INDIA ENERGY FORUM

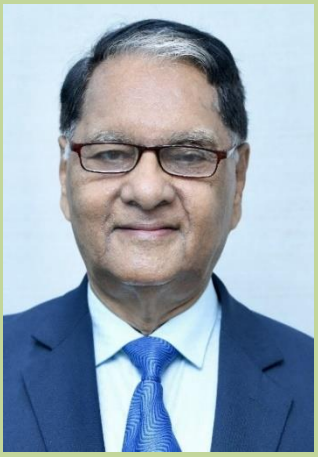
TOTAL ENERGY

Volume 19, Issue 2 May 2025

Shri Pankaj Agarwal IAS, Secretary, Ministry of Power launched India Energy Debate (an India Energy Forum Initiative – monthly discussion) on 31st May 2025 in New Delhi

India to become a Developed Nation by 2047 is Achievable: Exponential growth of Power Supply Holds the Key: Distribution Sector Reform is Crucial (Part – IV)

R.V. Shahi



In the previous Part of this Article, it has been articulated that the management of electricity distribution, in a manner that it is financially sustainable, is crucial not only for the entire value chain in the power sector- from fuel supply to generation, transmission and distribution businesses, but also it is equally essential for the improved quality of services to consumers served by distribution companies. This is an area, which has continued to remain far behind expectation, even during the last over twenty years, when the Electricity Act 2003 was put in place. It is generally believed that while the Electricity Act and the associated Statutory National Electricity Policy, Tariff Policy, and Rural Electrification Policy, extensively focused on generation and transmission, but they fell far too short of expectations while dealing with the distribution business. As a matter of fact, one of the top leading industrialists of the country, during a recent discussion with the author, commented that Electricity Act has been able to deliver on power generation and power transmission, but one needs to be critical of these policies in so far as dealing with distribution business is concerned, and that it did not provide adequately for participation of private sector in distribution. This conversation, and a general perception among many, led the author to a sharper examination of the specific provisions laid down in the Electricity Act and the Statutory Policies, which were notified subsequent to the notification of the Act. It needs to be emphasised, however, that legislations and policies enablers and provide for specific actions to be taken by concerned authorities and various stakeholders. That is why quite often it is mentioned that "Act is necessary, but it is not sufficient" to deliver the outcomes. Obviously, It is only actions which can lead to outcomes.

It is relevant to have an overview of various provisions which are aimed at setting right electricity distribution business in the overall interest of the industry as also of consumers. Indeed there have been inadequacies in implementation in many areas even in respect of generation and transmission but, in relation to distribution, the gaps in implementations of many specific provisions have had adverse impact on sustainability of distribution business. These gaps have also led to constraining the benefits of competition which consumers would have enjoyed – contrary to the provision in the Preamble of the Act which lays emphasis on "protecting interest of consumers".

One of the strongest criticisms is about inadequacy in the Act in relation to private sector participation in distribution. Though privatisation cannot be considered as the panacea for addressing all the shortcomings, yet it is definitely an important tool to create and influence a competitive market structure in larger interests of consumers. The Sections in the Electricity Act, which deal with re-organisation of Electricity Boards, do provide, in sufficient measure, the intent of the Act on this issue. Section 132 mentions "in the event that a Board or any utility owned or controlled by the appropriate Government is sold or transferred in any manner to a person who is not owned or controlled by the appropriate Government, the proceeds from such sale or transfer shall be utilized in priority to all other dues in the following manner……." Similarly, Section 133 lays down provisions relating to officers and employees in case of transfer of the company. In the National Electricity Policy, while dealing with distribution Clause 5.4.4 provides "private sector participation in distribution needs to be encouraged for achieving the requisite

reduction in transmission and distribution losses and improving the quality of service to consumers."

Clause 5.4.5 of the National Electricity Policy notified in February 2005- "The Electricity Act 2003 enables competing generating companies and trading licensees, besides the area distribution licensees, to sell electricity to consumers when open access in distribution is introduced by the State Electricity Regulatory Commissions. As required by the Act, the SERCs shall notify regulations by June 2005 that would enable open access to distribution networks in terms of sub-section 2 of section 42 which stipulates that such open access would be allowed, not later than five years from 27th January 2004 to consumers who require a supply of electricity where the maximum power to be made available at a time exceeds one mega watt. Section 49 of the Act provides that such consumers who have been allowed open access under section 42 may enter into agreement with any person for supply of electricity on such terms and conditions, including tariff, as may be agreed upon by them. While making regulations for open access in distribution, the SERCs will also determine wheeling charges and cross-subsidy surcharge as required under section 42 of the Act."

National Electricity Policy Clause 5.4.7 – "One of the key provisions of the Act on competition in distribution is the concept of multiple licensees in the same area of supply through their independent distribution systems. State Governments have full flexibility in carving out distribution zones while restructuring the Government utilities. For grant of second and subsequent distribution licence within the area of an incumbent distribution licensee, a revenue district, a Municipal Council for a smaller urban area or a Municipal Corporation for a larger urban area as defined in the Article 243(Q)of Constitution of India (74th Amendment) may be considered as the minimum area. The Government of India would notify within three months, the requirements for compliance by applicant for second and subsequent distribution licence as envisaged in Section 14 of the Act. With a view to provide benefits of competition to all section of consumers, the second and subsequent licensee for distribution in the same area shall have obligation to supply to all consumers in accordance with provisions of section 43 of the Electricity Act 2003. The SERCs are required to regulate the tariff including connection charges to be recovered by a distribution licensee under the provisions of the Act. This will ensure that second distribution licensee does not resort to cherry picking by demanding unreasonable connection charges from consumers."

The provisions in the Act relates to giving advantage of competition for direct supply to consumers through Open Access to the transmission and distribution infrastructure. This provision also lays down that in these cases the consumers will need to pay to the distribution company a Surcharge. The spirit of this Act is that the State Regulatory Commissions would enable implementation of this provision in a manner that these competitions help in developing a market structure which will be helpful to a large cross section of consumers. The experience over last twenty years indicates that the implementation has been, by and large contrary to the spirit of the Act. The objective was by and large defeated by the State Regulatory Commissions fixing excessively high rates of Surcharge. The Act specifically lays down (Section 42(2) "provided also that such Surcharge and Cross Subsidies shall be progressively reduced and eliminated in the manner as may be specified by the State Commission".

Based on the recommendations of the Standing Committee on Energy, on the Electricity Bill which was pending in Parliament, a specific Clause, under Section 14 of the Electricity Act, was provided by way of an amendment to the Bill for parallel distribution licensee in the same area of supply. This was intended to introduce competition and provide the benefit of better consumer services. This provision has also been not implemented except for a limited number of cases in some of the States. Similarly, the Rural Electrification Policy, a statutory instrument as provided in the Act stipulated that the strengthening of the rural distribution infrastructure

with substantial financial support of the Government of India would necessarily require franchisee arrangement to be put in place. The idea was that extensive electrification in villages, which was necessary, will also need to be financially sustainable apart from improving the quality of supply. Franchisee arrangement was stipulated on the basis that this would meet both the above requirements. Even this requirement got diluted subsequently.

In fact, Electricity Act Section 14 has a. specific provision " Provided also that where a person intends to generate and distribute electricity in a rural area to be notified by the State Government, such person shall not require any licence for such generation and distribution of electricity ....." We may see how powerful this provision is to bring about a radical change, but not acted upon. Delicensing generation as well as distribution, if acted upon for rural area supply,, could have transformed the shape of distribution business - wider and faster access, competition and improved quality of supply. With economics of Solar Power assuming a different dimension delicensed generation and distribution could become even more relevant.

In March 2005, the Ministry of Power, Government of India notified Scheme of Rural Electricity Infrastructure and Household Electrification. It was a very powerful Programme with 90 percent of the Capital Cost to be funded as capital Subsidy of the Government of India. Massive Electrification would have meant huge investments and also highly accelerated requirement of power supply. To address the financial sustainability essential requirement was to put in place Franchisees - "For projects to be eligible for capital subsidy under the Scheme, prior commitment of the State will be obtained before sanction of the project for deployment of Franchisees for the management of rural distribution in projects financed under the Scheme." This condition, it is understood, was later on diluted. This again is a major implementation gap.

In the light of the above, and considering the huge opportunities to enhance the levels of consumption of electricity with a view to making India a developed nation in next two decades, it appears essential that the distribution segment of the industry is set right. All the expectations in the past with various types of small policy changes – sometimes in the reverse direction – the outcome has been such that the Electricity Distribution Sector has not been able to create, a satisfactory level of confidence for a substantially higher growth of the sector , This inevitably deprives the country to achieve a substantial jump in per capita electricity consumption, leading, in turn, to a respectable rank among nations on per capita GDP, This is not possible unless drastic changes are made in how electricity distribution is managed. The following steps need appropriate consideration:

a) The few private sector managed distribution companies provide a good framework of management. Almost all of them have been doing very well in terms of suitable expansion of infrastructure, much lower technical losses in distribution, much higher – almost 100 percent - collection of bills, much better technology inputs in consumer services, proper reliability of power supply, etc.

b) Privatisation of Delhi electricity supply in 2002-03 demonstrated that in a period of just five years things changed and, in a period of twenty years, how the supply could be one of the best in the country compared to what was one of the worst in the country prior to privatization.

c) Privatisation of power distribution in Orissa, which saw different types of challenges in the past, threw open a number lessons, came back with new approaches, and is now in a position to reflect a better degree of confidence and also a number of lessons.

d) Attempt is being made now in some of the States for private sector participation in distribution through strategic disinvestment.

This is a highly welcome initiative. Structuring of the process to introduce private sector has to be on the basis of very careful consideration in order to see that the initiative succeeds. The above examples have provided enormous amount of lessons of what to do and what not to do. The exercise should aim at not testing the ability of private sector by introducing hard challenges, it should be structured to see that the initiative succeeds.

e) The first and foremost task should be to develop, in a short time, with the services of competent Consultants, the baseline reliable date on the input power, the technical losses in the system, the gap in what is invoiced and what is collected. The bitter experience of Orissa privatization in the year 2000 led to the "Distribution Loss" being changed to "Aggregate Technical and Commercial Loss (AT&C)". This was very effectively introduced in the case of privatization of Delhi. Since AT & C Losses in Delhi were very high in the range of 50-55 %, the template for private participation was designed around loss reduction and an essential element for Transition a period Support to avoid any abrupt tariff shock Similar model may be relevant to cases where ATC losses continue to be very high After the reliable baseline data is established, in all such cases where AT&C losses are very high, say plus 20%, it will be necessary to provide transition period support to avoid any tariff increase shock. Only in such cases where AT&C losses are lower a valuation of equity will be relevant and equity could be a relevant criterion apart from other factors.

f) In States where the resistance to privatization is extensive the approach could be selective – choosing such towns and cities where losses are upward of 20% and putting them to strategic disinvestment rather than taking up huge areas of the State, could be an option.

g) Parallely many of the provisions of the Electricity Act, National Electricity Policy, Tariff Policy, and Rural Electricity Policy, which have remained either unimplemented or partially implemented, could be seriously perused. All efforts should be made to ensure that these are implemented. All these have powerful potentials to make significant impact on improving the distribution business of the power sector.

h) With emergence of Solar Power, many states have gone in for implementation of KUSUM Scheme and strong financial support is being provided by the Central Govt. to States. This is a good opportunity for the Govt. of India to link this Scheme to the provision of the Act mentioned earlier in this paper and integrate licence free generation and distribution through private sector participation. This needs to be properly structured to harness the potential to transform the rural power supply. State Regulators could devise Feed in Tariff mechanism, considering State specific situation, to ensure a quick start.

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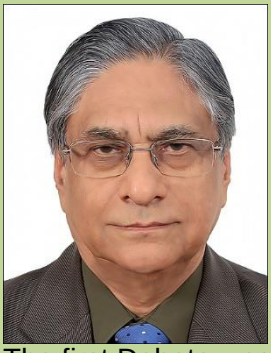
Dear Reader



I am happy to share the May 2025 issue of TOTAL ENERGY- a monthly publication of IEF.

India Energy Forum has launched a new initiative **" India Energy Debate".** Its an initiative on monthly discussion on critical issues. The first Debate was organized in India International Centre on 31st May afternoon on the subject of Developing Hydro Power Projects in North East; Opportunities , Challenges and Way forward" Secretary Ministry of Power, Sh Pankaj Agarwal , was the Chief Guest. Former Secretaries MOP Sh Anil Razdan & Sh RV Shahi, Chairperson CEA Sh Ghanshyam Prasad , CMD NHPC Sh RK Choudhury, ADG,APP, Sh ICP Keshari participated in the Panel discussions highlighting the opportunities, challenges and put forward suggestions for way forward . It was attended by many Energy Stalwarts and past Secretaries and CMDs of CPSUs, besides members of IEF. Very interesting discussions followed the presentations. A detailed report shall be shared in the next issue.

On 26th April 2025, IEF organized a largely attended Webinar on the theme of "Capacity Market for India "Pricing and Financing, on the 9th April 2025.

The forthcoming physical program include RE Conference now rescheduled for 31st July 2025 on the theme of "Renewable Energy – Key to Power Sector Decarbonisation". It will dwell upon on the issues of (i) Accelerating RE Deployment – Challenges and Solutions; (ii) RE Integration Challenges; and (iii) DRE and Innovative RE Technologies. It will be followed by Seminar on Pumped Storage.

India is looking for substantial increase in power generation capacity from Fossil & Non Fossil Fuels. CEA's current projections indicate about 900 GW by March 2032 from the current level of 472 GW (April 25). While share of power from Fossil Fuels will come down from present 51 % to 34 % by March 32, coal will continue to be the main source of energy in the near future. It is assuring to see that RE share will rise to 54% (Solar + Wind + small Hydro).

Govt. has already announced its plans to scale up generation capacity of 100 GW of Nuclear Power by 2047 and setting up the Nuclear Energy Mission. NPCIL has been the sole agency for setting up and operating Nuclear Power Plants and is likely to contribute 55 GW out of this target, including the 8.2 GW plants already in operation and plants under construction, that will enable the capacity to reach 23 GW by 2032. By forming a joint venture with NPCIL, NTPC has already entered this sector. Four PHWR units of 700 MW each – at Mahi Banswara site of Rajasthan - are being set up by the NTPC-NPCIL joint venture company. AERB has given its consent on these units, recently. Besides the three 700 MW PHWRs already commissioned & one under commissioning, 12 more are under various stages of construction and procurement. NPCIL recently announced that it has approval for a batch of another 10x700 MW PHWRs. That would all add upto 26 sets of 700 MW PHWR.

The Government has announced its intent to amend the Atomic Energy Act and the Civil Liability for Nuclear Damage Act. Once the acts are amended to allow private sector to participate, the Nuclear Power Generation capacity could see rapid growth. All this augurs well for the Nuclear Energy Sector growth. necessitated by more demand for electricity for the industrial growth. With renewed focus on Nuclear Power, many conferences, panel discussions are being organized on it. IEF also plans to do so

IEF has drawn a schedule of webinars and seminars on various energy related sectors including webinars on "Improving coal quality for improved thermal efficiency, Energy Transition- How India is preparing for it, Operating Experiences on 700 MW PHWRs etc besides the RE Seminar on 31st July- as mentioned above IEF will continue to be a Think Tank on use of all forms of Energy; Coal, Renewable, Nuclear, Oil & Gas etc. I call upon all members of IEF to take active part in the activities and programs of IEF on its verticals. We also need to involve more and more stake holders for sharing their domain knowledge and guiding the Energy Programs being conducted by IEF for the benefit of India's Energy Sector.

S M Mahajan

Renewable Energy to Power Growth Vision for the North East: Shri Pralhad Joshi

Union Minister for New and Renewable Energy, Shri Pralhad Joshi said that the renewable energy sector will play a pivotal role in powering the growth vision for the North East Region. North East is witnessing tremendous development under the leadership of Prime Minister Shri Narendra Modi in the last eleven years. The Minister made these remarks at 'Ministerial Session on 'Green Northeast: Advancing Renewable Energy for Sashakt Bharat' at the Rising North East Investors Summit 2025 in New Delhi.

India's Ashtalakshmi of Green Power
The Minister noted that the North East possesses vast untapped renewable energy resources, including over 129 GW potential from large hydro projects and more than 18 GW from pumped storage plants. These natural advantages, coupled with rising energy demand and strategic cross-border positioning, make the region central to India's green growth plans

Describing the Northeast as India's Ashtalakshmi, he stated, "By turning the North East's natural resources into wealth through green power, we are in effect making each state a Lakshmi of clean energy contributing to India's prosperity." He also said that North East will play a key role in ensuring India's grid stability in the near future under 'One Nation, One Grid'.

Major Investment Commitments and Industrial Interest: Shri Joshi informed that during recent investor engagements, major Indian conglomerates expressed significant interest in the region's renewable energy potential. A total of 115 Memoranda of Understanding (MoUs) worth ₹38,856 crore has been signed between state governments and private investors in RE sector. The Minister also highlighted various recent investments from private players which will bring massive employment and development in North East.

Special Initiatives for North East:To promote clean energy development in the region, the Ministry of New and Renewable Energy (MNRE) has earmarked 10% of its annual scheme budget exclusively for the North Eastern Region. In addition to this dedicated allocation, the Ministry is extending enhanced financial assistance to further encourage investment. This includes a 10% higher Central Financial Assistance (CFA) under the PM Surya Ghar Muft Bijli Yojana, as well as a 20% higher CFA for Components B and C of the PM-KUSUM scheme.

Shri Joshi shared that a 20 MW solar park has been successfully commissioned in Champhai district of Mizoram, showcasing the region's project-readiness. He also mentioned that a 25 MW green hydrogen plant is under development in Assam, which also hosts India's first pure green hydrogen plant. The Minister also shared that more than 2000 individuals in the region have been trained under various programmes such as Suryamitra, Varunmitra and Jal Urjamitra.

Northeast as India's Gateway to Clean Energy Exports: Positioning the region as a future energy export hub, the Minister emphasized the Northeast's proximity to Myanmar, Bangladesh, and Bhutan, making it ideal for cross-border electricity trade. He also noted the growing global movement toward carbon neutrality and green certification, stating that investments in renewable energy will equip the region and the nation to meet emerging international standards such as the EU's Carbon Border Adjustment Mechanism.

Concluding his address, Shri Joshi urged industry leaders and innovators to look east and participate in the transformation of the North East and utilise its potential. He assured investors of comprehensive government support through single-window clearances, capital subsidies, and dedicated solar park development. "The time to invest is now. Not just for returns, but for impact, for a cleaner tomorrow and a self-reliant India," the Minister said.

India's renewable energy capacity grows three-fold to 232GW in last decade

India has witnessed a threefold increase in its renewable energy capacity over the past decade, with the installed green energy capacity reaching 232GW, including large hydropower plants, compared to 75.52GW in March 2014. The country has emerged as a global front-runner in the renewable energy space. The tariff of grid-connected solar power plants has decreased by 80% to Rs.10.95 (US$ 0.13) per unit. In March 2014, India's installed solar energy capacity was 2.82GW, now crossing 108GW. Wind energy capacity has more than doubled to 51GW from 21GW in 2014. In 2024, India became a global leader, with solar module manufacturing skyrocketing to 90GW. By 2030, the nation aims to reach an impressive 150GW. India has built a strong foundation with 25GW solar cell production and 2GW wafer production. The country has planned solar cell and wafer capacity of 100GW and 40GW, respectively, by 2030 to reduce dependence on imports and become a self-sustaining powerhouse. Even in fully integrated production, the country has reached 3.2GW in 2024, with a target of 24GW by 2030.

Similarly, the bio-power generation capacity has increased by 42% from 8.1GW to 11.5GW over the last ten years. The Compressed Biogas (CBG) sector expanded from a single project with 8 tonnes per day (TPD) CBG generation capacity in 2014 to 150 projects with a cumulative capacity of 1,211TPD in 2024. The PM-Surya Ghar Muft Bijli Yojana has gained significant traction, benefitting almost 13.3 lakh households, with nearly 12 lakh installations in the past ten months. India added a record 25GW of renewable energy capacity in 2024, 34.63% higher than the 18.57GW achieved in the previous year. India has set an ambitious target of having 500GW of renewable energy capacity by 2030, which requires the addition of about 50GW of green capacity per annum in the next five to six years. Four renewable energy implementing agencies (REIA), SECI, NTPC, NHPC, and SJVN, have collectively issued RE power procurement tenders of around 44GW in FY25. In April 2024, India became the world's third-largest electricity producer of wind and solar energy, overtaking Germany.

REC to provide Rs 2.5 trn finance for renewable energy projects till 2030

State-owned non-banking finance firm REC Ltd will increase its exposure to renewable energy projects by about Rs 2.5 trillion in next six years to aid India's target of having 500 GW of non-fossil fuel energy by 2030.

REC currently has an exposure of about Rs 53,000 crore in renewable energy projects with a total loan book of Rs 5.67 trillion as on March 31, 2025.

The company has planned to achieve a loan book of Rs 10 trillion including Rs 3 trillion exposure in renewable energy project by 2030.

Renewable energy is a key area where the company will focus in the coming six years in view of nation's ambitious target of having 500 GW renewable energy by 2030.

Talking to PTI, REC Chairman and Managing Director Jitendra Srivastava said, "Currently, our loan book stands at around 5.67 trillion. and we are trying to aim for a loan book of 10 trillion by 2030. Out of this, we would like to see the renewable sector touching around 3 trillion, which is currently around Rs 52,000 crore to Rs 53,000 crore. So we are hopeful. We would like to push the sector." He said the company will be fairly aggressive in the renewable energy sector.

India's installed renewable energy capacity is about 220 GW as of March 31, 2025, which includes around 48 GW large hydro power project, over 50 GW wind energy and about 106 GW solar projects.

India needs to add 50 GW of renewable energy capacity per annum till 2030 to achieve the target of 500 GW.

Thus the nation needs a lot of investment and finance facility to achieving this tall order.

The government has appointed REC as the nodal agency for implementing roof-top solar scheme 'PM Surya Ghar Yojana'.

About the progress on the scheme, Srivastava said, "We have a target of 1 crore households for PM Surya Ghar Yojana, out of which 51 lakh applications have come in. Out of this, 1.2 million people have already received it and we are trying to complete our target of 1 crore households in next two years." About reducing the net credit impaired assets or bad loans, he stated that the company is targeting zero bad loans this fiscal, which has already been brought down to 0.38 per cent from 0.86 per cent a year ago.

Solar PV component market in India to exceed $7 billion by 2029: Report

India's solar photovoltaic (PV) balance of system (BoS) market is on a robust growth trajectory and is projected to grow from approximately $3 billion in 2024 to around $7 billion by 2029, registering a compound annual growth rate (CAGR) of 16 per cent, a report showed recently.

Several factors are driving this growth, including India's national target of 500 GW non-fossil fuel capacity by 2030 and the commitment to generate 50 per cent of its electricity from renewable sources, according to 1Lattice's latest industry report.

Enabling schemes like PM-KUSUM, the Grid Connected Rooftop Solar Programme, and the Delhi Solar Energy Policy are helping to democratise solar adoption across rural and urban areas, bringing new opportunities for innovation, manufacturing, and investment in the BoS space.

The report provides a deep analysis of the BoS segment, which includes all supporting components of solar PV installations other than the panels, such as inverters, mounting structures, trackers, wiring, combiner boxes, circuit protection devices, monitoring systems, charge controllers, and batteries.

"As the world races toward decarbonisation, the focus must go beyond solar panels to the infrastructure that supports them. Our latest report underscores the pivotal role of the balance of system components in making solar truly scalable and sustainable," said Abhishek Maiti, Director-Industrial Goods and Services, 1Lattice

With India set to witness a BoS boom, now is the time for manufacturers, investors, and policymakers to align strategies and investments, he added.

The global BoS market is also expected to experience significant expansion, growing from an estimated $60 billion in 2024 to approximately $100 billion by 2029 at a CAGR of 10 per cent, driven by robust clean energy commitments and incentives across key regions. As India accelerates its shift toward renewable energy, the BoS segment is emerging as a critical enabler in the country's energy transition journey.

India’s Wind Energy Capacity Up 134% QoQ in Q1 2025

India added 1.8 GW of wind energy capacity in the first quarter (Q1) of the calendar year 2025, an increase of 63% year-over-year from 1.15 GW in Q1 2024. The capacity additions rose 134% quarter-over-quarter, according to Mercom India Research. Wind-specific renewable purchase obligations from 2023 to 2030 and the annual onshore wind bidding target of 10 GW from 2023 to 2027 have served as key long-term policy enablers for capacity additions. However, the 100% interstate transmission system charges waiver, currently set to expire in June 2025, has led to a spike in installations in Q1 and is expected to further accelerate activity in the upcoming quarter, particularly if the waiver is not extended.

The Delhi Government approved an additional subsidy of ₹30,000 (~$352.20) for installing 3 kW rooftop solar systems. This subsidy is in addition to the ₹78,000 (~$915.72) already provided by the Central Government under the PM Surya Ghar: Muft Bijli Yojana. With this approval, the total support for 3kW rooftop solar systems now stands at ₹108,000 (~$1.267.92). Delhi’s Chief Minister said such solar installations can save an average of ₹4,200 (~$49.31) per month. According to Shripad Yesso Naik, Minister of State for New and Renewable Energy and Power, approximately 3,476 households

in Delhi have benefited from the PM Surya Ghar program, with a total capacity addition of roughly 10 MW as of March 26, 2025.

The Jabalpur Municipal Corporation invited bids to set up a cumulative 10 MW open access solar power project in Jabalpur, Madhya Pradesh. Bids must be submitted by June 30, 2025. Bids will be opened on July 5. The scope of work covers the design, engineering, construction, erection, testing, and commissioning of the solar project. It also entails providing O&M services for 25 years. Successful bidders must connect the project with the 132/32 kV substation of the Madhya Pradesh Transmission Company. They must obtain connectivity approval for the proposed substation on behalf of JMC and perform power scheduling/banking functions.

Agra Nagar Nigam issued an engineering, procurement, and construction tender for 7.5 MW solar projects at four locations in Agra, Uttar Pradesh. Bids must be submitted by June 13, 2025. Bids will be opened on the same day. The projects comprise 2 MW capacity in Kanha Gaushala in Tedhi Bagiya, 750 kW each in Jal Kal 1 and 2, and 4 MW in MSW Plant Chalesar. The scope of work entails the design, engineering, procurement and supply, and construction of the solar projects. It also includes five years of comprehensive operation and maintenance.

Building materials manufacturer Everest Industries will procure 5.5 MW of solar power from a group captive project of Amplus Energy Solution's (now Gentari) special purpose vehicle, Amplus Ampere. Everest will invest ₹17.6 million (~$205,494) for 1.76 million, or 3.12% equity shares, at a face value of ₹10 (~$0.12) per share in Amplus Ampere. The total capacity of Amplus Ampere's project is 54.94 MW. The acquisition will be completed by September 30, 2025. Per its annual report 2023-24, Everest Industries consumed 7834.7 gigajoule (GJ) of electricity from renewable sources. It sourced about 55%, or 152,023.4 GJ, of its energy needs from renewable sources.

Mumbai-headquartered integrated solar module manufacturer RenewSys announced a significant expansion of its encapsulant manufacturing capacity by adding eight new production lines at its facility in Khopoli, Maharashtra. This development will increase the company's total encapsulant production capacity to 30 GW. Encapsulant is a protective layer for shielding solar cells from environmental damage. Seven of the new encapsulant lines are operational, with four more expected to be commissioned within 2025. The company plans to operate 19 advanced encapsulant production lines across its facilities. It said the manufacturing capacity expansion addresses the increasing demand for high-performance encapsulants in the Indian and global solar markets.

The United States International Trade Commission (USITC) voted to conclude that domestic solar module manufacturers suffered material injury from imports of crystalline silicon photovoltaic cells, whether or not assembled into modules, from four Southeast Asian countries. USITC has cleared the way for tariffs on solar imports from Cambodia, Malaysia, Thailand, and Vietnam. The U.S. Department of Commerce has determined that the cells, whether or not assembled into modules, are sold in the country at less than fair value and subsidized by the Malaysian and Vietnamese governments. The Commission highlights the same issues with cells imported from Cambodia and Thailand.

Wind sector investing in tech, workforce to reach 100 GW by 2030: IWTMA

India's wind energy sectors is investing in capacity, technology innovation, and workforce development to help the country reach 100 GW of production by 2030, industry body IWTMA has said. At present, the country has an installed wind energy capacity of over 50 GW, as per the latest report of March 2025 of Central Electricity Authority.

"The Indian wind industry is fully aligned with the government's clean energy vision. We are investing in capacity, technology innovation, and workforce development to achieve 100 GW of wind energy by 2030," said Aditya Pyasi, CEO, Indian Wind Turbine Manufacturers Association (IWTMA).

At a high-level meeting with the Ministry of New and Renewable Energy (MNRE) recently, IWTMA

outlined the industry's readiness to scale up manufacturing, generate employment, and advance the 'Make in India' mission, the industry body said in a statement.

Leading players, including Suzlon, Nordex, Windar, Senvion, Envision, Siemens Gamesa, Flender, ZF Wind Power, Aditya Birla Advanced Materials, Vestas, GE Vernova, and Inox Wind, manufacture critical parts -- blades, nacelles, gearboxes, generators, and towers -- within the country. This strong value chain supports both domestic demand and India's emergence as a potential global export hub for wind equipment, it said, adding that the wind energy sector is set to become a major employment generator. Renewable sector hiring is expected to grow by 19 per cent in FY25, with wind power contributing thousands of jobs across manufacturing, installation, operations, and maintenance, it stated. The industry body further said that over 55 per cent of the workforce is between 26 and 35 years old, positioning wind as a future-focused employer for young Indians. With India being the fourth-largest renewable energy generator in the world, wind power plays a key role in ensuring grid stability. As it complements solar energy by generating power during non-solar hours, wind helps provide reliable, round-the-clock green electricity at affordable rates, it said. IWTMA also stressed the need for continued policy support, streamlined regulations, and improvements in infrastructure and testing facilities to realise the sector's full potential. "With strong policy support and a future-ready industrial base, India's wind industry is poised to power the next chapter of our green growth story. Wind energy is not just clean energy, it's a national economic driver," Pyasi said.

SECI inks PPA with R-Power arm for 1.4 GW solar storage project

Reliance Power has secured a 25-year PPA (power purchase agreement) with SECI for a 1.4 gigawatts solar and battery storage project to be built by subsidiary Reliance Nu Suntech, marking the single-largest deal inked by the government’s renewable project aggregator in recent times. Reliance will supply 930 MW of power at ₹3.53 per unit from the single-location project to be built over the next 24 months at an investment of ₹10,000 crore. The project includes a battery storage system offering a backup of 465 MW for four hours, the company said recently.

The capacity allotted to Reliance was also the single-largest award in SECI’s tranche XVII auction that concluded in December 2024. The comany has submitted a performance bank guarantee of ₹378 crore to SECI.

The PPA provides a comfort level for the project, especially in raising debt. Currently, some 40 GW of capacity offered in various tranches of SECI auction is struggling to secure PPAs.

India must be cautious on Net Energy Ratio of bioenergy production: Niti Aayog's Rajnath Ram

Bioenergy plays a crucial role in India's energy transition helping the country adopt cleaner and more sustainable energy sources but there is a need to exercise caution to ensure that the Net Energy Ratio (NER) of the biomass utilised for energy production is above unity, Niti Aayog's Energy Programme Director Rajnath Ram has said.

Net Energy Ratio (NER) is an important parameter that determines the economic use of biomass as a fuel. It is the ratio between energy produced from a fuel and the energy consumed to obtain it. Higher NER suggests a more sustainable energy source as less energy is required to obtain it. If the NER value is below 1, it indicates more energy is put to produce the biofuel than the energy obtained.

"The idea is to understand what are the different kinds of inputs that go into producing bioenergy, and (based on that) whether it is net surplus of energy or net user of energy. We also have to be cautious while choosing the kind of biomass because it should not be the case that we invest more energy in producing the bioenergy than what we gain," Ram said.

Crops like Maize and Sugarcane are generally considered to have low NER as compared to other crops.

India's commitment to achieve net zero carbon emission by 2070 brings bioenergy at the centerstage of the green energy transition. Biofuels have played a pivotal role in reducing energy imports, lowering greenhouse gas emissions and enhancing energy security while supporting rural prosperity too.

"Bioenergy can help fully utilise biomass and waste for economic use and India possesses large surplus of biomass and other waste material which can be converted into energy. This has the potential to reduce import dependence on fossil fuels and help manage the waste effectively. Its use has environmental benefits for mitigating air pollution due to less use of fossil fuels, and also the reduction of water and land footprint," Ram said

Biofuels also create positive economic and social impact through creation of local jobs and business opportunities. Additionally, industries can decarbonize their operations using bioenergy. Ram also said India has the potential to generate roughly 208 billion units of power annually from bioenergy sources itself, with additional opportunities in bioethanol and Compressed Bio Gas (CBG) production.

"Bioenergy is a key pillar in India's energy transition offering environmental, economic and social development. As policy and investment continue to grow bioenergy will play and even bigger role in shaping India's sustainable future. It is estimated that bioenergy could meet at least 15-20 per cent of our total energy demand by 2040 or so, thus ensuring long-term sustainability," he said.

India's Renewable Energy FDI Grows Eightfold Since FY21 to USD 3.4 Billion: CEEW-GFC

India's renewable energy sector witnessed a significant eightfold surge in foreign direct investment (FDI) since FY21, reaching a record USD 3.4 billion in FY25, according to the latest Market Handbook released by the Council on Energy, Environment and Water's Green Finance Centre (CEEW-GFC).

The share of RE in the country's total FDI inflows has grown remarkably, from about 1 percent in FY21 to around 8 per cent in FY25, reflecting the increasing global confidence in India's clean energy landscape. The USD 3.4 billion inflow in the first three quarters of FY25 has nearly matched the entire FDI received in FY24, which stood at USD 3.7 billion.

The CEEW-GFC's Market Handbook, which provides a comprehensive view of India's electricity, green mobility, and green finance sectors, also revealed that the country added approximately 33 GW of power generation capacity in FY25. Of this, a record 89 percent or 29.5 GW was contributed by renewable sources, marking a sharp increase from 71 per cent in FY24. As a result, India's total installed RE capacity climbed to 220 GW out of the overall 475 GW, underscoring the accelerating transition to cleaner power. Concurrently, the share of coal and lignite in total installed power capacity dropped from 49 per cent (218 GW) in FY24 to 47 per cent (222 GW) in FY25.

Gagan Sidhu, Director at CEEW-GFC, emphasised that India's energy transition has reached a critical juncture, with RE emerging as the dominant contributor to new power capacity. Notably, around 42 GW of renewable energy was auctioned in FY25, with nearly 59 per cent of it comprising innovative formats like firm and dispatchable renewables (FDRE) and hybrid models, which are designed to improve grid stability and resilience amid rising RE penetration. While the total number of tenders issued by Renewable Energy Implementing Agencies (REIAs) declined to around 33 GW in FY25 from 47.5 GW in FY24, much of the drop was attributed to limited wind project tenders, even as state-level tender activity remained robust.

A major highlight in FY25 was the continued innovation in renewable auctions, especially with storage integration. About 24 per cent of total completed RE auctions included energy storage components, reflecting the sector's growing technological sophistication. This was further supported by sovereign green bond auctions conducted by the Reserve Bank of India, totalling USD 3.8 billion across six issuances, boosting green finance availability.

Shalu Agrawal, Director of Programmes at CEEW, pointed to several promising trends, including the rapid discovery of competitive energy storage pricing, which could unlock affordable grid-scale renewable deployment. She noted that FY25 might mark an inflection point for storage, similar to the transformative drop in solar costs a decade ago. The year saw the conclusion of seven standalone battery energy storage system (BESS) tenders, with the lowest discovered tariff plunging to INR 1.84 per unit, down by 54 per cent from FY24, supported by viability gap funding (VGF). In total, 16 standalone BESS tenders were issued in FY25, and the government has approved VGF for 4,000 MWh of energy storage capacity by 2030–31.

India's rising power demand also stood out, with peak power hitting a record 250 GW in the first quarter of FY25 and remaining above 220 GW throughout the year. Total electricity generation increased by approximately 5 per cent compared to FY24. Renewables, including large hydro, now contribute roughly 21 per cent to the country's average daily power generation, further solidifying their place in India's energy mix.

On the mobility front, electric vehicle (EV) adoption continued to gain momentum. FY25 saw the sale of over 1.9 million EVs, marking a 17 per cent increase from the previous year. October 2024 and March 2025 each recorded over two lakh EV sales, making them landmark months for the clean mobility push. By the end of FY25, India had achieved approximately 95 per cent of its EV sales target under the PM E-DRIVE scheme, reinforcing its critical role in expanding sustainable transport solutions.

Capacity of RE with storage may hit 30GW by FY28: Crisil

India's installed capacity of storage-backed renewable energy is likely to increase to 25-30 GW by FY28 from almost nil in FY25, Crisil Ratings said recently.

The incremental capacity will account for more than 20per cent of the total renewable energy capacity to be added over the three years, driven by the central government's push to make renewables more sustainable. Energy storage provides an effective solution for the intermittent nature of renewable energy generation.

Such projects, which include firm and dispatchable renewable energy, solar with energy storage and others, supply power when required and support grid stability.

The projects can provide green power on a monthly or hourly schedule or at the peak hours of morning and evening, the agency said.

Battery PLI beneficiaries seek relief on penalties

The three beneficiaries selected for the Advanced Chemistry Cell (ACC) manufacturing program have sought relaxations from the Centre after not meeting the specific scheme deadlines. Slippages make the companies liable to penalties. The three beneficiaries of the ACC Production Linked Incentive (PLI) scheme are Ola Electric, Rajesh Exports and Reliance Industries.

The Ministry of Heavy Industries is said to have received requests from all three participants. Minister H D Kumaraswamy will now take a call on waiving the penalty and allowing extension to the earlier deadlines. The National Programme on Advanced Chemistry Cell Battery Storage was launched with a ₹18,100 crore outlay in 2021.

An official said the beneficiaries did not meet the December 2024 milestone. Notices were sent to companies in March 2025. Fresh notices were sent in May as well. According to officials aware of the matter, these penalties are in proportion to investment commitment and expected incentives to be accrued by company.

If penalties are levied, Ola Electric would have to pay ₹12.5 lakh per day from January 1, 2025, until the commitments made by the company under the scheme are met. Reliance Industries-owned RNEL and ACC Energy Storage - which bid as Rajesh Exports - would have to pay ₹5 lakh per day.

India can cut 8 gigatons CO_2 by 2050 through net-zero buildings: Report

With India's urban population projected to reach 612 million by 2030 and 843 million by 2050, the National Institute of Urban Affairs (NIUA) and the Rocky Mountain Institute (RMI) have launched a report titled "Build Right for the First Time: Scaling Adoption of Net-Zero Carbon Buildings in India" to support the country's net-zero 2070 target.

Released at the "Heat Resilient and Low Carbon Housing in India" convening in New Delhi, the report outlines five high-impact decarbonization strategies that could collectively reduce up to 8 gigatons of emissions by 2050. These solutions, the report notes, can be implemented with a cost premium of ₹4,566 per square metre over traditional approaches.

The event was attended by senior officials including Dr. Debolina Kundu, Director, NIUA; Sachin Kumar, Director, Shakti Sustainable Energy Foundation; Satish Chandra Vishnubhatla, Deputy Vice President, Johnson Controls-Hitachi Air Conditioning; Tarun Garg, Principal, RMI India Foundation; and Dr. S K Chaturvedi, Joint Director, National Council for Cement and Building Materials (NCB).

Satish Chandra Vishnubhatla said, "There is universal agreement on the need to work towards heatresilient housing and low-carbon housing, yet implementation remains a key challenge at the ground level." He added that the industry must focus on innovation and user-friendly technologies, noting that Hitachi's approach includes offering energy-efficient technologies, self-cleaning features for product longevity, and simplified communication of benefits.

As part of a collaboration with RMI, Johnson Controls-Hitachi Air Conditioning is developing air conditioning systems that are five times more efficient than current market offerings.

Akshima Ghate, Managing Director of RMI India, said, "India stands at a pivotal juncture in its development journey, with rapid urbanization and economic growth set to more than double its building stock by 2050. This moment presents a critical opportunity to align infrastructure expansion with climate goals."

The report includes a framework for behavioural change and recommends both national and subnational policy interventions to support implementation. It targets multiple stakeholders including policymakers, developers, and industry professionals.

Dr. Debolina Kundu said, "India's current urban trajectory and economic growth present a once-in-ageneration opportunity to shape a low-carbon and heat-resilient future. We hope this effort empowers stakeholders across the value chain to lead India's building sector toward a climate-resilient, energyefficient, and equitable future."

Mrinalini Shrivastava, Director, National Disaster Management Authority (NDMA), proposed the creation of an urban heat mitigation lab to act as a research and knowledge hub. Dr. Shailesh Agrawal, Executive Director of the Building Material & Technology Promotion Council (BMTPC), encouraged innovators to register their technologies as green building materials.

Ministry of New & Renewable Energy participates in World Hydrogen Summit 2025, highlights India's vision and capabilities in Renewable Energy and Green Hydrogen

Secretary, Ministry of New & Renewable Energy, Government of India, Shri Santosh Kumar Sarangi recently addressed the World Hydrogen Summit 2025 in Rotterdam, highlighting India's strategic vision and capabilities in the domain of renewable energy and green hydrogen production.

The Secretary underscored India's transformative potential of Green Hydrogen to become a global leader in this space. This ambition largely relies on India's strength in the renewable energy domain.

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Turning Coal into a Strategic Engine for Sustainable Growth and Global Leadership

Shri G Kishan Reddy, Union Minister of Coal & Mines

On this day, 26th May, in 2014, Shri Narendra Modi assumed office as Prime Minister for the first time, setting into motion the mission for India's resurgence. Ever since, each sector has witnessed a massive transformation and renewed energy, coal being a prime example.

India's double achievement of surpassing 1 billion metric tonnes in coal production and dispatch in the last financial year not only fortifies our energy security needs but also contributes significantly to a cost-effective, reliable, and continuous supply of power. This achievement by itself is a testament to the hard work of about 5 lakh workers directly involved in mining, apart from several more who indirectly contribute to the sector.

This milestone, however, is not an overnight transformation, but is the result of a decade of deep reforms. In 2014, the coal sector was in complete disarray. There was a severe deficit in coal production compared to its dramatically rising demand. Coal and lignite production saw a modest increase from 566 million tonnes in 2009–2010 to 610 million tonnes in 2013–2014. A cumulative annual growth rate of 1.89% was far from sufficient for our needs as a growing economy. This was being pegged as one of the biggest challenges for the newly elected Narendra Modi government. The Supreme Court's cancellation of 204 coal blocks in 2015 provided an opportunity for the Government to seek transformational change. The introduction of commercial coal mining in 2020 followed, marking a new era of transparency and competition.

Ten years down the line, till March-2025, approximately 150 Coal Mines have been successfully auctioned. Since the launch of Commercial Coal Mining in June,2020 by the Hon'ble Prime Minister of India, 11 rounds have been completed and 12th round of commercial coal mine auction which was recently launched in March,2025 is in progress. The results speak for themselves: India's coal production has seen a 70% growth over the last decade—a massive increase combined with transparency, efficiency, and sustainability. State governments have been one of the biggest beneficiaries with close to Rs. 2.50 Lakh crores in auction premiums and royalties being received into various state government exchequers.

The private sector as a strategic partner

After independence, there was a huge opportunity to ramp up coal production and herald a new era of growth. However, a lack of strategic understanding to effectively leverage the private sector was a detriment. Policies such as the freight equalization policy provided no incentive to set up industries close to mining regions, encouraging factories to be set up further away, which caused huge losses to the public exchequer.

On 17th May 1957, the then Minister of Steel, Mines and Fuel, Sardar Swaran Singh introduced the Coal Bearing Areas (Acquisition and Development) Bill in the Lok Sabha with the intent to gain greater public control over the coal mining industry and for the acquisition of land containing or likely to contain coal deposits. India's coal production at the end of the First Five Year Plan between 1951 and 1956 stood at 38 million tons. Speaking on the floor of the house, the Minister observed "IN THE UNITED KINGDOM, WHICH IS 13 TIMES SMALLER THAN OUR COUNTRY, COAL PRODUCTION IS 230 MILLION TONS. IF YOU TAKE THE UNITED STATES OF AMERICA, IT IS SOMEWHERE LIKE 460 MILLION TONS A YEAR. IN THE SOVIET UNION, IT IS ABOUT 390 MILLION TONS. EVEN CHINA HAS RECENTLY INCREASED ITS PRODUCTION TO SOMEWHERE BETWEEN 100 TO 120 MILLION TONS PER YEAR."

However, a lack of trust in the innovation and risk-taking capabilities of the private sector and the entrepreneurial spirit of the Indian youth resulted in coal production hovering at around 200 million metric tonnes in 1990. The commercial auction regime of today harnesses the private sector as a critical partner in a transparent and structured manner—a significant departure from the past.

Addressing environment and sustainability concerns
For decades, environmental concerns in the coal and mines sector were brushed under the carpet. However, over the past decade, sustainability has moved to the forefront. Initiatives such as large-scale afforestation, eco-friendly mining practices, and cleaner coal technologies have reduced the sector's environmental footprint.

Diversification has gathered pace, with ongoing solar and wind projects, pumped storage plants, and Coal India's first-ever non-coal critical mineral block acquisition. Blast-free coal mining now contributes 55% of the production, reducing pollution significantly. Further, the Cabinet has green lighted coal gasification with a financial outlay of Rs. 8,500 crores and plans to increase investment in this cleaner coal alternative and securing a sustainable energy future. Over the next few years, mine closure will remain a core priority and guidelines are being revised to enable seamless, progressive, and sustainable mine closure activities.

Recognizing the environmental advantages of underground mining like lower land disturbance, reduced emissions and extraction at greater depths, our government is giving it a major push. A clear roadmap to reach 100 MT by 2029–30 is already being implemented with full commitment.
Furthermore, the Ministry is fast-tracking First Mile Connectivity (FMC) projects, ensuring that 90% of coal will be loaded through mechanised and eco-friendly systems including conveyor belts, Silo and Rapid Loading Systems, and water sprinklers.

Despite the record coal production and dispatch in India, the per capita coal energy consumed by countries such as China, Australia, the USA, and the European block is significantly more than India's consumption on a per capita basis. Even with regard to total coal energy consumed, India is a distant third after China and the developed OECD block of countries with a similar population. Coal's contribution to the overall installed capacity of electricity has seen a downward glidepath. From contributing 60% of installed capacity in 2014–2015 it has now reduced to 47% while solar and other renewable sources have ramped up. However, coal as a critical primary source of energy will continue to power India towards a Viksit Bharat 2047.

Therefore, it must be our constant endeavour to strike a balance between the transition to renewable energy sources and, at the same time, to innovate and develop eco-friendly measures for sustainable coal production.

Coal sector for a Viksit Bharat 2047
India's per capita electricity consumption of 1.10 MWh is less than one third the world average of 3.42 MWh. As we continue to grow and become a $5 trillion economy and further transform into a fully developed $35 trillion economy by 2047, our energy needs will continue to grow, and coal will continue to be a critical pillar in our energy mix.

India's coal sector is not just fuelling India's growth, it is also rewriting the rules of what is possible in a modern mining economy. India will soon be launching its first coal trading exchange. The platform will revolutionize coal accessibility for industries, enable seamless trading and transparent price discovery while ensuring stable supply of fuel to power our growing economy. The sector has also embraced cutting-edge technologies to streamline operations and improve governance. The DigiCoal initiative aims to digitise coal mines by deploying 5G technologies, AI-driven monitoring, GPS tracking for coal transportation, drone surveys, and digital auction platforms to ensure transparency apart from digital twins of coal mines to ensure safety and efficiency.

Once dismissed as a corruption-laden, bloated, and an inefficient monolith, the coal and mines sector has undergone a seismic shift over the last decade. As we look to the future, with a continued focus on modernization, international collaborations, and sustainable practices, the journey ahead is bound to witness even greater milestones, solidifying India's role as a leader in the global mining and resource economy.

Cabinet approves revised 'SHAKTI' policy for coal allocation to power sector

The Cabinet Committee on Economic Affairs (CCEA), chaired by Prime Minister Narendra Modi, recently approved the grant of fresh coal linkages to thermal power plants of the Central Sector, State

Sector and Independent Power Producers (IPPs) under the revised 'SHAKTI' policy.

The approval includes Coal linkage to Central Gencos and states at notified price in 'Window–I' and coal linkage to all Gencos at a Premium above notified price in 'Window–II', according to an official statement. For Window-I, the existing mechanism for grant of coal linkage to Central Sector Thermal Power Projects (TPPs) including Joint Ventures (JVs) and their subsidiary will continue, the statement said.

The coal linkages will be earmarked to states and to an agency authorised by group of states as per existing mechanism, on the recommendation of Ministry of Power.

Coal linkage earmarked to states may be utilised by states in its own Genco, Independent Power Producers (IPPs) to be identified through Tariff Based Competitive Bidding (TBCB) or existing IPPs having Power Purchase Agreement (PPA) under Section 62 of the Electricity Act, 2003 for setting up of a new expansion unit having PPA under Section 62, the statement explained.

Under 'Window-II' for premium above notified price, any domestic coal-based power producer having PPA or untied and also imported coal-based power plants (if they so require) can secure coal on auction basis for a period up to 12 months or for the period of more than 12 months up to 25 years by paying premium above the notified price and providing the power plants the flexibility to sell the electricity as per their choice.

Directions would be issued to Coal India Limited (CIL)/Singareni Collieries Company Limited (SCCL) for implementation of the aforesaid decisions.

Besides, the concerned Ministries and all the states will also be apprised of the revised 'SHAKTI' policy for further dissemination to the concerned Departments/Authorities and also to the Regulatory Commissions, the statement said. With the introduction of revised SHAKTI Policy, existing eight paras for coal allocation have been mapped to only two windows, in the spirit of ease of doing business.

The policy will enable the power plants to plan for meeting their coal requirement depending upon their demand for long-term and short–term.

The Central Sector Thermal Power Projects (TPPs) will continue to get coal linkage on nomination basis on the recommendation of Ministry of Power, whereas, the linkages earmarked to the States on nomination basis on the recommendation of Ministry of Power may be utilised by the states in the State Generating Company.

The requirement of PPA has been entirely done away with for selling the electricity generated through the coal secured under Window-II, thereby providing the power plants the flexibility to sell the electricity as per their choice.

Allowing flexible linkage for new capacity addition with or without PPA with a tenure ranging from 12 months to 25 years is expected to encourage IPPs to plan new thermal capacities, which will help in achieving the future thermal capacity addition.

Imported Coal Based (ICB) plants can secure domestic coal under Window-II, subject to the technical constraints of ICB plants, thereby reducing their import coal dependency. The benefits accrued, on account of import coal substitution, would be determined by Appropriate Regulatory Commission and passed on to the electricity consumers/beneficiaries.

The revised SHAKTI Policy, besides supporting brownfield expansion, will promote setting up of greenfield thermal power projects primarily at pithead sites which are nearer to the coal source. With an aim to reduce the 'landed cost' of coal at thermal power plant end, coal source rationalisation will be done.

This will not only ease up railway infrastructure but would also ultimately result in reduced tariff for electricity consumers, the statement said.

The revised 'SHAKTI' policy also provides for delegation of powers for enabling minor changes, in the policy, at the level of concerned Ministries.

Further, for dealing with operational issues, an "Empowered Committee" comprising Secretary

(Power), Secretary (Coal) and Chairperson, CEA is proposed, the statement added.

CIL to set up $3 bn worth clean energy projects to boost renewable heft

Coal India will set up clean energy projects of around 4.5 gigawatts at a cost of ₹25,000 crore (about $3 billion), it said recently, as it aims to achieve net zero carbon emissions from its operations.

The state-owned miner has been diversifying beyond the polluting fuel, which is still key for the country's power needs, as a part of the wider national aim to achieve net zero carbon emissions by 2070.

The coal giant targets to supply clean energy through solar and wind energy projects to the upcoming green ammonia facilities of AM Green Ammonia (India). It did not give a date for building these projects.

AM Green, in which the founders of India's Greenko Group have large stakes, targets to produce 5 million tons per annum (MTPA) of green ammonia by 2030.

Coal India's clean energy projects come amid its drive to expand its coal-powered capacity, and at a time when electricity demand in the country has been increasing thanks to climate change and increasing industrialisation.

India aims to raise its coal-fired capacity by 80 gigawatts by 2031-32, from the current 222 GW, to meet growing demand for power, and, in parallel, the country is also aiming to add at least 500 GW of clean energy by 2030, against 172 GW currently.

However, India's renewable energy sector is grappling with several obstacles, including weak demand for tenders, land acquisition challenges, delays in power purchase agreements, and project cancellations.

Thermal coal imports down 5% in FY25 as production improves

India's import of non-coking coal used by **thermal power** stations reduced by 5.04% to 167.10 million tonnes in the financial year 2024-25 against 175.96 million tonnes in FY24, according to the latest data by the coal ministry.

The decline in coal imports can be attributed to an increase in domestic production which crossed 1 billion tonnes touching 1.05 billion tonnes in FY25, compared to 997.83 MT in FY24. The government now intends to reduce its substitutable coal imports to nil by FY26.

The country's total import of **coal** including coking coal and other varieties also reduced by almost 2% to 263.56 million tonnes in FY25. India imported 54.08 million tonnes of coking coal, also down by 5.48% than 57.22 million tonnes in FY24.

As per separate data from commerce ministry, the country's imports of coal, coke & briquettes stood at $31 billion in FY25, down 20% from $38.9 billion in the previous year. In March, the import value of these items stood at $2.25 billion, down 30% on year.

India imports 220 million tonnes of coal every year on an average which includes coking coal and coal required by thermal plants. Of this, 110 million tonnes of coal used in thermal plants is available in the country as reserves and the remaining is imported to meet the requirements of plants that are run especially on imported coal owing to its better quality and low amount of sulphur. The government plans to reduce its import of coal which is available in the country to nil by FY26, the then coal secretary Amrit Lal Meena had told FE.

In March alone, overall **coal imports** stood at 22.79 million tonnes, down from 23.96 million tonnes in March 2024. Indonesia emerged as the largest supplier of coal to India in March with imports from the country reaching 8.87 million tonnes, followed by South Africa at 25.64 MT and the US at 10.70 MT.

The current coal production by CIL stands at 781.05 million tonnes. Additionally, the production from commercial & captive, and other entities also saw a remarkable surge, reaching 197.50 MT —a 28.11% increase on year. By FY26, the private sector is seen producing 203 million tonnes of coal, official sources have told FE.

The country's coal production has increased owing to several measures taken by the government to increase domestic availability including auctioning of new mines.

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 MT per year. The government has projected coal production to reach 1.13 billion tonnes in the upcoming financial year 2025-26, according to the sources.

Once the government has achieved its target of nil coal imports, it aims to enter into the coal gasification segment which can help in reduction of imports of ethanol, methanol, di-methyl ether, ammonium nitrate, it had earlier said. These components are byproducts of coal gasification. The government has thus set up a target to gasify 100 million tonnes of coal by FY30.

In a further move to reduce import dependency for coal, the power ministry is also exploring the option of equipping thermal plants run on fuel from abroad to use certain quantities of domestic fuel also.

FY26 coal production target set at 1.15 billion tonnes

The government has finalised India's coal production target for FY26 at 1.15 billion tonnes, marginally lower than the target set in November at 1.19 billion tonnes for the same period. It is higher than the total production of 1.05 billion tonnes recorded in FY25. In its action plan for FY26, the coal ministry stated that it will provide coal linkages to consumers without any need of specific end use in addition to the present end use-based linkages. This would require changes to the non-regulated sector auction policy of 2016, it said

The ministry will also hold three auctions in FY26 for commercial mines in which it sees successful auction of 25 mines. Coal production and dispatch from commercial mines in the ongoing financial year is aimed at 203.4 million tonnes. Seven commercial coal mines are expected to start production in the ongoing financial year.

The coal ministry has planned to have 'on-demand' coal supply capacity to consumers by FY47 for which additional coal capacity is needed. The ministry had set a target of opening 100 new mines with an intent to create an additional production capacity of 500 million tonnes per year by FY30. Of this, 13 mines were operationalized in FY25 with a capacity of 83 million tonnes.

Edited & e-printed by **Mr S M Mahajan, Secretary General, IEF**

Published by Mr S S Rawat, Head (Admn), IEF

on behalf of

INDIA ENERGY FORUM

Registration No. DELENG/2007/20915
908 Chiranjiv Tower, 43 Nehru Place, New Delhi – 110 019

NTPC plans Rs 55,920 crore capex to add 11,806 MW capacity across group in FY26

State-run power major NTPC has planned a capital expenditure of ₹55,920 crore at the group level as it plans to add a capacity of 11,806 megawatt (MW) in FY26.

The group capex spend would see an increase of 25.3 per cent year-on-year from ₹44,636 crore in FY25. A large part of the capacity addition during the year would be from renewable energy.

"At the group level, NTPC would add 11,806 MW in FY26. This includes thermal capacity of 3,580 MW, hydroelectric capacity of 1,000 MW, and renewable energy capacity of 7,226 MW, chiefly coming from our subsidiary NTPC Green Energy and there will also be some capacity addition from NTPC and some from our other subsidiaries as well," Jaikumar Srinivasan, director (finance), NTPC, told analysts at the fourth quarter earnings call recently.

Srinivasan said that on a standalone basis, NTPC has estimated a capex of around ₹26,000 crore in the current financial year, while at the group level, the capex would be ₹55,920 crore.

At a group level, NTPC's operational capacity stood at 79,930 MW as of March 31, 2025.

Around 78 per cent of this capacity is coal-based power, while 8 per cent each is from solar and gas, 5 per cent from hydro and the remaining 1 per cent from wind.

Under various stages of construction is a cumulative capacity of 33,750 MW, of which 50 per cent is coal, 28 per cent solar, 15 per cent wind and the remaining 7 per cent from hydro.

Ambitious goals: In line with the national target of 100 GW (gigawatt) nuclear power capacity by 2047, NTPC has set an ambitious goal to develop 30 GW of nuclear power.

"Our approach is two-pronged. In FY25, the government has approved Ashvini (JV with NPCIL) to build, own and operate nuclear power plants. We are in the process of executing Mahi Banswara Rajasthan Atomic Power Project, comprising four 700 MW reactors," said Srinivasan.

He further said that through NTPC's wholly owned subsidiary — NTPC Parmanu Urja Nigam Limited — incorporated in January 2025, the power major is exploring advanced nuclear technology and has identified 28 sites across India.

"We will see our first 1,000 MW pump storage project commissioned through Tehri PSP shortly." he said.

NTPC has a pipeline of around 21 GW of pump storage projects.

Bhutan signs MoU with Adani Group to develop 5,000 MW hydropower projects

The Adani Group and the Druk Green Power Corporation (DGPC) of Bhutan have signed a landmark Memorandum of Understanding (MoU) to jointly develop 5,000 MW of hydropower projects in Bhutan.

The MoU was signed here by DGPC's MD Dasho Chhewang Rinzin and Adani Green Hydro Ltd's COO, PSP & Hydro, Naresh Telgu, in the presence of Prime Minister Dasho Tshering Tobgay, Minister for Energy and Natural Resources Lyonpo Gem Tshering and other senior dignitaries.

This MoU builds on the ongoing partnership for the 570/900 MW Wangchhu Hydropower Project, in which the DGPC will hold a majority 51 per cent stake and the Adani Group will hold 49 per cent. The broader 5,000 MW initiative will encompass additional hydropower and pumped storage projects to be identified, Detailed Project Reports prepared, and taken forward for implementation in phases.

“This partnership reflects our deep commitment to developing clean energy infrastructure that enhances regional energy security,” Adani Green Hydro Ltd’s COO, PSP & Hydro, Telgu said. “Together with the DGPC, we are enabling Bhutan to harness its hydropower potential and export reliable green energy to India.

This is a powerful example of cross-border collaboration in pursuit of shared sustainable development goals.”

“This strategic partnership with Adani will further strengthen our very strong engagement with the Government of India in harnessing Bhutan’s abundant hydropower resources, which is considered the cornerstone of the exemplary and friendly relations between our two countries,” DGPC MD Rinzin said.

“We look forward to taking this partnership forward with Adani and learning from their huge successes across the globe.” The DGPC, Bhutan’s premier hydropower developer, has decades of experience in managing the nation’s renewable energy resources.

It plays a pivotal role in Bhutan’s clean energy journey, contributing to both domestic energy security and sustainable development. Through such partnerships, the DGPC is also helping to strengthen Bhutan’s position in regional energy cooperation.

The Adani Group, India’s leading infrastructure and renewable energy player, brings extensive expertise in project development, financing, and market access. It will support Bhutan in scaling up its hydropower capacity and facilitating access to Indian energy markets.

As part of this collaboration, the Adani Group will ensure reliable power offtake and integration with India’s commercial power markets, further reinforcing Bhutan’s role in the regional energy trade. The partnership is strongly backed by both the Bhutan and Indian governments, underscoring a shared vision for clean energy growth and economic integration.

This initiative also aligns with Bhutan’s Renewable Energy Roadmap, which aims to achieve an additional 20,000 MW of generation capacity by 2040.

The roadmap prioritises diversification into solar and geothermal energy, and also encourages strategic partnerships to attract investment and innovation. In a further milestone, the DGPC and the Adani Group also initialled the Shareholders’ Agreement for the Wangchhu Project, marking significant progress in their collaborative efforts to advance Bhutan’s hydropower sector.

IEX to log double-digit growth in trading volume in FY26

India Energy Exchange, the country's leading electricity exchange, is expected to log a double-digit volume growth in the current financial year that started in April, on the back of increasing sell side liquidity and launch of new products, according to analyst reports post IEX's FY25 earnings. The current financial year is likely to see a capacity addition of 11 GW on thermal side and up to 40 GW on renewable side that is expected to keep supply-side liquidity on exchanges strong, thereby driving down price discovery in key trading segments like Day Ahead Market and Real Time Market (RTM).

According to analysts, introduction of new products like green RTM and long-duration contracts (LDC) of up to 11 months will further add to volumes on IEX. In 2024-25, IEX logged the highest-ever traded electricity volume of 121 billion units (BUs), up 18.7 per cent year on year. 'Approval for 11-month LDC contracts, green RTM, private participation in selling un-requisitioned surplus on exchanges, declining BESS prices, boost for FDRE/RTC green projects are all likely to boost supply-side liquidity/volume growth outlook,' AXIS Capital said in its post earnings note. 'As BESS becomes increasingly competitive, it will support growth of FDRE solutions and thereby improve liquidity on exchanges,' the note said.

According to analysts, IEX has submitted a petition to regulator CERC for an 11-month LDC contract. It shall help shift part of DEEP volume (40 BU in FY24) to exchanges. Price discovery in LDC is expected to

be around 25 per cent lower than on DEEP platform for a similar duration. Also, margin requirements for customers will mean that IEX does not run any working capital risk in LDC contracts. The approval is awaited. The long duration contract is aimed at offering greater flexibility for market participants, particularly distribution companies, by enabling longer-term contracts for more stable power procurement.

'If approved in the next two to three months, IEX expects an additional annual potential of 40 BU (billion units). Additionally, the Green RTM (new product) would allow resellers to earn a price premium over conventional power, while enabling buyers to fulfil their renewable purchase obligations by sourcing green electricity,' Antique Stock Broking said in a report. 'It (launch of LDC) shall help to shift part of DEEP volume to exchanges. Price discovery in LDC is expected to be ~25 per cent lower than on DEEP platform for a similar duration. Also, margin requirements for customers will mean that IEX does not run any working capital risk in LDC contracts,' AXIS said in its note. Beyond electricity trading, IEX is witnessing traction in other commodity exchanges such as gas with nearly 50 per cent growth in volumes, carbon exchange that commenced operations in FY25 and coal exchange where a consultation paper has been floated. According to Antique, IGX volume increase is mainly due to Reliance Industries and ONGC selling a good part of their production in the market now. 'IGX achieved a record 60 million MMBtu in traded gas volume in FY25, up 47 per cent YoY. With falling gas prices, IGX expects continued volume growth,' said the Antique note. 'Diversification into carbon exchange and coal exchanges in the future and improvement in volume growth outlook for IGX add growth options over the medium term,' AXIS said. IEX is working with the coal ministry to set up India's first Coal Exchange by FY27. The launch is expected to require amending Mines and Minerals Development Regulations Act to facilitate sale of surplus coal through coal exchange, including from commercial and captive mines. Talking about market coupling, the analysts have said that there is no clarity on the issue as yet. 'Inordinate delays by the government/regulator imply challenges/ limited merit in implementing the same,' IIFL Capital said in its post-earnings note. During the 2024-25 fiscal, IEX reported a consolidated net profit of ₹429.16 crore compared to ₹350.78 crore a year ago while total income rose to ₹657.36 crore from ₹550.84 crore in 2023-24.

Spot power prices down 50% in May, as demand reduces

Electricity prices in the spot market declined by as much as 50% during the first five days of May as unseasonal rains, particularly in the North, reduced power demand while sell bids increased substantially, according to data from the Indian Energy Exchange.

According to the data by IEX, electricity consumption during May 1-May 5 stood at 23.5 billion units, a reduction of 6% from the same period last year. The average price in the Real-Time Market, declined by 50% from last year at Rs 2.71/unit.

During the period, the lowest recorded price for a single block was Rs 0.11/unit. For the same period, the average market clearing price in the Day-Ahead Market was Rs 4.02/unit, down 29% from the same period a year ago.

“Unseasonal rain and thunderstorms across several regions, including Delhi, Himachal Pradesh, Rajasthan, Gujarat, Kolkata, and Bengaluru, kept temperatures low and reduced electricity demand in the first five days of May 2025,” said Rohit Bajaj, Joint Managing Director, Indian Energy Exchange, adding that fuel supply remained stable, while power exchanges saw increased sell-side liquidity.

On IEX, sell-side liquidity increased by 43% year-on-year during this period. As per the exchange, the combination of reduced demand and higher sell bids led to lower prices in both DAM and RTM.

“These prices present an opportunity for discoms and Commercial & Industrial consumers to meet their demand at a competitive price,” Bajaj said.

The country’s energy consumption reached 147.5 billion units, an increase of 2.2% compared to the previous year in April, as per official data. The peak demand for power reached 235 gigawatt (GW) on April 25, surpassing the maximum peak demand of 224 GW recorded in April 2024.

Despite the increase in power demand, the average market clearing price in the Day Ahead Market during April remained competitive at Rs. 5.20/unit, similar to last year, due to increased supply.

Looking ahead to FY26, peak power demand is expected to exceed 270 GW. In response to this rising demand, the government has implemented necessary measures, including the mandatory operation of imported coal-based plants, gas-based plants, and better availability of coal. “These measures will also enhance sell liquidity on the power exchanges,” IEX has said.

The country’s coal based power plants are also ramping up coal stocks to meet the expected surge in the demand for power. Coal stocks at the country’s thermal power plants stood at 79% of the normative level as on May 5 at 56.9 million tonnes, data from the Central Electricity Authority showed.

New carbon credit scheme targets 60 plants by 2030 for coal phase out

The Rockefeller Foundation aims to sign up 60 projects by 2030 to a new carbon finance scheme for phasing out coal-fired power in developing countries, it said recently, after its rulebook was given the go-ahead.

Around 2,000 coal-fired power plants need to be decommissioned from now until 2040 in order to meet global climate targets, the International Energy Agency says, but only 15 per cent are covered by decommissioning pledges.

The Rockefeller Foundation's Coal to Clean Credits Initiative (CCCI) is one of several schemes under development that aim to use carbon finance to help close them earlier than scheduled and replace them with renewable power.

"That target of 60 projects by 2030 is our overall goal, our ambition," said Joseph Curtin, who runs the Rockefeller Foundation's "coal to clean" programme. In Singapore recently, carbon standards organisation Verra launched CCCI's methodology for determining which projects are eligible and how emission reductions from early coal plant shutdowns will be calculated, allowing them to generate carbon credits. The first project to use the methodology will be the South Luzon Thermal Energy Corporation (SLTEC) plant in the Philippines, with the transaction expected to be completed next year. "Obviously if we can close one transaction - and we're getting much closer - we think that will have a very strong impact on the market and will hopefully reverberate across the region and send a signal that this is indeed possible."

Curtin said his team has identified around 1,000 coal-fired plants in developing countries that would be eligible under the methodology. The 60 project target could attract $110 billion in public and private investment by 2030, he said, citing research commissioned by the foundation. The early retirement of SLTEC is backed by Philippine energy firm ACEN together with Singapore clean investment group GenZero, the infrastructure conglomerate Keppel, Japan's Mitsubishi and its subsidiary Diamond Generating Asia. Revenue from carbon credits will be used to cover foregone cashflows brought about by the closure, help pay for the energy storage needed to support renewables and protect the interests of local workers and communities, said Eric Francia, ACEN's chief executive.

CCCI went through seven rounds of consultations on its methodology, partly to allay concerns of environmental groups, who say carbon finance should not be used to bail out coal asset owners. "The risk with this is how do you determine you are not giving finance to something that was a stranded asset, that wasn't going to be viable in the future?" said Jonathan Crook of Carbon Market Watch, a research group. The CCCI initiative's criteria will only select projects that are profitable and owned by companies or countries that have made firm "no new coal" commitments, said Curtin. While there is a moratorium on new coal plants in the Philippines, new facilities approved before the ban are still expected to come on line in the next few years. But the early retirement of SLTEC would still deliver progress on the energy transition, ACEN's Francia said. "Of course we need to manage the perception, which is admittedly not good, but we look at the substance, and that is really the equation here," he said. (Reporting by David Stanway; Additional reporting by Simon Jessop in London; Editing by Christian Schmollinger and Sonali Paul)

India orders power transmission system for upcoming dam on Chenab

The Centre has issued a notification to set up a power transmission system for the proposed 1000 MW Pakal Dul hydroelectric project in Jammu and Kashmir, speeding up processes for what will be the biggest dam on the Indian side of the Indus river system.

The notification is the first major step in commissioning work for the dam, which will be capable of storing water, since India unilaterally suspended the Indus water treaty with Pakistan after terrorists massacred dozens of tourists in Kashmir's Pahalgam on April 22.

The notification was issued recently, hours before Indian armed forces carried out precision missile strikes on "terrorist infrastructure" at nine sites in Pakistan and Pakistan-occupied Kashmir in retaliation for the Pahalgam terror attack that killed 26 civilians two weeks ago.

New Delhi announced a raft of punitive measures, including the suspension of the Indus Waters Treaty, the closure of its airspace to Pakistani aircraft, the expulsion of most Pakistani nationals, and the closure of the only operational land border crossing at Attari following the terror attack.

Following up on the announcement, the Union Jal Shakti (water resources) minister CR Patil last month declared that India would "ensure not a drop of water from the Indus rivers reaches Pakistan".

Alongside, the state-run National Hydroelectric Power Corporation Ltd, the country's biggest hydropower firm, has begun carrying out reservoir flushing in the Salal and Baglihar dams, being done for the first time since the latter was built in 2008.

"This involves flushing sediments downstream from the reservoirs, which increases flow downstream till the process is completed," said Sadaman Reddy, a former engineer with the Central Water Commission. Pakistan lies downstream of the Indus rivers.

India did not inform Pakistan about the work at the dams as it no longer adheres to the Indus treaty, a person familiar with the matter said.

De-risking investments for India's energy transition

India, the world's third-largest emitter of greenhouse gases, is at a pivotal crossroads in its energy transition journey. With a population exceeding 1.4 billion and an economy set to become the third-largest globally by 2030, India's energy demands are rising rapidly. However, these demands must be met while navigating the urgent need to decarbonize the economy. India's commitment to achieving net-zero emissions by 2070 and the goal of obtaining 50% of its energy from non-fossil sources by 2030 presents a colossal challenge—but also a massive opportunity.

At the heart of this energy transition is the need for large-scale investments in renewable energy infrastructure, clean technologies, and sustainable practices across various sectors. Yet, as India strives to move away from its reliance on coal and other fossil fuels, financing this transition remains one of the greatest hurdles. The key challenge lies in de-risking investments to attract the necessary capital for a sustainable and low-carbon energy future.

India's energy transition strategy is centred on scaling up renewable energy capacity, especially in solar and wind power, improving energy efficiency, and accelerating the development of green hydrogen. India's target of 500 gigawatts (GW) of renewable energy capacity by 2030 requires an estimated $20 billion annually in investment through 2050 to decarbonize key sectors such as energy, transport, and industry. However, investors remain wary of the risks involved in India's renewable energy market. These risks arise from issues such as policy uncertainty, regulatory challenges, financial sector limitations, and delays in project execution, including land acquisition and approvals.

De-risking Investments: A Multi-Dimensional Approach: **Government Incentives and Policy Support.** To attract investment, the Indian government must continue offering strong policy support. Clear and long-term policy frameworks, such as the Production-Linked Incentive (PLI) Scheme and tax incentives for component manufacturing, can incentivize private sector investment. These incentives reduce the risks associated with project development, providing much-needed assurance to investors.

MPs Applaud Energy Reforms and Growth of Energy Infrastructure across country

Union Minister for Petroleum & Natural Gas, Shri Hardeep Singh Puri, while chairing the Consultative Committee meeting of the Ministry of Petroleum and Natural Gas in Manesar, Haryana, highlighted India's remarkable progress in energy affordability, access, and infrastructure development. He underscored the government's proactive measures in stabilizing fuel prices, expanding LPG coverage, and boosting refining and distribution capacity across the country. Shri Puri reaffirmed the Ministry's commitment to inclusive and consumer-focused energy policies.

Minister of State for Petroleum & Natural Gas, Shri Suresh Gopi also attended the meeting, which witnessed robust participation from 27 Members of Parliament. The MPs shared insightful suggestions and feedback on key issues including fuel affordability, LPG access, regional infrastructure disparities, and energy resilience.

The Minister Hardeep Singh Puri elaborated on how under the visionary leadership of Prime Minister Shri Narendra Modi, India was able to successfully navigate geopolitical adversities to ensure affordability and availability of energy for citizens without any shortage. He noted, when the fuel prices were skyrocketing all over the world, India was the only country where the prices came down. Notably, the Government reduced excise duties twice—on 4 Nov 2021 and 22 May 2022—slashing petrol by Rs 13/litre and diesel by Rs 16/litre. A recent hike in April 2025 was absorbed by Oil Marketing Companies, protecting consumers from additional burden.

Highlighting LPG reforms, the Minister detailed the transformational impact of the Pradhan Mantri Ujjwala Yojana (PMUY). Since its inception, LPG coverage has soared from 55% in 2014 to nearly universal access today. LPG consumption rose significantly, with daily deliveries exceeding 56 lakh cylinders. Over 25,000 LPG distributors now operate across the country, 86% in rural areas, ensuring deep last-mile reach.

Shri Hardeep Singh Puri informed that LPG prices in India are among the lowest globally. Despite a steep 58% increase in international LPG prices, PMUY consumers now pay only Rs 553 for a 14.2 kg cylinder.

Oil companies have incurred a loss of Rs 40,000 crore last year to keep LPG prices affordable. A cylinder costing approximately Rs 1,058 is being provided to PMUY beneficiaries at just Rs 553. For regular consumers, the price is Rs 853. As a result, the per-day cooking cost comes to around Rs 6.8 for PMUY households and Rs 14.7 for non-PMUY users.

Shri Puri informed that LPG prices in India are among the lowest globally. Despite a steep 58% increase in international LPG prices, PMUY consumers now pay Rs 553 for a 14.2 kg cylinder—39% less than the Rs 903 they paid in July 2023. Oil companies have incurred Rs 40,000 crore loss last year in order to keep LPG prices low. Cylinder of approximately Rs 1058 cost is being sold at Rs 553 to Ujjwala consumers.

For regular consumers, the price is Rs 853. The per-day cooking cost is now around Rs 6.8 for PMUY households and Rs 14.7 for non-PMUY users.

Marketing infrastructure has seen robust growth: India now operates over 24,000 km of product pipelines, 314 oil terminals/depots, and nearly 96,000 retail outlets. These advancements, along with strategic reserves and LPG caverns, have bolstered energy resilience.

MPs lauded the Government's balanced approach, blending consumer welfare, fiscal discipline, and global diplomatic agility. The meeting reflected the increasing depth of parliamentary dialogue on energy, with active participation shaping future policy directions.

Their engagement underscored the importance of parliamentary dialogue in shaping inclusive energy policies. The Government welcomed the inputs and reaffirmed its commitment to incorporating them into future planning. The participating MPs acknowledged the Ministry's achievements, shared

their views and expressed support for expanding outreach and improving implementation at the grassroots level.

India's energy future steadily moving towards self-sufficiency: Hardeep Puri

India's energy future is taking shape, steadily moving towards self-sufficiency, Union Minister for Petroleum and Natural Gas, Hardeep Singh Puri, said recently. In a post on X social media platform, the Union Minister said it is hard to predict when India's oil demand will peak.

"We currently import $150 billion worth of energy every year. If global green hydrogen prices fall, it could trigger a revolution in sustainable energy," the minister informed.

The country has made remarkable strides in green hydrogen development, allocating 862,000 tonnes per annum (TPA) production capacity annually to 19 companies, and awarded 3,000 MW annual electrolyser manufacturing capacity to 15 firms.

The country has also launched pilot projects in steel, mobility, and shipping sectors. India has already installed over 223 GW of renewable energy - that includes 108 GW from solar and 51 GW from wind - placing India among the fastest-growing renewable energy markets globally.

To drive this transition, the National Green Hydrogen Mission was launched by the Government in 2023, with an initial allocation of $2.4 billion.

It lays out a comprehensive roadmap to identify and create demand in potential sectors, provide production incentives for setting up domestic capacity, achieve 5 million metric tonnes of green hydrogen production by 2030, avert nearly 50 MMT of CO2 emissions annually, attract investments of about $100 billion and generate over 600,000 jobs.

Union Minister of New and Renewable Energy, Pralhad Joshi, recently launched the Green Hydrogen Certification scheme in the country, which is a foundational step towards creating a robust framework for certifying green hydrogen production and ensuring transparency, traceability and market credibility.

Petrol consumption rises 5%, diesel 4.4% in April; LPG up 6.2%, naphtha down 23.4%

Consumption of petroleum products in the country stood at 20.13 million metric tonnes (MMT) in April 2025, recording a marginal year-on-year decline of 0.2 per cent compared to 20.16 MMT in the same month last year, according to data released by the Petroleum Planning and Analysis Cell (PPAC).

Petrol consumption increased 5 per cent to 3.45 MMT in April from 3.29 MMT in April 2024. Diesel, which accounts for the largest share in petroleum products consumption, recorded a 4.4 per cent increase to 8.28 MMT, up from 7.93 MMT in April last year.

Consumption of LPG rose 6.2 per cent to 2.52 MMT during the month, as against 2.37 MMT in April 2024. The Pradhan Mantri Ujjwala Yojana (PMUY) beneficiaries accounted for 85.5 per cent of the domestic LPG demand in the month. As on April 30, 2025, the number of PMUY beneficiaries stood at 10.33 crore out of 32.99 crore active domestic connections.

Naphtha consumption fell sharply by 23.4 per cent to 0.93 MMT during the month, compared to 1.22 MMT in April 2024, primarily due to lower offtake by petrochemical plants. Furnace oil and low sulphur heavy stock (LSHS) usage dropped 8.8 per cent to 0.48 MMT.

Light diesel oil (LDO) consumption increased 67.8 per cent to 0.086 MMT, attributed to increased demand from the power sector.

Natural gas consumption in April 2025 rose 9.1 per cent year-on-year to 5,901 MMSCM. The fertiliser sector accounted for 29 per cent of the total gas consumption, followed by city gas distribution at 21 per cent, power at 12.5 per cent, and refineries at 8 per cent.

The report noted that cargo throughput at major ports increased 7.02 per cent during the month, while electricity consumption rose 2.2 per cent to 139.99 billion units. Total highway toll collection for the month was ₹5,371 crore.
The PPAC said the overall growth in petroleum products consumption was supported by increases

in petrol, diesel, LPG, and ATF, while the decline in naphtha and fuel oil consumption contributed to the marginal dip in total POL demand.

India's gas use at 5766 MMSCM, LPG coverage hits 102.8%: PPAC

India's total gas consumption averaged 5766.75 million metric standard cubic meters (MMSCM) per month as of March 31, 2025, according to the latest edition of the Oil and Gas Snapshot released by the Petroleum Planning & Analysis Cell (PPAC).

Monthly petroleum products (POL) consumption stood at 19.93 million metric tonnes (MMT), with diesel accounting for 10.29 MMT and petrol 4.25 MMT. Monthly average LPG consumption was recorded at 2.6 MMT.

The report shows that India had 329.7 million domestic LPG customers, including 103.3 million under the Pradhan Mantri Ujjwala Yojana (PMUY). The number of double bottle connection (DBC) customers stood at 148.1 million. LPG coverage exceeded 100 per cent , at 102.8 per cent , reflecting access saturation. Per capita annual consumption of 14.2 kg cylinders was 5.96, while among PMUY beneficiaries it stood at 4.47 cylinders.

The average ethanol blending under the Ethanol Blended Petrol (EBP) Programme during November 2024 to March 2025 reached 18.36 per cent , with a total of 3.91 billion litres of ethanol blended.

In the natural gas segment, onshore production stood at 827.45 MMSCM and offshore at 2106.97 MMSCM. PNG connections included 14.7 million domestic consumers, 20,253 industrial units, and 44,869 commercial consumers.

The compressed natural gas (CNG) sales averaged 748.6 MMSCM per month, while piped natural gas (PNG) consumption stood at 95.6 MMSCM for domestic use, 24.6 MMSCM for commercial, and 400.9 MMSCM for industrial applications.

Crude oil processing by refineries averaged 22.84 MMT monthly. Domestic crude oil production was 2.37 MMT, while monthly output of petrol and diesel was 4.25 MMT and 10.29 MMT, respectively. LPG production was 1.09 MMT.

India's total natural gas consumption through the City Gas Distribution (CGD) network, comprising CNG and PNG segments, remains a growing contributor to the country's energy basket. Meanwhile, policy efforts including the PMUY and ethanol blending programme continue to influence clean fuel accessibility and energy diversification trends.

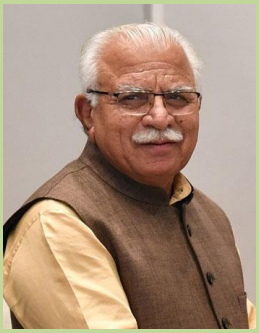
IndianOil sales volume, including exports, crosses 100 MMT for 1st time

In a significant feat for the Indian oil sector, state-run Indian Oil Corporation recently said its total sales volume, including exports, has crossed 100 million metric tonnes (MMT) for the first time ever.

In a post on X social media platform, the oil major said it a historic milestone for them. "Our total sales volume, including exports, has crossed 100 MMT for the first time ever — a solid 3 per cent growth. Driven by 1.6 per cent rise in POL, 21 per cent in gas, and 6 per cent in petrochemicals, this marks a new chapter of excellence," said the company. In its just-declared quarterly results, the oil giant's net profit more than doubled on quarter-on-quarter basis to Rs 7,265 crore, compared to Rs 2,874 crore in Q3FY25. The strong rebound was supported by improved refining margins, inventory gains, and better operational efficiencies.

The oil giant's Gross Refining Margins (GRMs) or the difference between the total value of petroleum products coming out of a refinery and the price of raw materials, stood at $8 per barrel. Indian Oil had reported GRMs of $2.9 per barrel in the previous quarter. EBITDA (earnings before interest, tax, depreciation and amortisation) margin for the quarter stood at 7 per cent, higher than the 3.7 per cent registered in the third quarter, reflecting the oil major's better control over costs and better product mix. EBITDA nearly doubled on a sequential basis, rising 90 per cent QoQ to Rs 13,572 crore from Rs 7,117 crore in the previous quarter. This translated into a robust improvement in operating profitability. On the top line, revenue from operations remained steady at Rs 1.95 lakh crore, marginally higher than Rs 1.94 lakh crore in the preceding quarter. The quarterly performance comes on the heels of IOCL's continued push in both refining and clean energy.

Centre urges states to explore possibility of setting up nuclear power plants



Union Minister of Power Manohar Lal Khattar recently said the Centre has asked state governments to examine the feasibility of setting up nuclear power plants. The Centre also asked Goa Chief Minister Pramod Sawant to explore the possibility of establishing a nuclear power facility as a long-term measure for energy security and sustainability in the coastal state.

The Union Minister said that India was currently generating eight gigawatts of nuclear power while the aim is to generate 100 gigawatts by 2047. “We are of opinion that wherever there is a possibility of setting up a nuclear power plant, it should be considered.

In future, if Goa puts up a proposal for a nuclear power plant, it would be considered positively,” he told journalists after the meeting. The minister also pointed that Goa does not have any thermal, hydro or solar power plants. Given that around 80 per cent of Goa’s electricity is procured from outside the state, the Minister urged the State to explore all possible avenues for local generation of power.

The meeting concluded with the assurance that the Ministry of Power would extend full support to the State in achieving its energy goals. Highlighting the importance of operational efficiency, the Minister encouraged the state to further reduce utility losses and integrate more Renewable Energy into the grid.

He mentioned that this would help lower the cost of power supply and enhance overall performance. Union Minister of State for New and Renewal Energy Shripad Naik, Goa Power Minister Sudin Dhavalikar and Urban Development Minister Vishwajit Rane also attended the meeting with the Power Minister.

The meeting also focused on the power sector developments, loss reduction initiatives, and the progress under the Revamped Distribution Sector Scheme (RDSS). Commending the government of Goa and the Electricity Department for their effective efforts in ensuring power availability and achieving universal electrification, Manohar Lal stated: “Goa has shown exemplary performance in reducing AT&C losses to 9.32 per cent, which is significantly below the national average.

This is a testament to the state’s sustained efforts in improving the efficiency of its power distribution system.” The minister appreciated the state’s significant progress in implementing infrastructure works under RDSS aimed at reducing losses.

However, he emphasized the need to accelerate the pace of smart metering, which has the potential to revolutionize consumer engagement with DISCOMs through data analytics and AI/ML tools. “Now that the contracts have been awarded, I am confident that the implementation will gain momentum.

Prioritizing saturation of smart meters in Government offices, colonies, commercial and industrial units, and high-load consumers will help ensure digitization and improved service delivery,” Manohar Lal Khattar added. He also acknowledged Goa’s citizen-centric efforts in simplifying procedures for rooftop solar installations and new electricity connections, enhancing the ease of living for consumers.

Eye on nuclear energy mission, NPCIL looks to speed up capacity addition

Nuclear Power Corporation of India Ltd (NPCIL) may soon seek approvals for 10 more pressurised heavy water reactors (PHWRs) of 700 MW each to be built in 'fleet mode', said people aware of the development, underscoring the company's strategy to fasten the pace of nuclear capacity addition. The new units could be greenfield or brownfield, one of the persons said.

NPCIL's move tracks the state-run company's aim to pursue the majority of the capacity building of India's nuclear energy mission. New Delhi is also looking to amend the Atomic Energy law to enable private sector foray into the strategic sector.

Fleet mode refers to building multiple reactors of a similar design and configuration at the same time, or in a series.

The latest plan adds to the company's ongoing development of 10 units of PHWRs under fleet mode including in Rajasthan, Karnataka, Haryana and Madhya Pradesh.

NPCIL had earlier told ET it was aiming to achieve about half of India's nuclear energy capacity goal of 100 GW by 2047. The target may rise to 54 GW as per the roadmap discussions for 100 GW capacity, a second person said.

India has currently installed nuclear power capacity of 8.8 GW from 25 operational plants operated entirely by NPCIL.

The indigenous 700-MW PHWRs would be the company's mainstay, supplemented by large-capacity light water reactors with potential international cooperation.

NPCIL is looking to commission multiple reactors, including PHWRs and LWRs, to boost its installed capacity to about 22 GW by 2031-32. With the addition of Bharat Small Reactors (BSRs) by 2035, the installed nuclear capacity will grow further, NPCIL chairman Bhuwan Chandra Pathak had told ET.

PHWRs are developed in fleet mode to reduce costs, expedite construction, and leverage economies of scale.

Nuclear Energy: Russia's Rosatom in talks to introduce advanced SMR solutions in India

Russia's state atomic energy corporation, Rosatom, is in discussions with multiple stakeholders to introduce advanced small module reactor (SMR) solutions in India, its First Deputy Director General – Director for Development and International Business, Kirill Komarov, told recently

He said that SMRs are a key part of their long-term cooperation with India, and they see strong alignment between their technological expertise and India's evolving energy priorities.

"We are in discussions with multiple stakeholders to introduce advanced SMR solutions that are safe, scalable, and capable of supporting both industrial applications and grid-based power," he said in an exclusive interview.

Komarov added that SMRs are particularly suited to remote locations and industrial applications.

"Our SMR technology has the potential to be integrated into regions with limited grid infrastructure or phased-out coal plants, offering flexible, modular capacity that aligns with India's evolving power needs," he added.

The Moscow-based corporation is aligning its efforts towards localization and long-term fuel partnerships to deliver safe, sustainable, and commercially viable civil nuclear energy solutions for India's future.

"We believe SMRs can play an important role in ensuring energy security while enabling decarbonization… Together with colleagues from India's Department of Atomic Energy, we are working within the framework of the joint working groups to explore new areas of cooperation in nuclear reactors with molten salt and gas coolants, SMRs, fusion energy, quantum technologies…," he added.

According to Komarov, Rosatom continues to engage in dialogue with Indian authorities on new financing approaches that could help accelerate deployment, particularly in the context of emerging technologies such as SMRs and future sites beyond Kudankulam.

“Rosatom is committed to working with India in scaling up nuclear energy as a key pillar of its clean energy transition… Currently, we are the only foreign company whose design is being used for the construction of a nuclear power plant in India. Our partnership with India spans decades,” he added.

Rosatom is a global company, which operates in diverse markets and has extensive experience navigating complex international frameworks. Its focus in India is to deliver on its commitments, support India’s energy transition goals, and deepen bilateral cooperation across the full spectrum of nuclear technologies, said Komarov.

India's route to 100 GW nuclear power by 2047 may require strategic reforms

India's plan to reach an ambitious 100 gigawatts (GW) nuclear power capacity by 2047 may require a concerted effort to overcome existing challenges and implement strategic reforms in the nuclear sector, says a report by SBICAPS. India's plan to produce 100GW of nuclear power capacity by 2047 aligns with the target to achieve a netzero emissions target by 2070. The report outlines several key strategies and reforms that are crucial for India to successfully expand its nuclear power capacity. One of the critical areas being, reducing the time taken for nuclear plant construction. It also notes that Indian projects currently take around 10 years to complete, significantly longer than the global best of approximately 6 years.

The report suggests attracting greater foreign investment which would include allowing 49 per cent Foreign Direct Investment (FDI) in nuclear power generation sector to facilitate increased capital inflows. Additionally "diversifying fuel sources via international agreements and accelerating the transition to Stages 2 and 3 of India's nuclear program are essential to address the nation's limited uranium reserves," the report said. The report, highlights that the India's installed nuclear capacity is around 8 GW, with an additional 7 GW under construction and target is to achieve the 100GW in the next two decades. The report emphasizes the need for a significant acceleration in the pace of nuclear development.

Achieving the 100 GW target within the next two decades will overcoming potential hurdles and for that "the Government has initiated the Nuclear Energy Mission, allocating Rs 200 billion towards R&D and the deployment of at least five Bharat Small Modular Reactors (BSMRs) as announced in the Union Budget." The BSR program will enable private sector development of Pressurized Heavy Water Reactor (PHWR) reactors for dedicated captive utilisation. The report from the Indian bank points towards China as leading this revival, with a substantial 30 GW of nuclear reactor capacity under development. While India and Turkey are also showing increasing interest in expanding their nuclear capabilities, Europe maintains a more cautious stance.

Meanwhile, SBICAPS's report underscores the significant financial and strategic implications of India's ambitious nuclear energy goals. Earlier in March, Indian Union minister Jitendra Singh also emphasized that Nuclear Energy is critical for India's net zero goal. 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.

In nuclear energy push, Govt to allow private operators, limit their liability

IN WHAT could set the stage for an unprecedented opening up of the civil nuclear sector, the government is likely to move two crucial amendments in the laws governing the country’s atomic energy sector in the upcoming monsoon session of Parliament, according to sources aware of the developments.

The first relates to the easing of provisions in the nuclear liability law, which would effectively cap the liability of equipment vendors in the event of an accident, both in terms of limiting the monetary exposure to the original value of the contract, and a possible time frame limitation on when this liability would apply.

The second amendment is aimed at enabling private companies to enter nuclear power plant operations in the country, and this could also entail foreign

companies potentially taking a minority equity exposure in upcoming nuclear power projects.

Hitherto, atomic energy has been one of India's most closed sectors. The twin legal amendments are being seen as a reform push that could help leverage the commercial potential of the Indo-US civil nuclear deal nearly two decades after it was inked. New Delhi is also keen to package this as part of a broader trade and investment outreach with Washington DC, which could eventually culminate with a trade pact that is currently under negotiation.

The two amendments are expected to take care of niggling legal bottlenecks which are seen to have stymied foreign investments in the atomic energy sector. The Civil Liability for Nuclear Damage Act, 2010, which sought to create a mechanism for compensating victims from damage caused by a nuclear accident, and allocating liability and specifying procedures for compensation, has been cited as an impediment by foreign players such as GE-Hitachi, Westinghouse and French nuclear company Areva (now Framatome). This is primarily on the grounds that the legislation channelises operators' liability to equipment suppliers, with foreign vendors citing this as a reason for holding them back from investing in India's nuclear sector due to fear of incurring future liability in the event of a nuclear accident.

Amendments to the Atomic Energy Act, 1962 are being initiated to enable private companies, and possibly even foreign players at a later stage, to enter nuclear generation as operators. Currently, this is restricted to state-owned companies such as NPCIL or NTPC Ltd.

The government has committed to getting both these legislations passed. An explicit assurance to this effect was made in the Union Budget presented earlier this year, even though the legislative route for at least one of the two proposed bills would be an arduous one.

Nuclear revival needs a clear road map

The US Department of Energy's (DoE) approval for an American company to design and build nuclear reactors in India is a welcome move. It will help India achieve its goal of trebling its nuclear energy capacity by 2031-32, strengthening energy security and advancing clean energy commitments to address climate change.

It also reflects India's diplomatic prowess in a shifting geopolitical landscape and suggests recent administrative changes in the US have not diminished bilateral cooperation. On the contrary, Prime Minister Narendra Modi and President Donald Trump pronounced a joint declaration on February 13, which reinforced prior commitments made on all fronts, including nuclear energy. Given the highly sensitive nature of nuclear technology, the finer details will require utmost vigilance.

The recent approval of Holtec International, a US-based supplier of energy industry equipment and systems, to transfer its small modular reactor (SMR) technology to Indian firms comes against the backdrop of the 2008 India-US Civil Nuclear Agreement. The agreement initially struggled to materialise due to multiple challenges, with the Civil Liability for Nuclear Damage Act (CLNDA) being a major hurdle, as it places liability for nuclear incidents on technology suppliers too. Further, despite receiving a Nuclear Suppliers Group (NSG) waiver under the India-US agreement, India's non-membership in the group remained a limiting factor.

Now that amendments and measures introduced in the CLNDA over the years have paved the way for nuclear development in India, it is crucial to sustain the momentum by addressing the critical gaps in safety assurance, technology preparedness, and financing strategies.

SMR technology enables reactors to be manufactured in a controlled factory setting rather than being built entirely on-site, helping to address concerns related to cost and timelines. India has recently completed the concept design for its indigenously developed "Bharat Small Modular Reactor", a 200-megawatt unit based on pressurised water reactor (PWR) technology. This reflects a growing commitment to building domestic capabilities.

In contrast, large-scale nuclear projects like Hinkley Point C and Flamanville 3 have faced significant delays, often taking twice the estimated time to

commission and exceeding their budgets two-three times. These challenges reflect the limitations of traditional nuclear power plant construction, reinforcing the potential of SMRs as a more efficient alternative.

Nevertheless, SMRs do not inherently guarantee safety. While CLNDA revisions have somewhat addressed concerns over the initial years of construction and operation, the end-of-life phase demands even greater caution. Decommissioning a nuclear plant is time-consuming and costly, with critical safety challenges like fuel removal and managing radioactive waste.

European countries are facing significant difficulties in this regard. The challenges are so extensive that many ageing nuclear plants are now considering lifetime extensions, a technically demanding and expensive alternative that presents its own set of safety concerns. India must seek technical support not only for the design and construction of nuclear power plants but also for their decommissioning phase, ensuring this aspect is an integral part of agreements with foreign or private developers.

Technology remains a critical consideration. India has traditionally relied on pressurised heavy water reactors and has gradually introduced PWRs — the most widely used globally — with the Kudankulam Nuclear Power Plant in Tamil Nadu. The anticipated deployment of Holtec's PWR-based SMRs reinforces this trend.

While the adoption of PWR technology enhances India's nuclear capacity, an over-reliance on imported reactor designs could shift focus from indigenous R&D in advanced nuclear technologies. The recent concept design of the Bharat SMR by scientists at the Bhabha Atomic Research Centre and the Nuclear Power Corporation of India (NPCIL) highlights the country's potential in technological self-reliance.

India's long-term strategic interests lie in fast breeder reactors and thorium-based reactors, which align with its three-stage nuclear programme and leverage the country's thorium reserves — the largest in the world. Ensuring a balanced approach that incorporates PWRs while advancing domestic reactor innovations will be crucial for India's long-term energy security and technological self-reliance.

Generating electricity from nuclear energy is capital-intensive, with project costs varying significantly. While state-owned agencies such as the NPCIL and NTPC are expected to lead India's nuclear expansion, allowing private developers to participate would be sensible, and they should be helped in raising investments.

Since nuclear energy will be a key pillar of India's clean energy transition, integrating it into the climate finance framework could be a strategic move. Given its high costs, innovative financing mechanisms — particularly blended finance — can help unlock its full potential.

As countries worldwide grapple with challenges in maintaining a carbon-neutral trajectory — including geopolitical divides, financing gaps, technological uncertainties, and fragile supply chains — nuclear energy is emerging as an underutilised yet transformative clean energy source. Its potential to advance net-zero ambitions for India and other nations makes it a compelling addition to the global climate agenda, with the possibility of gaining traction in future COP negotiations.

Tata Power eyes nuclear as a key pillar in India's clean energy shift

Praveer Sinha, CEO and MD of Tata Power, is exploring nuclear energy as a crucial part of its clean energy strategy. He emphasized that while the company is focused on renewables, nuclear will play a significant role once regulatory changes are in place. He highlighted that the company is considering various nuclear technologies including small modular reactors and aims to make nuclear an integral part of its energy transition plan.

Launch of India Energy Debate and Panel Discussion on "Developing Hydro Projects in North East: Opportunities, Challenges and Way Forward

31st May 2025, IIC New Delhi

India Energy Forum started a new monthly series to debate the critical issues of India's energy sector called "India Energy Debate". The launch of the India Energy Debate and a Panel Discussion on "Developing Hydro Projects in North East: Opportunities, Challenges and Way Forward" were organized on 31st May 2025 at India International Centre, New Delhi. **Shri Pankaj Agarwal IAS**, Secretary, Ministry of Power was the Chief Guest on the occasion, launched the Debate and shared his views and **Shri Ghanshyam Prasad**, Chairperson, CEA delivered the key-note address. **Shri R V Shahi**, President, IEF and Former Secretary, Ministry of Power set the content of the Discussion and moderated the Panel Discussion. The other distinguished Panelists who participated and shared their views were: **Shri Anil Razdan**, Former Secretary, Ministry of Power, **Shri R K Chaudhury**, CMD, NHPC; and **Shri ICP Keshari**, Former Secretary (Hydro), Ministry of Power and ADG, APP.

The following topics (tentative) are identified for the India Energy Debate:

- Relevance of continued Growth of Coal Based Power - Why and Why Not.
- Projected Growth of Power till 2047 and Target of Making India a Developed Nation - Is there a Disconnect?
- What is the Thrust- Meeting Power Demand or Accelerating Demand Growth - What, Why and How?
- Hydro power proportion declined sharply over decades - Where Did we go wrong? What needs to be done now?
- Gas Based Power Generation - Relevance of its Growth in Energy Transition
- Rapid Growth of Nuclear Power Generation - Policy changes for PPP
- Potential and Prospects of Pump Storage Power Projects - Required Policy Support
- Coal Quality - Required Policy Changes.
- Emerging Technology Solutions for Coal - CCU and Others, How to kick start?
- Coal Transportation Infrastructure and Logistics.
- Prospects of Balancing Solar, Wind, Hydro Power, Pump Storage, Battery.
- Green Hydrogen
- Transmission Challenges in rapidly changing supply and demand profiles.
- Financial Sustainability of Electricity Distribution: Challenge and Response
- Opening Up of Distribution - Challenges and Way Forward.
- Electricity in Rural Areas - Decentralized Small Solar Plants with Battery/ other Back up
- Energy Security in the Petroleum Sector - Reducing Import Dependence - a Major Challenge: Way Forward.

Glimpses of the programme are given below: