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RENEWABLE ENERGY: KEY TO POWER SECTOR DECARBONISATION

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Accelerating Nuclear Power Capacity to 100 GW by 2047 is Challenging but Achievable

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In the overall planning process, aimed at managing energy transition, the present status of Nuclear Power, in the power sector profile of India, has remained a matter of concern considering its marginal position. Energy professionals and Policy Planners have been deliberating and exploring possibilities of getting the rightful place for Nuclear Power. India Energy Forum, over last four years, organised series of Debates, Seminars, and Conclaves. Based on such a Seminar in November, 2021, which was also attended by the Secretary of Department of Atomic Energy, the author had developed an article, an extract of which is relevant to produce.

"That the Nuclear power has continued to remain in the margin for more than last fifty years, with its share in power sector profile in the range of merely 1.5 to 2.5 percent, has been a matter of concern not only for Nuclear Scientists and Engineers but also for all energy professionals. India's ambitious and massive programmes for Solar and Wind Power have provided yet another great opportunity to the Nuclear Power to grow faster. In next twenty-year time frame, we could expect the total installed capacity in the country to be of the order of 1500 GW, roughly doubling every ten years. Can we plan 5 percent of the total for Nuclear Power that is 75 GW? We have 7.5 GW now, 8.0 GW under construction and 32 GW under planning and investigation. We need to identify about 30 GW of another set of new projects. Obviously, if we continue with the performance track record of 7.5 GW implemented over fifty years, and business as usual approach, it can never lead us to this level of target. Unless we revisit every element in the chain and break the inertia of legislation, of policy, of organisation structure, of ownership structure and finally of systems and procedures, we should be sure we shall not get there. Indian Power Sector is a case in example. In the first five years of the current century, led by the new legislation Electricity Act 2003, we had planned for a new look power sector, not in all, but in most of its elements. We started this century with just 100 GW achieved in over fifty years. In last twenty years now we have 400 GW, with private sector share rising from less than 10 percent to about 50 percent. Similarly opening up Transmission Sector has been equally successful with significant private sector investments. The target of 75 GW cumulative nuclear power capacity to be achieved by around the year 2045 is, no doubt, challenging but achievable. This will, however, require major changes in policies and implementation strategy."

Budget of the Government of India 2025 has laid strong emphasis, and rightly so, on accelerated expansion of Nuclear Power Capacity, more importantly, on the need for legislative and policy changes to facilitate opening up of the sector for wider participation firstly contributed by public sector organisations, and subsequently through private sector participation. The vision is to achieve and installed Nuclear Power capacity of the order of 100 GW by the year 2047, the centenary year of India's independence. Therefore, the task is now not to convince the Government on the need, not on the nature of legislative and policy changes, not even on the opening up of the nuclear sector to private sector participation, but the bigger task is how to go about it. Still bigger challenge is the recognition of the time frame and the urgency with which these changes need to be brought about. India

Energy Forum organized a National Conclave, which was held in March 2024, in the Baba Atomic Research Center Complex, at the Convention Center of the Department of Atomic Energy. This facilitated a much wider participation by energy professionals, Nuclear Scientists and Engineers, the Nuclear Energy technology manufacturers and suppliers, and highly experienced professionals. The theme was "Nuclear Power – Pathways to Rapid Growth"**.**

Summarising the debates we have had, during last over four years in various seminars, the following approach may be considered appropriate while launching the new initiative, which is indeed highly forward looking, though with a number of associated challenges.

1. The policy directions, which have been briefly highlighted in the Budget, would require preparations for amendments to the legislation, and associated rules and regulations, which are quite often time consuming. The experience indicates that when the government directions are set for such major changes, actions even within the existing Policy Framework slowdown on the pretext that major policy directions and Guidelines are forthcoming. It is, therefore, necessary that within the existing framework renewed momentum is introduced to expedite the process of capacity addition programmes. The approach which could be followed within the existing framework to accelerate capacity addition is outlined below:

   (a) Nuclear Power Corporation of India should scale up their growth pattern – already that process has started, it could be further augmented.

   (b) The NPCIL could definitely consider their generation capacity addition programmes going beyond the budgetary support of the Government of India by accessing the capital market, and enhancing their Equity Base.

   (c) Based on the previous experience of the NPCIL they could review their project planning and monitoring management aspects, including the procurement policy and procedure, so as to reduce the gestation period of construction and commissioning of projects.

   (d) Within the existing legislation, some more public sector companies could be asked to diversify into nuclear business. A beginning has already been made by NTPC initiating this process. The feedback is that any reservations on the part of Department of Atomic Energy or Nuclear Power Corporation to make this option and opportunity restrictive need to be addressed. Interest of good public sector companies could wane away if the process becomes highly restrictive in view of concerns in NPCIL. We need to recognize that similar has been the experience of opening up of any sector. Such difficulties do arise, but they do get addressed.

   (e) There are genuine concerns on the suggestion of Nuclear Power Corporation of India to get other organisations to only finance the investments and the management control to remain with Nuclear Power Corporation of India. Whether these concerns are misplaced or what is being perceived is untrue, needs to be clarified. In any case, this type of restrictive approach may not yield the desired outcome. We need to trust the capabilities of successful public sector companies who have scope in their

financial packaging to cope with development of Nuclear Power capacities. The suggestion of Nuclear Power Corporation can definitely be taken as an option. There could be organisations which can consider this feasible and commercially acceptable option for investments. Hence, this possibility cannot be ruled out altogether. However, organisations with profound experience of power sector as also related infrastructure sector can definitely be expected to get into Nuclear Power business in projects and in manufacturing. This will only better enable the National Plan to achieve an accelerated growth to be effectively implemented.

2. Exercise on Amendments to the Atomic Energy Act and also associated rules and regulations needs to be taken up on priority. The draft would need widespread consultations with various stakeholders. Based on a pre-determined time frame, with various intermediate milestones, leading up to submission of the amendments to the Parliament could be worked on. A period of three months could be a reasonable target to introduce the Amendment Bill.

3. Associated policies and rules could be simultaneously drafted and have their own time frame to finalise the draft for approval by the Cabinet of the Government of India.

4. Guidelines on association of public sector companies to develop Nuclear Power Plants could be another important document which could be drafted in parallel, and be completed within next three months. When legislative provision for private sector participation is put in place, corresponding guidelines would be needed for its early implementation.

5. Nuclear Power Corporation of India has vast experiences of constructing, commissioning, and successfully operating Nuclear Power plants. NPCIL could consider setting up Consulting Companies for Engineering, Construction, Operation, and Maintenance. These Companies could assist the new organisations coming up in this sector to develop these projects.

6. The requirement of trained manpower for the type of growth being projected will be massive. NPCIL could consider recruiting larger number of Graduate Engineers and others for training. They could be available for further expansion of NPCIL and also for other organisationns. In next few years such training infrastructure could come up also in the new organisations which could be joining the sector.

7. With the entry of other public sector companies initially and private sector company subsequently, the need for further strengthening of the Regulatory organisations on Safety and Health will be of paramount importance. The existing set up has been providing outstanding guidance and support. With expansion and, particularly entry of new entities, the safeguards may have to be further tightened and the organization structure will need to be augmented.

8. Ministry of Power, as the Nodal organization for power sector, should consider required strengthening of Central Electricity Authority which, in association with Baba Atomic Research Center, could be entrusted with the responsibility of Technical Clearances for these power projects. Required strengthening of both these orgnisations for providing guidance and facilitating new capacity additions will be necessary.

9. For Electricity Tariff Regulation, the experience of working with Central Electricity Regulatory Commission can be greatly relevant. They could be entrusted with this responsibility of price determination for Government, Public Sector, Private Sector Nuclear Power generating companies.

10. With different types of orgnisations joining the Nuclear Power Development Programmes, the Policy and Guidelines for supply of Nuclear Fuel, also taking care of the much-needed safety requirements, would be necessary. An independent fuel supply organization under the control of Department of Atomic Energy will be a feasible option.

11. While the expansion plan of 100 GW in the next about twenty-five years is achievable, dependence on import of Nuclear Fuel we will have its own challenges. Department of Atomic Energy will need to create a set up to ensure that availability of fuel does not become a major constraint. Long term agreements with required safeguards for strict compliance also stipulating the price mechanism will be necessary (the country has the experience of dealing with Gas supply for Gas based power stations – the challenges have been so huge that no proper solutions could be found out resulting in almost two third of the capacity of Gas based power plants remaining stranded). The issue may not be only of availability, but also of prices at which Nuclear Fuel is available.

12. For 100 GW Nuclear capacity to materialize, Pressurised Fast Breeder Reactor (PFBR) using Thorium which has been researched for last twenty years could provide a big relief to the challenge that has been mentioned about import of Nuclear Fuel.

13. The manufacturing sector will need to be restructured in terms of Design and Engineering capabilities and production facilities to cope with annual capacity addition programme of the order of at least 5,000 MW to cater to the need of the Nuclear Power sector. Required collaborations with international organisations, with requisite experience, may have to be put in place in time.

14. India has demonstrated that the Nuclear Scientists and Engineers have successfully operated Nuclear Power Plants with required safeguards. Yet, safety concerns about Nuclear Power do get often expressed by public at large. The expansion programme of this dimension may need a commensurate communication highlighting the advantages which Nuclear Power brings about in the context of climate change concerns.

The Government decision to embark upon a programme of expansion of Nuclear Power capacity to 100 GW by the year 2047 is not only well timed but also laudable. The associated challenges can be addressed by properly putting in place the Policy Guidelines as well as organizational Frameworks. A few suggestions have been put forth in this paper. These are, by no way completely exhaustive, but they do provide a template for moving forward and for making necessary modifications considering the issues that come up in the process of implementation.

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Load shedding fears in Summer and Fear of Slow down

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

This month the data of Core sector growth was released which says core sector growth slows to 5-month low of 2.9% in Feb. The output of eight key infrastructure sectors slowed down to a five-month low of 2.9 per cent in February as against 7.1 per cent growth registered a year ago, according to official data released recently.

The previous low level of growth at 2.4 per cent was recorded in September 2024. In February, production of crude oil and natural gas recorded a negative growth. The production growth of coal, refinery products, and electricity moderated to 1.7 per cent, 0.8 per cent, and 2.8 per cent, respectively, against 11.6 per cent, 2.6 per cent, and 7.6 per cent in February last year.

Another issue emerged this month that India's top grid operator has flagged May and June as "high-risk months" citing anticipated power shortages, warning that unmet electricity demand could reach 15-20 gigawatts (GW), particularly during non-solar hours. The National Load Despatch Centre (NLDC), in a new report, has recommended implementing demand-side measures, such as shifting electricity use to off-peak hours, to reduce stress on the grid during critical periods.

"May 2025 is the most critical month, followed by other high-demand summer months. The data suggests that system vulnerabilities are heightened during these periods, likely due to peak demands and potential variability in renewable generation," the NLDC said in a report released in January. It also suggested invoking emergency powers under Section 11 of the Electricity Act, 2003 to require imported coal-based plants to run at higher capacities.

While solar generation helps meet peak demand during daylight hours, it falls short in the evenings and early mornings due to its intermittency. Meanwhile, India's baseload power capacity – dominated by coal-based plants – has remained stagnant over the years, making it increasingly insufficient to meet rising demand in non-solar hours. As a result, the NLDC, under the Grid Controller of India Ltd, anticipates significant power shortages this summer, particularly in May and June.

"Unserved energy is predominantly observed in May and July 2025, often exceeding 15 GW. Shortages are more likely to occur during non-solar hours in May, June, July, and August 2025. It could also be inferred that meeting maximum demand during solar hours is not an issue, as solar generation significantly contributes to supply adequacy during these periods," the report said. This summer, with peak demand projected at 270 GW, up from the 250GW last year, grid managers are learnt to be concerned.

Recognising the grid stability challenges posed by intermittent renewables, the Central Electricity Authority (CEA) issued an urgent advisory on February 18, calling for energy storage systems to be co-located with solar projects. Battery energy storage systems (BESS) and pumped storage plants (PSP) can store surplus solar power during the day and release it when demand surges outside daylight hours.

While the country's total renewable energy capacity has crossed 200 GW, the installed energy storage capacity till end-2024 was just under 5 GW (4.75 GW of PSP and 0.11 GW of BESS).

"The timely commissioning of BESS and PSP, as mentioned by CEA, is crucial to ensuring grid stability and managing peak demand efficiently. Any delays in their deployment could exacerbate energy shortages, particularly during high-demand months and non-solar hours. Ensuring these resources are available as planned will enhance system flexibility, support renewable integration, and mitigate reliability risks," the NLDC report noted.

"The monthly LOLP and energy surplus trends indicate that certain periods, particularly in May, and June 2025, are high-risk months for shortages. The study suggests that demand-side measures, such as load shifting strategies and demand response mechanisms, could help alleviate system stress during these critical periods," the report said.

"To mitigate supply shortages, directions under Section 11 of the Electricity Act for imported coal-based thermal stations should be considered. Given their higher generation costs, these stations are generally dispatched less frequently. However, during periods of system stress, their optimal utilization can play a crucial role in meeting peak demand," it added.

The NLDC also suggested shifting planned outages of thermal plants from high-shortage months (April to July), when they are more frequent, to lower-demand months (November to January). Thermal plants play an indispensable role in providing baseload support to the grid during non-solar hours, especially in the absence of energy storage systems.

This month IEF Nuclear Group organized a highly successful 14th Nuclear Energy Conclave on 11th March 025 at DAE Convention Centre, Mumbai. A brief Report is also given in this issue.

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India to Lead the World in Green Hydrogen: Union Minister Shri Pralhad Joshi

Union Minister for New and Renewable Energy, Shri Pralhad Joshi, recentlyy said that India is striving to becoming a global leader in green hydrogen production and utilization. Speaking at the flag-off ceremony of India's first fleet of hydrogen-powered truck trials in New Delhi, the Minister highlighted the transformative vision behind the National Green Hydrogen Mission (NGHM) and the country's strides towards energy independence.

Union Minister Shri Pralhad Joshi emphasized that, under the leadership of Prime Minister Shri Narendra Modi, India has positioned itself at the forefront of the global green energy transition. With an allocation of ₹19,744 crore, the National Green Hydrogen Mission aims to establish India as a key player in hydrogen production, storage, and application across various sectors. He noted that India has already made remarkable progress, awarding 4,12,000 TPA of Green Hydrogen production and approving 3 GW of electrolyser manufacturing capacity per annum. Additionally, seven pilot projects have been launched across transportation, shipping, steel, and storage, alongside the publication of 88 standards to ensure safety and scalability.

Looking ahead, the Minister outlined India's ambitious 2030 targets, which include producing 5 million metric tons (MMT) of Green Hydrogen annually, installing 60-100 GW of electrolyser capacity, and adding 125 GW of renewable energy capacity dedicated to hydrogen production. These initiatives are expected to help reduce 50 million metric tons of CO_2 emissions annually, save ₹1 lakh crore in imports, and attract investments worth ₹8 lakh crore.

Shri Joshi described the launch of hydrogen-powered truck trials as a radical shift in India's mobility sector, reducing dependence on fossil fuels and enhancing energy security. He noted that India is the third-largest oil consumer and fourth-largest crude oil importer, and hydrogen technology will play a key role in reducing this reliance. The first batch of three hydrogen-powered heavy-duty trucks will operate on the Faridabad–Delhi NCR and Ahmedabad–Surat–Vadodara routes. To support this transition, Indian Oil Corporation Limited (IOCL) is establishing hydrogen refueling stations in Faridabad, Vadodara, Pune, and Balasore.

The Minister also lauded the contributions of Union Minister Shri Nitin Gadkari, whose leadership in promoting hydrogen-powered mobility has driven innovation in the sector.

Union Minister Shri Joshi also called upon all stakeholders to support the green energy revolution and emphasized that hydrogen will play a crucial role in shaping India's energy future and urged industry leaders, innovators, and policymakers to collaborate in making this vision a reality.

183 GW non-fossil fuel-based power capacity under implementation process in India: Shripad Naik

About 183.19 gigawatt (GW) of non-fossil fuel-based projects are under implementation across the country, Parliament was informed recently. A total of 222.86 GW non-fossil power capacity has been installed in the country as of February 28, 2025, Minister of State for Power, New and Renewable Energy Shripad Yesso Naik said in a reply to Lok Sabha. He further said that projects of about 183.19 GW are under implementation and projects of 77.21 GW have been tendered.

On PM Surya Ghar: Muft Bijli Yojana, Naik said 10.32 lakh residential households have been benefited under the scheme through the installation of rooftop solar plants as on March 17, 2025.

The government is targeting to solarise 20 lakh households by October. Launched by Prime Minister Narendra Modi in February 2024 with a budget outlay of Rs 75,021 crore, the initiative aims to provide free electricity to households by facilitating the installation of rooftop solar panels.

Under the scheme, discoms are designated as state implementation agencies (SIAs) responsible for facilitating various measures, including net meter availability, timely inspection, and commissioning of installations. India has set a target of 500 GW non-fossil power capacity by 2030.

PM Surya Ghar: Muft Bijli Yojana Crosses Milestone of 10 Lakh Installations

PM Surya Ghar: Muft Bijli Yojana (PMSGMBY), the world's largest domestic rooftop solar initiative, has achieved a significant milestone by completing 10.09 lakh installations across the country as of 10th March 2025. This ambitious scheme, launched by Prime Minister Shri Narendra Modi on 13th February 2024, aims to provide free electricity through rooftop solar systems to 1 crore residential households and reduce dependence on conventional power sources while enabling citizens to become energy producers. The scheme enables every household to contribute to climate change mitigation by reducing carbon emissions equivalent to planting 100 trees.

Empowering Households with Subsidies and Incentives
The scheme, implemented by the Ministry of New and Renewable Energy (MNRE) has received 47.3 lakh applications. 6.13 lakh beneficiaries have successfully received subsidies, amounting to ₹ 4,770 crore. With a fully automated application, vendor selection and subsidy redeem process through www.pmsuryaghar.gov.in subsidies get credited to applicants' bank accounts within 15 days.

Under Prime Minister Shri Narendra Modi's leadership, a key feature of the PM Surya Ghar: Muft Bijli Yojana is the provision of collateral-free loans through 12 Public Sector Banks (PSBs) at a subsidized interest rate of 6.75% for loans up to Rs. 2 lakhs, making rooftop solar installations more accessible to the masses. With the easy loan facility, a 3 KW rooftop solar system could be installed with an investment as low as ₹15,000/- giving returns up to ₹15 lakh in 25 years. Loan application process is also fully automated and online. So far, 3.10 lakh loan applications have been received, with 1.58 lakh loans sanctioned and 1.28 lakh disbursed, ensuring wider accessibility for potential beneficiaries. Beneficiaries receive subsidy of upto ₹78000 for upto 3KW rooftop solar system, significantly reducing installation costs.

Remarkable Progress Across Several States
The scheme has seen remarkable progress across several states. Notably, Chandigarh and Daman & Diu have achieved 100% of their government building rooftop solar targets, leading the nation in clean energy adoption. States like Rajasthan, Maharashtra, Gujarat, and Tamil Nadu are also performing exceptionally well, contributing significantly to the overall installation figures. The Government is actively monitoring the progress across all states to ensure the smooth and timely execution of the scheme, with the goal of reaching 1 crore households by 2026-27.

Driving India's Rooftop Solar Sector
The scheme has a total outlay of ₹75,021 crore. To facilitate easy financing, Union Minister of New and Renewable Energy Shri Pralhad Joshi recently held a meeting with top bankers at National Workshop on Mobilizing Finance for Renewable Energy in Mumbai, urging them to ensure the hassle-free disbursement of loans under the scheme. The discussions led to several key takeaways to unlock access to finance, including the need for lower-cost financing, innovative financing models, improved access to global climate funds, and enhanced risk-sharing mechanisms for new technologies. The meeting also underscored the importance of strengthening public-private partnerships and expanding green financial instruments to support India's clean energy transition.

The Government is also extending the rooftop solar initiative to public infrastructure, promoting the installation of solar systems on Government

buildings. This effort not only reduces operational energy costs but also serves as a model for the commercial and industrial sectors, encouraging a broader adoption of solar power across the country.

Under the leadership of Prime Minister Shri Narendra Modi, aligned with the Aatmanirbhar Bharat initiative, the PM Surya Ghar: Muft Bijli Yojana supports domestic manufacturing by mandating the use of solar modules and cells produced in India. As of 10th March 2025, the scheme has facilitated the installation of over 3 GW of rooftop solar capacity, with an additional 27 GW targeted by March 2027. This initiative is also driving the local production of inverters and Balance of Plant (BoP) components, further strengthening India's renewable energy ecosystem and enhancing the Make in India vision.

Under the guidance of Union Minister Shri Pralhad Joshi, MNRE has been working towards faster rollout, building infrastructure for rapid deployment, ensuring efficient subsidy disbursement, and conducting extensive awareness campaigns. The scheme continues to receive overwhelming support from the public and the Government, marking a transformative step toward a cleaner, greener, and energy-secure future for India.

Pilot Projects on Hydrogen Fuelled Buses and Trucks Launched under the National Green Hydrogen Mission

As part of the National Green Hydrogen Mission, the Government has initiated five pilot projects for using Hydrogen in buses and trucks. Earlier the Ministry of New and Renewable Energy had issued guidelines for implementing Pilot projects in the Transport Sector under this Mission.

Accordingly, the proposals were invited for different types of hydrogen-based vehicles, routes, and hydrogen refueling stations. After detailed scrutiny, the Ministry of New and Renewable Energy has sanctioned five pilot projects consisting total of 37 vehicles (buses and trucks), and 9 hydrogen refueling stations. The vehicles that will be deployed for the trial include 15 hydrogen fuel cell-based vehicles and 22 hydrogen internal combustion engine-based vehicles. These vehicles will run on 10 different routes across the country viz., Greater Noida – Delhi – Agra, Bhubaneshwar – Konark – Puri, Ahmedabad – Vadodara – Surat, Sahibabad – Faridabad – Delhi, Pune – Mumbai, Jamshedpur – Kalinga Nagar, Thiruvananthapuram – Kochi, Kochi – Edappally, Jamnagar – Ahmedabad, and NH-16 Visakhapatnam – Bayyavaram. The above projects are awarded to major companies like TATA Motors Ltd, Reliance Industries Limited, NTPC, ANERT, Ashok Leyland, HPCL, BPCL, and IOCL.

The total financial support for selected projects made available will be around Rs. 208 Crore from the Government of India. These pilot projects are likely to be commissioned in the next 18-24 months, paving the way to the scaleup of such technologies in India.

The thrust area for providing support under the scheme is the development of commercially viable technologies for the utilization of hydrogen in the transport sector as fuel in buses and trucks and Supporting infrastructure like Hydrogen refueling stations.

One of the objectives of the Mission is to support the deployment of Green Hydrogen as fuel in buses and trucks, in a phased manner on a pilot basis. These pilot projects can demonstrate safe and secure operations, assess the effectiveness of hydrogen-based vehicles and refueling stations, validate technical feasibility and performance, and evaluate their economic viability, thereby leading to hydrogen-based vehicles and hydrogen refueling stations under real-world operational conditions.

The Scheme Guidelines for the implementation of Pilot projects for use of Green Hydrogen in the Transport Sector under the NGHM can be accessed here.

The National Green Hydrogen Mission was launched on 04th January 2023 with an outlay of Rs. 19,744 crores up to FY 2029-30. It will contribute to India's goal to become Aatmanirbhar (self-reliant) through clean energy and serve as an inspiration for the global Clean Energy Transition. The Mission will lead to significant decarbonization of the economy, reduced dependence on fossil fuel imports, and enable India to assume technology and market leadership in Green Hydrogen.

Prime Minister applauds India's historic achievement of 1 billion Tonnes Coal Production

The Prime Minister, Shri Narendra Modi hailed India's historic achievement of 1 Billion Tonnes Coal Production, highlighting significant commitment to energy security, economic growth and self-reliance.

Shri Modi also lauded this achievement, calling it a "proud moment for India" and recognizing the relentless dedication and hard work of those associated with the sector.

Union Minister for Coal and Mines, Shri G Kishan Reddy informed in a X post that India has crossed a monumental 1 billion tonnes of coal production.

Responding to the X post of Union Minister, Shri Modi wrote on X; "A Proud Moment for India!

Crossing the monumental milestone of 1 billion tonnes of coal production is a remarkable achievement, highlighting our commitment to energy security, economic growth and self-reliance. This feat also reflects the dedication and hardwork of all those associated with the sector."

India aims to boost Coal Bed Methane production to 5 MMSCMD by 2027-28

India aims to increase Coal Bed Methane (CBM) production to 5.0 million metric standard cubic meters per day (MMSCMD) by 2027-28, strengthening domestic energy security and reducing dependence on imported natural gas, according to the Ministry of Petroleum and Natural Gas.

With strong policy support, technological advancements, and rising investments, the CBM sector presents a lucrative opportunity for both domestic and international energy companies.

With policy reforms and advanced drilling technologies, CBM production is expected to grow significantly, helping reduce reliance on conventional fossil fuels.
India is taking major steps to develop CBM as a key energy source, creating new investment opportunities in the unconventional hydrocarbon sector.

The government has been actively working to expand CBM exploration. Through two special bid rounds in 2021 and 2022, seven new CBM blocks were added, bringing the total number to 15 blocks.

These new blocks come with a committed investment of $16.64 million for exploration, signaling strong interest from energy companies in India's CBM reserves.

To support CBM development, the government introduced the Policy for Exploration and Exploitation of Unconventional Hydrocarbons.

Twelve Mines Successfully Auctioned in 11th Round of Commercial Coal Mine Auctions

The Ministry of Coal has launched the 11th round of coal mine auctions for commercial mining on December 05, 2024 marking another significant step in India's journey towards self-reliance in the coal sector. In the forward auctions, a total of twelve coal mines were successfully auctioned, comprising eight fully explored mines and four partially explored coal mines.

These twelve mines collectively hold a geological reserve of approximately 5,759.23 million tonnes, with a cumulative Peak Rated Capacity (PRC) of 15.46 Million Tonnes Per Annum (MTPA), excluding partially explored mines. The auctions witnessed intense competition, achieving an impressive average revenue share of 36.27%, reflecting the sustained interest of industries in India's coal sector and the Ministry's commitment to providing a stable and transparent policy framework.

The mine-wise result for auctions held is as under:
The newly auctioned mines are projected to generate an annual revenue of ~₹3,330 crore (excluding partially explored mines) and attract a capital investment of approximately ₹2,319 crore. Additionally, these mines are expected to create 20,902 employment opportunities, significantly contributing to economic development in coal-bearing regions.

Since the inception of commercial coal mining in 2020, the Ministry of Coal has successfully auctioned a total of 125 coal mines, with a combined production capacity of 273.06 Million Tonnes per year. Once operationalized, these mines will play a crucial role in enhancing domestic coal production and strengthening India's energy security. Collectively, these mines are expected to generate an annual revenue of ₹38,767 crore, attract a capital investment of ₹40,960 crore, and create employment opportunities for approximately 4,69,170 people.

Production from commercial coal mines have shown significant growth. Production of coal in FY 23-24 was 12.55 MT and it has increased in FY 24-25 to 22.35 MT (till date) registering a growth of ~78.14%.

These strategic initiatives undertaken by the Ministry of Coal reaffirm its dedication to transforming the coal sector into a key driver of economic growth. By ensuring a robust and sustainable supply of coal, these efforts not only address the nation's energy demands but also foster economic stability and employment generation, further advancing the vision of an 'Atmanirbhar Bharat.'

Removing the Restrictions on Coal Purchases for Power Plants

Supply of coal to thermal power plants was earlier governed by New Coal Distribution Policy, 2007 (NCDP). The provisions of coal linkages of NCDP for power sector have been replaced by the Shakti Policy, 2017. Coal under these policies is supplied as per the commercial terms and conditions of the Fuel Supply Agreement (FSA) executed between the coal companies and the power plants. It has been decided by the Government in 2022 that the coal to meet the full Power Purchase Agreement (PPA) requirement of all the existing linkage holders of Power Sector shall be made available by the coal companies irrespective of the trigger and Annual Contracted Quantity (ACQ) levels. Coal Supply beyond the ACQ under the FSA has enabled supply of coal as per the requirement of the power plants. In addition, coal is also sold by the coal companies under the Single Window e-auctions, which caters to all the sectors including power sector.

In case of coal supply under FSA, pricing of coal is done as per commercial terms, conditions of the FSA and the price notifications issued by Coal India Limited / Singareni Collieries Company Limited from time to time.

The focus of the Government is on increasing the domestic production of coal to ensure sufficient availability of domestic coal. The country has witnessed highest ever coal production in the year 2023-24. The all-India coal production during the year 2023-24 was 997.826 million Tonne (MT). In the current year 2024-25, the country has produced 929.15 MT (provisional) of coal (upto February, 2025) in comparison to 881.16 MT in the corresponding period of the last year 2023-24 with a growth rate of 5.45%.

The steps taken by the Government to ensure adequate coal availability and enhance coal production in the country are as under:

i. Regular reviews by Ministry of Coal to expedite the development of coal blocks.

ii. Enactment of Mines and Minerals (Development and Regulation) Amendment Act, 2021 [MMDR Act] for enabling captive mines owners (other than atomic minerals) to sell up to 50% of their annual mineral (including coal) production in the open market after meeting the requirement of the end use plant linked with the mine in such manner as may be prescribed by the Central Government on payment of such additional amount.

iii. Single Window Clearance portal for the coal sector to speed up the operationalization of coal mines.

iv. Project Monitoring Unit for hand-holding of coal block allottees for obtaining various approvals / clearances for early operationalization of coal mines.

v. Auction of commercial mining on revenue sharing basis launched in 2020. Under commercial mining scheme, rebate of 50 % on final offer has been allowed for the quantity of coal produced earlier than scheduled date of production. Further, incentives on coal gasification or liquefaction (rebate of 50 % on final offer) have been granted.

vi. Terms and conditions of commercial coal mining are very liberal with no restriction on utilization of coal, allowing new companies to participate in the bidding process, reduced upfront amount, adjustment of upfront amount against monthly payment, liberal efficiency parameters to encourage flexibility to operationalize the coal mines, transparent bidding process, 100% Foreign Direct Investment (FDI) through automatic route and revenue sharing model based on the National Coal Index.

In addition to the above, coal companies have also taken the following steps to increase domestic coal production:

i. Coal India Limited (CIL) has adopted a number of measures to increase coal production. In its Underground (UG) mines, CIL is adopting Mass Production Technologies (MPT), mainly with Continuous Miners (CMs), wherever feasible. CIL has also planned Highwalls (HW) mines in view of the availability of Abandoned/ Discontinued mines. CIL is also planning large capacity UG mines wherever feasible. In its Opencast (OC) mines, CIL already has State-of-the- Art technology in its high-capacity Excavators, Dumpers and Surface Miners.

ii. Regular liaison is being undertaken by Singareni Collieries Company Limited (SCCL) for grounding of new projects and operation of existing projects. SCCL has initiated action for developing infrastructure for evacuation of coal like Coal Handling Plants (CHPs), Crushers, Mobile Crushers, Pre-weigh-bins etc.

This information was given by Union Minister of Coal and Mines Shri G. Kishan Reddy in a written reply in Rajya Sabha recently.

One Billion Tonne: Strengthening India's Energy Future!

India has achieved a momentous milestone in coal production, surpassing one billion tonnes (BT) on March 20, 2025, in the fiscal year 2024-25. This remarkable achievement comes 11 days ahead of last fiscal year's coal production of 997.83 million tonnes (MT), underscoring India's significant progress in ensuring its energy demands and driving industrial, agricultural, and overall economic growth.

The coal sector's success is attributed to the tireless efforts of Coal Public Sector Undertakings (PSUs), private players, and the dedicated workforce of around 5 lakh mine workers across more than 350 coal mines. These coal miners, who have defied numerous challenges with unmatched dedication, have played a pivotal role in achieving this historic milestone.

India relies on coal for approximately 55% of its energy mix, and around 74% of the country's electricity is generated by coal-based power plants. This underscores the critical importance of coal in powering India's economy and sustaining energy security.

The record-breaking coal production reflects the Government's strategic reforms and policies, such as amendments to the Mines and Minerals (Development and Regulation) Act and the opening of the coal sector to private players through the commercial auctioning of coal blocks. These initiatives have led to a marked increase in the availability of domestic coal, progressively substituting imports and significantly contributing to foreign exchange savings. From April to December 2024, India's coal imports declined by 8.4%, resulting in forex savings of around $5.43 billion (₹42,315.7 crore) as compared to the same period of last year.

This milestone aligns with Prime Minister Narendra Modi's vision of 'Atmanirbhar Bharat' and highlights the Ministry of Coal's ongoing efforts to foster self-

reliance in the energy sector while ensuring sustainable development.

This achievement is not just about coal production; it is a crucial step towards ensuring long-term energy security and propelling India's overall development. By embracing advanced mining techniques, optimizing logistics, and promoting sustainable practices, the coal sector is playing a central role in strengthening India's energy infrastructure and bolstering economic resilience.

Aligned with the 'Viksit Bharat 2047' vision, this milestone positions India to become fully self-reliant in the energy sector. Through continued strategic reforms, technological advancements, and a focus on responsible resource management, India's journey towards an Atmanirbhar Bharat remains on track. This achievement is a testament to the nation's unwavering dedication to securing a self-reliant, energy-secure future for generations to come.

BCCL Achieves Historic Milestone with Successful Monetization of 2 MTPA Dugda Coal Washery Paving the Way for Energy Self-reliance

Under the guidance of Ministry of Coal, Bharat Coking Coal Limited (BCCL), a CIL subsidiary has achieved a historic milestone by successfully monetizing the 2 MTPA Dugda Coal Washery located in Bokaro, Jharkhand. This first-ever monetization of a coal washery in India marks a transformative step in coal sector reforms, reinforcing the country's commitment to enhancing efficiency, asset optimization, and energy security.

The monetization of the Dugda Coal Washery is expected to have a significant impact on energy sector in India. With improved coal washing capabilities and enhanced beneficiation processes, this initiative will contribute to higher efficiency in domestic coal utilization. More importantly, it will play a crucial role in reducing India's dependence on imported coking coal, leading to foreign exchange savings and reinforcing the country's vision of Atmanirbhar Bharat.

Strategic Importance of the Monetization:

- Optimizing Underutilized Assets
- Encouraging Private Participation
- Enhancing Coal Beneficiation:
- Revenue Generation:

This landmark achievement is part of the broader reforms initiated by the Ministry of Coal to modernize Coal sector in India and ensure the optimal utilization of its vast coal resources. By facilitating the participation of leading industry players, the Ministry is fostering a competitive and transparent ecosystem that encourages technological advancements, operational efficiency, and long-term sustainability in coal processing.

The successful auction of BCCL's Dugda Coal Washery represents a significant shift towards a more dynamic and efficient coal sector, aligning with the Government's policy of asset monetization. By leveraging private sector expertise and investment, the Ministry of Coal aims to drive efficiency, reduce wastage, and maximize the value of coal sector infrastructure.

Beyond its impact on the coal sector, the monetization of the Dugda Coal Washery is expected to generate significant economic benefits for the region. Involvement of private sector leaders will not only improve supply chain efficiency, enhance coal-washing capabilities but also create employment opportunities, and boost industrial growth in Jharkhand and adjoining areas.

The Ministry of Coal remains committed to progressive reforms, ensuring India's coal sector plays a key role in national energy security and sustainability. This historic achievement reaffirms dedication to innovation, efficiency, and sustainable growth. Moving forward, the Ministry will continue optimizing coal assets, expanding domestic coal washing capacity, and reducing import dependency. Coal sector in India is well-positioned to contribute significantly to the nation's economic progress and energy self-sufficiency.

Coal Gasification Initiative

The coal gasification initiatives taken by the Government are as under:

(i) On January 24, 2024 the Government has approved an outlay of ₹ 8,500 crore as financial incentive, for promotion of coal/lignite gasification projects for both government PSUs as well as private sector.

(ii) Government has also approved investment by Coal India Limited (CIL) in joint ventures of CIL-BHEL and CIL-GAIL for undertaking coal gasification projects.

(iii) In 2022, a new sub-sector, "Production of Syngas leading to coal gasification," was created under the NRS linkage auctions policy to support this initiative. Further under this sector the government has allowed auction with a floor price at the notified price of the regulated sector, for the projects commissioning within the next seven years.

(iv) 50% rebate in the revenue share for coal used in gasification has been introduced in commercial coal block auctions, provided that at least 10% of the total coal production is used for gasification purposes.

Coal is one of the most abundant natural resources in the country. Coal gasification technology enables conversion of coal into syngas (synthetic gas), which can be used to produce downstream products like methanol, ammonium nitrate, Synthetic Natural Gas (SNG) and Fertilizers etc. Coal gasification technology provides alternative use of coal promoting environmental sustainability to align with vision of developed India 2047.

The Government has not conducted any specific impact assessment of the financial incentive scheme for coal gasification projects.

Coal India Limited (CIL), a CPSE under Ministry of Coal, has secured Khattali Chhoti Graphite Block in Madhya Pradesh, India through e- auction of critical mineral blocks conducted by Ministry of Mines. Besides, CIL has also signed Non-Disclosure Agreement with an Argentinian company and an Australian company for acquisition of lithium assets in Argentina.

The Government has, *inter-alia*, taken the following steps to reduce India's import dependency and build supply chain resilience in critical minerals:

- Central Government has been empowered to exclusively auction mining lease and composite license for 24 critical minerals, with an aim to increase exploration and mining of critical minerals and ensure self-sufficiency in their supply.

- The Government has announced in the Union Budget 2024-25 the setting up of a Critical Mineral Mission for a harmonized approach in areas including domestic production, recycling, overseas acquisition of critical mineral assets and research & development (R&D).

This information was given by Union Minister of Coal and Mines Shri G. Kishan Reddy in a written reply in Lok Sabha recently.

Coal Supply and Logistics to Meet Electricity Demand

There is adequate availability of coal in the country. The focus of the Government is on increasing the domestic production of coal to meet the energy requirement of the country. The country has witnessed highest ever coal production in the year 2023-24. The all-India domestic coal production in the year 2023-2024 was 997.826 MT in comparison to 893.191 MT in the year 2022-2023 with the growth of about 11.71 %.

In the current year 2024-25, the country has produced 929.15 MT (provisional) of coal (upto February, 2025) in comparison to 881.16 MT in the corresponding period of the last year 2023-24 with a growth rate of 5.45%.

Ministry of Power communicated their domestic coal requirement of 906.1 million tonnes (MT) for the financial year 2025-26, against which Ministry of Coal (MOC) has conveyed the domestic coal supply plan of 906.1 million tonnes (MT) to the power sector for FY 2025-26.

As per Central Electricity Authority (CEA), the coal stock at domestic coal-based power plants stands at

53.49 million tonne (MT) as on 10.03.2025, in comparison to 44.51 MT in the corresponding day of the last year 2023-24 with a growth rate of 20.20%. The current coal stock is sufficient for about 20 days at 85% Plant load factor (PLF).

The supply of coal to the power plants is a continuous process. Coal supply is continuously monitored by the coal companies and also by an Inter-Ministerial Sub-Group comprising of representatives from Ministry of Power, Ministry of Coal, Ministry of Railways, Central Electricity Authority (CEA), Coal India Limited (CIL) and Singareni Collieries Company Limited (SCCL) which meet regularly to take various operational decisions to enhance supply of coal to Thermal Power Plants.

Besides, an Inter-Ministerial Committee (IMC) has also been constituted comprising of Chairman, Railway Board; Secretary, Ministry of Coal; Secretary, Ministry of Environment, Forest and Climate Change and Secretary, Ministry of Power; to monitor augmentation of coal supply and power generation capacity. Secretary, Ministry of New and Renewable Energy and Chairperson, CEA are co-opted as Special Invitees as and when required by the IMC.

This information was given by Union Minister of Coal and Mines Shri G. Kishan Reddy in a written reply in Rajya Sabha recently.

Coal Imports During April-December 2024 Drops by 8.4% Compared to Same Period of FY 2023-24

Coal imports to the country during April to December 2024 fell by 8.4%, totalling 183.42 million tonnes (MT), compared to 200.19 MT in the same period of previous fiscal year. This reduction resulted in foreign exchange savings of approximately $5.43 billion (₹42,315.7 crore). Notably, the Non-Regulated Sector, excluding the power sector, experienced a more significant decline, with imports dropping by 12.01% year-on-year. Although coal-based power generation grew by 3.53% from April to December 2024 compared to the previous year, imports for blending by thermal power plants sharply decreased by 29.8%. This highlights India’s ongoing efforts to reduce its dependence on imported coal and enhance self-sufficiency in coal production.

The Government of India has implemented several initiatives, including Commercial Coal Mining and Mission Coking Coal, to enhance domestic coal production and reduce imports. These efforts have also led to an encouraging 6.11% growth in coal output during the April-December 2024 period compared to the same period of FY 2023-24.

India's coal sector plays a pivotal role in supporting its rapidly growing economy, with coal serving as a primary energy source for critical industries like power generation, steel production, and cement manufacturing etc. However, the country faces a significant challenge in meeting its domestic coal demand, especially for coking coal and high-grade thermal coal, which are in short supply within the country's reserves. As a result, coal imports have been vital to meet the needs of key sectors, including steel production.
The Ministry of Coal has been implementing strategic measures to strengthen domestic production and ensure a secure coal supply, aligning with India's goals of reducing coal imports and enhancing energy security. By prioritizing domestic coal output, the government aims to march ahead towards *Viksit Bharat* goal by building a self-reliant, sustainable energy framework that supports long-term economic growth.

Coal Production from Captive and Commercial Mines Grows 32.53% YoY to 167.36 MT

The Ministry of Coal is pleased to report that total coal production from captive and commercial mines for the financial year 2024-25 has reached 167.36 million tonnes (MT) as of February 2025. This represents a 32.53% year-on-year (YoY) increase compared to the 126.28 MT produced by February 28, 2024.

Coal dispatch has also witnessed a significant surge, with total dispatch for the financial year reaching 170.66 MT, surpassing the 128.45 MT recorded in the previous year. This marks a 32.86% YoY growth, ensuring a stable and uninterrupted coal supply to key sectors such as power, steel, and cement.

Bhaskarpara Coal mine of M/s Prakash Industries Limited commenced coal production on February 15, 2025, with a Peak Rated Capacity (PRC) of 15 MT.

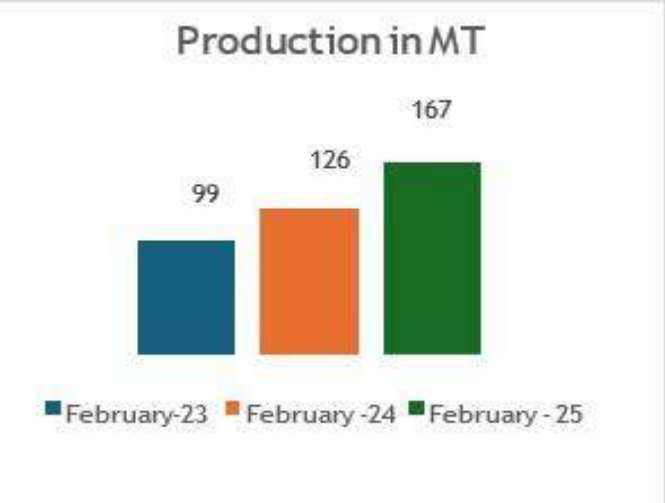

Figure 1: Glance at the coal production for last three consecutive years till February.

Looking ahead, the Ministry of Coal remains committed to fostering a sustainable and efficient coal sector that contributes to national growth and development. This vision aligns with Viksit Bharat 2047, which aims to establish a developed India by 2047. The coal sector will play a pivotal role in achieving this goal by ensuring energy security, promoting sustainable development, and driving economic progress.

Govt report flags dependence on coal for energy requirements

While India's energy needs are rising rapidly, the supply is still heavily dependent on coal which accounted for nearly 79% of the total in 2023-2024, the Energy Statistics 2025 released recently.

Despite a boom in renewable-energy installations, coal production grew by 11.71% in 2023-24, reaching 997.83 million tonnes, up from 893.19 million tonne in the previous year, the report, released by the ministry of statistics and programme implementation, showed.

"In the context of rapidly growing economies, especially in densely populated regions like Asia, there is an urgent need to shift towards cleaner energy sources," the report said. "Coal has underpinned the expansion of electricity generation and industry, and remains the largest single fuel in the energy mix."

According to official projections, India is likely to account for a quarter of the global energy demand in the next two decades.

To be sure, the share of the energy sector in emissions decreased from 59.74% in 2014 to 56.53% in 2020, the report added. In petroleum, high-speed diesel was the dominant product, accounting for 42% of total production, followed by petrol at 16%, the report showed.

The per capita energy consumption in the world's fifth-largest economy jumped 23% in the last decade (from 22,434 mega joules/person in 2014-15 to 27,574 mj/person in 2023-24), pointing to higher demand. India is currently the world's third-largest oil and LPG consumer, fourth largest LNG importer and the fourth largest refiner.

Renewable energy resources saw a growth of 11.15% during 2023-24 over 2022-23, the report showed, but they aren't enough to meet the country's increasing demand due to economic expansion, a growing population and extreme weather.

Installation of solar street lighting systems, home lighting systems and solar lanterns remained stable compared to the previous year, the report showed. Solar photovoltaic plants registered a growth rate of 19.61% over the previous year, indicating a positive increase in decentralised renewable energy solutions.

Frequent heat waves and cold snaps cause sudden spikes in power demand, increasing peak consumption and putting additional pressure on electricity reserves. "Estimating future demand accurately has become extremely important to prevent supply-demand mismatches and outages," said Vivek Choudhuri, an engineer with the Central Electricity Authority.

India's energy demand to grow 11-fold by 2070; infrastructure, investment, supply chains to see massive surge: NITI Aayog official

India's energy requirements are projected to grow 11 times by 2070, with electricity demand alone set to increase threefold by 2047 and four to five times by 2070, said Rajnath Ram, Programme Director (Energy), NITI Aayog.

Speaking at the ET Energyworld Solar Power Congress, he outlined the magnitude of resource mobilisation, investment, infrastructure development, and supply chain expansion required to meet India's twin goals of becoming a developed nation by 2047 and achieving net zero emissions by 2070.

"Let me start by saying that, as we all know, that our country has set up a huge inspirational goal for achieving status of developed nation by 2047 and achieving net zero by 2070. As of now, India is just 18-20 per cent built. So rest of India still needs to be built. So you can imagine the kind of resource requirement, the kind of investment and the infrastructure build-up, and the kind of supply chain requirement for achieving this such huge, huge target for the country," said Rajnath Ram.

He detailed that the share of electrification in total energy demand, currently at 19-20 per cent, will increase by 60 per cent by 2070. Correspondingly, electricity demand will grow 11-fold. In the transport sector, passenger travel, currently pegged at 6,000 billion passenger-kilometres, is expected to multiply four times. Freight travel will grow approximately five times.

In the industrial sector, key materials are expected to see substantial increases in production. "The production of steel will multiply by six times, the cement production five times, aluminum production six times, ethylene production, and more of that. This production will come from the refinery sector, which will multiply by eight times," he said.

Rajnath Ram also flagged the exponential rise in ancillary demands such as cooling and agricultural mechanisation. "The kind of cooling requirement for the country, it will multiply by 19 times. The kind of mechanization in the agriculture sector, three times. So you can imagine the kind of resources required, the kind of infrastructure build-up and the associated supply chains. A huge effort is required," he said. He cautioned that balancing energy security, affordability, and sustainability will be a persistent challenge as India navigates its energy transition. "Our energy demand itself will grow three times till now, till 2047 and almost four to five times by 2070. So this is — our resources are limited. We also need to focus on the optimization of the resources and the major challenge before us would remain with balancing the act — the three important aspects of energy security, affordability and the sustainability," he added.

He noted that more than 80 per cent of India's current energy use is still fossil-based. Transitioning from fossil fuels to non-fossil energy sources, according to him, will demand major systemic overhauls and financial investment, especially given the varying maturity levels of clean technologies. "Our entire economy is largely driven by more than 80 per cent and which is based on the fossil-dependent energy resources. And transitioning away from the fossil to the non-fossil kind of energy resources, a huge effort is required, and particularly given the situation where the clean energy technology — many few technologies are matured enough as of now, few are in

conceptual stage. They may take some time to mature itself. Some are semi-mature," he said.
Rajnath Ram also pointed to the challenges related to financing and technological readiness. "The investment, the kind of financing requirement, all these are the big, big challenge before us," he said.
While acknowledging the efforts made so far, he highlighted the progress in solar power, where India has already installed more than 100 GW of capacity. However, he said this is a fraction of what is ultimately needed. "In the general scenario, the solar install capacity requirement varies from 3000 to 4000 gigawatt. It is almost 30 to 40 times as of now. So you can imagine the kind of investment, the infrastructure requirement and tackling the issues both at the generation side and also on the supply side — supply chain management — then also on the integration of this renewable in energy into the system," he said.

He concluded by expressing confidence in collective action. "These are the challenges before. I am sure this aspect would be discussed during this session, and hopefully the collective efforts would put us all together to achieve these targets," Rajnath Ram said.

Centre rolls out new payout rules for transmission line land use, states told to comply

In a significant move aimed at fast-tracking power infrastructure projects and resolving long-standing compensation disputes, the ministry of power has issued revised guidelines for payment of compensation related to Right of Way (RoW) for transmission lines. The new norms, shared with all States and Union Territories on March 21, 2025, seek to bring uniformity, procedural clarity, and timely resolution in land acquisition for transmission projects.

According to the guidelines, compensation will be paid under two distinct components — one for the "tower base area" and another for the "line corridor." Compensation for the tower base area will be 100 per cent of the land value, while for the line corridor, it will be calculated on a pro-rata basis depending on the extent of land use impacted by the overhead line.

The value of land will be determined based on the higher of two criteria: either the circle rate (as notified by the competent government authority) or the average sale deed rates of similar land in the area over the preceding one year. District Collectors or Deputy Commissioners will be responsible for determining and disbursing the compensation.

The ministry, in its official communication, stated:
"The Central Government vide letter dated 14.06.2024 has issued guidelines for determination of compensation for laying Inter-State Transmission Lines. In order to bring clarity in the matter, following supplementary guidelines are issued with the approval of competent authority."

The guidelines also clarify that in cases where land is classified as government, forest, or community land, the compensation norms will be determined by the respective State or Union Territory. However, the compensation provided by States and UTs must not fall below the provisions specified in the central guidelines.
States and UTs have the option to adopt their own compensation norms provided that such provisions are not less than those outlined in the supplementary guidelines.

The ministry has made it clear that these guidelines are applicable only to future projects — specifically, those where physical work has not started and where compensation has not already been disbursed under the earlier framework. Projects that are already under

execution or where payment has been made based on the earlier guidelines will not be affected by this change.

The Central Transmission Utility of India (CTUIL) has been asked to ensure that all transmission licensees comply with the new compensation norms. The Ministry has instructed that the supplementary guidelines be implemented uniformly to avoid any inconsistency in compensation practices across States.

The communication has also been sent to the Chairperson of the Central Electricity Authority (CEA), Secretary of the Central Electricity Regulatory Commission (CERC), CMDs of State Power Utilities and State Electricity Boards, and all transmission licensees through CTUIL.

Initiatives Regarding National Electricity Plan

The National Electricity Plan-Transmission outlines the transmission system required to be added in the country during the period 2023 to 2032, commensurate with the generation capacity addition and growth of electricity demand in the country. The transmission plan includes the addition of central and state transmission systems (220 kV level and above) to meet the projected peak electricity demand of 388 Giga Watt (GW) by the year 2032.
High Voltage Direct Current (HVDC) lines facilitate bulk transfer of power over long distances. New HVDC lines have been primarily planned for transfer of bulk power from Renewable Energy (RE) rich areas to major load centers.

Resources for electricity generation are unevenly distributed across the country. Some states have huge variable RE potential while some states are rich in hydro potential. The increase in Inter- Regional transfer capacity from 119 GW to 168 GW by 2032 would facilitate seamless transfer of power from power surplus regions/states to power deficit regions/states, thereby helping the states to meet their electricity demand.
The National Electricity Plan -Transmission, inter-alia, outlines the transmission system for evacuation of power from major RE potential Zones/ areas. Further, transmission system has also been planned for delivery of power to the Green Hydrogen/Green Ammonia manufacturing potential hubs in the country. The transmission projects associated with integration of RE and for delivery of power to Green Hydrogen manufacturing hubs are under different stages of implementation.

The Reply was given by the Minister Of State in the Ministry of Power Shri Shripad Naik In Rajya Sabha recently.

Union Minister Shri Manohar Lal chairs meeting of the Consultative Committee of the Members of Parliament for Ministry of Power

The Meeting of the Parliamentary Consultative Committee of the Members of Parliament for the Ministry of Power was held in New Delhi last evening.

Shri Manohar Lal, Union Minister for Power and Housing & Urban Affairs chaired the meeting. Members of Parliament of various political parties from Lok Sabha and Rajya took part in the meeting.

The subject of the meeting was "National Electricity Plan -Transmission".

During the meeting, Shri Manohar Lal highlighted that power is a critical component in achieving the goal of a developed India by 2047. He said that the National Electricity Plan provides the details of transmission system required to be added in the country during the period 2023 to 2032, commensurate with the generation capacity addition and growth of electricity demand in the country.

He also informed that the optimal utilization of generating capacity can be ensured with availability of adequate transmission system, which is the requirement of a reliable power system. As per the NEP- Transmission, about 1.91 lakh ckm of transmission lines and 1274 GVA of transformation capacity is planned to be added during the ten-year period (2023 to 2032). National Electricity Plan-Transmission covering transmission plan till the year 2031-32 has been prepared by CEA. The Plan has been released in October, 2024. As per Section 3 of the Electricity Act, 2003, Central Electricity Authority (CEA) has to prepare the National Electricity Plan in accordance with the National Electricity Policy.

In the meeting issues related to RoW(Right of way), new technologies in transmission, Cyber Security were also discussed.

Members of Parliament provided several suggestions concerning various initiatives and schemes. They also commended the initiatives and efforts of the power ministry in expansion of the transmission network in the country.
Shri Manohar Lal concluded the meeting by expressing gratitude to the participants for their valuable contributions. He further directed officials to take appropriate actions to incorporate the suggestions made by Members of Parliament and prioritize the welfare of the people.

CEA issues "Comprehensive guidelines for the usage and sharing of fiber cores of Optical Ground Wire (OPGW)/ Under Ground Fiber Optic (UGFO) Cable for power system applications"

Central Electricity Authority (CEA), under Ministry of Power, has issued Comprehensive Guidelines for the usage and sharing of fiber cores of Optical Ground Wire (OPGW)/Underground Fiber Optic (UGFO) cables for Power System applications. The guidelines have been formulated with the collective efforts of the Committee constituted under the chairmanship of Member (Power Systems), CEA with representatives from Central Transmission Utility, State Transmission Utilities, Grid Controller of India Ltd, Transmission Service Providers, and other key stakeholders.

These guidelines aim to provide a clear and standardized framework for the allocation and sharing of fiber cores of OPGW/UGFO cable deployed across power transmission network, thereby balancing the commercial prospects of fiber usage with the imperative of maintaining secure, reliable, and scalable grid operations. It establishes a structured approach to fiber allocation, safeguarding power system communication needs and mitigating future conflicts.

Key Highlights:

i. **Prioritizing grid needs:** The guidelines prioritize fiber allocation for critical grid communications, ensuring free spare fibers for future grid needs.

ii. **Sharing framework:** A well-defined framework has been outlined to facilitate the sharing of spare fiber capacity among various stakeholders, including Central Transmission Utility (CTU), State Transmission Utilities (STUs), Transmission Service Providers (TSPs), and other entities.

iii. **Commercial Utilization with Safeguards:** Leasing of spare fibers for non-grid applications permitted provided it doesn't compromise future grid requirements. All leasing contracts to include a termination clause, mandating at max of 18-month notice period to

reclaim fiber cores for grid applications whenever required**.**

iv. **Due diligence & compliance:** It emphasises the need for assessment of future grid communication needs and adherence to applicable CEA/CERC/SERC regulations.

v. **Scalability for future needs:** Utilities encouraged to plan and install OPGW with 48/96 fiber cores to provide sufficient capacity for last-mile connectivity, future expansions, and LILO requirements, leveraging the Right of Way (ROW) effectively.

vi. **Maintenance of database:** A comprehensive database to be maintained to monitor the allocation and utilization of OPGW fibers, ensuring transparency and accountability.

vii. **Technological neutrality:** The guidelines offer the choice between IEEE C37.94 protocol over shared fiber or separate optical fibers, thereby, ensuring flexibility and adaptability in the implementation of differential protection schemes.

By promoting efficient allocation, sharing, and utilization of optical fibers, the guidelines will contribute to a more reliable, resilient, and future-ready power grid and efficient resource management across the power sector. The document is available on the CEA website for reference by all stakeholders.

Hydropower generation rises 10% amid demand surge; thermal steps in to balance grid

A 10 per cent rise in hydropower generation during April 2024 to February 2025 helped support India's rising electricity demand, but variability in renewable energy output required thermal generation to bridge the gap and ensure grid stability, the Minister of State for Power Shripad Naik informed the Lok Sabha.

Hydropower generation reached 1,39,780 million units (MUs) during the period, up from 1,27,038 MUs in the corresponding months last year. The increase coincided with a peak all-India electricity demand of 2,49,856 MW, recorded on May 30, 2024. The demand was successfully met with only a marginal 2 MW gap.

The ministry stated that India has a total installed generation capacity of 470 GW and has added 238 GW since April 2014. The capacity expansion has transformed the country from power deficit to power surplus. Further, since 2014, the transmission system has expanded with the addition of 2,01,088 circuit kilometres (ckm) of transmission lines, 7,78,017 MVA of transformation capacity and 82,790 MW of inter-regional capacity, with a total transfer capability of 1,18,740 MW across regions.

According to the mid-term review of the 20th Electric Power Survey, the country's peak power demand is projected to reach 277 GW in FY 2025-26. The ministry said it is confident that this projected demand will be met through optimal use of existing and upcoming capacity.

To ensure uninterrupted power supply, all generating companies (GENCOs), including Independent Power Producers (IPPs) and central generating stations, have been directed to maintain full daily availability, except during planned maintenance or forced outages. Hydro generation is being scheduled to conserve water for peak demand hours, and planned maintenance is being minimized during high-demand periods.

The ministry is also closely monitoring the commissioning of new power generation capacity and has ensured steady coal supply to thermal power plants. Imported coal-based plants have been directed to operate at full capacity under Section 11 of the Electricity Act. Gas-based power plants, including those operated by NTPC, are also being scheduled during periods of high demand.

To facilitate efficient power allocation, the government has enabled power trading between surplus and deficit states through three power

exchanges: Indian Energy Exchange (IEX), Power Exchange India Ltd (PXIL), and Hindustan Power Exchange Ltd. The market has been expanded with mechanisms such as the Real Time Market (RTM), Green Day Ahead Market (GDAM), Green Term Ahead Market (GTAM), and High Price Day Ahead Market (HPDAM). DISCOMs procure short-term power via ebidding on the DEEP portal and e-reverse auctions.

The ministry stated that any shortfall in hydro or renewable energy output is met by adjusting thermal generation.

To support grid reliability and integration of renewable energy (RE), the government is developing intra-state transmission networks under the Green Energy Corridor Scheme. Inter-State Transmission System (ISTS) RE schemes are being connected to state networks to improve voltage and angular stability and reduce losses.

States are being provided Central Financial Assistance for RE transmission infrastructure, and the government is encouraging RE projects with energy storage for optimal transmission use. Thermal generation is being made flexible to accommodate RE variability.

The Central Electricity Authority (CEA) has laid out technical standards for grid connectivity, which RE plants must meet before integration. These standards are verified by the Central Transmission Utility (CTUIL) and Grid India/RLDCs.

RE plants are mandated to participate in frequency control under the Indian Electricity Grid Code. Hybrid RE plants, Battery Energy Storage Systems (BESS), and Pumped Storage Projects (PSP) are being promoted to support grid frequency. Thirteen Renewable Energy Management Centres (REMCs) have been set up in RE-rich states to assist with monitoring, forecasting and scheduling.

Commenting on the government’s overall approach, Megha Arora, Partner at IndusLaw, said, “The continued focus on renewable energy sources coupled with the government’s push towards nuclear energy, is a significant step in achieving sustainable energy security. While thermal power will continue to meet a significant part of India’s peak demand, deployment of new technologies such as BESS and pumped storage power will help in mitigating the intermittent nature of power supply from renewable sources.”

Smart metering programme can help discoms generate Rs 4 lakh crore additional revenue: Care Edge

Power distribution companies (discoms) could generate an additional revenue potential of around Rs 4.0 lakh crore over the next seven years by installing smart meters across India, Care Edge Ratings said in a report this week.

Should billing and collection efficiencies improve substantially, the financial gains could exceed initial projections, further bolstering the financial health of the power sector, the rating agency asserted.

India's power distribution sector is undergoing a critical transformation with the push towards smart grids. The implementation of advanced metering infrastructure (AMI) has shown positive results by far.

The installation of smart meters has been progressing, with around 2.0 crore meters installed by January 2025, according to Care Edge.

However, the report anticipates that smart meter installations will reach only 25 per cent of the target of 25 crore meters by March 2026, falling short of the government's set goal.

"The ambitious target of installing 25 crore smart meters requires a significant investment of Rs 1.25 lakh crore, with Rs 95,000 crore in debt and a 25 per cent equity contribution," said the report.

The smart metering system has significant potential, as they play a key role in enhancing power sector efficiency through real-time monitoring, reducing power theft, and improving demand forecasting.

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PNGRB seek comments on gas tariff reform, proposes two unified zones and CNG incentives

The Petroleum and Natural Gas Regulatory Board (PNGRB) has invited stakeholder comments on a set of proposed reforms to the Natural Gas Pipeline (NGPL) tariff regulations aimed at expanding pipeline infrastructure and supporting City Gas Distribution (CGD) networks across the country.

As of December 2024, India has approximately 7,395 operational Compressed Natural Gas (CNG) stations and around 1.4 crore Piped Natural Gas-Domestic (PNG-D) connections. These numbers are expected to increase to 17,500 CNG stations and 12 crore PNG-D connections by 2030 under the Minimum Work Programme (MWP).

In this regard, a Public Consultation Document has been webhosted on 21.03.2025 for seeking comments from the stakeholders on various aspects of NGPL tariff regulations like reducing the unified tariff zones to two from three, levying zone one unified tariff to all the CNG and PNG Domestic customers, incentivising the isolated network operators/pipelines, equal distribution of benefit of volumes beyond the normative threshold with the consumers and pipeline operators and usage of such benefits by pipeline operators for creation of pipeline infrastructure, policy for long term procurement of System Use Gas (SUG) by the pipeline operators, etc.

India currently has an authorised pipeline network of approximately 33,475 km, of which 24,945 km is operational. The remaining pipeline infrastructure is under various stages of development. The CGD network now covers all geographical areas in the country, except the islands.

The proposed changes aim to facilitate investment in natural gas pipeline networks and enhance gas availability across regions, particularly for CNG and PNG-D segments.

PNGRB had earlier implemented reforms in 2020 and 2022, including the introduction of a unified tariff system across three zones, integrated tariffs, a 2% cap on normative SUG volumes, a 10-year volume ramp-up period, a 5-year capacity moratorium for new gas sources, and a permitted transmission loss of 0.1%.

The CGD sector is projected to be the key driver of gas consumption in the coming years, with an estimated compound annual growth rate (CAGR) of about 10% by 2030 and 2040.

Government measures to increase Ethanol Blending beyond 20%

The National Policy on Biofuels – 2018, as amended in 2022, *inter-alia* advanced the target of 20% blending of ethanol in petrol to Ethanol Supply Year (ESY) 2025-26 from 2030. Public Sector Oil Marketing Companies (OMCs) achieved the target of 10% ethanol blending in petrol in June 2022 i.e. five months ahead of the target during ESY 2021-22. Blending of ethanol further increased to 12.06% in ESY 2022-23, 14.60% in ESY 2023-24 and 17.98% in ESY 2024-25 upto 28th February 2025. So far, no decision has been taken by the Government for increasing ethanol blending beyond 20%.

According to the Roadmap for Ethanol Blending in India 2020-25, prepared by an inter-ministerial committee, using 20% ethanol-blended petrol (E20) results in marginal reduction in fuel efficiency for four-wheelers designed for E10 and calibrated for E20. The Society of Indian Automobile Manufacturers (SIAM) had informed the committee that with modifications in engine hardware and tuning, the efficiency loss due to blended fuel can be reduced. The committee report has also highlighted that no major issues were observed in vehicle performance, wear of engine components, or engine oil deterioration with E20 fuel.

The National Policy on Biofuels permits use of food grains during surplus phase as declared by the National Biofuel Coordination Committee. This Policy also promotes and encourages use of feedstock such as corn, cassava, rotten potatoes, damaged food grains like broken rice, food grains unfit for

human consumption, maize, sugarcane juice & molasses, agriculture residues (Rice straw, cotton stalk, corn cobs, saw dust, bagasse etc.). The extent of utilization of individual feedstock for ethanol production varies annually, influenced by factors such as availability, costs, economic feasibility, market demand, and policy incentives. Any diversion of sugarcane juice, its by-products, maize etc. for ethanol production is carefully calibrated in consultation with relevant stakeholders.

Further, Government, since 2014, has taken several measures to encourage farmers and ethanol producers to scale up production under the EBP Programme which include expanding feedstock for ethanol production, implementing an administered price mechanism for the procurement of ethanol under the EBP Programme, lowering the GST rate to 5% on ethanol for the EBP Programme, amending the Industries (Development and Regulation) Act to facilitate intrastate and interstate movement of ethanol, simplifying the ethanol procurement process by Public Sector Oil Marketing Companies (OMCs), and advancing the target for 20% ethanol blending in petrol to the Ethanol Supply Year (ESY) 2025-26 from 2030. Additionally, during 2018-22, the Government introduced various Ethanol Interest Subvention Schemes (EISS) for ethanol production from both molasses and grains to establish ethanol plants. Long Term Offtake Agreements (LTOAs) were also signed by OMCs with Dedicated Ethanol Plants (DEPs).

This information was given by the the Minister of State in the Ministry Of Petroleum And Natural Gas Shri Suresh Gopi, in a written reply in Lok Sabha recently.

Government steps to Strengthen Strategic Petroleum Reserves

Government, through a Special Purpose Vehicle called Indian Strategic Petroleum Reserve Limited (ISPRL), has established Strategic Petroleum Reserves (SPR) facilities with total capacity of 5.33 Million Metric Tonnes (MMT) of crude oil at 3 locations namely (i) Vishakhapatnam (1.33 MMT), (ii) Mangaluru (1.5 MMT) and (iii) Padur (2.5 MMT) capacity.

To further augment the SPR capacity, Government, in July 2021, had also approved the establishment of two additional commercial-cum-strategic petroleum reserve facilities with total storage capacity of 6.5 MMT at Chandikhol (4 MMT) in Odisha and Padur (2.5 MMT) in Karnataka, on a Public Private Partnership mode. Government and OMCs evaluate, from time to time, the possibility of augmentation of storage capacities based on technical and commercial feasibility. Assessment of new sites for establishing additional petroleum reserves is a continuous process.

To ensure security of crude supplies and to mitigate the risk of dependence on crude oil from single region, Indian Oil Public Sector Undertakings (PSUs) have diversified their crude basket and are procuring crude from countries located at various geographical locations viz. Middle East, Africa, North America, South America etc. Further, Government has already diversified the import of LNG by adding Australia, USA and UAE as sourcing destinations. India has also signed various long-term agreements for procurement of LNG for ensuring uninterrupted supplies and safeguearding from price volatility.
To counter the reliance on fossil fuels, Government has adopted a multi-pronged strategy to promote clean energy which, inter alia, include:

- Demand substitution by promoting usage of natural gas as fuel/feedstock across the country towards increasing the share of natural gas in economy and moving towards gas-based economy.

- Promotion of renewable and alternate fuels like ethanol, second generation ethanol, compressed bio gas, biodiesel, Green Hydrogen and EVs.

- Refinery process improvements, promoting energy efficiency and conservation,

- Efforts for increasing production of oil and natural gas through various policies initiatives, etc. For promoting the use of Compressed Bio Gas (CBG) as automotive fuel, Sustainable Alternative Towards Affordable Transportation (SATAT) initiative has also been launched.

- To promote the use of biofuels across the country, various programmes, such as Ethanol Blended Petrol (EBP) Programme, wherein Oil Marketing Companies (OMCs) sell petrol blended with ethanol, Biodiesel blending programme wherein biodiesel is blended with diesel, have been taken up.

This information was given by the Minister of State in the Ministry of Petroleum and Natural Gas Shri Suresh Gopi, in a written reply in Lok Sabha recently.

Government steps to promote clean energy alternatives to Kerosene

Effective 1st March, 2020, the retail selling price of PDS Kerosene is being maintained at NIL under-recovery level on pan India basis.

Government makes allocation of Public Distribution System (PDS) Kerosene for cooking and lighting purpose. Besides this, Government in 2012, has also empowered States/ UTs to draw an allocation of one month's quota of PDS Kerosene at Non-Subsidized rates during each financial year for special needs such as natural calamities, religious functions, fisheries, various yatras etc. The allocation of SKO under PDS has been rationalized considering the polluting nature of Kerosene. Further, Government provided cash incentives to States under Direct benefit Transfer for Kerosene scheme (DBTK) for voluntary surrender of PDS Kerosene allocations from 2015-16 to 2019-20. Since then, 13 states have become Kerosene free till FY 2023-24.

Government is leading as well as working with various international initiatives to lead a clean energy transition. India was one of the founding members of the International Solar Alliance in November 2015 and the Global Biofuel Alliance during its G20 presidency in September 2023. During India Energy Week 2025, India hosted a Ministerial Roundtable on Clean Cooking to discuss ways to address challenges faced by the Global South and share lessons from India's Pradhan Mantri Ujjwala Yojana (PMUY).

Government has adopted a multi-pronged strategy to promote clean energy which, inter alia, include demand substitution by promoting usage of natural gas as fuel/feedstock across the country towards increasing the share of natural gas in economy and moving towards gas based economy, promotion of renewable and alternate fuels like ethanol, second generation ethanol, compressed bio gas and biodiesel, refinery process improvements, promoting energy efficiency and conservation, efforts for increasing production of oil and natural gas through various policies initiatives, etc. For promoting the use of Compressed Bio Gas (CBG) as automotive fuel, Sustainable Alternative Towards Affordable Transportation (SATAT) initiative has also been launched.

As a cleaner alternative to Kerosene for lighting purposes, India has achieved near universal saturation in electricity access through Saubhagya (Pradhan Mantri Sahaj Bijli Har Ghar Yojana) and Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY).

With a view to provide access to clean cooking fuel to poor households across the country, Pradhan Mantri Ujjwala Yojana (PMUY) was launched in May, 2016. To make LPG more affordable to PMUY consumers and ensure sustained usage of LPG by them, Government started a targeted subsidy of Rs.200/- per 14.2 kg cylinder for up to 12 refills per annum (and proportionately pro-rated for 5 Kg connections) to the PMUY consumers in May 2022. In October 2023, Government increased the targeted subsidy to Rs.300 per 14.2 kg cylinder for up to 12 refills per annum (and proportionately pro-rated for 5 Kg connections). After a targeted subsidy of Rs. 300/cylinder to PMUY consumers, Government of India is providing 14.2 Kg LPG cylinders at an effective price of Rs.503 per cylinder (in Delhi). This is available to more than 10.33 crore Ujjwala beneficiaries, across the country.

In order to improve awareness of the benefits of LPG across the country, various steps have been taken inter alia, including organizing campaigns for improving awareness about PMUY, organizing melas/camps to enroll and distribute connections, promotion through Out of Home(OOH) hoardings, radio jingles, Information, Education and Communication (IEC) Vans etc., spreading awareness about advantages of using LPG over other conventional fuels and safe usage of LPG

through LPG Panchayats, enrolment/awareness camps under Viksit Bharat Sankalp Yatra, facilitation of consumers and their families for Aadhar enrolment and opening of bank accounts for getting PMUY connections, simplification of process of getting LPG connection, online application for PMUY connection at www.pmuy.gov.in, nearest LPG distributors, Common Service Centres (CSC) etc., option of 5 Kg Double Bottle Connection(DBC), swap option from 14.2 Kg to 5 Kg, provision for Migrant Families to avail new connection on Self-Declaration instead of Proof of Address and Ration Card. Further, OMCs are continuously commissioning new LPG Distributorships, especially in rural areas. Since the launch of PMUY scheme, OMCs have commissioned 7959 Distributorships (commissioned during 01.04.2016 to 31.12.2024) across the country, out of which 7373 (i.e. 93 %) are catering to rural areas. As a result of Government's interventions, LPG access in India has improved from 62 % in April 2016 to near saturation now.

This information was given by the Minister of State in the Ministry of Petroleum and Natural Gas Shri Suresh Gopi, in a written reply in Rajya Sabha recently.

Oilfield (Regulatory and Development) Amendment Bill passed in Lok Sabha

Lok Sabha recently passed the Oilfield (Regulatory and Development) Amendment Bill, 2024. The Bill was earlier passed by the Rajya Sabha on 3rd December, 2024. The Bill intends to reform the legal framework to meet the current needs and market conditions and to make the sector more attractive to investors so that exploration and production of oil and gas could be increased further. The Bill will play a key role in India's quest for ensuring energy availability, accessibility, affordability and security for the citizens and fulfilling the Hon'ble Prime Minister's vision of Viksit Bharat by 2047.

Over the last decade, the Government has brought several path breaking reforms including a landmark shift from 'production sharing' regime to 'revenue sharing' regime for awarding contracts, simplified processes and reduced regulatory burden to promote exploration and production of oil and gas in India, release of previously No Go areas for new exploration, deregulation of crude as well as marketing and pricing freedom for natural gas. A crucial outcome of these major reforms, more than 76% of the active acreage under exploration in India recently have been awarded post 2014.

While introducing the historical amendment Bill, the biggest of such path breaking legal reforms, Hon'ble Minister of Petroleum and Natural Gas Sh. Hardeep Singh Puri stated that the present regime, focussing mainly on licensing, regulatory control and collection of royalties, needed reorientation to promote Ease of Doing Business and collaboration between the Government and the Contractors. He stated that exhaustive discussions with industry leaders, potential investors and stakeholders were held to understand the pain points in the system. Given the long gestation periods and very high project risks involved, investors need a legal framework that is simple, stable, predictable and provides access to efficient expeditious dispute resolution mechanism. The amendments proposed in the Bill are designed to meet investor expectations whilst promoting, protecting and prioritizing the interests of India.

The Amendment Bill seeks to do away with the historical erroneous practice of putting mining and petroleum operations in the same bucket. It also introduces a single permit system namely, petroleum leases, which will substitute the extant system which requires the Contractors to take multiple licenses for carrying out various types of activities for different types of hydrocarbons. The Bill will facilitate development of comprehensive energy projects and adoption of new technologies like Carbon Capture utilization and sequestration (CCUS), green hydrogen etc.

Post 2014, MoPNG has embarked on an accelerated path towards monetising discoveries. Towards this goal, the discovered small fields policy had been notified in 2015 and many small operators have been awarded fields unmonetised by previous operators. Many of these isolated fields have been suffering for want of infrastructure. This Bill seeks aid small operators by enabling sharing of resources and infrastructure between different operators to improve viability of oil blocks.

The Bill also aims to resolve one of the biggest grievances of global oil companies interested in investing in India by providing stability in operations, both in terms of tenure of the lease and conditions therein. It emphasizes efficient alternate dispute resolution mechanisms which will ensure disputes can be resolved in a timely, fair and cost-effective manner.

To promote enforcement of the provisions of the Act, penalty has been increased to 25 lakh rupees and upto 10 lakh per day for continuing infraction so that they have deterrent effect. To make the system effective and expeditious, the Bill creates an adjudication authority and an appellate mechanism for levy of penalties.

Sh. Puri emphasized that the Bill intends to maintain cooperative federalism and does not impact the rights of the States in any manner. The States will continue to give Petroleum leases, necessary statutory clearances and receive royalties, as before. Minister emphasized that with the passing of the Bill, the provisions will improve the “Ease of doing business”, make India an attractive destination for production of oil and gas and play an instrumental role in unlocking hydrocarbon potential of our resource rich nation.

Government Initiatives to promote Gas based Power Generation

Gas-based plants in the country are operating at very low Plant Load Factor (PLF). To enhance the availability of natural gas for power generation, Government have placed Liquefied Natural Gas (LNG) under the Open General License (OGL) category, thereby allowing power plants to import LNG as per their requirements on mutually agreed commercial terms with suppliers. The gas imported by power plants during 2024-25 (Apr-Jan), is about 9.58 MMSCMD. Government from time to time have brought out schemes for competitive procurement of power from gas-based power plants during peak demand periods.

Various steps taken by the Government for increasing the share of natural gas in the energy basket, inter-alia, include expansion of National Gas Grid Pipeline, expansion of City Gas Distribution (CGD) network, setting up of Liquefied Natural Gas (LNG) Terminals, allocation of domestic gas to Compressed Natural Gas (Transport) / Piped Natural Gas (Domestic) CNG(T)/PNG(D) on priority, allowing marketing and pricing freedom with a ceiling price to gas produced from high pressure/high temperature areas, deep water & ultra-deep water and from coal seams, Sustainable Alternative Towards Affordable Transportation (SATAT) initiative to promote Bio-CNG, etc.

This information was given by the Minister of State in the Ministry of Petroleum and Natural Gas Shri Suresh Gopi, in a written reply in Rajya Sabha recently.

Steps by Government to reduce country’s dependence on crude oil imports

Government have taken various measures to reduce the dependency on imported crude oil and to promote domestic production of oil and gas which inter alia include:

i. Policy under Production Sharing Contract (PSC) regime for early monetization of hydrocarbon discoveries, 2014.
ii. Discovered Small Field Policy, 2015.
iii. Hydrocarbon Exploration and Licensing Policy (HELP), 2016.
iv. Policy for Extension of PSCs, 2016 and 2017.
v. Policy for early monetization of Coal Bed Methane, 2017.
vi. Setting up of National Data Repository, 2017.
vii. Appraisal of Un-appraised areas in Sedimentary Basins under National Seismic Programme, 2017.
viii. Policy framework for extension of PSCs for Discovered Fields and Exploration Blocks under Pre-New Exploration Licensing Policy (Pre-NELP), 2016 and 2017.
ix. Policy to Promote and Incentivize Enhanced Recovery Methods for Oil and Gas, 2018.

x. Policy Framework for exploration and exploitation of Unconventional Hydrocarbons under Existing Production Sharing Contracts (PSCs), Coal Bed Methane (CBM) Contracts and Nomination Fields, 2018.

xi. Natural Gas Marketing Reforms, 2020.

xii. Lower Royalty Rates, Zero Revenue Share (till Windfall Gain) and no drilling commitment in Phase-I in OALP Blocks under Category II and III basins to attract bidders.

xiii. Release of about 1 Million Sq. Km. (SKM) 'No-Go' area in offshore which were earlier blocked for exploration for decades.

Various steps have been taken by Government and Public Sector Undertaking (PSUs) Oil Marketing Companies (OMCs) to address issues related to fuel pricing, the impact of global crude oil prices and to mitigate the burden on consumers which, inter-alia, include:

i. Reduction of Central Excise duty by the Central Government by a total of Rs. 13/litre and Rs. 16/litre on petrol and diesel respectively in two tranches in November 2021 and May 2022, which was fully passed on to consumers. Some State Governments also reduced VAT rates to provide relief to citizens. In March, 2024, OMCs also reduced the retail prices of petrol and diesel by Rs. 2 per litre each, across the country.

ii. Insulating common citizens from high international prices by diversifying the crude import basket, invoking the provisions of Universal Service Obligation to ensure availability of petrol & diesel in domestic market, increasing the blending of ethanol in petrol, etc.

iii. Intra-state freight rationalisation by PSU OMCs which has benefitted consumers located at remote areas within the states. This initiative has also reduced the difference between the maximum and minimum retail prices of Petrol or Diesel within a state.

iv. Subsidized domestic LPG cylinder made available to more than 10.33 crore PM Ujjwala Yojana beneficiaries, across the country. A few State Governments are also providing some additional subsidy on LPG refills and bearing the additional cost from their respective budgets.

Oil and Gas PSUs have already announced their target dates for Net Zero status and developed plans for the same. To address environmental concerns and achieving country's net-zero emissions target they are adopting several methods to decarbonize their operations and value chain which, inter alia, include introduction of cleaner / alternate fuels; such as leapfrogging from Bharat Stage (BS) IV to BS VI fuel norms; adoption of Biofuels e.g. Ethanol Blending, Compressed Bio Gas (CBG) and Biodiesel, promotion of cleaner production processes; promoting gas based economy, promoting energy efficiency and conservation practices, production and utilisaton of Green Hydrogen, installation of Electric Vehicle (EV) charging infrastructure, etc. Over the last 10 years, Ethanol blending in Petrol by public sector OMCs has helped reduce approximately 578 lakh metric tonne of CO2 emissions. Government has also notified the "Pradhan Mantri JI-VAN (Jaiv Indhan - Vatavaran Anukool Fasal Awashesh Nivaran) Yojana", to provide financial support for integrated bio-ethanol projects aimed at setting up advanced Biofuel projects in the country using lignocellulosic biomass and other renewable feedstock.

This information was given by the Minister Of State In the Ministry Of Petroleum and Natural Gas Shri Suresh Gopi, in a written reply in Rajya Sabha recently.

Nuclear Energy is Critical for India's Net Zero Goal, Major Expansion Planned: Dr. Jitendra Singh

Addressing a post-budget webinar organized by NITI Aayog, Union Minister of State (Independent Charge) for Science and Technology; Earth Sciences, and Minister of State for PMO, Department of Atomic Energy, Department of Space, Personnel, Public Grievances and Pensions, Dr. Jitendra Singh emphasized that Nuclear Energy is critical for India's Net Zero goal.

He highlighted the Union Budget 2024-25's vision for India's nuclear power expansion, which sets a target of achieving 100 GW by 2047.

Pointing out the crucial role of nuclear energy in India's transition to clean energy and achieving Net Zero emissions by 2070, he called for private sector participation, regulatory reforms, and sustained public engagement.

Highlighting the growing energy demand, Dr. Jitendra Singh stated that India's electricity needs are expected to increase four to five times by 2047. While renewable energy sources are expanding, they alone cannot meet the base-load demand, making nuclear power a key component of India's energy strategy. "Achieving 100 GW of nuclear power will require a focused and determined approach, adding around 4 GW annually from now onwards," he said, expressing confidence in meeting the goal with proper planning and execution.

A major shift in India's nuclear policy is the proposed involvement of the private sector in designing, building, and operating nuclear power plants. Dr. Jitendra Singh acknowledged that legislative amendments to the Atomic Energy Act, Civil Liability for Nuclear Damage Act, and Electricity Act would be required to enable this participation. "Opening up the nuclear sector will send a strong policy signal to industry players, boosting investor confidence and encouraging long-term investments," he noted.

He also highlighted that NPCIL, along with its subsidiaries, aims to contribute nearly half of the 100 GW target by leveraging domestic and international partnerships. Meanwhile, NTPC's joint venture, Ashwini, has already taken the lead in constructing four 700 MWe PHWRs at Mahi-Banswara.

The Minister further announced the launch of a Small Modular Reactor (SMR) R&D Mission, with the objective of developing five SMRs by 2033. These reactors, known for their adaptability, could be deployed in industrial zones, remote areas, and hard-to-abate sectors like cement and steel manufacturing.

Dr. Jitendra Singh emphasized that India's nuclear energy journey, pioneered by Dr. Homi Bhabha, was often met with skepticism, both domestically and internationally, due to restrictive global policies and misplaced concerns over nuclear proliferation. However, he noted that under Prime Minister Narendra Modi's leadership since 2014, India has witnessed a paradigm shift, with greater acceptance of its nuclear energy program as a key component of clean and sustainable power generation. He pointed out that unlike in the past, the announcement of a 100 GW nuclear target has not faced any negative implications, reflecting India's growing credibility in the global nuclear community and the recognition of its responsible and transparent approach to nuclear energy development.

Dr. Jitendra Singh also underscored the need for a nationwide awareness campaign to address public concerns regarding nuclear energy. "A much more vigorous and sustained public outreach program is necessary to dispel fears and highlight nuclear power as a safe and clean energy source," he said, urging collaboration among government agencies, private players, and environmental groups.

With a roadmap now being formulated in consultation with stakeholders, the Minister affirmed that while challenges exist, achieving the 100 GW target by 2047 is both ambitious and achievable

India Expands Nuclear Power Generation Capacity to 35.3 GW With 25 Operational Reactors, Eyes Private Investment

India has ramped up its nuclear power generation capacity to 35.3 GW with 25 reactors now operational, the government told Parliament recently, as it sets its sights on boosting private investment for further expansion.

A 700 MW Rajasthan Atomic Power Station (RAPS)-7 was recently connected to the grid on March 17 taking the total installed capacity in the country to 8,880 MW – almost double from 4,780 MW in 2014. Speaking in Parliament recently, Union Minister of State (Science & Technology) Dr Jitendra Singh highlighted that India is keen to expand nuclear power as a clean energy source and has already opened the doors for private players.

Mega Nuclear Push

While Rajasthan now houses seven of India's 25 operational reactors, a new reactor has been approved for Gorakhnagar in Haryana to expand the nuclear infrastructure beyond the traditional strongholds in Tamil Nadu, Andhra Pradesh, Gujarat and Maharashtra.

There is currently no operating nuclear power reactor in Madhya Pradesh, but financial sanction has already been granted for setting up a 2X700 MW nuclear power project at Chutka in Mandla district which has completed most procedural formalities, including environmental clearance and land acquisition. "But the challenges due to resettlement and rehabilitation are being addressed in consultation with the state government," the minister informed.

"While 'in principle' approval of the site at Bhimpur in Shivpuri district for locating four nuclear power reactors of 700 MW each has been granted, it is awaiting final arrangements for water supply," Dr Singh told Parliament, hinting at further expansion under the Nuclear Mission could eventually include the Khandwa region as well.

Meanwhile, the government said it is also actively pursuing environmental clearances for uranium exploration in Rajasthan, and once secured, the state will contribute significantly to India's uranium reserves.

The statement comes amid the government's renewed push for nuclear energy. The latest Union Budget also announced a Rs 20,000-crore Nuclear Energy Mission aimed at deploying at least five indigenously developed small modular reactors by 2033. The Centre also plans to bring two amendments to the Atomic Energy Act and Civil Liabilities for Nuclear Damages Act for active partnership with the private sector.

But Safety First, Expansion Next

Responding to concerns over safety, the minister told Parliament that nuclear power reactors are constructed to the highest quality standards, and the operations are performed using well-laid-out procedures. "The plants are provided with fail-safe design features to ensure there are multiple barriers between the source of radioactivity and the environment," he added.

Parliament Question: Nuclear Energy Mission

The nuclear energy mission announced in the budget-2025 envisages deployment of 100 GWe of nuclear energy by 2047, which is essential for NetZero by 2070. The mission aims to provide reliable energy alternative to fossil fuel energy sources with an objective to replace retiring thermal power-plants, set up captive plants for energy intensive industry & providing energy for remote as well as off-grid location with objective to decarbonize the energy sector.

DAE is designing and developing SMRs mentioned below:

- Bharat Small Modular Reactor (BSMR)-200MWe,
- Small Modular Reactor (SMR) -55Mwe, and
- Gas-cooled high-temperature reactor meant for hydrogen production.

Fund of INR 20,000 Crore allocated in the budget-2025for deployment of five SMRs by 2033. Fund is also allocated for supporting to development of Small Modular Reactors mentioned above.

In Financial Year 2024-25, as part of Budget Announcement, policy directive has been set to partner with the private sector for setting up Bharat Small Reactor (BSR), and in pursuance of the same, NPCIL has floated Request-for-Proposal to private industries to finance and build small-sized 220 MW-PHWR based NPPs as captive plants for electricity production.

A Task Force has been constituted in Department of Atomic Energy (DAE) to look into the amendments required in the Atomic Energy Act. This Task Force has members from DAE, AERB, NPCIL, NITI Aayog, MoLJ and MEA. The Task Force is looking into various aspects like build, own, operation of NPPs by Private Sector, nuclear safety, security, safeguards, fuel procurement/ fabrication, waste, management, spent fuel reprocessing, etc. In addition, a separate Task Force is also looking into Civil Liability for Nuclear Damage Act (CLND Act) to address the concerns raised by private suppliers.

This information was given by Dr. Jitendra Singh, Union Minister of State (Independent Charge) for Science and Technology, Department of Atomic Energy, Department of Space, in a written reply in the Rajya Sabha recently.

North India's first nuclear power project coming up in Haryana

Union Minister Dr. Jitendra Singh announced recently that North India's first nuclear power project will be established in Gorakhpur, Haryana. He described the project as a significant milestone in India's nuclear energy expansion and a crucial step toward the country's clean energy goals.

Addressing concerns in the Lok Sabha regarding the environmental impact and safety of the Jaitapur project, Dr. Singh clarified that its environmental clearance is currently under renewal. He assured that all necessary safeguards are in place to mitigate ecological risks and ensure safety.

Despite objections from conservation groups and concerns about its seismic zone location, Dr. Singh reiterated the government's confidence in the project's safety. He said that concerns about risks to marine life and local livelihoods have been raised repeatedly, and the government has consistently provided evidence-based studies proving there is no such risk.

Dr. Singh further explained that the environmental clearance had expired in December 2022 due to procedural delays, not because of any fresh environmental objections. He emphasized that if there were serious environmental hazards, the project would not have received environmental clearance earlier.

Jaitapur Nuclear Plant to Contribute 10% of India's 100 GW Clean Energy Goal Dr. Jitendra Singh

The Jaitapur Nuclear Power Plant, initially approved in 2008, faced delays due to shifts in agreements with French stakeholders. With technical agreements now finalized, discussions are ongoing to settle commercial terms with the French side.

Once operational, the Jaitapur plant will house six nuclear reactors, each with a capacity of 1,730 MW, totaling 10,380 MW. This will contribute 10 percent of India's 100 GW nuclear energy target by 2047, making it a cornerstone of the nation's clean energy strategy.

Dr. Singh also highlighted that India's Civil Liability for Nuclear Damage (CLND) framework provides robust safeguards. The primary responsibility rests with the operator, and an insurance pool of ₹1,500 crore has been set up, with additional government commitments if required. India has also aligned with global compensation mechanisms to ensure financial security in case of an incident.

With India aiming for net-zero emissions by 2070, the Jaitapur Nuclear Power Project and other upcoming plants will play a critical role in the country's clean energy ambitions, further strengthening India's position as a leader in nuclear technology.

Key nuclear deal breakthrough: US clears firm to build and design n-reactors in India

Two decades after it was inked, decks have been cleared to tap the commercial potential of the India-US civil nuclear deal with an unprecedented regulatory clearance from the US Department of Energy (DoE) that will allow a US company to build and design nuclear reactors in India.

The March 26 approval from DoE cleared Holtec International's application for specific authorisation with respect to the restrictive regulation that is referred to as "10CFR810". (Part 810 of Title 10, Code of Federal Regulations of the US Atomic Energy Act of 1954).

This authorisation permits Holtec, with conditions, to transfer "unclassified small modular reactor (SMR) technology" to three firms in India: its regional subsidiary Holtec Asia; Tata Consulting Engineers Ltd; and Larsen & Toubro Ltd. Holtec International is promoted by Indian-American Kris P Singh, and has its wholly-owned subsidiary Holtec Asia operating an engineering unit in Pune since 2010 and has a manufacturing unit in Dahej, Gujarat.

Holtec's original request included three additional proposed Indian end-users: Nuclear Power Corporation of India Limited (NPCIL), thermal utility NTPC Ltd., and the Atomic Energy Review Board (AERB). But the Government of India did not provide the requisite non-proliferation assurances for these three state-owned entities.

As per the approval, Holtec may, in the due course, request to amend this authorisation to add NPCIL, NTPC, and AERB as authorised end users. The latest authorisation has been granted for 10 years from the date of issuance, subject to a review at 5-year intervals.

The authorisation is also subject to assurances from the Government of India extended on March 3, 2025 that the three selected private entities — L&T, TCE, and Holtec Asia — will use the technology and information transferred from Holtec only for "peaceful nuclear activities under International Atomic Energy Agency safeguards and not for nuclear weapons or other nuclear explosive devices or for any military purpose".

This clears one significant roadblock.

So far, the regulation, while giving US companies, such as Holtec, the ability to export equipment to countries such as India under strict safeguards, explicitly barred them from manufacturing any nuclear equipment or performing any nuclear design work in India. This provision was a non-starter from New Delhi's perspective, which wanted to participate in manufacturing SMRs and co-produce the nuclear components for its domestic needs.

India's small nuclear reactor initiative a huge step in the right direction: IAEA

Rafael Mariano Grossi, the director-general of the International Atomic Energy Agency (IAEA), has lauded India's small nuclear reactor initiative.

In an interview with The Times of India's Surojit Gupta, Grossi said that although the country initially derived nuclear technology from Western sources, it later focused on indigenous development, producing "very good reactors," with "20 of them operating flawlessly."

"But still, nuclear is a minute percentage of national electricity production. And I was happy to see that the government is aiming much, much higher—100 gigawatts, which is possible. I see India as a country with enormous internal potential. But also, if I may, I see India playing a role globally. Nuclear technology is being exported, and I don't see why India should not join the family of vendors active in the global market," he told TOI.

Regarding the recent announcement by the Indian government on the small reactor segment, he said, "Nuclear is capital-intensive, and not everything can come from public or public utilities. Given India's energy needs, public-private partnerships or even private ownership of plants, including small modular reactors, must be explored. I see this shift in India's legal and policy approach as a huge step in the right direction."

14th Nuclear Energy Conclave

11th March 2025, Mumbai

India Energy Forum – Nuclear Energy Group – and Nuclear Power Corporation of India Limited (NPCIL) jointly organised 14th Nuclear Energy Conclave (NEC) on 11th March 2025 in the DAE Convention Centre, Anushakti Nagar, Mumbai. The theme of the conference was **"Nuclear Power: Pathways to Rapid Growth"**. It was supported by the Department. Of Atomic Energy.

Shri SM Mahajan, Convenor of the Nuclear Energy Group, welcomed all those present. He mentioned that besides NPCIL, IEF & various divisions of DAE, manufacturing industry is represented in large number not only by main plant equipment & BOP but also by material suppliers, including the welding consumable industry. This is a welcome development. The industry is buoyant due to recent initiatives of DAE and expects regular & increased flow of orders. He welcomed the Speakers, Panelists and the large number of delegates for their participation and hoped for useful interaction on various topics.

Setting the context of the conclave **Dr. RB Grover**, Member, AEC and Chairman of the Nuclear Energy Group spoke about the complexities of the nuclear regime and stressed on the importance of the nuclear safety culture. He informed that as the nuclear industry imbibed the safety culture, the capacity factors of the operating plants improved. He spoke about forecasting studies that have brought out the importance of nuclear energy in the energy mix in India and how they have influenced the policies. Shri RV Shahi highlighted the role played by IEF in promoting the importance of nuclear power in the energy mix of the country. He highlighted the inevitable role of nuclear power in the endevour to achieve net zero emissions. Noting the excellent response, he proposed to hold the Annual NECs in the DAE Convention Centre.

Shri BC Pathak dwelt at length on how NPCIL will contribute to the target of achieving an installed capacity of 100 GW by 2047. He announced that NPCIL has finalized plans to set up a second fleet of 10 PHWRs of 700 MW rating. He informed the audience that NPCIL has already set up a joint venture with NTPC, and IOCL, NLC and Indian Railways are interested in having a joint venture. He opined that pathways have to be explored to set up reactors with minor equity provided by the state governments. He expressed the hope that in the future, there could be more nuclear companies in India. Dr. AK Mohanty, Secretary DAE and Chairman, AEC was the Chief Guest and delivered a Keynote Address. He covered a wide range of topics: the ongoing programme on the development of PWRs of 200 MW and 55 MW rating, fast reactors including difficulty in loading fuel in the PFBR at Kalpakkam due to misalignment, the accelerator-driven systems, and fusion reactors.

The Printed Souvenir comprising the Profile of all Speakers, a few Informative Articles and Advertisements etc. was released. It was distributed to those present and will be emailed to all concerned Shri BVS Sekhar, ED (CP& CC), NPCIL proposed a vote of thanks to all Dignitaries, Speakers and Delegates. He thanked the members of the Organising Committee for their hard work in ensuring a successful NEC.

Five speakers spoke during the session on invited thematic presentations. Shri V Rajesh, Director (Technical), NPCIL provided details about the Bharat Small Reactor, time taken by pre-project activities, need for establishing site-specific Safe Shutdown Earthquake (SSE) and Operating Basis Earthquake (OBE) spectrums. Dr. R Srikanth, NIAS, spoke about the siting of nuclear power plants. He opined that in place of offering 200 MW PHWR for captive power use by the private industry, NPCIL might offer PHWRs of higher rating. Shri Alok Kumar, former Secretary, Power dwelt on the role of nuclear power. He said that to stay relevant in a scenario where both the demand and supply would have variability, the reactor designers would have to innovate. Referring to the fine print in the budget for 2025-26, he opined that the target of 100 GW was only aspirational. There were two presentations from the manufacturing industry: Shri Anil Parab, Whole-time Director from L&T, and Shri Sanjay Kirloskar, CMD, Kirloskar Brother Limited. Both presentations provided confidence about the readiness of the manufacturing industry toward achieving the target of 100 GW by 2047.

There was a lively panel discussion on the participation of industry in the growth of nuclear

installed capacity. The pawho made rticipants included Shri Sumesh Anand from BHEL, Shri Sushil Agarkar from Godrej and Boyce, Shri CP Tiwari from Tata Power, Shri Vivek Sharma from Adani Power, Shri TT Mani from ATL, Shri Nitin Patil from KSB, Shri Somnath Chakravarty from AWPM, and Dr Alok Mishra from Westinghouse India. The session evinced a lot of interactive interest from the participants.

The Conclave ended with a vote of thanks by Shri Umed Yadav, ACE (CP & CC) on behalf of NPCIL and Shri SM Mahajan on behalf of India Energy Forum to all participants, Organizing Committee members, DAE, speakers, Panelists and all those who strived hard to make the Conclave a grand success. It was mentioned that all the presentations will be put on the IEF website after taking due permission.

GLIMPSES OF 14TH NUCLEAR ENERGY CONCLAVE