluating the “**net present cost of reaching net zero**” while planning future investments.
- He highlighted risks associated with large and long-duration investments such as **LNG terminals, long-term LNG contracts, power plants and refineries**, noting that these assets may face future closure costs and risk becoming stranded. He also referred to the **Enron power project experience**, involving LNG-linked generation and later use of naphtha, as an example of how inappropriate long-term investments can create economically unviable infrastructure.
- To address possible disruptions in LPG and gas supplies, he advocated promotion of electric cooking systems, noting that **electricity-based cooking** is widely used in Europe and that cooking through electricity remained economical. He also referred to India’s successful **LED transition programme**, achieved within approximately three years through bulk procurement, lower pricing and discom-supported installment models, as a template for future interventions.

- Dr. Shankar emphasized that oil and gas companies should undertake long-term strategic transformation and diversify toward **green energy, renewable manufacturing, low-carbon technologies and advanced industrial systems**.
- He highlighted the strategic opportunities emerging from India's Green Hydrogen Mission, stating that India stands at par with leading economies in green hydrogen development and could build competitiveness in technology, downstream applications and low-carbon production.
- He also referred to opportunities arising from the **India–EU Free Trade Agreement (FTA)** framework and the **European Union Carbon Border Adjustment Mechanism (CBAM)**, observing that India could leapfrog into green industrialisation because, unlike countries with large legacy assets, it can directly build new low-carbon industrial infrastructure. He concluded by noting that India's population of **1.4 billion people**, rising energy demand and climate leadership make its transition path critical for global outcomes.

Dr. Kaustav Nag, Additional Director General (Exploration), Directorate General of Hydrocarbons, Ministry of Petroleum & Natural Gas, Government of India.



- Dr. Kaustav Nag stated that India is at a critical inflection point while navigating the “energy trilemma” of ensuring energy accessibility, affordability and environmental sustainability alongside resilience against global uncertainties. He highlighted that India is the world's fourth largest economy aspiring to become a **USD 7 trillion economy by 2030**, while the oil and gas sector contributes significantly to GDP and industrial growth.
- He emphasized that despite the global energy transition, fossil fuels will continue to remain important for India until at least **2047**, as India's energy demand is expected to rise substantially. He noted that India imports nearly **89% of its crude oil** and a large share of natural gas, making energy security and domestic exploration a national priority.
- Dr. Nag highlighted India's vast untapped hydrocarbon potential, stating that the country has nearly **3.36 million sq. km. of sedimentary basins** with substantial oil and gas resources still unexplored. Referring to discoveries such as the **Digboi oil field** and **Bombay High**, he stressed that India still offers major opportunities for exploration and production activities.
- He outlined key Government initiatives to strengthen domestic exploration, including the **National Seismic Program** involving extensive 2D and 3D seismic surveys and drilling programmes to assess remaining hydrocarbon potential. He also highlighted the **Samudra Manthan** initiative, involving an investment of nearly **₹1 lakh crore**, aimed at unlocking offshore resources and strengthening the blue economy.
- Dr. Nag stated that major policy reforms have been introduced to encourage investment in the upstream sector, including amendments to the **Oilfields Regulation and Development Act (ORDA), 1948** and the **PNG Rules, 1959**. He noted that these reforms provide fiscal stability, decriminalization and neutral arbitration mechanisms, while also permitting integrated energy projects involving **coal bed methane, shale gas and CCUS**.

- He highlighted that after intervention from the Prime Minister's Office, restrictions on offshore exploration were lifted and India's offshore areas, including deep-water and ultra-deep-water regions, are now open to Indian and international companies. He also referred to the growing importance of **CCUS technologies**, mentioning the launch of a commercial-scale project linked to **IIT Bombay** for reducing industrial carbon emissions.
- Concluding his remarks, Dr. Nag emphasized that while renewable energy and electric mobility will continue to expand, oil and gas will remain relevant in India's energy mix for the foreseeable future. He stressed the need for responsible and green exploration, development of untapped gas reserves in regions such as the **Mahanadi** and **Andaman Basins**, and parallel progress under the **National Critical Mineral Mission** to support the Prime Minister's vision of **Viksit Bharat by 2047**.



Mr. Asim Prasad, Executive Director, Corporate Strategy, Planning, Advocacy and Corporate Affairs, GAIL India Ltd

- Mr. Asim Prasad highlighted that fossil fuels continue to account for nearly **89% of India's energy mix**, with natural gas contributing around **6.2%**, while India's overall energy demand has been growing at a significantly faster pace than the global average. He noted that India's renewable energy growth rate has also remained higher than the global average over the last several years, although still below China's growth trajectory.
- He emphasized the importance of recent Government initiatives such as the **National Green Hydrogen Mission for 2030**, including the incentive schemes for developing **hydrogen clusters and hydrogen valleys**, particularly in coastal regions. He stated that the Mission aims to reduce dependence on fossil fuels and accelerate clean energy transition across hard-to-abate sectors such as **power, refineries, steel and cement**.
- Referring to the Government's **Critical Minerals policy**, under which around **30 critical minerals** have been identified, he observed that although India possesses mineral reserves in states such as **West Bengal, Odisha and Jharkhand**, the country remains dependent on imports from countries like **Australia, China, Argentina and Chile** because of limited refining and processing capabilities required for batteries, semiconductor chips and other advanced technologies.
- India's per capita energy consumption remains only about **one-third of the global average**, indicating strong future demand growth. While acknowledging several progressive renewable energy policies and incentive schemes, he stressed that infrastructure development and power evacuation systems are lagging behind generation capacity. The key issue is the growing gap between the increase in renewable energy capacity and the preparedness of transmission infrastructure. He noted that nearly as per reported data **25–30 GW of renewable power offtake** may remain constrained because of inadequate transmission and synchronization infrastructure.

- Highlighting the growing importance of **artificial intelligence, machine learning, energy storage systems and smart grid management** for handling dynamic energy demand and supply situations, he also referred to falling prices for green hydrogen and green ammonia projects, observing that costs are gradually becoming more competitive through technologies such as **alkaline electrolysis**.
- He emphasized the rapid increase in data consumption, data centres and digital infrastructure requirements across sectors including oil and gas, power, manufacturing and automobiles. Referring to Government initiatives for **digital connectivity of village panchayats** and online public services, he noted that future energy demand from digital infrastructure would be substantial and would require reliable supplies from both renewable energy and conventional oil and gas sources.
- Addressing the impact of the ongoing **West Asia crisis**, he highlighted vulnerabilities in global crude oil and petroleum product supply chains, particularly given India's continued import dependence. He stressed the need for a resilient energy framework capable of addressing both demand-side and supply-side disruptions.
- He advocated reducing import dependence through greater self-reliance, expansion of **renewable methane (biogas), solar, wind and wave energy**, while acknowledging that technology availability and affordability remain major challenges for large-scale deployment.

Mr. Rajesh Kumar Mediratta, Managing Director & CEO, Indian Gas Exchange



- Mr. Rajesh Kumar Mediratta highlighted that the recent disruptions around the **Strait of Hormuz** exposed the need not only for diversification of energy supplies but also diversification of supply corridors. He observed that India's LNG sourcing strategy had traditionally focused on obtaining the cheapest gas from the Middle East, whereas the current crisis demonstrated the importance of building resilience through geographically diversified import routes.
- Despite sharp increases in LNG prices, India managed the gas supply situation relatively well. Referring to the Ministry's emergency supply directions and GAIL's pooling mechanism, he explained that priority sectors such as **City Gas Distribution (CNG and PNG)** continued receiving full supply, while industries and fertilizer sectors initially received restricted allocations before supplies gradually stabilized as LNG cargoes became available from multiple sources.
- Mr. Mediratta emphasized that India needs a more resilient and diversified gas procurement strategy, including balancing **long-term and short-term LNG contracts** and diversifying pricing benchmarks such as **Brent-linked, Henry Hub-linked and gas-indexed contracts**. He noted that volatility in global gas markets has shown that no single pricing model consistently remains advantageous and highlighted the launch of India's own gas benchmark, the **Indian Gas Index (IGXI)**.

- He underlined the need to diversify between “grey” and “green” energy molecules, particularly by promoting **biogas and green gas solutions**. He observed that India’s strong agricultural base gives the country significant potential in biogas production, which could simultaneously support rural economic development, reduce import dependence and strengthen the clean energy transition.
- Mr. Mediratta highlighted the growing importance of creating **strategic gas reserves**, similar to India’s strategic crude oil reserves. He stated that although gas storage through salt caverns or depleted fields may involve significant costs and require Government support, India should balance strategic reserves and commercial reserves to improve seasonal energy management and strengthen long-term energy security.
- On electrification and energy transition, he supported greater use of electricity for cooking during daytime hours but cautioned that India’s power grid currently faces severe stress during evening peak demand periods.
- He observed that complete electrification of cooking could add nearly **30 GW of additional load** during peak hours, which the existing grid may not be able to handle immediately. He therefore suggested a balanced transition approach where electricity and gas continue to complement each other while renewable capacity and grid infrastructure are progressively strengthened.



Mr. Kamal Kishore Chatiwal, Managing Director, IGL Delhi

- Mr. Kamal Kishore Chatiwal emphasized India’s high dependence on imported energy, noting that nearly **97% of cooking fuel consumption is dependent on LPG**, while only 2–3% is supported by gas and electricity. He highlighted that almost **90% of LPG imports come from the Gulf region**, while nearly **89% of crude oil is imported**, making India highly vulnerable to geopolitical disruptions such as the Hormuz crisis.
- He stressed the urgent need for **strategic gas reserves** in India. Explaining that India already possesses significant potential through depleted oil reservoirs, aquifers and salt caverns and argued that underground gas storage could be created at a far lower cost than current overground LNG storage infrastructure.
- Mr. Chatiwal observed that India has not adequately addressed structural challenges in expanding the share of gas in the energy mix. Speaking from the perspective of the **City Gas Distribution (CGD) sector**, he explained that PNG expansion is highly capital-intensive, making rapid scaling difficult despite expectations of replacing LPG consumption quickly.
- He highlighted policy and regulatory imbalances between LPG and PNG. According to him, LPG pricing structures and subsidy mechanisms create an uneven competitive environment, while PNG operators must comply with strict **PNGRB safety and technical norms**.
- He also pointed out practical urban challenges such as building structures, ventilation requirements and tenant-based housing arrangements that limit PNG penetration despite increasing demand.

- **Piped Natural Gas (PNG)** should become a major long-term solution for cooking fuel, particularly in urban and semi-urban India as the country already produces nearly **100 MMSCMD of natural gas**, of which only a small portion is currently used for domestic cooking. He suggested that even if PNG connections increase significantly, much of the demand could still be met from domestic gas sources, thereby reducing import dependence.
- On energy transition and electric mobility, he cautioned against excessive dependence on imported technologies and minerals for EVs and batteries, particularly rare earth minerals sourced from China. He stated that while EVs and renewable energy will play an important role, India must carefully assess the overall emissions ecosystem because coal-based electricity currently powers a large portion of EV charging.
- Concluding his remarks, Mr. Chatiwal stressed the need for a balanced and diversified fuel strategy involving **conventional fuels, clean fuels and green fuels**. He advocated stronger focus on gas storage infrastructure, diversification of consumption patterns and a realistic roadmap for clean energy transition.
- He also raised concerns regarding the economics of **Compressed Biogas (CBG)** and the rising cost of domestic gas production, noting that India's gas production costs remain significantly higher than countries such as the United States, Nigeria and Gulf nations, making affordability and competitiveness a major challenge for increasing gas adoption.

Mr. Ajay Kumar, General Manager (Production), ONGC Ltd.



- Mr. Ajay Kumar highlighted that India's oil and gas sector is under constant pressure to maintain and increase domestic production, while the Middle East energy sector faces instability. He stressed that India must revisit its definition of energy security under the vision of **Viksit Bharat 2047**, especially in the context of changing geopolitical realities and rising energy demand.
- He emphasized that sustaining India's projected 7–7.5% GDP growth will require annual energy sector growth of around 3.5–4%, with total energy demand expected to rise from nearly 900 MMT of oil equivalent to 1800 MMT by 2047. He said India must carefully prioritize its future energy mix across oil, gas, coal, nuclear and renewable energy sources.
- Mr. Kumar pointed out India's heavy import dependence, noting that nearly **90% of crude oil is imported** and that increasing gas in the energy mix from 6% to 15% would require massive LNG imports, along with significant investments in ports, pipelines and shipping infrastructure. He underlined that affordability is as important as energy security, since high energy prices directly affect India's manufacturing competitiveness and GDP growth.
- He discussed several Government of India initiatives including the push for **100 GW of nuclear power**, expansion of ethanol blending from the current 20% target toward higher levels, promotion of CBG, geothermal energy development, and green hydrogen. He noted that ONGC is actively exploring geothermal energy in the Puga Valley and recently achieved a drilling milestone there, which could support India's first geothermal well project.

- On clean energy economics, he observed that green hydrogen costs have reduced significantly and are approaching parity with natural gas in some applications. However, he warned that CBG production remains expensive and requires supportive policy measures, tax rationalization and viable financial models to attract investors. He emphasized that policies must ensure reasonable investor returns to encourage long-term investments in India's energy sector.
- Mr. Kumar strongly advocated expanding India's strategic petroleum reserves and developing strategic gas storage infrastructure. He compared India's relatively small reserves with much larger reserves maintained by countries like the United States and China. He also highlighted China's advantage in securing pipeline-based energy supply routes from Russia, Myanmar and Vietnam, while India remains highly dependent on vulnerable maritime supply chains.
- He concluded by stressing the importance of diversification in energy sources and consumption patterns. He suggested that India should promote electric cooking, induction systems, nuclear power and renewable energy alongside natural gas to reduce LPG imports and improve long-term energy security. He also noted ONGC's plans to expand petrochemical production capacity from 4 MMT to 8 MMT through major investments, recognizing petrochemicals as a key future growth area for the energy sector.



Mr. Manas Majumdar, Partner, Lead Energy & Resources, Oil & Gas Sector Leader, PwC India

- Mr. Manas Majumdar emphasized that India's energy transition cannot follow a "one-size-fits-all" model because India consists of diverse economic, social and regional realities. He highlighted that while urban India debates LPG, PNG and electric cooking, nearly 40% of households still rely on firewood, biomass and traditional fuels, making energy access and transition highly uneven.
- Advocated "**energy addition**" or "**energy multiplicity**" rather than replacing one fuel with another. He stated that India's future energy mix will include firewood, LPG, PNG, electricity, green hydrogen, fossil fuels and renewable energy simultaneously. He also stressed that India's cooking habits and cultural practices require fuel diversity, as several traditional cooking methods still depend on flame-based energy.
- He underlined the importance of energy efficiency and reducing wastage across the oil and gas value chain. Referring to methane emissions, gas flaring and refinery losses, he noted that digital technologies, AI and digital twins can significantly improve operational efficiency. He cited **GAIL's Pata plant** as an example where digital transformation reduced energy consumption.
- India needs stronger commercial and strategic planning in energy security. He highlighted the need for larger crude and gas reserves, noting that India's current strategic petroleum reserves are far below global benchmarks and significantly lower than China's storage capacity. He also emphasized the need for overseas energy assets, shipping ownership and stronger supply chain control.

- Highlighted several Government of India reforms and initiatives including the transition from the National Data Repository, gas market reforms and the development of refining and petrochemical infrastructure. However, he stated that India still needs greater private sector participation, improved data quality and stronger execution capabilities.
- He concluded that India should position itself as a global refining, petrochemical and specialty chemicals hub. Highlighting India's status as the world's third-largest refining hub, he stressed the need for integrated refining-petrochemical complexes, expansion of PCPIR regions, coal gasification initiatives and holistic policymaking. He also proposed the creation of a unified 'Ministry of Energy' to coordinate decisions across oil, gas, coal, renewables, hydrogen and petrochemicals.

Mr. Raman Jha, Executive Director, PwC India



- Mr. Raman Jha emphasized that India's offshore exploration push but it must not only focus on drilling and seismic activity but also on building a strong domestic ecosystem under the Make in India framework. He highlighted the need to develop indigenous capabilities in drill ships, jack-up rigs, manufacturing, and offshore services to reduce dependence on foreign vendors and strengthen long-term energy security.
- He noted that the Government's offshore strategy is being designed holistically with multiple pillars including exploration, manufacturing, data generation, and technology development. He referred to frontier energy opportunities such as gas hydrates, deepwater, shallow water, and ultra-deepwater exploration, while stressing that basin evaluation requires extensive drilling and geological data collection before hydrocarbon potential can be fully assessed.
- Mr. Jha underlined the growing importance of data-driven exploration through initiatives such as the **National Data Repository (NDR)**. He advocated the use of AI, advanced analytics, and data science alongside traditional geological interpretation to improve seismic data processing, exploration efficiency, and hydrocarbon discovery rates.
- Addressing India's Net Zero target, Mr. Jha stated that decarbonization cannot be achieved without alternate fuels such as **green hydrogen, biogas and compressed biogas (CBG)**. He argued that newer CBG business models have become commercially competitive with natural gas and highlighted large-scale investments by private players such as Reliance Industries in developing hundreds of CBG plants across the country.
- He pointed to the success of the Government's ethanol blending programme, which rapidly achieved the 20% blending target through policy mandates and enforcement mechanisms. According to him, similar blending mandates and regulatory pressure could accelerate adoption of CBG and SAF, enabling faster progress toward clean energy targets and domestic fuel diversification.

- Highlighted the progress and challenges of India's **Green Hydrogen Mission**. While acknowledging that green hydrogen prices have become increasingly competitive and that the Government has introduced substantial incentives, including capital subsidies and electricity-related incentives from several states, he noted that project execution remains slow.
- He emphasized that India possesses the necessary resources and capabilities to emerge as a global leader in green hydrogen and bioenergy, provided policy intent is matched by faster implementation and industry action.

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