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TRANSFORMATION OF GAS SCENARIO: BIO GAS ON A MAJOR TAKE OFF STAGE

Transformation of Gas Scenario: Bio Gas on a Major Take Off Stage

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In the energy basket of India Gas constitutes only about 6%. The desired goal, for last about twenty years, has been that its proportion should rise to 15%, a target which has remained elusive. In the beginning of 1980's Gas was considered, based on its environmental advantages, to be a preferred fuel as compared to coal for power generation. Experiences over the decades, however, indicated that in view of lack of reliability of supply, and, more importantly, because of its price behavior, it has continued to remain a challenge for the power sector. For the Fertiliser Sector, in view of the subsidy by the Government, the proportion of consumption of Gas continues to be significant. The other reason for this fuel not occupying a major share in the energy basket has been the setbacks in the domestic production. For the last almost twenty years, the growth in domestic production has remained either negative or stagnant. As a result, much against the requirement for reducing import dependence, India continues to import almost 50% of its consumption and bears the burden of unpredictable volatile price behavior as also the ever-increasing foreign exchange rates. As a result of all these experiences power sector has given up its hope on any expansion of Gas based power generation, it continues to struggle to salvage the situation with reference to the existing over 25,000 MW of capacity.

City Gas Distribution and access to Gas supply for domestic consumption in every city and town, and, in fact, even in rural India, has emerged as a national desire. In the wake of India going on a massive expansion of renewables, particularly Solar Power, the management of power supply does have a challenge to cope with the backup power requirements in evenings and nights. Several options are being explored. Technologies which are at present not delivering the backup power at an affordable cost are being perfected at costs higher than the normal are also getting accepted to support the low-price Solar Power. It is in this context that Gas based power generation even at somewhat higher price could get into reckoning to support the backup power requirement. With this background, and with the objective of energy security, it is imperative that the domestic manufacturing of Gas should reassume the center stage. Explorations of Gas fields and enhance production will obviously continue.

Bio Gas has been produced and used for years, but has not been able to occupy a respectful position to be a significant contributor in the energy basket. Recent research studies indicate the estimated Bio Gas potential to be of order of 75 billion Cubic Meter per year while the current production is hardly about 4 billion cubic meter per year, approximately 5.5%. With all the industrial developments, it needs to be recognized, India continues to be in a significant way, highly dependent on rural economy. In the context of Bio Gas, the agricultural wastes provide a large base to be exploited, and be converted into Compressed Bio Gas. Industrial wastes are equally important and their potentials have hardly been harnessed to produce energy. The waste in Municipal towns and cities, in absence of being properly processed, have not only kept the opportunity for securing a substantial amount of energy, but, in fact, have caused avoidable environmental damage and adversely affected the air quality. It is not to suggest that nothing has been done. But, can we feel satisfied with the proportion of what has been done to be merely 5% of what could have been done? It is here where the challenges have to be converted into opportunities.

An important aspect which needs to be considered is about the technologies which have been deployed to convert waste to energy. There have developments within India and in many other countries. The process of, research suited to Indian situations, like in many other fields, has been slow. Recent initiative at the level of Government, some of the industrial houses and also research and technology professionals, however, indicate that not only efforts have intensified in terms of advancing and enriching the technology, but the outcomes have

been positive and satisfying. In the recent years a few large Compressed Bio Gas projects have given demonstrable results and have reached the level of affordability.

The challenge of technology of production and related design emanates from the dynamic nature of the process since the researchers have been trying to explore and invent more effective processes aimed at bringing the cost of production in affordable range. In India also institutions and individuals have been contributing to explore possibilities, but it appears that in Germany the technology which has evolved needs deeper understanding in Indian context to determine how best these can be adapted. The nature and dimensions of problems in India relate to various types of situations, hence the appropriateness of the technologies suitable for small scale, medium scale, and large scale manufacturing will need the required moderations.

Apart from the issue of technology, two other aspects which also are equally important to see that the cost of production together with transportation till delivery of Gas is brought down to reasonable levels. Logistics have also stood in the way of expansion of these facilities in Indian context. Transportation of feed-stocks poses its own problems, and transportation of Gas to the desired destinations become equally critical. Therefore, in order to rapidly expand the capacity all these three aspects- technology, logistics relating to feed-stock and transportation options for delivery of Gas - will need required attention.

A few recent examples of relatively larger Bio Gas production facilities, developed in last few years, do provide positive indication. The Bio Gas manufacturing plant in Patan District (Gujarat) is one of the largest in the country and it is developed and managed by a Cooperative Society. Learnings from this plant in respect of all the three elements mentioned above can be of great value. The Bio Gas plant at Sangrur in Punjab which was commissioned in October, 2022 is another large plant and this plant has led to not only production of Bio Gas but also to provide a lasting solution to the stubble burning problem in Punjab. It may be relevant to mention that the air quality in Delhi and NCR region is largely attributed to stubble burning in Punjab and other neighbouring States. The Sangrur plant when further scaled up and similar plants elsewhere can serve the dual purpose of providing Bio Gas and also addressing the challenge of poor air quality in all the affected States. Yet another example is the project being developed by Adani Group in Barsana (Uttar Pradesh). These are very encouraging developments. They will definitely provide a template for large scale expansion of this industry throughout the country. As a matter of fact, the Government of India launched a Scheme called "Sustainable Alternative Towards Affordable Transportation Scheme (SATAT) in October, 2018. Following this a number of initiatives have been taken, while others are in the pipline, and the confidence level across the country, for major Schemes on Bio Gas manufacturing and supply, has enhanced.

Gas Authority of India Ltd. (GAIL) has launched an innovative Scheme which takes care of Gas plants of various capacities to be developed by small and medium entrepreneurs and also companies of larger size in various places, with the commercial arrangement of transportation and sale of Gas being coordinated and handled by GAIL. The CBG – CGD Synchronisation Scheme has been notified by the Ministry of Petroleum and Natural Gas, under which GAIL has been mandated to implement the Scheme for supply of Bio Gas and Compressed Bio Gas mingled with domestic Gas at a uniform base price to various City Gas Distribution entities. The GAIL has taken up this initiative on all India basis in which any CBG producer can participate. The Scheme has already taken off and more than 120 Tripartite Agreements have been signed by GAIL with CBG Producers and City Gas Distribution entities. Selling of Bio Gas to more than 50 City Gas Distribution all over the country will be covered. This indeed provides a good template for scaling up. What is remarkable is that in this coordinated dispensation among Bio Gas Producers, the City Gas Distribution Companies and GAIL, there is no requirement of subsidy and the blended Gas supply is at the APM rate. Obviously, this structure of GAIL as an Aggregator and facilitator, takes care of the complicated issues of being able to supply CBG and related challenge of tariff and transportation of Gas. However, transportation logistics for the raw materials will obviously have to be handled by the manufacturers. As the Scheme moves forward – and there are reasons to believe that it is moving on the

right line without much of difficulties – it would throw several experiences and for further refining the approach and the Scheme. Perhaps many other organisations like ONGC, IOC, and other Petroleum Companies could also facilitate on the basis of the format which has been adopted by the Government and is under implementation by GAIL.

Road Map for Accelerated Growth of Bio Gas

There is a need to develop short, medium and long term targets for production and supply of Bio Gas with a view to bridging the huge gap between potential and what is produced. The present level is 5% of the potential. The following approach may be considered for the format of growth :

(a) This should be targeted to grow at an accelerated rate – for the first five years at the rate of 10% annually, next five years at the rate of 15%, and subsequently at the rate of 20%.

(b) Considering the logistic challenges associated with transportation of agricultural, industrial, and municipal wastes, and also the challenge associated with transportation of Bio Gas manufactured, a three tier Manufcturing capacity development programmes may be evaluated. This will be more or less on similar lines as the country has, after last ten years of experience, evolved for development of Solar Power Plants.

(c) The small capacity Bio Gas plants in rural areas can accumulate the agricultural raw materials from groups of villages, set up the plant at an appropriate location and cater to the needs of groups of villages. These may be categorized as Decentralised Distributed Bio Gas Production and Supply Systems. This approach will take care of the present logistic challenges both of transportation of raw materials and pipe lines for gas supply. Similar approach can be considered even for small towns.

(d) Medium size Bio Gas plants can be considered for large municipal towns and cities whose requirement of gas may be of higher order which can also be largely met by the local municipal wastes. Wherever needed the additional quantity could be supplied from the main gas pipeline system.

(e) Large size Bio Gas plants could depend on aggregated accumulation of agricultural, municipal, and industrial wastes. Gas produced could be pumped into the appropriate gas supply pipelines. In these cases corporates could come forwrd in a significant way with appropriate investments.

(f) The Regulatory interventions could correspond, in the matter of tariff and structure of supply balancing the concerns of financial institutions, investors, as well as consumers. In each of the cases the supply side of wastes, particularly in the case of agriculture will need to be priced appropriately.

(g) In almost all these cases, the production and supply of Gas would address, to a great extent the environmental requirements and air quality challenges. An appropriate mechanism will need to be developed, so that investments are finically supported to take care of high capex problems in initial stages till the time the industry matures to a sustainable level and need for such financial support may not be there.

(h) From the point of view of Cess, Taxes, and Duties, the appropriate authorities of may consider favourable dispensations, since Bio Gas expansions are going to fulfill a number of national needs – large scale access to a convenient and environment friendly fuel to the rural India, addressing the challenges of environment, particularly air quality, and more importantly, leading to reduced dependence on import of Gas.

(i) Networking of Research and Technology to innovate and to adapt the best available globally has to be a dynamic process and it needs to be institutionalised.

The above approach may need extensive consultations and discussions to fine tune the modality. Time is now appropriate that a quantum jump in the Bio Gas production is planned, and with appropriate policy intervention and implementation strategy the outcomes are achieved.

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Dear Colleagues

India Cements Position as Global Energy Leader

I am happy to share with you the February Issue of Total Energy. This issue covers news and views of the energy sector during the month.

In this month, a premier global event in the energy sector, India Energy Week (IEW) 2025, was held from February 11 to 14, 2025, at **Yashobhoomi Convention Centre, New Delhi**. The event was held under the Patronage of the Ministry of Petroleum and Natural Gas and has grown into the world's second-largest energy conference.

They key focus area were:

- **Energy Transition & Green Future:** Major focus on biofuels, flex-fuel vehicles, ethanol blending, and green hydrogen. India has its goal of produce 5 million metric tons (MMT) of green hydrogen annually by 2030.
- **Exploration & Production (E&P) Reforms:** Launch of Open Acreage Licensing Program (OAL) Round X, covering 200,000 sq km, along with regulatory changes to boost investment in oil and gas exploration.

- **India-US Energy Cooperation:** Strengthening LNG Supply partnerships and increasing natural gas consumption in India's energy mix from 6% to 15%.
- **Global Energy Investments:** Expanding investments in oil and gas assets across Brazil, Venezuela, Russia, and Mozambique while benefitting from emerging oil sources.

- **Start-up & Innovation Recognition:** The Avinya'25 - Energy Startup Challenge, led by the Ministry of Petroleum and Natural Gas, awarded innovative startups for breakthroughs in CO2 capture, ESG solutions, and renewable energy. The Vasudha – Oil and Gas Startup Challenge recognized overseas startups revolutionizing the upstream oil and gas sector with AI-driven solutions.

Shri Hardeep Singh Puri, Minister of Petroleum and Natural Gas highlighted the measurable success of India Energy Week 2025 through its unprecedented participants (7000 delegates) and 700 Exhibitors from 120 countries and technical paper submissions. The Minister noted that the event had exceeded expectations by encompassing a comprehensive range of sectors including petroleum, natural gas, green energy, biofuel, and CBG, showcasing remarkably innovative developments.

He described the biofuel program as a remarkable story, citing the current capacity of 1,700 crore liters for ethanol blending, while discussing potential beyond the 20% blending target. Moreover, he expressed particular excitement about green hydrogen, confirming confident progression toward the 5MMT annual production target for 2030, while also highlighting sustainable aviation fuel development.

Shri Pankaj Jain, Secretary, Ministry of Petoleum and Natural Gas, also highlighted the unprecedented scale of OALP Round X, emphasizing the need for global expertise to exploit hydrocarbon resources in the country. Shri Jain also discussed the potential use of the Oil Industry Development Fund, established under the Oil Industry Development Act, for innovative financing needs in deep-water exploration projects.

During the month, India Energy Forum organized an online Discussion on "Budget 2025: Impact on Energy Sector on 11th. O 28th February 2025 one Webinar on Bio Gas was also organized by the Forum. 22nd AGM of India Energy Forum was held on 17th February 2025 at IIC Annexe, New Delhi.

With best wishes

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India achieves 100 GW solar energy capacity: Pralhad Joshi

India has achieved the milestone of 100GW solar energy capacity, Union Minister Pralhad Joshi said on Friday, underscoring the country's target of having 500 GW renewable energy capacity by 2030. "Under the visionary leadership of Hon'ble PM Shri @narendramodi ji, India has achieved the historic milestone of 100 GW solar capacity. This achievement is powered by our relentless commitment to a cleaner, greener future," the New & Renewables Energy Minister said in a post on X.

Earlier, India had planned to have 175 GW of renewable energy capacity, including 100 GW solar by 2022. But it could not be achieved due to staggering impact of the pandemic which forced imposition of lockdown restrictions.

According to a statement issued by Ministry of New & Renewable Energy, the milestone reinforces India's position as a global leader in renewable energy.

"Initiatives like solar panels, solar parks and rooftop solar projects have brought about revolutionary changes. As a result, India has successfully achieved the target of 100 GW of solar energy production. In the field of green energy, India is not only becoming self-reliant but is also showing the world a new path," the statement quoted Joshi as saying.

The minister said PM SuryaGhar Muft Bijli Yojana is making rooftop solar a household reality and is a game changer in sustainable energy, empowering every home with clean power.

India's solar power capacity increased 35 times over the past decade, rising from 2.82 GW in 2014 to 100 GW in 2025.

As of January 31, 2025, India's total solar capacity installed capacity stands at 100.33 GW, with 84.10 GW under implementation and an additional 47.49 GW under tendering.

The country's hybrid and round-the-clock (RTC) renewable energy projects are also advancing rapidly, with 64.67 GW under implementation and tendered, bringing the grand total of solar and hybrid projects to 296.59 GW.

Solar energy remains the dominant contributor to India's renewable energy growth, accounting for 47 per cent of the total installed renewable energy capacity.

In 2024, record-breaking 24.5 GW of solar capacity was added reflecting more than twofold increase in solar installations compared to 2023.

Last year also saw the installation of 18.5 GW of utility-scale solar capacity, a nearly 2.8 times increase compared to 2023.

Rajasthan, Gujarat, Tamil Nadu, Maharashtra and Madhya Pradesh are among the top-performing states, contributing significantly to India's total utility-scale solar installations.

The rooftop solar sector in India witnessed remarkable growth in 2024, with 4.59 GW of new capacity installed, reflecting a 53 per cent increase compared to 2023.

A key driver of this growth has been the PM Surya Ghar: Muft Bijli Yojana, launched in 2024, which is now nearing 9 lakh rooftop solar installations, enabling households across the country to embrace clean energy solutions.

India has also made significant strides in solar manufacturing. In 2014, the country had a limited solar module production capacity of just 2 GW.

Over the past decade, this has surged to 60 GW in 2024, establishing India as a global leader in solar manufacturing. With continued policy support, India is on track to achieve a solar module production capacity of 100 GW by 2030, the ministry said. This 100 GW milestone in solar energy underscores

India's role as a renewable energy powerhouse, ensuring clean, sustainable, and affordable energy access for millions while shaping a self-reliant energy future, the ministry said.

India targets 40-45 GW rooftop solar by 2027, installed capacity at 456.7 GW: Economic Survey

India's installed power capacity reached 456.7 GW in November 2024, reflecting a 7.2% year-on-year growth, with renewable energy contributing 209.4 GW, or 47% of the total capacity, according to the Economic Survey 2024-25 presented in Parliament.

Union Minister for Power and Housing & Urban Affairs Manohar Lal, highlighted the sector's progress, stating that sustained reforms and policy measures have strengthened financial viability and environmental sustainability.

The report noted that ₹1.85 lakh crore investments led to the electrification of 18,374 villages, benefiting 2.9 crore households. The Revamped Distribution Sector Scheme, with a budget of ₹3 lakh crore, is focused on enhancing power supply reliability and implementing smart metering solutions.

The PM Surya Ghar: Muft Bijli Yojana aims to achieve 40-45 GW rooftop solar capacity by 2027, while the ₹7,453 crore Viability Gap Funding (VGF) scheme is set to support offshore wind energy expansion.

The Green Energy Corridor has added 9,136 circuit km of transmission lines, contributing to improved power supply. The survey reported that daily electricity supply has improved to 23.4 hours in urban areas and 21.9 hours in rural areas, with the energy demand-supply gap reducing to 0.1%.

"The survey aptly reflects the robust expansion of India's power sector, which has witnessed significant strides under our government's initiatives. We are committed to ensuring uninterrupted and affordable electricity for every citizen while steering India towards becoming a major energy exporter by 2047, in line with the vision of Viksit Bharat," the Union Minister stated.

The Economic Survey highlighted the continued growth of the power sector, emphasizing the role of renewable energy expansion, infrastructure investment, and policy reforms in driving India's energy transition.

India's wind power capacity poised to surge to 63 GW by 2026-27

India's annual capacity addition of wind power is projected to more than double to 7.1 gigawatt (GW) on average in the next two financial years, compared with 3.4 GW in fiscal year 2023-25 — driven by government measures to ramp up the pace, a report said on Monday, adding that this will take the country's total installed wind capacity to around 63 GW by 2026-27.

The capacity additions over the financial years 2023-24 and 2024-25 continued to remain tepid in the range of 6-7 GW on account of fewer successful auctions of wind capacities (5.9 GW in FY21-23 and 5.2 GW in FY23-25), according to a Crisil report.

These were largely due to lower interest from developers on account of low tariffs that dampened returns for developers along with issues in terms of availability of land and transmission infrastructure at sites with high wind potential, the report observed. However, tailwinds are emerging which will help double the pace of capacity additions over the next two financial years.

The government's push towards the auctions of hybrid renewable projects (which are a combination of solar, wind and/or storage) as well as an emerging favourable cost regime for wind projects are expected to drive capacity additions, according to the Crisil report. In addition to the steady auction pace of standalone wind projects, auctions of hybrid renewable energy projects (which require the developers to supply renewable electricity during high-demand — evening and early morning — hours) have spurted.

Around 30–50 per cent of the capacities of such hybrid projects are expected to be wind power as these generate electricity during peak load times, unlike solar power, which generates mostly during daytime. Further, as these hybrid projects help

distribution companies (discoms) solve the problem of scheduling power at critical times, they are expected to find favour in offtake and grow fast, the report stated.

According to Ankit Hakhu, Director, Crisil Ratings, the country has over 30 GW of hybrid projects in the pipeline which are expected to be commissioned within next 2-4 years and would contribute to the expected step-up in wind capacity additions.

“Traction in signing power purchase agreements (PPAs) is also visible, with more than 60 per cent of such projects auctioned till March 2024 having their PPAs signed by January 2025,” he noted.

NTPC Green Energy inks pact to develop 20 GW Renewable Energy Projects in MP

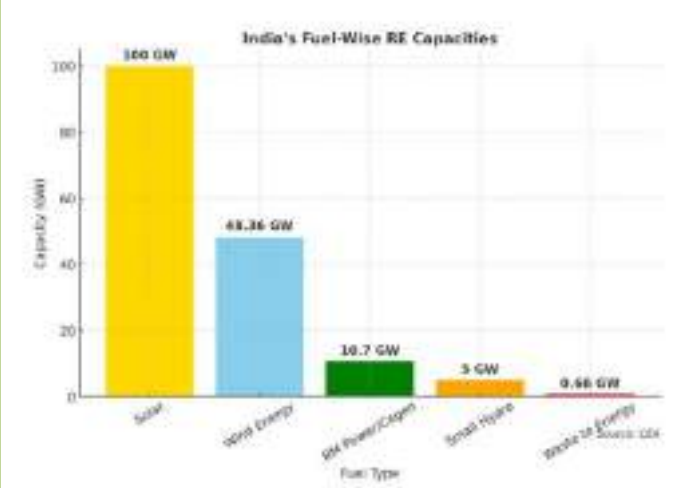
State-owned NTPC Green Energy (NGEL) on Monday said it has inked a pact with Madhya Pradesh Power Generating Company (MPPGCL) to collaborate in the renewable energy sector to develop up to 20 GW projects in the state.

MPPGCL and NGEL shall jointly work for the formation of a joint venture company to meet the renewable generation obligation of Madhya Pradesh power generating company and renewable purchase obligation of the state's discoms (distribution companies), a regulatory filing said.

In order to collaborate in development of renewable energy parks/projects and to facilitate in government of India's efforts towards energy transition, a memorandum of understanding (MoU) was signed between NGEL and MPPGCL at Global Investors Summit, 2025 held in Bhopal, the filing said.

The MoU was exchanged between NGEL and MPPGCL in the presence of state chief minister Mohan Yadav. This pact envisages to collaborate in the field of renewable energy through setting up of projects comprising solar/wind/hybrid with or without storage up to 20 GW or more in Madhya Pradesh, it stated.

India Adds 18.5 GW Of New Solar Capacity In 10 Months of FY25



India’s solar energy capacity continues to rise strongly, with a strong 2.5 GW addition in January as well. The latest data from the Central Electricity Authority (CEA) revealed that India added 18.5 GW of new solar capacities in the current fiscal, since April 2024. This is a 147% growth in new solar power additions yearly (YoY).

While India added 18.5 GW of solar capacity since April 2024, it was able to add only 7.5 GW between April 2023 to January 2024. Although wind energy capacity did not grow significantly, it increased marginally.

As per the CEA data, India added 2.5 GW of new wind energy capacity in the 10 months of FY25. On the other hand, it was able to add 2.3 GW of new wind energy capacities in the first 10 months of FY24. Thus, wind energy capacity grew by 8.70% YoY.

Additions in January 2025
January also proved significant from the new renewable power additions. India added 2.5 GW of new solar capacities in January 2025 alone. This is equivalent to the total wind energy capacity India added in the first 10 months of FY25.

Meanwhile, in the first 10 months of FY24, the country had added 9.88 GW of new solar capacities. Thus, on a YoY basis, the country registered a growth of 149.5% on YoY, hinting at faster installations in January.

On the other hand, the country added 202 MW of new wind energy capacities in January. This is against the new wind energy capacity addition of 232.76 MW in January FY24. Thus, the country registered a negative growth of 13% in wind energy capacity in January. That is probably a blip, as industry is confident of adding capacities before March 31.

Overall, India's renewable energy capacity (excluding large hydro) has touched 165 GW by the end of January 2025. With the current pace of deployment, it is expected that India's total new solar energy capacity additions in FY25 could reach anywhere between 22 GW to 25 GW in FY25.

ONGC targets 10 GW renewable capacity by 2030, plans ₹40,000 crore investment in energy transition

Oil and Natural Gas Corporation (ONGC) has set a target of 10 GW renewable energy capacity by 2030, with plans to expand investments in solar, wind, and green hydrogen projects. The company recently signed an agreement with Ayana Renewables, increasing its clean energy portfolio from 153 MW to 3 GW in a single step.

Pankaj Kumar, Director (Production), ONGC, said the company is committed to achieving its renewable energy goals ahead of schedule. "My target is to go to 10 GW by 2030, and I am confident we will achieve it much earlier," he said during an interaction at India Energy Week (IEW) 2025.

The company is also focusing on importing and trading gas as part of its energy transition strategy. "We will not shy away from importing and trading gas. We know gas better than anyone. We produce, transport, and sell gas, and gas is the lowest polluting fuel in the transition to cleaner energy sources," Kumar said.

ONGC has diversified its portfolio into refining, petrochemicals, power, and gas transportation, in addition to its core exploration and production (E&P) business. The company recently infused capital into ONGC Petro Additions Ltd. (OPaL), securing a continuous gas supply to enhance production capacity.

Increased investments in oil and gas production
ONGC has expanded its capital expenditure beyond ₹30,000 crore in the current financial year, with next year's investment projected between ₹35,000-40,000 crore. A large portion of the investment will be directed towards exploration and production (E&P) projects, deepwater drilling, and offshore field development.

The company is advancing multiple offshore developments, including the Daman Upside Development Project (DUDP), which is set to commence production by late 2025. The Deepwater Cluster-1 project in the East Coast is also in the pipeline.

ONGC has started seismic data collection and exploration in no-go areas, following the government's decision to open these zones for hydrocarbon exploration. Kumar confirmed that ONGC has already announced a discovery in the East Coast's no-go area, with further appraisal work underway.

BP partnership for Mumbai High to boost production
ONGC is targeting a 40% increase in oil production and 80% growth in gas output from the ageing Mumbai High field over the next 10-12 years, following its technical service provider agreement with BP. Kumar said the partnership is expected to yield a 60% overall increase in hydrocarbon output.

The four-day workshop starting February 24 will bring together ONGC and BP's technical teams to discuss reservoir management, facility optimization, and flow assurance. With increased investments, renewable energy expansion, and offshore exploration initiatives, ONGC is positioning itself for long-term production growth and energy transition.

Reducing Coal Imports and Increasing Domestic Production in Focus of Coal Ministry: Union Minister G Kishan Reddy

Reducing Coal Imports and Increasing Domestic Production is the focus of the Coal Ministry, said Union Minister of Coal and Mines, Shri G Kishan Reddy. Addressing a press conference in New Delhi recently, minister said that coal ministry is progressing in the path of achieving 'Atmanirbharta' in the sector. Secretary, Ministry of Coal, Shri Vikram Dev Dutt, Director General, PIB Shri B Narayanan, Additional Secretary, Ministry of Coal Smt Vismita Tej and Joint Secretary, Ministry of Coal Shri Sanjiv Kumar Kassi were also present at the Press Conference.

The coal sector remains a cornerstone of India's energy security, playing a vital role in the country's industrial and economic growth. With the fifth-largest geological coal reserves globally and as the second-largest consumer, coal continues to be an indispensable energy source, contributing to 55% of the national energy mix. Approximately 74% of power generation in India relies on Thermal Power Plants (TPPs), reaffirming the need for a robust and sustainable coal sector, said the Minister. Addressing the media, minister highlighted the progress made by the Ministry.

Record-Breaking Production and Policy Reforms: India's coal production has reached an all-time high of 997.82 million tonnes (MT) in FY 2023-24, marking a significant rise from 609.18 MT in FY 2014-15, with a Compound Annual Growth Rate (CAGR) of 5.64% over the past decade. In FY 2023-24 alone, production has surged by 11.71% compared to the previous year.

A landmark policy reform came with the introduction of commercial coal mine auctions in 2020, encouraging private sector participation and modern technological adoption. As of January 2025, the Ministry of Coal has allotted 184 mines, with 65 blocks receiving Mine Opening Permissions. Total production from these blocks has reached 136.59 MT, registering a 34.20% year-on-year increase. This is expected to exceed 170 MT target in FY 2024-25.

Coal Sector's Contribution and Growth Among the eight core industries, coal has exhibited the highest growth rate, recording a 5.3% increase in December 2024 compared to the previous year. Additionally, the coal sector accounts for about 50% of freight revenue for Indian Railways and provides direct employment to nearly 4.78 lakh individuals.

State Governments also benefit significantly from coal revenues, with royalty, District Mineral Foundation (DMF) contributions, and State GST collections amounting to ₹31,281.7 crore in the fiscal year 2023-24.

Strengthening Coal Supply Chains To ensure uninterrupted coal supply, robust institutional mechanisms have been put in place, including an Inter-Ministerial Committee and coordination meetings with Railways and power sector stakeholders. As a result, coal stock at TPPs now stands at 49 MT—sufficient for nearly 21 days, even amidst logistical restrictions during the Maha Kumbh period.

To further enhance supply efficiency, the Ministry has launched the First Mile Connectivity (FMC) initiative, commissioning 39 projects with a total capacity of 386 MTPA. Additionally, the Rail-Sea-Rail (RSR) mode has successfully doubled coal movement from 28 MT in FY 2022 to 54 MT in FY 2024.

Sustainability and Diversification Efforts The coal sector is embracing sustainability with large-scale afforestation efforts, with over 54.06 lakh saplings planted across 2,372 hectares in 2024. Under the 'Ek Ped Maa Ke Naam' campaign, over 1 million saplings were planted at 332 locations in 11 states.

Additionally, 4,695 hectares of land have been identified for Accredited Compensatory Afforestation, and a total of 18,513 LKL of treated mine water has been provided to over 18.63 lakh people across 1,055 villages over the past five years.

Technological Advancements and Future Readiness Coal gasification is emerging as a key strategy for energy security, with a target of 100 MT by 2030. The Government has approved an ₹8,500 crore incentive scheme to support coal gasification projects across public and private sectors. The introduction of the National Coal Mine Safety Report Portal and the Mine Closure Portal ensures responsible and transparent mining practices.

The Ministry is also considering the establishment of a Coal Trading Exchange to create a competitive and transparent market, further modernizing the sector.

Commitment to Responsible Growth The coal sector's transformation is marked by policy-driven reforms, sustainable initiatives, and technological advancements, ensuring energy security while prioritizing environmental responsibility. Through these efforts, India is paving the way for a resilient, self-sufficient, and sustainable future in coal production and energy supply.

The Ministry of Coal is committed to ensuring a robust, efficient, and sustainable coal sector that supports India's economic growth and energy security. Through policy reforms, production enhancements, and environmental initiatives, the Ministry continues to drive progress towards a self-reliant coal industry.

Reducing Imports and Strengthening Domestic Production: Coal Ministries efforts has significantly reduced reliance on imported coal. Between April and November 2024, coal imports declined by 5.35%, saving approximately $3.91 billion (₹30,007.26 crore). Notably, coal imports for domestic power plant blending fell by 23.56%.

The Ministry's 'Mission Coking Coal' aims to increase domestic coking coal production to 140 MT by FY 2029-30, thereby reducing dependency on imports in the steel sector.

Coal Ministry plans to offer additional incentives in underground mine auctions

The Ministry of Coal is planning additional incentives to boost underground (UG) commercial coal block auctions in India, a senior government official said recently.

The push for UG mining aligns with India's drive for sustainable coal production.

The proposed incentives are in an advanced stage of discussions and are expected to be announced soon, Coal Secretary Vikram Dev Dutt said at a roadshow for commercial coal mine auctions in the city.

Additional Secretary and nominated authority Rupinder Brar clarified that any new incentives and policy relaxations are expected to be applicable prospectively.

The coal ministry's policy evolution has involved multiple stakeholders, including industry players.

"We have consistently refined the auction framework based on industry feedback, ensuring an investor-friendly environment," Dutt said.

The ministry was discussing demands for reclassification, as underground mining faces inherent challenges.

Of the 113 commercial mines successfully auctioned, 37 are underground, officials said.
The ministry is also working to secure environmental concessions with the Ministry of Environment, Forest, and Climate Change.

The ministry believes the next 2-3 years are crucial for commercial mines to rapidly begin production.

Currently, production from auctioned commercial mines is 20 million tonnes, but combined with captive production, it totals 157 million tonnes and is expected to reach 170 million tonnes by the end of the fiscal year, an official said.

In 2025-26, this production is projected to rise to 210 million tonnes.
Currently, 14 mines are operational and more will join soon.

The ministry plans to auction a similar number of blocks in the 12th tranche as it did in the 11th round, Dutt said.

In the 11th round, 27 mines were under the hammer and received 72 bids for 17 mines. The technical evaluations are on and allotment is expected in a month.

Coal India Chairman PM Prasad said the company currently feels no impact from commercial mining production.

Ministry of Coal Announces Selected Applicants under Category-II of Financial Incentive Scheme, Advancing India's Coal Gasification Mission

The Ministry of Coal has announced the selected applicants under Category-II of the Financial Incentive Scheme, a major step in India's ambitious coal gasification program. With an ₹8,500 crore financial outlay, the scheme is designed to accelerate coal gasification, reduce carbon emissions, enhance energy security, and promote sustainable development.

Launched on January 24, 2024, the scheme encourages both private companies and government PSUs to undertake coal gasification projects. The Request for Proposals for Category-II was issued on May 15, 2024, and technical bids were opened on January 10, 2025. The Selected Applicants, for receiving Financial Incentive under Category-II of the scheme are as follows:

Category II (for Private Sector & Government PSUs):

- Jindal Steel and Power Limited
- New Era Cleantech Solution Pvt. Ltd.
- Greta Energy Limited

This initiative is an essential part of India's strategy to achieve 100 million tonnes of coal gasification by 2030. The growing industry participation in this bidding process highlights the increasing momentum around coal gasification technologies, signalling a positive shift in India's energy landscape and its transition from conventional coal use.
The successful completion of this bidding process further reinforces the Ministry of Coal's vision of a greener, more energy-efficient coal industry.

Bids for 11th Round and Second Attempt of 10th Round of Commercial Coal Mines' Auctioned

The Nominated Authority, Ministry of Coal recently opened the bids for the 11th round of commercial coal mines' auction. This round received unprecedented responses from the bidders. Bids have been received for 20 coal mines out of offered 27 coal mines.

The online bids were decrypted and opened electronically in the presence of the bidders. Subsequently, sealed envelopes containing offline bid documents were also opened in the presence of bidders. Entire process was displayed on the screen for the bidders. Under this round, only 70 bids have been received online, however, 72 bids have been received in physical form.

A total of 65 bids were received against 15 coal mines offered in the 11th round. Under 2nd Attempt of 10th round, a total of 7 coal mines were put up for auction and 5 bids received against 5 coal mines with each mine receiving 1 bid each.

Coal Production and Dispatch from Captive and Commercial Mines Cross Last Financial Year's Total; Production in January crosses 19 MT

In furtherance of the vision of Atmanirbhar Bharat, India's coal sector continues to set new benchmarks. As on January 2025, the total coal production from Captive and Commercial mines for the financial year 2024-25 has surged to 150.25 million tonnes (MT), surpassing last financial year's total of 147.12 MT by January 27, 2025, 64 days ahead of schedule. This marks an impressive 34.05% YoY growth from 112.08 MT at the end of January 2024, underscoring the resilience and accelerated pace of India's coal industry.

Similarly, coal dispatch has mirrored this success, with the total dispatch for the financial year reaching 154.61 MT, surpassing last financial year's total of 142.79 MT by January 11, 2025. This reflects a robust 33.75% increase from 115.57 MT in January 2024, ensuring a consistent and uninterrupted coal supply to key industries, including power, steel, and cement.

With coal production reaching an all-time high of 19.20 MT in January 2025, this milestone represents the highest-ever monthly output from Captive and Commercial mines. This achievement marks a 33.15% increase YoY from 14.42 MT in January 2024. Coal dispatch in January, similarly surged to 17.26 MT, a 32.45% rise YoY from the previous year, further securing the supply for industrial growth.

Additionally, the Ministry of Coal has granted Mine Opening Permissions for three new mines—Bhaskarpara, Utkal E, and Rajhara North (Central and Eastern). Notably, Rajhara North (Central and Eastern), allocated to Fairmine Carbon Pvt. Ltd., is the first commercial coal mine in Jharkhand to receive Mine Opening Permission. This development will significantly contribute to boosting coal production and enhancing the role of commercial mining in the region.

The Ministry of Coal remains unwavering in its commitment to augmenting domestic coal production, reducing import dependency, and ensuring energy security for the nation. The sector continues to play a pivotal role in the realization of Viksit Bharat—a self-reliant and developed India.

CIL's subsidiary Western Coalfields bids for 2 coal blocks in 11th tranche of auction

In a bid to overcome limited reserves and adverse geo-mining conditions, Western Coalfields Ltd has participated in the bidding for two coal blocks offered in the 11th tranche of the commercial coal blocks auction, a top company official said. This is the first time any Coal India subsidiary has participated in commercial coal block auction.

"We have bid for two non-coking coal blocks-Bandhak West and Dahegaon Makardhokra IV. Both blocks are close to our existing mining projects. If we secure them, we will able to carry out mining activities with minimal capex as we already have the necessary infrastructure in place," Western Coalfields chairman and managing director Jai Prakash Dwivedi told PTI.

Both coal blocks are in Maharashtra. Bandhak West block remained in high demand, receiving a total 15 bids-the highest among all 19 coal blocks that attracted interest out of the 27 blocks put up for auction. Dahegaon Makardhokra IV received three bids. The coal ministry stated currently technical evaluation process is currently underway, and the final allocation will be announced within a month. Dwivedi said WCL is keen to participate in future rounds of coal block auctions but preferably for blocks close to its existing operations. The Nagpur-headquartered company operates 52 mines, including 19 underground and 33 open-cast mines, across 10 areas in Maharashtra and Madhya Pradesh. WCL produced 45.1 million tonne of coal between April and December, marking a modest 3.1 per cent growth.

"Our total production for FY'25 will remain around 69 million tonne, similar to last year. Despite our best efforts, we expect production to remain flat next fiscal as well due to unique mining challenges, which are leading to higher costs," the official said. Dwivedi highlighted major hurdles, including high stripping ratios (over burden removal costs), strata control issues, and limited reserves. He said that upcoming projects would primarily offset depleting reserves rather than contribute to growth. WCL had anticipated a gradual decline in production, projecting output to drop to 50 million tonne by 2047, signalling the need for new reserves and alternative strategies.

India to launch carbon market by 2026, says Power minister

India is set to launch its first carbon market by mid-2026, Union Minister for Power Manohar Lal said recently. The move is expected to support industries in meeting global carbon emission norms and reducing reliance on fossil fuels.

The minister said the initiative would be crucial for exporters, particularly in sectors such as steel and cement, which face compliance requirements under the European Union's Carbon Border Adjustment Mechanism (CBAM). The CBAM imposes tariffs on carbon-intensive imports, making it necessary for Indian companies to adopt cleaner energy practices to remain competitive.

"Very soon we are going to launch an independent carbon market of our country, likely by mid-2026. Those using fossil fuels or emitting carbon will have to buy carbon credits, while those using power from non-fossil sources will earn credits that they can sell in the market," the minister said.

The Energy Conservation (Amendment) Bill, 2022, passed by Parliament, provided the foundation for setting up carbon credit trading systems in India. Under this framework, industries that reduce emissions will generate credits that can be sold, while high-emission companies will be required to purchase credits to offset their carbon footprint.

The minister said the Indian Energy Exchange Ltd, Power Exchange India Ltd, and Hindustan Power Exchange Ltd are expected to develop carbon credit trading platforms to facilitate the market.

At the event, the power ministry released the annual ratings of distribution companies (discoms) based on financial sustainability, billing efficiency, collection efficiency, and distribution losses. Adani Electricity Mumbai Ltd secured the top position with a score of 99.8, followed by Dakshin Gujarat Vij Company Limited.

The government aims to prepare industries for a structured transition towards clean energy, ensuring compliance with international trade norms and supporting India's long-term sustainability goals.

The installation of smart meters has reached 2.13 crore, with 19.8 crore additional meters sanctioned, along with 52.5 lakh distribution transformers and 2.1 lakh feeders. The initiative aims to improve billing efficiency and reduce revenue losses.

Energy efficiency measures have resulted in 53 MTOE savings in 2024, leading to a reduction of 321 million tons of CO2 emissions. The government has launched sustainable building codes to enhance energy efficiency in commercial and residential buildings.

With a focus on electric mobility, the government plans to install 1 lakh EV charging stations by 2030.

Power sector needs ₹4.5-6.4 lakh crore per year to meet net-zero targets: Report

India will require an annual investment of ₹4.5 lakh crore to ₹6.4 lakh crore ($53 billion to $76 billion) over the next decade to support its transition to clean energy and achieve its 2070 net-zero target, according to a new report by Moody's Ratings. The power sector, which contributes nearly 37% of India's carbon emissions, will need substantial funding in renewable energy, grid infrastructure, and energy storage to sustain the country's growing electricity demand.

The report highlights that India's economy is projected to grow at approximately 6.5% per year over the next decade, leading to a compound annual growth rate of 6% in power demand. To meet this rising demand, India must add around 450 GW of renewable energy capacity by fiscal 2034-35. However, despite the focus on renewables, coal-based power generation capacity is expected to increase by 35% over the same period, underscoring the challenges in balancing energy security with sustainability.

The report estimates that India's installed generation capacity will grow by 2.0x-2.2x by fiscal 2034- 35, with the share of non-fossil fuel power increasing to

45%-50% from 23.5% in fiscal 2023-24. "The transition to a sustainable energy future will require substantial capital, with the private sector playing a crucial role in funding and implementing renewable projects," the report states.

A key area of investment will be the power grid, with an estimated INR 2.3 trillion ($28 billion) annually required over the next decade to enhance transmission and distribution infrastructure. Additionally, energy storage—critical for integrating renewable power—will require INR 600 billion to INR 850 billion ($7.2 billion to $10.2 billion) in funding.

Foreign investment will play a key role in funding India's energy transition, with sovereign wealth funds, global asset managers, and private investors expected to contribute significantly. The Indian government has introduced several policy measures, including waivers on interstate transmission charges for renewable energy projects and incentives for battery and pumped hydro storage, to encourage capital inflow into the sector.

The report also highlights nuclear energy expansion, with the government targeting 100 GW of nuclear capacity by 2047, a 12-fold increase from the current 8 GW. However, the execution of nuclear projects will require amendments to key legislation, including the Atomic Energy Act.

Despite challenges such as financial constraints of state-run power distribution companies (DISCOMs), land acquisition issues, and regulatory hurdles, India has continued to attract significant private sector investment in renewable energy, with over 90% of installed non-hydro renewable capacity developed by private enterprises.

The report underscores that India's energy transition will require long-term strategic planning, with both public and private investments playing a critical role in ensuring a secure and sustainable power ecosystem.

India's power transmission network expands 70% in a decade; non-fossil fuel capacity grows 180%.

India's power transmission network has grown from 2.91 lakh ckm in 2014 to 4.92 lakh ckm in 2025, marking a 70% expansion, Union Minister for Power Manohar Lal said at a press conference in New Delhi. The expansion has strengthened the grid, ensuring improved electricity access across the country.

The non-fossil fuel power capacity has increased from 80 GW in 2014 to 220 GW in 2025, registering a 180% rise, while fossil fuel-based power capacity has grown from 168 GW in 2014 to 246 GW in January 2025.

India has transitioned to a net power exporter, with 1,625 MU net exports in 2025, reversing its net import position of 3,267 MU in 2014. The power shortage has declined from 4.2% in 2014 to 0.1% in 2025.

Modernise power grids now or create bottleneck for AI boom

If the world's electricity grids fail to keep pace with soaring demand, led in large part by artificial intelligence, national AI ambitions could stall. "AI progress will slow down in countries that cannot provide ready access to electricity," Vera Silva, chief strategy and technology officer at GE Vernova, tells us during a recent trip to India.

She points out that the dramatic growth in data centres and GPU-powered computation places enormous pressure on power infrastructure. "We used to think of data centres in terms of 300-megawatt loads, then they moved to 1 gigawatt, and now we're talking about 3 gigawatts. This is all connected to high-voltage transmission, which means the grid becomes a real bottleneck if it's not upgraded."

GE Vernova, spun out of General Electric as its energy-focused entity, is trying to address this challenge by modernising how energy is generated, transmitted, and consumed.

India a crucial base
India has emerged as a particularlycrucial base in this modernisation. The country is GE Vernova's second largest region in terms of employees and factories. "It has strong manufacturing capabilities as well as expansive engineering and research centres. Not only do we serve national infrastructure needs, but we also produce in India to serve customers in

Brazil, the Middle East, Asia-Pacific, and Europe," Vera says.

NTPC, France's EDF ink pact on hydro projects

Government-owned power giant NTPC and EDF India, a subsidiary of France's Electricite de France, have entered into a partnership to set up pumped hydro storage and hydro projects bundled with renewable energy initiatives along with exploring opportunities in the distribution business.

"NTPC and EDF India have signed a non-binding term sheet to develop, own, operate and maintain pumped storage projects and any other hydro-power projects," according to a joint statement issued by the two companies.

The agreement was signed by Federico D'Amico, CEO of EDF India, and JC Kakoti, NTPC's GM Hydro Engineering. NTPC Chairman and Managing Director Gurdeep Singh and EDF France Chairman and CEO Luc Remont.

Power Secretary Pankaj Agarwal and senior ministry officials were also present on the occasion. Under the agreement signed by the two companies on February 23, NTPC and EDF propose to form a JVC with a 50:50 partnership after requisite approval from the Government of India.

This JV company will undertake such projects on its own or may create JV and subsidiaries for undertaking such projects within India and neighbouring countries, the statement said. EDF India is owned by Électricité de France SA, a French multinational electric utility company owned by the Government of France.

The agreement was signed on the sidelines of the global ELECRAMA 2025 summit held in Greater Noida on the outskirts of Delhi. Speaking at the summit, Chairman Gurdeep Singh emphasised NTPC's commitment to enhancing energy efficiency, scaling renewable capacity, and integrating AI-driven power management solutions.

He said, "ELECRAMA 2025 is a testament to India's rapidly evolving power sector. The vast array of innovative products and machinery on display highlights the success of the 'Make in India' initiative." "With a strong manufacturing ecosystem and increasing global participation, India is well-positioned to not only meet its domestic energy needs but also emerge as a key exporter of high-quality power equipment.

NTPC is committed to driving this transformation by optimising thermal efficiency, expanding renewable energy capacity, and leveraging cutting-edge technology," he added.

Bihar to get 2,400MW thermal power plant

In a major boost to state's power sector, the state govt has approved the construction of a 3x800MW (total 2,400MW) thermal power plant at Pirpainti in Bhagalpur district at an estimated cost of Rs 21,400 crore. This will be the largest private sector investment in the state. An energy department official said the project would benefit 13 crore people and boost industrial activities. Bihar State Power Generation Company Limited has been designated as the nodal agency, overseeing implementation, including the tender process.

Energy minister Bijendra Prasad Yadav said recently that this project was the result of CM Nitish Kumar's visionary energy policy. He added that once work begins, Bihar will become an attractive destination for investors. He also said the project would reduce energy costs and drive industrialization in the state.

Currently, Bihar is heavily dependent on other states for electricity. However, chief secretary Amrit Lal Meena confirmed that coal has already been allocated for the new plant, which will help reduce electricity costs by cutting dependence on external supply.

Energy secretary Pankaj Kumar Pal said an earlier solar power project proposed in Pirpainti was replaced by the thermal power plant due to the site's proximity to a coal source and favourable land conditions. Apart from lowering electricity costs, the project is expected to create large-scale employment opportunities in Bihar.

India opens to buying energy from all sources, gas prices to come down in 2026: Hardeep Singh Puri

Union Oil Minister Hardeep Singh Puri recently said that India is open to energy imports from all sources at the lowest rates and domestic oil marketing firms are looking for more gas which is expected to cost less in 2026.

Addressing a presser on Indian Energy Week 2025 beginning recently, Puri allayed fears of impact on energy supplies to India from Russia after US sanctions. "Today we have a situation that we have (increased) from 27 suppliers to 39 suppliers. We added Argentina among others. We are open to import from all sources."

"We issued tenders at the importation. Those tenders are open to any supplier. We buy from the cheapest source possible." He also informed that domestic (oil marketing firms) companies are looking for more gas.

We also expect the prices of gas (natural gas) to come down. My reading of the international market is that in 2026 you will begin to see a major increase in the availability of natural gas. We may get more gas from Qatar. Our companies are looking for more gas."

Puri stated that the LPG (liquified petroleum gas) is more or less saturated in the country and the idea is to take piped natural gas to every house as it is 30 per cent cheaper.

A top official said that Indian Oil, Bharat Petroleum and GAIL are considering the purchase of LNG (liquified natural gas) and crude oil from the US. The top official also stated that domestic firms may sign long-term contracts and may look to invest in the US (energy projects).

This assumes significance in view of Prime Minister Narendra Modi's visit to the US later this week where discussion on energy is likely on the agenda. During the presser, Puri also said, "I will be surprised if sourcing of energy from the US does not figure in the discussions (of PM and Trump)." He said, "With President (Trump) saying he wants to see global prices of energy to come down, he wants more and more energy to come to the market. For countries like India, it is a positive development." During the India Energy Week 2025, energy buyers will hold meetings with producers in the national capital.

India is comfortable near $70-a-barrel crude price: Oil minister Hardeep Singh Puri

Amid uncertainties in the energy market in the past few years due to geopolitical tensions, Hardeep Singh Puri, the union minister for petroleum and natural gas, said there is a need to ensure predictability and stability in the oil market and prices of the commodity. He noted that the current price level of around $74 per barrel is good for India, but given that it is a major consumer, a price rationalization to $70 would be even better. Amid geopolitical tensions and the Opec+ grouping's persistent output cuts, Puri said that no single country can drive prices independently in the current scenario.

India's natural gas production declines 2.1% in December, LNG imports up 19.2%: PPAC

India's natural gas production declined by 2.1 per cent in December 2024, with gross production recorded at 3,066 MMSCM, according to the latest data from the Petroleum Planning & Analysis Cell (PPAC) under the Ministry of Petroleum & Natural Gas.

The report showed that the country's liquefied natural gas (LNG) imports rose by 19.2 per cent during the same period, reaching 3,047 MMSCM. The total availability of natural gas for sale in December stood at 5,612 MMSCM, reflecting a 10.8 per cent increase over the corresponding month in 2023. The report stated that net domestic production available for sale, after adjusting for internal consumption and technical flaring, was 83.7 per cent of the gross production during the month.

The production of natural gas by state-run ONGC was 1,201 MMSCM, which was lower than the

previous year by 5 per cent. Oil India Ltd (OIL) recorded a production of 270 MMSCM, reflecting an increase of 2.7 per cent over December 2023. Private and joint venture companies produced 1,594 MMSCM, registering a marginal increase of 0.7 per cent.

Natural gas consumption for December 2024 was 5,883 MMSCM, with the fertilizer sector being the largest consumer, using 1,766 MMSCM, accounting for 30 per cent of total consumption. The City Gas Distribution (CGD) sector consumed 1,310 MMSCM, accounting for 22 per cent of the total. The power sector reported a consumption of 571 MMSCM, with a share of 10 per cent. Refineries consumed 413 MMSCM, accounting for 7 per cent of the total, while the petrochemical sector used 319 MMSCM, which was 5 per cent of total consumption. Other sectors, including industrial usage, accounted for 1,505 MMSCM, making up 26 per cent of the total.

The data showed that consumption in the fertilizer sector declined by 5 per cent compared to December 2023, while the power sector recorded a decline of 10 per cent. The City Gas Distribution sector recorded an increase of 11 per cent in consumption. Petrochemical consumption saw an increase of 32 per cent, while refinery consumption declined by 12.2 per cent. State-wise, Gujarat recorded the highest natural gas consumption at 46.12 MMSCMD, followed by Uttar Pradesh at 32.68 MMSCMD and Maharashtra at 25.88 MMSCMD. Rajasthan recorded a consumption of 10.80 MMSCMD, Haryana reported 9.41 MMSCMD, and Delhi stood at 5.70 MMSCMD. Other states with significant consumption included Assam at 7.47 MMSCMD, Tamil Nadu at 7.56 MMSCMD, and Tripura at 3.38 MMSCMD.

The report showed that the share of the fertilizer sector in total gas consumption for April-December 2024 was 28.5 per cent, while the CGD sector accounted for 20.7 per cent. The power sector's share stood at 13.2 per cent, refineries at 8.3 per cent, and petrochemicals at 4.5 per cent. The share of other sectors, including industrial and miscellaneous use, stood at 24.8 per cent.

India's crude oil production falls 1.2% in January, petroleum output up 8.3%

India's crude oil and condensate production stood at 2.5 million metric tonnes (MMT) in January 2025, registering a 1.2% decline compared to the same month in the previous year, according to the latest data from the Petroleum Planning & Analysis Cell (PPAC) under the Ministry of Petroleum & Natural Gas.

According to official data, Oil India Limited (OIL) produced 0.3 MMT, Oil and Natural Gas Corporation (ONGC) registered 1.6 MMT, while production under Production Sharing Contracts (PSC) and Revenue Sharing Contracts (RSC) stood at 0.6 MMT.

Total crude oil processed by Indian refineries in January 2025 reached 23.7 MMT, reflecting a 5.2% increase over January 2024. Public Sector Undertaking (PSU) and Joint Venture (JV) refiners accounted for 16.4 MMT, while private refiners processed 7.4 MMT. Indigenous crude contributed 2.3 MMT, with imported crude making up 21.4 MMT of the total. Crude processing for April-January FY 2024-25 saw a 2.5% increase compared to the same period in the previous financial year.

Petroleum product output was recorded at 24.9 MMT in January 2025, an 8.3% increase over January 2024. Of this, refinery production contributed 24.6 MMT, while 0.3 MMT was sourced from fractionators. During April-January FY 2024-25, petroleum product output rose by 3.4% compared to the corresponding period in FY 2023-24.

Among key petroleum products, high-speed diesel (HSD) accounted for 43.1% of total production in January 2025, followed by motor spirit (MS) at 17%, naphtha at 6.3%, aviation turbine fuel (ATF) at 5.7%, pet coke at 5.3%, and liquefied petroleum gas (LPG) at 4.7%. The remaining production was shared by bitumen, fuel oil, lubricants, and other petroleum derivatives.

Crude oil imports fell by 3.1% in January 2025 but increased by 2.7% during April-January FY 2024- 25 compared to the same period in the previous year.

Imports of petroleum, oil, and lubricants (POL) increased by 14% in January 2025 and by 8.2% in April-January FY 2024-25, primarily due to a rise in petcoke and LPG imports.

Exports of petroleum products grew by 13% in January 2025 and by 3.3% in April-January FY 2024-25, supported by higher shipments of motor spirit, petcoke, carbon black feedstock (CBFS), and fuel oil.

GAIL, Cummins sign MoU for hydrogen and energy transition projects

GAIL (India) Limited, a Maharatna CPSE under MoPNG and India's leading natural gas company, and Accelera by Cummins have signed a memorandum of understanding (MoU) to collaborate on hydrogen and energy transition technologies in India. The agreement was signed at India Energy Week 2025 and aims to explore opportunities in hydrogen production, blending, transportation, and storage, leveraging GAIL's natural gas infrastructure and Accelera's expertise in clean energy solutions.

GAIL has advanced its Scope 1 and Scope 2 net-zero targets from 2040 to 2035. The company commissioned a 10 MW green hydrogen unit at its plant in Vijaipur, Madhya Pradesh, in April 2024, using an electrolyser from Accelera by Cummins. Through its joint venture Avantika, GAIL conducted pilot-scale studies blending hydrogen into city gas distribution networks, reaching a 5% blend in pipeline natural gas.

Cummins Inc. is engaged in sustainability and energy transition solutions, with a portfolio covering advanced diesel, natural gas, electric and hybrid powertrains, hydrogen production technologies, and fuel cells. The MoU with GAIL will facilitate hydrogen's application across transport, power, and steel sectors, as well as its use as a mono-fuel or in blends with LNG, CNG, and natural gas. The agreement will also focus on infrastructure development for hydrogen production, transportation, and storage.

GAIL has been expanding its clean energy initiatives, setting up a 5 TPD compressed biogas (CBG) plant in Ranchi, with plans for 26 more CBG plants in the next three to four years. A joint venture with Leafiniti Bioenergy is working on 10 CBG plants, while another JV aims to establish a 500 KLPD grain-based ethanol plant in Rajasthan. Additionally, GAIL has partnered with Coal India for synthetic natural gas production in West Bengal.

Increase in MSME financing right step to boost biogas industry, says IBA

Indian Biogas Association (IBA) recentlydd said the proposed increase in MSME financing in the Gen eral Budget 2025 is a right step to boost biogas industry.

With a strong push for manufacturing, green energy, and digital transformation, this Budget sets the sta ge for Aatmanirbhar and Viksit Bharat, an IBA statement said. From the standpoint of the fledgling biogas/CBG (compressed biogas) industry, the announced increas e to the MSME Credit Guarantee Scheme will significantly benefit the biogas industry, which often fac es challenge in securing credit with reasonable terms, it noted.

By expanding the credit guarantee cover from Rs 5-10 crore, the scheme ensures easier access to collat eral-free loans, thus reducing financial barriers for the CBG developers, it pointed out. Additionally, the revised MSME classification criteria allow for almost 2-2.5 times higher investment a nd turnover limits as compared to earlier regime.

India's petroleum product consumption rises 3.5% in April-Jan FY25, natural gas use up 10.2%: Report

India's petroleum product consumption recorded a 3.5% growth during April-January FY 2024-25, reaching 199.2 million metric tonnes (MMT), compared to 192.5 MMT in the same period of the previous year, according to data released by the Petroleum Planning & Analysis Cell (PPAC). This growth was primarily led by an increase in high-speed diesel (HSD) consumption by 2.4%, motor spirit (MS) by 7.9%, aviation turbine fuel (ATF) by 9.8%, liquefied petroleum gas (LPG) by 6.5%, and lubricants by 12.8%. The consumption of petroleum products for January 2025 recorded a 3.1% growth,

reaching 20.5 MMT compared to the same period last year.

Indigenous crude oil and condensate production in January 2025 stood at 2.5 MMT, with Oil India Ltd (OIL) producing 0.3 MMT, ONGC producing 1.6 MMT, and PSC/RSC contributing 0.6 MMT. There was a 1.2% decline in crude oil and condensate production compared to the same month last year. However, crude oil processing increased by 5.2%, with total crude oil processed at 23.7 MMT in January 2025. Public Sector Undertakings (PSUs) and Joint Venture (JV) refiners processed 16.4 MMT, while private refiners processed 7.3 MMT.

Crude oil imports in January 2025 declined by 3.1%, but cumulative imports in April-January FY 2024-25 increased by 2.7%. The net oil and gas import bill for January 2025 was $11.0 billion, compared to $11.8 billion in January 2024. Of this, crude oil imports accounted for $11.5 billion, LNG imports stood at $1.3 billion, and petroleum product exports were valued at $3.8 billion.

Production of petroleum products in January 2025 reached 24.9 MMT, marking an 8.3% increase from January 2024. Refinery production accounted for 24.6 MMT, while fractionators contributed 0.3 MMT. During April-January FY 2024-25, petroleum product output grew by 3.4% compared to the same period last year. The share of major petroleum products in January 2025 included HSD at 41.8%, MS at 17.3%, naphtha at 6.2%, ATF at 6.6%, petcoke at 5.2%, and LPG at 4.5%.

Imports of petroleum products increased by 14% in January 2025 and by 8.2% in April-January FY 2024-25, primarily due to higher imports of petcoke and LPG. Meanwhile, exports of petroleum products rose by 13% in January 2025 and by 3.3% in the April-January period, driven by higher exports of motor spirit (MS), petcoke, and fuel oil.

Ethanol blending in petrol stood at 19.6% in January 2025, with cumulative ethanol blending for November 2024-January 2025 at 17.4%.

Total natural gas consumption, including internal consumption, in January 2025 was 6,072 million standard cubic meters (MMSCM), reflecting a 2.8% increase from the same month last year. Cumulative natural gas consumption for April-January FY 2024-25 reached 61,282 MMSCM, marking a 10.2% increase over the previous year.

Gross natural gas production in January 2025 was 3,066 MMSCM, a 2.3% decline from the previous year. However, cumulative gross production for the April-January period was marginally higher by 0.1%, at 30,376 MMSCM.

LNG imports saw a significant rise, with January 2025 imports at 3,047 MMSCM, 7.6% higher than the corresponding period last year. Cumulative LNG imports for April-January FY 2024-25 stood at 31,347 MMSCM, reflecting a 21.2% increase compared to the same period in the previous year.

The price of Brent crude averaged $79.23 per barrel in January 2025, compared to $73.94 in December 2024 and $80.32 in January 2024. The Indian basket crude price averaged $80.20 per barrel in January 2025, compared to $73.34 in December 2024 and $79.22 in January 2024.

India's first hydrogen train will be among world's longest and maximum powered: Railway Minister

Indian Railways has taken up a state-of-the-art project to develop the country's first hydrogen train, which is slated to be among the longest and the maximum powered hydrogen trains in the world, Railway Minister Ashwini Vaishnaw informed the Rajya Sabha in a written reply recently. "Indian Railways has taken up a state-of-the-art project for the development of the first hydrogen train on a pilot basis by retrofitment of hydrogen fuel cell on diesel electric multiple unit (DEMU) rake," Vaishnaw said.

"The specifications for this fully indigenously developed train have been prepared by the Research Design and Standards Organisation (RDSO). This is slated to be among the longest hydrogen train in the world presently. It will also be among the maximum powered hydrogen trains in the world," he added.

The railway minister was responding to a query raised by MP Ajit Kumar Bhuyan, who wanted to

know the status of development of hydrogen-powered train technology.

"Along with the train, concomitant on-ground infrastructure to refill hydrogen is envisioned with an integrated hydrogen production-storage-dispensation facility. Necessary safety approvals for the facility layout from the Petroleum and Explosives Safety Organisation (PESO) are in place," Vaishnaw informed the House.

"The project further establishes the commitment of Indian Railways towards advancements in alternative energy-powered train travel, thereby ensuring a cleaner and greener future for the country's transportation sector," he added.

IEA says India should free gas pricing; unbundle gas marketing, transportation business

International Energy Agency (IEA) recently asked India to free up its pricing of natural gas and unbundling of marketing and transportation business to help increase usage of the fuel in the economy. IEA in the India Gas Market Report: Outlook to 2030 projected the country's gas consumption rising by 60 per cent to 103 billion cubic metres (bcm) annually by the end of the decade.

As India targets raising the share of relatively cleaner natural gas in its energy basket to 15 per cent by 2030 from just above 6 per cent currently, IEA prescribed a set of policy reforms to usher in its greater use.

Pricing of gas, which is used to generate electricity, make fertilisers and turned into CNG to power automobiles and piped to household kitchens for cooking, is skewed. Gas from legacy fields of stateowned firms like ONGC and Oil India Ltd is currently capped at USD 6.5 per million British thermal unit while there are limits also imposed on fuel from difficult and high costing fields like deepsea.

"The anticipated easing of global gas market conditions in the latter half of the decade provides an opportunity for the government to implement full gas pricing freedom within the forecast horizon," IEA said.

Calling for transition to gas pricing freedom for all fields, the report said gradually extending gas pricing freedom to all fields, as recommended by the Kirit Parekh Committee in 2022, could stimulate greater investment in the upstream sector and improve the long-term availability of gas for India's consumers.

"A phased approach is advisable to protect consumers from price volatility during the transition. Initial measures could include lifting the price ceiling on deepwater and ultra-deepwater high pressure/high temperature projects and allowing upstream producers to sell a larger portion of their domestic production freely on the Indian Gas Exchange (IGX) than is currently permitted," it said.

IEA said international experience shows that the unbundling of supply and transmission activities and establishing independent gas transmission system operators (TSOs) are key prerequisites to a well-functioning gas market. In India, state gas utility GAIL owns the majority of the pipelines transmitting gas. It is also the biggest seller of gas. This may create conflicts where the company may want to prioritise sale of its own gas over allowing third parties to access its pipeline network to sell their gas.

"Acknowledging India's unique challenges and the different market in which deregulation and unbundling took place in mature natural gas markets across Europe and North America, it is appropriate to plan for the unbundling of India's main transmission pipeline operators on an extended timescale," the Paris-based agency said. "In the longer term, however, the legal separation of transport on the one hand and marketing and sales operations on the other hand could enhance market competition, increase flexibility, and improve infrastructure utilisation, ultimately supporting a greater role for gas in India's energy mix," it said.

Interim steps towards eventual unbundling could include the standardisation of gas sales agreements (GSAs) and gas transmission agreements (GTAs), which are currently not harmonised across India's main pipeline operators, and the strict enforcement of a code of conduct for the main operators to ensure an arms-length approach to capacity allocation, particularly to affiliated companies.

It also called for creation of an independent gas transmission system operator, saying a requirement of a well-functioning gas market is the creation of one or more independent transmission system operators, which can ensure that infrastructure access is provided fairly, transparently and in a nondiscriminatory manner. Other measures suggested included increasing transparency on available capacities and pipeline tariffs, promoting a transparent and efficient gas trading platform, ensuring effective, non-discriminatory third-party access to infrastructure, and levelling the playing field for gas across the economy.

"Adjusting the tax structure to support the use of gas as a transport fuel, similar to the favourable tax treatment for electric vehicles, could encourage its adoption and reduce emissions compared to diesel and gasoline vehicles," IEA said, adding, revising import duties on natural gas to align with those applied to crude oil and rationalising the GST on compressed natural gas (CNG) vehicles to reflect their lifecycle environmental advantages over diesel could further promote gas use in the transportation sector.

"These measures would enhance the competitiveness of natural gas and incentivise cleaner fuel use in India," it said. The IEA report, released at the India Energy Week here, said India's gas market is at an inflection point as infrastructure expansion and policy support drive unprecedented growth in consumption. Following over a decade of slow growth and periodic declines, India's natural gas demand increased by more than 10 per cent in both 2023 and 2024, indicating an inflection point. While total gas consumption in 2023 was only marginally higher than 2011 levels, three key factors are now converging to drive substantial growth: rapid infrastructure expansion, recovering domestic production, and an expected easing of global gas market conditions.

"India's gas market is entering a new phase of growth, supported by significant infrastructure development and clear policy direction," said IEA Director of Energy Markets and Security Keisuke Sadamori. "The prospect of higher gas demand in India coincides with an expected wave of new global LNG supply. However, it will require careful planning and market coordination to ensure supply security and to help gas to compete in a price-sensitive market."

Infrastructure development is playing a crucial role in enabling market growth. Since 2019, India has almost quadrupled its number of compressed natural gas (CNG) stations and more than doubled the number of residential gas connections, while extending its transmission pipeline network by 40 per cent. By 2030, the number of CNG stations and residential connections is expected to nearly double again, with the gas transmission grid expanding by an additional 50 per cent. The city gas distribution sector is expected to lead consumption growth in India between now and 2030, supported by rapid CNG infrastructure expansion and competitive pricing against liquid fuels.

The heavy industry and manufacturing sectors are expected to add around 15 bcm of demand during this period, while gas use in oil refining is forecast to increase by more than 4 bcm as more refineries connect to the network. India's domestic gas production, which met 50 per cent of demand in 2023, is projected to grow gradually, reaching just under 38 bcm by 2030. This would put it around 8 per cent above 2023 levels.

The limited growth in domestic supply means India's LNG imports will need to more than double to around 65 bcm a year by 2030 to meet rising demand. India is looking to increase the share of gas in its energy mix and the report identifies potential for even higher growth under an accelerated scenario, where targeted policy measures could push total demand to approximately 120 bcm by 2030, comparable to the current gas consumption of South America. This scenario would require additional policy support to drive higher utilisation of gas-fired power plants, faster adoption of LNG in heavy-duty transport, and more rapid expansion of city gas infrastructure. Looking ahead, the report emphasises the need for strategic planning in LNG procurement and import infrastructure.

As legacy contracts expire, India faces a widening gap between contracted supply and projected demand after 2028, potentially increasing exposure to spot market volatility unless new longterm contracts are secured in the coming year.

Nuclear Mission" announced in the Union Budget 2025-26 will mark a transformative shift in India's energy landscape and will enable Nuclear Power to emerge as a major source of energy in India.: Union Minister Dr. Jitendra Singh

Union Minister Dr. Jitendra Singh, in an exclusive media interview, said here today that the "Nuclear Mission" announced in the Union Budget 2025-26 will mark a transformative shift in India's energy landscape and will enable Nuclear Power to emerge as a major source of energy in India.

Union Minister of State (Independent Charge) for Science and Technology, Minister of State (Independent Charge) for Earth Sciences, Minister of State in the Prime Minister's Office, Department of Atomic Energy, Department of Space, and Personnel, Public Grievances, and Pensions, Dr. Jitendra Singh, underscored the crucial role of nuclear power in ensuring India's energy security. He emphasized the government's futuristic roadmap for the nuclear energy sector, which will significantly contribute to achieving self-sufficiency in energy production.

Dr. Jitendra Singh hailed the revolutionary decision to provide tax relief on income up to ₹12 lakh, noting that this initiative will bring satisfaction to a large section of the population and have a multiplier effect on the economy.

In a landmark move, Dr Jitendra Singh hailed the announcement that India's nuclear energy sector has been opened for private sector participation. Calling this step "revolutionary," he noted that for 60-70 years, the sector operated under secrecy. Now, with greater openness and collaboration, India can accelerate growth and innovation in nuclear energy, aligning with the vision of Aatmanirbhar Bharat.

Dr. Jitendra Singh recalled how Prime Minister Narendra Modi's decision to open the Space sector for private players transformed the industry. He expressed confidence that the nuclear sector will experience similar growth and innovation, leading to a major shift in energy security.

Highlighting India's reliance on petroleum imports, Dr. Jitendra Singh reaffirmed the government's commitment to clean and sustainable energy solutions. And categorically mentioned that nuclear energy will be a major source of India's energy security.

Recognizing nuclear power as a cornerstone for energy security, the government has introduced the Nuclear Energy Mission for Viksit Bharat, aiming to enhance domestic nuclear capabilities, promote private sector participation, and deploy advanced nuclear technologies.

The Union Budget 2025-26 has allocated ₹20,000 crore for R&D in Small Modular Reactors, targeting at least five indigenously designed operational SMRs by 2033. This aligns with India's target of 100 GW nuclear power capacity by 2047, a major step toward reducing carbon emissions and ensuring energy sustainability.

Dr. Jitendra Singh informed that India's nuclear power capacity, currently at 8,180 MW, is set to expand to 22,480 MW by 2031-32, with ten reactors under construction across Gujarat, Rajasthan, Tamil Nadu, Haryana, Karnataka, and Madhya Pradesh. Additionally, plans for ten more reactors are in progress, with a major 6 x 1208 MW nuclear power plant in collaboration with the USA at Kovvada, Andhra Pradesh.
He shared that a significant milestone was achieved on September 19, 2024, when the Rajasthan Atomic Power Project's Unit-7 (RAPP-7) reached criticality, marking the beginning of a controlled fission chain reaction—an achievement highlighting India's growing nuclear prowess.

Dr. Singh reaffirmed India's commitment to achieving 500 GW of non-fossil fuel-based energy generation by 2030, in line with its COP26 pledge, and PM Modi's vision for net-zero emissions by 2070 he remarked that it was Prime Minister Modi who initiated the Mission LiFE. He emphasized that

India's approach to nuclear and biotech advancements follows a whole-of-government and whole-of-science model, ensuring integrated progress.

Dr. Singh also introduced the recently announced BIOe3 Policy, India's first-of-its-kind initiative to foster a biotechnology-driven industrial revolution. He emphasized the creation of BIRAC, a platform to support biotech startups and facilitate collaborations with the Department of Biotechnology. India has already seen success in biotechnology, with achievements such as the development of its first antibiotic Nafithromycin and the Human Papilloma Virus (HPV) vaccine.

The BIOe3 Policy will drive advancements in bio-manufacturing, bio-foundries, and circular economy models, promoting recyclable and reusable products under the "Wealth from Waste" concept. This initiative is expected to spur economic growth, generate employment, and foster environmental sustainability.

Towards the conclusion Dr. Jitendra Singh reiterated that provisions for nuclear power in Union Budget 2025-26 mark a transformative shift in India's energy landscape. By expanding nuclear energy as a sustainable, scalable, and secure power source, the government aims to bolster energy security and meet the nation’s long-term economic and environmental goals. Dr. Singh reaffirmed that the Nuclear Energy Mission for Viksit Bharat is poised to accelerate nuclear power development, positioning India as a global leader in advanced nuclear technology by 2047.

Rlys seeks nuclear energy allocation for trains from NPCIL, Power Ministry

The Railways has approached the Nuclear Power Corporation of India Ltd (NPCIL) and the Ministry of Power for the allocation of nuclear energy to meet its increasing power requirement, the Rajya Sabha was recently informed.

"The power requirement of the Indian Railways (IR) is increasing consistently year on year. IR is exploring all the possible options of energy including nuclear energy.

"IR has been exploring the option of sourcing power from existing as well as upcoming nuclear power plants to meet part of its traction power requirement, Railway Minister Ashwini Vaishnaw said in a written reply in the Upper House on February 7.

Trinamool Congress MP Sagarika Ghose raised the issue of use of nuclear energy to supply power to Railways and asked "whether development and advancement has been made in the railway sector to use nuclear energy to reduce usage of fossil fuels to power trains".

Ghose also wanted to know the implications of using nuclear energy as well as its impact on the environment and whether nuclear energy shall be used regularly to supply power to railways.

Responding to the query, Vaishnaw said, nuclear power being a clean and reliable source of power will help IR in reducing the dependence on fossil fuels, thereby reducing carbon emissions.

He said the Railways has approached NPCIL and Ministry of Power for the allocation of nuclear power.

Nuclear Power in Union Budget 2025-26

Introduction

The **Union Budget 2025-26** outlines a significant push towards **nuclear energy** as part of India's long-term energy transition strategy. The government has set an ambitious **target of 100 GW nuclear power capacity by 2047**, positioning nuclear energy as a **major pillar** in India's energy mix. This development aligns with the broader objectives of **Viksit Bharat**, **ensuring energy reliability** and **reducing dependency on fossil fuels**. To achieve this goal, **strategic policy interventions** and **infrastructure investments** are being undertaken, with an emphasis on **indigenous nuclear technology** and **public-private collaborations**.

Recognizing nuclear power as a **critical component** for achieving energy security and sustainability, the government has introduced the **Nuclear Energy Mission for Viksit Bharat**. This initiative aims to **enhance domestic nuclear capabilities**, **promote private sector participation**, and **accelerate the deployment of advanced nuclear technologies** such as Small Modular Reactors (SMRs).

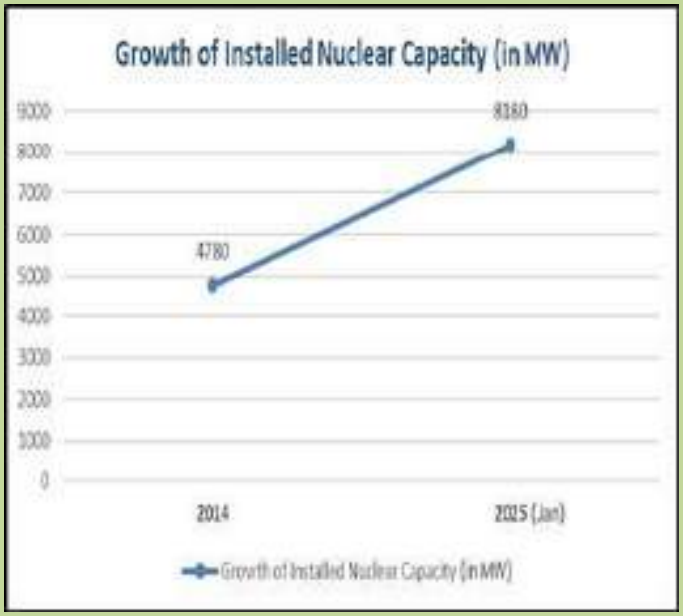
Small Modular Reactors (SMRs) and R&D Initiatives

A key highlight of the **Union Budget 2025-26** is the **launch** of a **Nuclear Energy Mission,** which is focused on research and development (R&D) of **Small Modular Reactors (SMRs).** The government has allocated **₹20,000 crore** for this initiative, aiming to develop at least **five indigenously designed and operational SMRs by 2033.**

Nuclear Energy Mission for Viksit Bharat

To facilitate the implementation of the **Nuclear Energy Mission**, amendments to the **Atomic Energy Act** and **Civil Liability for Nuclear Damage Act** will be taken up by the parliament. These amendments are expected to encourage **private sector investments** in nuclear power projects.

These legislative changes are expected to create a more conducive environment for investment and innovation in the nuclear sector. The mission aligns with India's commitment to achieving **100 GW** of **nuclear energy capacity** by **2047**, a milestone deemed essential for reducing carbon emissions and meeting future energy demands. As of **January 30, 2025**, India's nuclear capacity is **8180 MW**.



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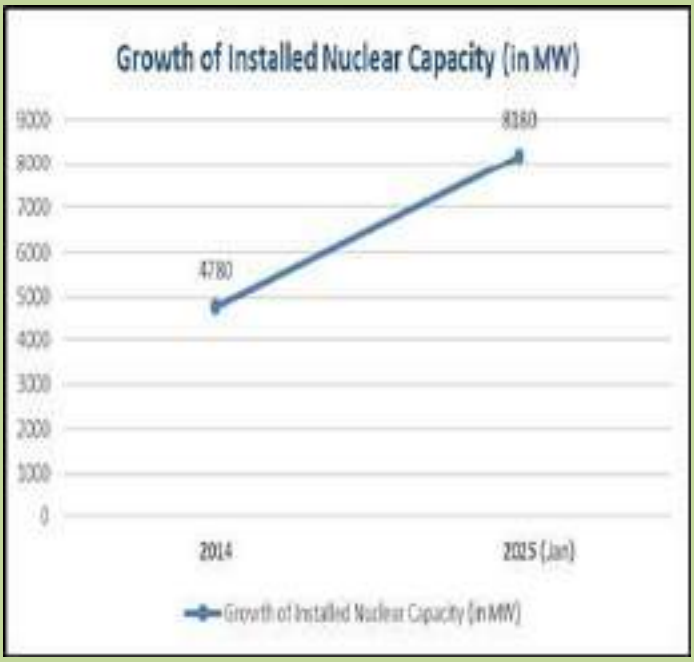

The government will enter into **partnerships** with the **private sector** with the motive of:

Setting up **Bharat Small Reactors,**
Research & development of **Bharat Small Modular Reactor**, and
Research & development of **newer technologies** for nuclear energy.

Bharat Small Reactors
The government is actively expanding its nuclear energy sector by developing **Bharat Small Reactors (BSRs)** and exploring **partnerships** with the **private sector**. BSRs are **220 MW Pressurized Heavy Water Reactors (PHWRs**) with a proven safety and performance record. These reactors are being upgraded to reduce land requirements, making them suitable for deployment near industries such as steel, aluminium, and metals, serving as captive power plants to aid in decarbonization efforts.

The plan involves private entities providing land, cooling water, and capital, while the **Nuclear Power Corporation of India Limited (NPCIL)** handles design, quality assurance, and operation and maintenance, all within the existing legal framework. This initiative aligns with India's commitment to achieving **500 GW** of non-fossil fuel-based energy generation by **2030** and meeting **50%** of its energy requirements from **renewable energy** by **2030**, as pledged at the **COP26 Summit** in **Glasgow** in **2021**.

In addition to BSRs, the **Bhabha Atomic Research Centre (BARC)** is developing **Small Modular Reactors (SMRs)** for **repurposing retiring coal-based power plants** and meeting power needs in **remote locations**. The **Department of Atomic Energy (DAE)** also plans to introduce **new nuclear reactors**, including high-temperature gas-cooled reactors for hydrogen co-generation and molten salt reactors aimed at utilizing India's abundant **thorium resources**.

This strategic move signifies India's dedication to **reducing carbon emissions** and **enhancing its civil nuclear energy program,** with private sector participation playing a crucial role within the bounds of Indian laws and regulations.

Bharat Small Modular Reactors
India is actively exploring **Small Modular Reactors (SMRs)** as a crucial part of its energy transition strategy, aiming to achieve net-zero emissions while ensuring energy security. SMRs, are advanced nuclear reactors with a power generation capacity ranging from less than **30 MWe to 300+ MWe**, provide a flexible, scalable, and cost-effective alternative to conventional large nuclear reactors. Given India's growing energy demands and the need for reliable, low-carbon power, SMRs can play a **transformative role** in complementing renewable energy sources and stabilizing the grid. Their modular design allows for **factory-based manufacturing**, reducing construction timelines and costs, making them suitable for both **on-grid** and **off-grid applications**, including deployment in **remote locations**.

India's **expertise** in **Pressurized Heavy Water Reactors (PHWRs)** provides a **strong foundation** for the development and deployment of indigenous SMR designs. By integrating SMRs into its energy mix, India can address land constraints, reduce dependence on fossil fuels, and enhance its ability to meet international climate commitments under the **Paris Agreement** (**2015**) which India ratified in **October 2016**.

Government Initiatives for Enhancing India's Nuclear Capacity

India is actively enhancing its nuclear power capacity to meet growing energy demands and achieve environmental goals. The government has initiated steps to increase nuclear power capacity from the current 8,180 MW to **22,480 MW** by **2031-32**. This expansion includes the construction and commissioning of **ten reactors,** totalling **8,000 MW,** across **Gujarat, Rajasthan, Tamil Nadu, Haryana, Karnataka,** and **Madhya Pradesh**. Additionally, pre-project activities for ten more reactors have commenced, with plans for progressive completion by **2031-32**. Further, the government accorded in-principle approval to set up **6 x 1208 MW nuclear power plant** in cooperation with the **USA** at **Kovvada** in **Srikakulam** district in the state of **Andhra Pradesh.**

A significant milestone was achieved on **September 19, 2024**, when the **Rajasthan Atomic Power Project's Unit-7 (RAPP-7), one of the country's largest and third indigenous nuclear reactors, reached criticality**, **marking the beginning of controlled fission chain reaction.** This event signifies India's growing capability in building and operating indigenous nuclear reactors, contributing to a future powered by homegrown technology.

Safety remains a cornerstone of India's nuclear energy policy. India's nuclear power plants operate with **stringent safety protocols** and **international oversight**. The **radiation levels** at Indian nuclear facilities are consistently well **below global benchmarks**, underscoring the country's commitment to secure and sustainable nuclear energy. These efforts align with India's broader strategy to provide clean and reliable energy, contributing to long-term energy security and environmental sustainability.

Recent Developments in Nuclear Energy in India

A significant discovery of new deposit in **India's oldest Uranium Mine, the Jaduguda Mines**, has been made in and around the existing mine lease area. This will increase the life of an otherwise depleting mine by **more than fifty years**.

First two units of the indigenous **700 MWe PHWR** at **Kakrapar, Gujarat (KAPS - 3 & 4)** have started commercial operation in FY 2023-24.

Closed fuel cycle being the cornerstone of Indian nuclear power program, the **country's first Prototype Fast Breeder Reactor (PFBR 500 Mwe)** achieved many of the milestones in 2024, viz., Primary Sodium filling in Main Vessel, purification of the filled sodium and commissioning of all the four Sodium pumps (2 Primary Sodium Pumps & 2 Secondary Sodium Pumps). Core loading was commenced with loading of first reactor control rod on 4th March 2024.

NPCIL and **National Thermal Power Corporation (NTPC)** have signed a supplementary **Joint Venture agreement** to develop nuclear power facilities in the country. The JV named **ASHVINI** will function within the existing legal framework of the Atomic Energy Act 1962 (amended in 2015) and will build, own, and operate nuclear power plants, including the upcoming **4x700 MWe PHWR Mahi-Banswara Rajasthan Atomic Power Project.**

Conclusion

The provisions for nuclear power in the Union Budget 2025-26 mark a **transformative shift** in India's energy landscape. By promoting nuclear energy as a sustainable, scalable, and secure power source, the government aims to bolster **energy security** and meet the **nation's long-term economic** and **environmental goals**. The Nuclear Energy Mission for Viksit Bharat is poised to accelerate nuclear power development, **positioning India as a global leader in advanced nuclear technology by 2047.**

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