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Energy Access, Energy Security and Environmental Sustainability – India's Prime Minister Reaffirms India's Direction

R.V. Shahi



The climate debate has assumed a new dimension with a very strong articulation that, for developing nations, it is essential that energy access and energy security occupy prime consideration, without, of course, disregarding environmental sustainability. In a recent conference, the Hon'ble Prime Minister of India

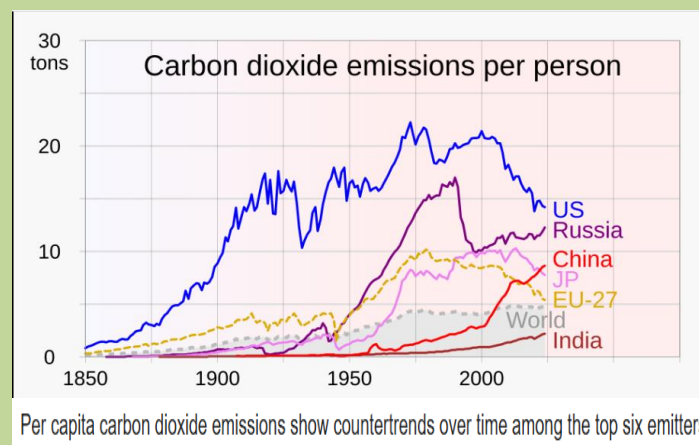
strongly argued that developing nations, particularly India, have per capita carbon emissions that are less than half the global average, whereas developed nations have contributed a much higher proportion of carbon emissions on a per capita basis. Therefore, for a developing nation like India, it is imperative that we expand energy availability on a per capita basis and also ensure energy security.

India's position right from the beginning of the climate debate has been that it accepts the principle of **Common but Differentiated Responsibilities (CBDR)** insofar as climate change issues are concerned. At COP21 this position was officially maintained, although we slightly diluted our stance. Since COP21(2015), many things have happened. The geopolitical situation has changed entirely. Developing nations are being severely affected by the political positions adopted by different countries. Energy security has consequently assumed prime consideration because, even if energy is available, whether it can be made available to other countries on reasonable terms has become a matter of concern.

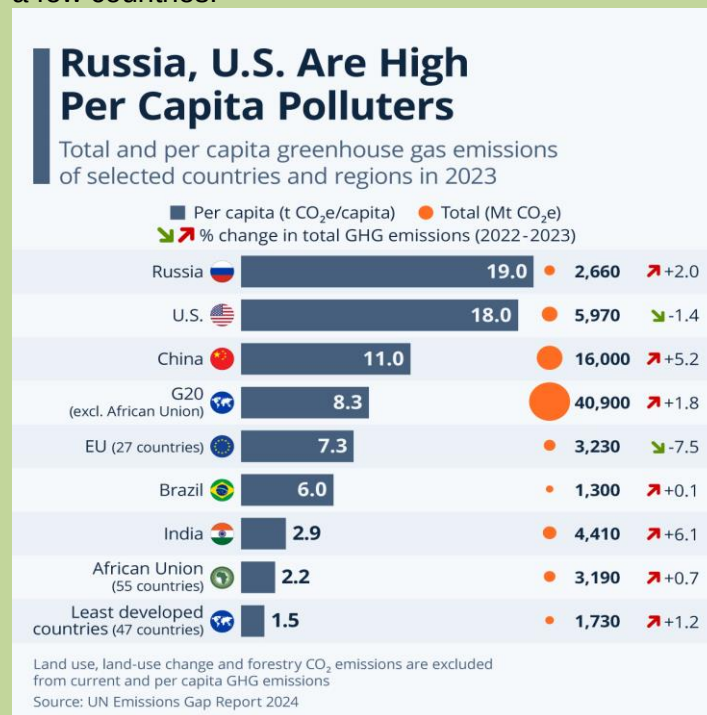
India's dependence on petroleum fuels has demonstrated this challenge very adequately. In such a situation, the country has to consider whether its development agenda - development of the lifestyle of people and bringing people from below the

poverty line to better living conditions - should remain the prime consideration, or whether it should become unduly affected by the climate debates that have continued over the years.

The following chart indicates the per capita carbon emissions of different countries. It can be seen that, right from the beginning, over almost hundred seventy years, carbon emissions per capita have behaved differently across countries, particularly between developed countries and India. India's position in this regard is comparatively much better.



The following Chart presents the current situation for a few countries:



To improve the working conditions and living standards of people, and to move people from below the poverty line to better income groups, countries like India have to struggle. In that struggle, it is essential that the development agenda occupies an important position. If that development agenda is too severely affected by environmental considerations, and if these considerations conflict with essential requirements, then it becomes a matter of choice. It is here that countries like India have to be very clear. India has always been clear, but somehow, during the last fifty years, debates even within India have seen different groups among NGOs advocating a much larger thrust on environmental issues, sometimes disregarding the dire need to raise the standard of living of people and, in particular, to take care of those who are deprived and those who do not have access to even a reasonable amount of energy.

India is very soon expected to become one of the three largest economies in the world. But in terms of per capita income, its position is still very low, and it has a long way to go. Comparing India with China, which is the only country that can be compared in terms of size, population and development needs, one can see how, during the last forty to fifty years, China has improved in terms of per capita power, per capita income as well as per capita carbon emissions. Even though China has increased its per capita carbon emission, if we look at the developed countries, their levels are much higher. Therefore, it does not adequately justify the stance that is normally taken in these climate debates, which can have the effect of depriving developing nations of the energy enhancement required for their development needs.

India vs China — what the figures show

- Delhi had an annual PM2.5 concentration of 99.6 $\mu\text{g}/\text{m}^3$ in 2025, about 20 times the WHO annual guideline of 5 $\mu\text{g}/\text{m}^3$.
- Kolkata recorded 51 $\mu\text{g}/\text{m}^3$, while Hyderabad and Chennai were around 33 and 31 $\mu\text{g}/\text{m}^3$, respectively.
- Among the Chinese cities in this dataset, Shanghai and Beijing were around 27 $\mu\text{g}/\text{m}^3$, Guangzhou about 21, and Shenzhen about 17.

- These are annual averages, not today's AQI. A city's AQI can be much higher or lower on a particular day.
- WHO's 2021 guideline recommends an annual average PM2.5 level of 5 $\mu\text{g}/\text{m}^3$ and a 24-hour level of 15 $\mu\text{g}/\text{m}^3$.

Important conclusion for a project

In the selected 2025 data, the major Indian cities shown here generally had higher annual PM2.5 concentrations than the major Chinese cities shown. However, air pollution varies greatly within both countries, and individual cities and seasons can differ considerably. China also has cities with very high pollution; for example,

Energy enhancement will sometimes inevitably conflict with concerns relating to carbon emissions, and one has to make a choice. India has deposits of energy resources in terms of coal and water, the only major energy resources that India possesses. India is embarking upon a huge programme of hydro project development and an equally significant programme of solar project development. It is trying to balance carbon emissions and the sources of carbon emissions that arise from fossil-fuel-based energy production, and it has done reasonably well during the last ten to fifteen years. Yet, it has a long way to go.

The path to making India a developed nation would definitely have to follow a balanced approach in which environmental sustainability will, no doubt, assume significant priority. However, when it conflicts with the basic requirement of enhancing energy availability on a per capita basis and, accordingly, enhancing the per capita income of the people, the country would have to make its choice very clear- in favour of energy and power. Dependence on imports has demonstrated during the last four to five years that energy security is a real matter of concern. Therefore, the entire energy agenda needs to be reoriented to factor in this type of uncertainty.

A few specific comments by the Prime Minister, at a recent International Conference on the future of environment and climate dynamics organised by the

NGT would be relevant to mention. "In developed countries, per capita carbon emissions are six times higher than India's. India presents this fact strongly on global platforms. We are establishing new benchmarks for environmental protection by taking the world along." Prime Minister further said that India is the only country in the G20 that has fulfilled all the commitments it made at the COP21 Summit in Paris in 2015, and has done so ahead of schedule. This is a strength of Hindustan that I am talking about." He further stated that, on every parameter energy capacity and curbing carbon emissions India's performance is today a subject of positive discussion worldwide. As a newspaper has observed, the Prime Minister's remarks are being seen as a pushback against the world's attempt, despite its historical responsibility for alarming emissions levels, to insist that India needs to accept further emission-reduction targets.

India's cumulative contribution to global carbon emissions from 1751 to 2024 is merely 3.5 percent, compared with 23.5 percent for the U.S., 15.4 percent for China, 6.6 percent for Russia, 5.1 percent for Germany and 4.3 percent for the U.K. Though India is currently the third-largest emitter, its per capita emissions, as the Prime Minister underlined, at 2.2 tonnes per person per year, is less than half of the global average of 4.7 tonnes per person per year and six times lower than the per capita emissions of the U.S. at 14.2 tonnes and Russia at 14 tonnes.

India's top priority for the development of renewable power and renewable energy is well established. In a short span of about ten years, the amount of capacity added through solar energy and wind turbines, together with some of the other renewable energy initiatives such as CBG, establishes that top priority has been accorded to those sources of power generation that are benign and non-fossil-fuel based.

The most recent initiative of a very significant proposed expansion of nuclear power, of the order of 100 GW by 2047, is another example of the priority that the Government is according to the development of clean and non-fossil energy. Yet, it cannot be ignored that the only major source of energy that India possesses in substantial quantity is coal. Therefore, the initiatives and priority that have been reoriented during the last couple of years towards the

development of coal-based thermal power also address the issue of India's dire need to enhance per capita power consumption. Though India has done well in capacity additions, it needs to move on an accelerated path so that it continues in the right direction towards achieving the recognition, acceptance and level of a developed nation.

It is in this context that the reorientation of the power generation agenda, incorporating coal as a source of power, is to be appreciated. This need will continue. The type of growth that the country has seen in power generation through coal may not continue in exactly the same manner as in the past. Yet, this important source of energy will have to be given due importance.

Recent developments in managing the grid indicate that this role will continue to be relevant despite the extraordinary thrust being given to hydropower development, nuclear power development, Pumped Storage Projects and, in the interim period, battery energy storage systems, which is to a great extent dependent on imports.

Therefore, while planning the energy agenda, not only the proportions of various sources of power generation have to be considered, but it also has to be examined whether, in the long run, our dependence not only on energy imports but also on technologies that are completely import-based will need a more careful consideration. In this context, the Government's initiatives towards indigenisation, domestic production, greater dependence on engineering and technology developed in India, and joint-venture arrangements with international manufacturing organisations are very important.

These developments will, in the long run, definitely reduce dependence on fossil fuels. But this path has to be very carefully charted so that, while we reasonably consider energy and environmental sustainability together, a balanced approach ensures that energy access and energy security are given prime positions without disregarding environmental concerns.

Dear Reader



India Energy Forum had recently organized a **Webinar on “Digital Transformation of Power Distribution: AI, Smart Technologies and the Road to a Reliable & Efficient Distribution System” on 30th September 2026. Prominent speakers like** Shri H C Sharma, Chief Technical Services & Power Management, TPDDL; Shri Abhishek Sharma, Co-

founder, CEO, Apparent Energy; and Shri Abhishek Ranjan, CEO, BRPL participated and shared their views. The Webinar was attended by more than 275 delegates. A report of the Webinar is given in this Issue of the TOTAL ENERGY.

India opened its nuclear power sector to wider private participation through the Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act, 2025. It seeks to increase nuclear capacity from the current 8.78 gigawatt (GW) to 100 GW by 2047.

EDF France is already in dialogue with state owned NTPC for cooperation in various energy fields especially in the green energy area. Now it is reported that Russia's state-owned nuclear energy corporation Rosatom is in talks with some of India's biggest corporate and government-owned power companies, including Adani Group, Reliance, Jindal and NTPC. The company seeks to explore participation in India's rapidly expanding nuclear power programme.

Recently the Green Energy Corridor Phase-III (GEC-III) scheme was approved by the Cabinet. This historic initiative will strengthen India's Intra-State Transmission System (InSTS) to enable evacuation of up to 135 Gigawatt (GW) of renewable energy across States/ Union Territories. The scheme also provides for deployment of 50 GWh of Battery Energy Storage Systems (BESS) at the Renewable Energy (RE) developer/generator end or any other location of importance for grid flexibility to address intermittency, congestion, peak-hour curtailment and meet non-solar hour demand.

The scheme will facilitate grid integration and power evacuation within the States/UTs of India. The scheme

is targeted to be set up by FY 2032-33 with total project outlay of Rs.1,86,405 crore, comprising Rs.1,36,378 crore for the development of Intra-State Transmission Systems (InSTS) under GEC-III, Rs.50,000 crore for 50 GWh of Battery Energy Storage Systems (BESS).

As states from Andhra Pradesh to West Bengal witness a data centre boom, the Central Electricity Authority (CEA) has set up a Committee to assess the impact of these power- and water-guzzling facilities on the country's power system and grid stability. The Committee is also examining potential cybersecurity risks, as the power sector was a key target of cyberattacks during the India-Pakistan conflict amid Operation Sindoor, people familiar with the development.

The immediate trigger for setting up the committee came after the Eastern Regional Power Committee recently red-flagged concerns raised by Odisha over grid-linked operational challenges arising from "large collective market purchases" by the industry, according to minutes of CEA committee meetings reviewed by ET

IEF will organize its annual flagship event “National Conference on Nuclear Energy: Leap Forward” on 28th November 2026 at NPCIL Seminar Hall, Mumbai. The Conference will be inaugurated by Dr A K Mohanty, Secretary, DAE and Chairman, AEC; and addressed by the prominent nuclear energy experts and policy makers. The conference will have three Sessions apart from the Inaugural Session which will focus on “New Comers Focus for Technology Choices”; “Industry Partners Focus for Supply Chain Management”; and “Emerging Technologies & Future Prospects”. It will also be addressed by the President, IEF; CMD, NPCIL; Chairman, AERB; Director, BARC; Director (T-LWR), and Director (Projects), NPCIL. The Panelists include the Representatives of: NTPC, ADANI Power, TATA Power, Jindal Power, BHEL, L&T, Godrej Boyce, Kirloskar Brothers, Walchandnagar, Bajaj Energy etc.

Other conferences on Oil & Gas & Petroleum (26th November 2026); Power including Transmission (9th December 2026); Energy Technology and Research (15th January 2027) and Renewable Energy (Mid-February 2027) will also be organized.

S M Mahajan

Nuclear Power Needs Green Energy Status, Says Power Ministry



As India finalises the rules and regulations under the SHANTI Act for private entry into civil nuclear power generation, Power secretary Pankaj Agarwal has reached out to the Department of Expenditure to accord green energy status to nuclear

power.

Agarwal has recently written to the expenditure secretary that nuclear should be included in the national green taxonomy to ensure bankability and attract climate finance. The Department of Atomic Energy (DAE) made similar requests a few months back, seeking a series of fiscal and non-fiscal incentives for the industry looking to venture into nuclear power.

Sandeep Raj, Joint Secretary and Financial Advisor, DAE, said an internal committee of DAE has given suggestions to the Department of Expenditure for inclusion of nuclear in green taxonomy.

"We had a meeting with very senior functionaries of the Department of expenditure, and they felt that even if, for various reasons, nuclear is not coming under green, it should not in any way affect the cost of borrowing. So even if it (the Department of Expenditure) doesn't classify (nuclear) in the green taxonomy, everybody knows that nuclear is one of the cleanest," said Raj, speaking at an industry event.

Current green finance frameworks -- the Sovereign Green Bond Framework, RBI green deposit rules, and SEBI green debt securities -- explicitly exclude nuclear power as it is not included in the national green taxonomy.

Low-cost capital

European Union has included certain nuclear activities in the green taxonomy. Raj said probably Korea is the only country where nuclear comes under green, world over it is treated as red.

"It is a baseload fuel which causes the least pollution. So at least for cost of borrowing, if there is some requirement like some notification needs to be done, we should be following that so that capital is available at lesser cost," he explained.

The DAE has sought that GST on nuclear be reduced from 18% to 5%, to make it at parity with the renewables like solar. It also included a mandate for a purchase obligation in nuclear power on the lines of solar.

"We had a lot of interaction with stakeholders, and there are a lot of suggestions regarding viability gap funding. So I also feel that we are trying for it and maybe we'll also come up with some sort of incentive, I mean, based on indigenization, based on cost of construction. There will be some incentives, both fiscal as well as non-fiscal, in the offing for the industry players," he said.

The industry says, keeping in mind the long gestation period of nuclear power with high cost of capital and delayed return on capital, the government needs to give green energy status to nuclear.

NPCIL begins fuel loading at RAPP-8, advancing India's nuclear push



न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड
Nuclear Power Corporation of India Limited

Nuclear Power Corporation of India Limited (NPCIL) has begun initial fuel loading (IFL) at Unit 8 of the Rajasthan Atomic Power Project (RAPP) in Rawatbhata, Rajasthan, marking a key step towards commissioning the 700-megawatt-electric (MWe) indigenous pressurised heavy water reactor (PHWR). The reactor is expected to commence commercial operation during the current financial year.

The process from initial fuel loading to commercial operation of the unit typically takes about six to eight months.

"Initial Fuel Loading commenced at 15:18 hrs on September 19, 2026, in the presence of Shri S. D. Paraswar, Director (Operations); Shri N. K. Mitharwal, Director (Projects); Shri D. S. Rao, Site

Director, Rawatbhata Rajasthan Site, along with the Station Directors,” NPCIL said in a statement.

The commencement of IFL followed permission from the Atomic Energy Regulatory Board (AERB) and completion of the prescribed prerequisites. “The permission was granted following rigorous safety evaluations, major system integrity audits and site readiness reviews conducted as part of the regulatory process,” the state-owned company said.

“With the commencement of IFL, Unit 8 has entered an important stage of its commissioning journey. The next major steps will include the First Approach to Criticality (FAC), marking the start of a controlled fission chain reaction, followed by the commencement of power generation,” NPCIL said.

Unit 8 of RAPP is the fourth reactor in the series of 16 indigenous 700 MWe PHWRs being set up in the country, the company said. The first two reactors in this series — Units 3 and 4 at Kakrapar Atomic Power Station (KAPS) in Gujarat — commenced commercial operation in 2023-24, followed by Unit 7 of RAPP in April 2025.

NPCIL said the development further strengthens the standardisation of the 700 MWe PHWR reactor design and supports its continued deployment in fleet mode.

“The progress at RAPP-8 reflects the continued advancement of India’s indigenous nuclear power programme and NPCIL’s commitment to the safe, clean, reliable and sustained generation of nuclear power-based electricity,” the state-owned company added.

Meanwhile, geotechnical investigations for Units 9 and 10 at the RAPP site in Rawatbhata also commenced on September 19, marking a key step in the foundational development of the project, The Indian Express has learnt.

Apart from Unit 8 of RAPP, NPCIL currently has eight other reactors under construction — two each at Gorakhpur in Haryana and Kaiga in Karnataka, and four at Kudankulam in Tamil Nadu.

NTPC’s mega power play: State-run giant targets 50GW nuclear capacity by 2047



India’s largest power producer is setting its sights firmly on nuclear energy with plans to develop 50GW of nuclear capacity by 2047.

The planned expansion represents exactly half of the country’s broader 100GW nuclear objective and marks a defining pivot in the state-run utility’s strategic direction.

According to a research note by JM Financial, following a day-long management interaction with NTPC Chairman and Managing Director Gurdeep Singh and Director (Finance) Jaikumar Srinivasan, nuclear power has taken center stage as “one of NTPC’s most important long-term growth options” to guarantee clean, non-intermittent baseload electricity.

JM Financial noted that NTPC is engaging with multiple international technology providers while simultaneously building its in-house technical capabilities. “Nuclear is emerging as one of NTPC’s most important long-term growth options,” it said.

To follow cost-plus model

On the commercial front, NTPC indicated that these capital-intensive nuclear developments will operate under cost-plus economics while the ultimate scale shall also depend on states’ willingness to support demand. The cost-plus model is designed to shield the balance sheet from the long gestation periods and substantial upfront expenditure inherent to nuclear energy.

The state-run firm is taking a grounded, pragmatic view on Small Modular Reactors (SMRs). The management explained that while it is actively evaluating SMR technologies, it does not view them as a near-term certainty because the “earlier global enthusiasm around SMRs has not yet translated into widespread commercial deployment,” the brokerage noted.

The NTPC management maintained that as a responsible PSU, it has to fulfill strategic objectives such as nuclear development even if another project

theoretically offers a higher Internal Rate of Return (IRR).

Beyond its nuclear push, the power major is mapping expansion across a diverse 37GW pipeline that spans conventional coal, hydroelectricity, and renewable installations. The company also views thermal generation as its core near-term earnings engine, shielded by robust power purchase agreements (PPAs) and regulated returns.

NTPC Ltd studying 2 Odisha sites for 3,200 MW nuclear plant: Govt



The National Thermal Power Corporation Limited is conducting feasibility studies at two locations in Odisha's Deogarh and Nabarangpur districts for a proposed nuclear power project, senior state govt officials said recently.

Additional chief secretary (energy) Vishal Kumar Dev said NTPC Ltd had initially identified four potential sites, but two were found unsuitable during preliminary assessments.

"They had applied for four sites. Out of these, two sites have not been found feasible. Studies are now being carried out in Deogarh and Nabarangpur districts," Dev said.

He was responding to media queries in the presence of Governor Hari Babu Kambhampati during an event marking Lok Bhavan's achievement of IGBC Platinum Green Campus certification.

Speaking on the prospects of nuclear energy, Governor said, "It could emerge as an important and economical source of power in the future, provided all safety measures are strictly followed." Dev said NTPC, in partnership with Nuclear Power Corporation of India Ltd (NPCIL), has proposed setting up a 3,200 MW nuclear power plant in Odisha.

An NTPC Ltd official said feasibility studies are underway and initial assessments appear encouraging. The energy secretary stressed that public safety and environmental safeguards would remain paramount in evaluating any nuclear power

proposal. "There will be no compromise on safety and security aspects," he said, adding that the state is exploring cleaner energy sources to meet its growing power requirements while pursuing long-term sustainability goals.

Tata Group and Adani Group have approached Odisha govt with proposals to set up nuclear power projects in the state, signalling growing private-sector interest in India's expanding nuclear energy sector. It may be mentioned here that Adani Group has proposed two nuclear power plants with a combined capacity of 6,000 MW as part of a broader clean-energy investment plan of around ₹1.5 lakh crore in Odisha. The proposal also includes pumped storage and floating solar projects aimed at strengthening long-term energy security.

Tata Group has separately proposed setting up four nuclear power units of 200 MW each in Malkangiri district. Officials said details of the investment size are yet to be disclosed. Odisha's Vision 2036 and 2047 roadmap identifies Small Modular Reactors (SMRs) as a promising technology for the future, with the long-term goal of positioning Odisha as a major energy hub.

Westinghouse plans 18 nuclear power plants in India by 2047



Westinghouse The Westinghouse Electric Company (WEC) of the US is looking to deploy 18 AP1000 nuclear power plants of 1,000 MW each in India by 2047 and is in talks with Indian industry players for manufacturing them in India.

According to the company, AP1000 features an innovative passive safety system that offers significant capital savings and lower maintenance costs. Two AP1000 reactors are operating in the US and four in China, while more are in the pipeline in Europe.

France's EDF pushes for its nuclear reactor tech in India



Senior officials of the Ministry of Power recently held a meeting with French government-owned

energy major Électricité de France (EDF) on the proposed deployment of European Pressurised Reactors (EPRs) in India, which has recently opened up its tightly-regulated civil nuclear sector for private players.

The opening up of the nuclear sector has renewed interest among global nuclear majors — including those from France, the US and Russia — in India's nuclear power programme. The government is now moving towards finalising the rules and regulations under the SHANTI Act.

France, a global leader in nuclear reactor technology, has shared close and trusted ties with India for several decades, including in the strategic and civil nuclear sectors.

"The discussions centred on the deployment of EPR technology, India's regulatory reforms for the nuclear sector, cooperation on pumped hydro storage projects, and the way forward for a robust, mutually beneficial partnership," the power ministry said in a statement.

The meeting assumes significance as the Department of Atomic Energy (DAE) last month issued the draft rules and regulations of SHANTI Act, laying out the regulatory framework for a wider nuclear power ecosystem, including private participation, captive nuclear generation, foreign reactor technology, licensing, safety oversight and nuclear liability.

Pankaj Agarwal, secretary at the Ministry of Power, officials of the Ministry of External Affairs, Central Electricity Authority (CEA), NTPC Limited and NPCIL on the Indian side, and by officials of EDF and the Embassy of France in India on the French side attended the meeting.

According to the power ministry, EDF briefed Indian officials on its efforts to develop an ecosystem and supply chain in India to enable large-scale localisation.

The French company reiterated that a sizeable programme involving multiple nuclear reactors would provide suppliers with confidence and enable economies of scale by leveraging the capabilities of Indian industry.

Agarwal briefed the French side on the progress in finalising India's regulatory framework for the nuclear power sector, including the draft SHANTI (Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India) Rules and Regulations, which were recently placed in the public domain by the DAE for stakeholder consultation.

"The two sides also discussed cooperation on pumped hydro storage projects, building on the proposed NTPC-EDF joint venture in this area," the ministry added.

EDF is already working with India's state-owned Nuclear Power Corporation of India to develop next-generation reactors, including the Jaitapur nuclear plant with a proposed capacity of 9,900 megawatt-electric (MWe). However, the project has been stalled for years, with the expected high electricity tariff emerging as one of the key hurdles to its progress.

Last year, India and France had signed a letter of intent on small modular reactors (SMRs) and advanced modular reactors (AMRs).

The developments come as India seeks to scale up its domestic civil nuclear capacity to 100 gigawatt-electric (GWe) by 2047.

India's civil nuclear power expansion is expected to involve fleet-mode deployment of reactors, including indigenous 700 MWe pressurised heavy water reactors (PHWRs) as well as foreign technologies such as light water reactors and pressurised water reactors.

Industry executives believe the initial deployment is likely to rely largely on indigenous PHWR technology, while foreign reactor technologies could be deployed at a later stage, as PHWRs alone may not be sufficient to meet the capacity target.

However, the cost of foreign reactor technologies remains a key concern.

According to industry executives, foreign technology providers would need to maximise localisation in India to make projects commercially viable, given the importance of costs in determining the

competitiveness and affordability of nuclear power, this newspaper had earlier reported.

Rosatom in talks with Adani Group, RIL, NTPC for nuclear power push in India



Russia's state-owned nuclear energy corporation Rosatom is in talks with some of India's biggest corporate and government-owned power companies, including Adani Group, Reliance, Jindal and NTPC. The company seeks to explore participation in India's rapidly expanding nuclear power programme, Kirill Komarov, First Deputy Director General for Corporate Development and International Business at Rosatom, told businessline.

The development follows India opening its nuclear power sector to wider private participation through the Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act, 2025, and seeks to increase nuclear capacity from the current 8.78 gigawatt (GW) to 100 GW by 2047.

Building capacity

"We now have talks with a lot of companies from the private sector, including all your famous names like the Adani Group, Reliance and Jindal, and your state-owned company NTPC," said Komarov. "All of them are interested in having access to nuclear technologies." Private participation, he said, will allow more companies to invest and build capacity alongside state-owned enterprises.

Rosatom, which accounts for about 20 per cent of Russia's power generation, ranks first globally in terms of the order portfolio size for constructing nuclear power plants, with 46 units at various implementation stages across 10 countries, including China, India, Bangladesh, Türkiye, Egypt, Hungary, Iran, and Kazakhstan.

The Indian government has been pushing for nuclear energy as it is a base load source of electricity available round the clock, with lifecycle emissions comparable to renewables such as hydro and wind power. It is also uniquely placed to meet always-on power needs of data centres, advanced industries and emerging technologies.

Currently, the domestic nuclear power capacity accounts for a mere 1.6 per cent of India's total installed capacity of 556.85 GW. Coal accounts for 45.35 per cent and renewable energy makes up 43 per cent.

Opening up is good

Komarov emphasised that the scale of the target makes it necessary to bring more companies into the sector. "Such an ambitious task is very difficult for only one company," he said, referring to the Nuclear Power Corporation of India (NPCIL), which currently operates and is building most of India's nuclear fleet.

"It's very good if your government decided to invite into the nuclear sector, not only state-owned companies but private companies, too, because you need a lot of companies who will construct, operate, invest money, put in effort and resources to do these very complicated things," he noted.

For Rosatom, the opportunity is not limited to supplying reactors. Komarov said localisation will be central to India's nuclear expansion, adding that the scale of the programme makes it impractical to rely on imported equipment and materials. "I think the key element of success for your country is your localisation [Make in India] programme. For such an ambitious programme, you need to be able to not only import all equipment and materials but also produce a majority of these things in India."

Rosatom, he said, had already reached 50 per cent localisation at Kudankulam in Tamil Nadu, and was ready to replicate the model with new Indian companies entering the nuclear sector.

Expert in the field

As one of the world's largest integrated nuclear energy companies, with operations spanning reactor construction, nuclear fuel, uranium mining and the wider nuclear fuel cycle, Komarov stressed on Russia's experience as a nuclear power technology and services exporter. Of its 32 nuclear units currently under construction globally for export, Komarov said 28 were based on Russian designs. Rosatom, he added, had also constructed about 20 nuclear power plants over the past two decades.

Why Adani and Tata Power are turning to foreign nuclear reactors over local models

Industry heavyweights including Reliance, Adani, Tata Power, JSW, and Jindal Nuclear Power Private Limited have opened discussions with global suppliers across the US, France, Korea, Russia, and Japan. Their focus is on SMR technology, an emerging field that is still under active development worldwide.

Meanwhile, India's domestic 220-megawatt Pressurised Heavy Water Reactor (PHWR) hasn't seen a new deployment since 2011, and core manufacturers have halted production of compatible nuclear turbines.

PHWR challenges

The Nuclear Power Corporation of India Ltd (NPCIL) is currently working to adapt its 220 MW PHWR design into Bharat Small Reactors (BSR). Teams are drawing up modified blueprints to add steel liners alongside upgraded control and instrumentation systems to bolster overall safety.

"The last 220MW PHWR in India was deployed way back in 2011 and some of these units are still operational. The NPCIL is making changes to its design 15 years later and those design drawings are not available for now," said a company spokesperson.

Equipment sourcing presents another steep hurdle for companies looking to set up the older 220 MW PHWRs. Major domestic suppliers like L&T and BHEL have discontinued manufacturing 220 MW turbines.

"If they want to start manufacturing these again, they would need to have sufficient order volume to again allocate some of their manufacturing space for this technology. At present, there is no other technology other than 220MW which is immediately available and this has its own challenges because it is on natural uranium, generating a lot of spent fuel which requires daily re-cooling," added the spokesperson.

As India pushes toward a target of 100 GW in nuclear capacity by 2047, industry experts maintain that adopting a mix of multiple technologies will be essential for medium and long-term success.

Demand for smaller reactors

To navigate massive initial capital costs, Indian firms want to start with smaller capacity reactors under 300 MW before scaling up to units exceeding 700 MW. However, operational track records for smaller units remain limited globally.

"Most of the existing operational foreign technology reactors are above 1,000 MW, whether it is French multinational EDF, US-based Westinghouse, or Russian state player Rosatom. Mostly, these reactor designs are available in twin construction means you have to take two reactors. So, if somebody is taking two 1,000 MW reactors, then your capacity becomes 2,000 MW, and their cost is very high," said an industry spokesperson from the metal sector.

Industry estimates put the average cost of foreign reactors at ₹35 crore per megawatt, bringing a 2,000 MW installation to roughly ₹70,000 crore.

"A private developer may not be able to commit such huge investment in the first project, when they are entering the market. That is why many private developers are looking to start with a smaller unit. The cost of a 2X220MW reactor, having an average cost of ₹20-25 crore per MW, is around ₹8,800-₹11,000 crore," said the spokesperson.

Need assessment

Corporate interest in nuclear power is largely driven by captive power needs to hit zero-carbon targets. For operational resilience, businesses favour running four smaller reactors instead of leaning on a single 1,000 MW plant.

"Even when one of the reactors is under maintenance or one reactor is down, I will still be able to get 70-75% of the power. For captive users, a smaller unit is preferred so that you have multiple units and even if one unit is down, your plant is not stopped," said the spokesperson.

Data centers, commercial operators, and heavy production sectors like steel, aluminum, and cement find utility-scale 1,000 MW reactors impractical. For these operations, smaller setups ranging between 220 MW, 300 MW, or up to 500 MW remain the functional choice.

Grid management, transmission key challenges as India's non-fossil power capacity crosses 300 GW; Power Secretary



India's non-fossil energy capacity has crossed 300 GW, marking a major shift in the country's power sector, with grid management and transmission expansion emerging as key challenges, Power Secretary Pankaj Agarwal said recently.

"We are already at 300 gigawatts of non-fossil, and now going forward, the challenges are entirely different. Grid management itself is a challenge, and building transmission systems is a challenge," Agarwal said.

He was speaking to reporters on the sidelines of the 2nd Indian Power Sector Conference, "Building a Reliable, Flexible and Market-Ready Power System".

Agarwal said the government has moved a Cabinet note for inter-ministerial consultation on a new power policy, which is being framed keeping in view the changing requirements of the sector and the objectives of Viksit Bharat 2047.

He said the existing power policy was issued in 2005, when the sector faced a different set of challenges, including shortages and limited access to flexibility.

"The last policy we issued in 2005, there were very different sets of challenges. Access to flexibility was one such challenge and shortages were another challenge. We were only initiating at that point of time and thinking about new sources of renewable energy, the sun and the wind," he said.

The Power Secretary said the sector now needs financially sustainable, self-reliant and technology-driven distribution companies to meet emerging requirements. "I think that is another way forward, where we need to really go," he said. Agarwal also stressed the need to promote open access to make Indian industry more competitive and encourage industries to shift towards green power. "Open access, yes, because if we really want our industry

to be competitive, we need to promote open access in a big way," he said. On grid utilisation, Agarwal said fluctuations were inevitable but better utilisation of existing transmission infrastructure would be important.

"If the grid is utilised better, say 24 by 7, that is the best. You can't expect the grid to be utilised 24 by 7 at a particular level. There will be fluctuations, but given those fluctuations, if we can really use 60 per cent of the grid capacity, I think that is a fairly good strategy," he said.

On smart meters, Agarwal said Indian chip developers and manufacturers were working on designing chips that would be tested and validated before commercial production. Procurement of such products would provide an assured market for domestically designed chips and meters using them, he said.

On coal availability for power plants, Agarwal said unusual rainfall patterns had affected coal supplies in producing regions even as electricity demand remained elevated in consuming areas. "Particularly in this month of September, coal-based electricity generation demand is elevated by 14 per cent plus," he said.

Agarwal said Coal India Ltd, captive mining companies and commercial coal producers were working to address the supply situation. He added that there was currently no logistics constraint, with more than 440 coal rakes being received daily. "Domestic supply is actually very good. Now it has picked up and with the recession in rainfall, production will only go up," he said. He also said an option had been provided to import 654 MW of power through the power market, except during the 1800-2400 hours period. This allows power imports for 18 hours a day, based on demand and market bidding.

The broader objective of the proposed new power policy would be to address the changing needs of the sector, including flexibility, grid management, transmission expansion, distribution reforms and greater participation of industry through open access.

India plans 900 GW transmission network by 2035-36 as renewables scale: Ghanshyamprasad, Chairperson, CEA



India is preparing its power system for a much larger renewable energy footprint, with a transmission plan aligned to around 900 GW of capacity by 2035-36 and a sharper focus on pumped storage, batteries and grid-forming technologies to manage the variability that comes with higher clean-energy penetration.

Ghanshyam Prasad, Chairperson, Central Electricity Authority, said India's 500 GW non-fossil capacity ambition for 2030 increasingly appears achievable after the country accelerated its pace of capacity addition. Delivering the next phase, however, will require generation, transmission and storage infrastructure to expand in tandem.

In a National Policy Keynote at the 6th edition of the ET Energy Leadership Summit 2026 recently, Prasad said India recently crossed around 300 GW of non-fossil capacity and added roughly 64 GW of generation capacity during 2025-26, including more than 50 GW of renewable capacity.

The two-day event is being held from September 9-10, 2026, in New Delhi. "Achieving 500 gigawatts is not a challenge now," he said, while cautioning that generation "cannot go alone" without corresponding transmission development.

Transmission planning moves beyond 2030

The transmission system originally planned around the 500 GW target is already being implemented, while CEA has developed a further transmission roadmap aligned to around 900 GW by 2035-36.

Prasad said power demand could approximately double over the coming years and rise several-fold by 2047, requiring India to maintain a diverse generation mix rather than depend on any single energy source. Alongside solar and wind, nuclear power is expected to play a larger role, with India targeting 100 GW by 2047. Pumped storage emerges as critical balancing resource Prasad

placed particular emphasis on pumped-storage projects as renewable penetration increases. India had remained at roughly 4.7 GW of pumped-storage capacity for an extended period, but around 2.6 GW was commissioned last year, with approximately 3 GW targeted this year.

Policy reforms have also expanded the identified pumped-storage potential from around 94 GW in 2022 to more than 300 GW, he said. Closed-loop, off-stream projects represent a particularly significant opportunity, with more than 200 GW of identified potential and development timelines that can potentially be reduced to around three-and-a-half to four years.

Battery energy storage will need to complement pumped storage, Prasad added, pointing to government support mechanisms aimed at accelerating deployment. A more complex grid needs new technologies. Higher renewable penetration is also introducing technical challenges ranging from reduced inertia and voltage quality issues to oscillations and harmonics.

Prasad said solutions such as STATCOMs, synchronous condensers, grid-forming inverters, supercapacitors and harmonic filters will increasingly form part of India's grid architecture. Transmission innovation will also be needed to address right-of-way constraints. Technologies such as insulated cross-arms could reduce corridor requirements while lowering steel usage by around 30-40 per cent, he said. Domestic manufacturing, cyber security and faster regulatory approvals will be equally important as the system expands. India's next power-sector milestone will therefore not be defined by renewable capacity alone. The test will be whether transmission, storage, domestic equipment supply and grid technologies can scale quickly enough to maintain reliability as the country moves towards its 2035-36 and 2047 ambitions.

India sees no growth in power sector CO₂ emissions as clean energy rises: Report

A surge in clean energy in India has kept carbon dioxide (CO₂) emissions in check across the country's power sector, with no growth from the first half of 2024 to the same period in 2026, and this is

the first time in more than 50 years that there has been no growth in coal power over a two-year period, found an analysis published by the UK-based Carbon Brief recently.

The analysis, done by Centre for Research on Energy and Clean Air (CREA) for Carbon Brief, underlined that coal power has not recorded growth during the period, even as overall electricity demand grew.

It also noted that both oil and gas consumption, at the same time, have fallen across the nation for two years in a row, helping alleviate the shock of the Hormuz crisis. Emissions from oil and gas, in fact, fell by 7% year-on-year, extending a reduction that began in 2025, despite higher demand for road transport fuels.

Nevertheless, the new six-monthly analysis shows that India's emissions grew by 3.7% year-on-year in the first half of 2026, due to increases from steel, cement and other sectors. The analysis found that the carbon-intensive steel and cement emissions grew by 8% year-on-year, reaching a 23% share of India's total CO₂ in the first half of 2026.

Flagging India's performance, the report noted that clean energy met all of the 7% rise in the country's electricity demand over the two years, adding 63 terawatt hours (TWh), equivalent to the total demand of Switzerland. India has added 77 gigawatts (GW) of solar in this two-year period, helping meet 60% of the rise in electricity demand overall, it added.

Looking at the state-wise contribution that led to the clean-power shift in India, the report said Gujarat saw both the largest reduction in fossil-fuel generation and the largest expansion in clean power. After Gujarat, the largest increases in clean-power generation were seen in Rajasthan and Tamil Nadu, which also saw reductions in power generation from fossil fuels.

The report suggested that if the pace of India's clean-energy expansion is to continue, it will need to upgrade its electricity grid, rapidly build out energy storage and boost the flexibility of coal power.

The analysis, based on official monthly data for fuel consumption, industrial production and power

generation from different ministries and govt institutes, shows that though clean-energy expansion is covering most or all of India's power-demand growth, the fossil-fuel industry continues to pursue major capital investments.

India's Power Capacity to Surpass 2,000 GW by 2047: ENCIS Outlook



India's installed electricity capacity is projected to exceed 2,000 GW by 2047, nearly four times the current level, driven by a rapid expansion in clean energy, according to the India's Power & Energy Transformation Outlook report released by the Energy & Climate Initiatives Society (ENCIS).

The report was unveiled at Yashobhoomi, New Delhi, during the inaugural session of Bharat Electricity, POWERGEN India & Indian Utility Week 2026. It projects solar power capacity to rise from around 119 GW currently to more than 1,100 GW, highlighting the scale of infrastructure, technology and policy support required to meet India's long-term energy ambitions.

According to the report, non-fossil sources account for 53% of India's installed electricity capacity of around 540 GW, putting the country five years ahead of its target. Meanwhile, peak electricity demand has nearly tripled since 2000 and is forecast to reach 366 GW by 2032, representing a 34% increase, driven by emerging loads from data centres, electric mobility and green hydrogen.

The report said India will need to significantly accelerate renewable energy deployment to reach 500 GW of non-fossil fuel capacity by 2030, while maintaining grid reliability. Grid-scale energy storage capacity is expected to require a nearly 40-fold increase to 200 GWh by 2030.

Distribution infrastructure remains a key challenge, with the report noting that nationwide smart meter deployment is expected to reach 250 million units by FY2028. This could enable real-time management of around 90% of consumer demand and help bring average AT&C losses below 10% nationally.

Despite progress in reducing distribution losses to around 15%, the report highlighted bottlenecks in the distribution segment, with 44 GW of renewable energy capacity reportedly held up due to contractual or financing issues.

Coal is expected to continue playing a role in maintaining grid stability, with coal-fired power plants required to operate at a minimum technical load of 40% and achieve ramp rates of 3% by 2030, according to the outlook.

The report estimates that India's power sector will require around \$500 billion in investment by 2030, while more than one million skilled workers will be needed to support the country's digitalisation and clean energy transition.

The report was released in the presence of senior government and industry representatives, including former Ministry of New and Renewable Energy Secretary Bhupinder Singh Bhalla, former CEA Chairperson P.K. Pujari, Ministry of Power Additional Secretary D. Sai Baba, Central Electricity Authority Chairperson Ghanshyam Prasad, Bihar Energy Minister Shailesh Kumar, Delhi Minister Ashish Sood and ENCIS Director General Abhishek Bhatnagar.

The three-day event, organised by ENCIS, is bringing together more than 15,000 professionals, 250 exhibitors and 150 global thought leaders from 40 countries. Participants and delegations from countries including the US, UK, Germany, France, Japan, South Korea, Australia, UAE and Singapore are attending the event in New Delhi.

With the theme "Shaping Energy Sovereignty • Building Climate Resilience • Powering Viksit Bharat," the event focuses on clean energy technologies, manufacturing, infrastructure and international collaboration to support India's evolving power sector.

India's coal-fired power generation falls for first time in 50 years: IEA



Coal-fired power generation in India declined in 2025 for the first time in 50 years, driven by an early and unusually strong monsoon and the expansion of

renewable energy, according to the International Energy Agency's (IEA) latest coal market update.

India's coal demand fell 1 per cent to 1,299 million tonnes (MT) in 2025, while coal production remained around 1.1 billion tonnes for the second consecutive year. The production was supported by continued efforts to strengthen domestic supply and reduce dependence on imports.

For the first time in five decades, coal-fired power generation declined in both India and China in the same year. While the decline in China was driven by the rapid expansion of renewable energy, India's fall was supported by the unusually strong monsoon.

The IEA expects India's coal production to increase by just 1 per cent, with captive and private mines continuing to expand output while growth in production from Coal India, the country's largest coal producer, moderates.

High inventories have also constrained further expansion in coal production. Large pithead stocks and comfortable inventories at power plants have reduced the need to accelerate output, while growing domestic capacity is increasingly displacing imports, particularly among electric utilities and industrial users.

A particularly strong El Niño weather phenomenon in 2026 is expected to support coal demand in India by increasing cooling needs and reducing hydropower output in some major coal-consuming countries in Asia, including India and Vietnam.

India and Europe remain the main sources of decline in seaborne thermal coal demand, the IEA said.

CERC Proposes Grid Code Amendment 2026 to Tighten Congestion Charges and Payment Default Rules



The Central Electricity Regulatory Commission (CERC) has issued a draft notification proposing the Indian Electricity Grid Code (Second Amendment) Regulations, 2026, aimed at strengthening grid security, streamlining power

scheduling, updating project trial-run procedures and introducing measures for transmission congestion and payment defaults. The draft was issued on September 21, 2026, and most provisions will take effect from the date of publication in the Official Gazette. Changes relating to operational timelines under Para 16(B) are proposed to take effect from April 1, 2027.

The draft introduces new definitions, including Central Hydro Generating Stations (CHGS), Renewable Energy Implementing Agencies (REIA) and Congestion Charges. It also establishes a Default Trigger Date for entities failing to clear statutory dues. For unpaid accounts, the date will generally be 75 days after the Regional Power Committee issues the account. In cases where payment security mechanisms are not replenished, the trigger date will be the next bank working day.

The proposed regulations provide a framework for imposing congestion charges on regional entities responsible for congestion in inter-regional or intra-regional transmission links. This may include over-drawal, under-injection, under-drawal or over-injection. The National Load Despatch Centre and Regional Load Despatch Centres will issue warning notices when transmission flow exceeds the Available Transfer Capability. Congestion charges will be imposed if the flow exceeds the Total Transfer Capability.

Entities liable for congestion charges will have to deposit the amount into the designated pool account within 10 days. Delayed payments will attract interest at 0.04% per day.

CERC has also proposed stricter measures against entities defaulting on charges such as Deviation Settlement Mechanism (DSM), congestion charges and reactive energy charges. After the Default Trigger Date, scheduling under Temporary General Network Access (T-GNA) will be regulated and subsequently suspended. If the default continues for two months, short-term contracts under General Network Access (GNA) will also face complete regulation. Access associated with non-short-term contracts will be reduced progressively by 5% every month until the outstanding dues are cleared.

The draft also proposes changes to trial runs and commercial operation procedures. Entities seeking extensions for power interchange will need to submit applications at least 10 days in advance. RLDCs may grant cumulative extensions of up to three months.

For generating projects of 250 MW or more, trial runs may be conducted in partial-capacity blocks of at least 50 MW. Specific trial-run provisions have also been proposed for standalone Energy Storage Systems and Pumped Storage Plants. During PSP trials, brief interruptions will be permitted, subject to a cumulative limit of four hours.

Scheduling of infirm power before COD will be permitted only after successful completion of the required trial runs. Such scheduling will have to comply with existing contractual arrangements or provide the contracted buyers with a first-refusal opportunity through seven days' notice.

The amendment further proposes a framework for state governments to schedule, sell and account for their free-power entitlement from Central Hydro Generating Stations directly from the bus bar. CERC has also proposed changes to Unit Shut Down and Security Constrained Unit Commitment procedures, enabling NLDC to commit or decommit generating units in real time to maintain grid balance and security.

Tata Power's Mundra plant to continue operations till December 31 under Centre's directions

Tata Power's Mundra thermal power plant will continue operating under directions issued by the Centre until December 31, 2026, after the Ministry of Power further extended their validity by three months. The company said it has received a letter from the Ministry of Power extending the directions issued under Section 11 of the Electricity Act, 2003, for its Mundra Thermal Plant. The directions, which were earlier valid until September 30, 2026, will now remain in force until December 31, 2026, Tata Power said in a regulatory filing recently..

"India's solar capacity rose from 2 GW to over 160 GW in 12 years": says PM Modi



Prime Minister Narendra Modi recently highlighted India's expansion in clean energy, saying the country's solar energy capacity has increased from around 2 GW 12 years ago to more than 160 GW recently.

Speaking at the International Conference on "The Future of Environment and Climate Dynamics" in Delhi, PM Modi said India had also expanded the use of rooftop solar, solar pumps, LED bulbs and other energy-efficient technologies as part of its efforts to reduce carbon emissions.

"Twelve years ago, India's solar energy capacity was around 2 Gigawatts. Today, that capacity has surpassed 160 Gigawatts," PM Modi said.

He said the government had launched the PM Surya Ghar: Muft Bijli Yojana to turn households into hubs of solar power generation, adding that rooftop solar panels had been installed in more than 50 lakh homes under the scheme.

According to recent government data, more than 50 lakh households had benefited from rooftop solar installations under the scheme by August 2026, with 14.8 GW of rooftop solar capacity commissioned.

PM Modi said the government had provided financial assistance of up to approximately Rs 80,000 per household under the scheme.

He also highlighted the Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM), saying solar pumps had been installed on the farms of around 30 lakh farmers.

The Prime Minister said India had also completed the "One Nation, One Grid" project and distributed LED bulbs to millions of households to promote energy efficiency.

"Through solar energy alone, India has successfully prevented approximately 20 crore tonnes of carbon emissions," he said.

PM Modi said India's clean energy expansion was not limited to solar power and highlighted growth in other sectors.

"Alongside solar energy, India has achieved significant milestones in other clean energy sectors as well. Over the past 12 years, the country's wind energy capacity has tripled. Hydro energy capacity has seen substantial growth, and the nation is now rapidly advancing its nuclear energy generation," he said.

He also referred to the development of technologies aimed at enabling cleaner utilisation of existing energy resources, including coal gasification.

The Prime Minister said India was also advancing hydrogen-based mobility, noting the launch of the country's first hydrogen train, which he described as marking a new phase in clean mobility. He further highlighted the growth of electric vehicles in the country, saying their number had increased nearly 950-fold over the past 12 years. PM Modi also raised the issue of debates surrounding nuclear energy projects, saying that some of those who speak about environmental protection also approach courts against nuclear projects when the government seeks to expand them.

The Prime Minister's remarks came as India continues to expand renewable energy capacity and household-level clean energy adoption. Government data shows installed solar capacity had reached 164.59 GW by July 31, 2026, up from around 2.8 GW in 2014.

Under the PM Surya Ghar scheme, the government aims to support rooftop solar installations in one crore households, with the programme having crossed the 50-lakh household milestone in 2026.

Non-fossil sources account for 54.18 % of India's installed electricity capacity: Bhupinder Yadav



Non-fossil sources in India now account for 54.18 per cent of installed electricity capacity, surpassing the 2030 target of 50 per cent, Environment Minister Bhupinder Yadav said recently.

The minister also said India ranks third globally in renewable energy-installed capacity and is the world's second-largest solar-growth market, demonstrating that economic growth and climate action can advance together. Yadav made these comments during the inauguration of the National Green Tribunal's (NGT) two-day international conference here on "The Future of Environment and Climate Dynamics".

In his address, the minister noted that India's approach to environmental responsibility is rooted in its civilisational ethos, which views the Earth as a shared inheritance and a sacred trust, and reaffirmed the country's commitment to collective action towards a sustainable, resilient and just future. Yadav also emphasised that the choice before the world is not between development and environment, but between sustainable development and development that cannot be sustained. The minister pointed out that forums bringing together judges, policymakers, scientists, practitioners and experts from across the world are vital at a time when environmental challenges transcend national boundaries.

Small Hydro Power has a distinctive role in India's clean energy transition: Shri Shripad Yesso Naik



Small Hydro Power has a distinctive role in India's clean energy transition, said Shri Shripad Yesso Naik, Minister of State for New and Renewable Energy and Power while addressing the Curtain Raiser Programme for the dedicated

Small Hydro Power (SHP) session at the Bharat Renewable Energy Summit & Expo 2026 held

recently in New Delhi. Addressing the gathering, he said that Small Hydro Power can contribute to energy security, decentralised generation, employment and socio-economic development in remote areas.

Shri Naik said that under the visionary leadership of Prime Minister Shri Narendra Modi, India's clean energy journey has undergone a remarkable transformation, propelling the country to the forefront of the global energy transition. He said renewable energy has emerged as a powerful instrument of energy security, economic growth, technological progress and employment generation.

The Minister highlighted that India has crossed the milestone of 300 GW of installed non-fossil-fuel capacity. He said the strength of India's energy transition lies in building a diverse, balanced and resilient energy portfolio suited to the country's geography, resources and development needs.

Shri Naik emphasised the significant potential of Small Hydro Power in this context. He said India's presently assessed Small Hydro Power potential is around 21 GW across more than 7,100 identified sites, of which only about 5.2 GW has been harnessed. He noted that this represents a significant opportunity for further development of the sector.

Shri Naik said the significance of Small Hydro Power goes beyond adding generating capacity. He noted that, wherever technically and environmentally feasible, appropriately designed run-of-river projects can provide a renewable energy option requiring relatively less land and avoiding the large-scale submergence and displacement associated with major reservoir-based projects.

He said Small Hydro Power can provide dependable renewable electricity closer to the point of consumption, strengthen decentralised generation and contribute to the resilience of the power system, particularly in geographically challenging regions. The sector can also create employment, support local enterprises and generate economic opportunities in remote areas while maintaining sensitivity towards ecology and local communities.

The Minister highlighted the Government's proposed Small Hydro Power Development Scheme for the period 2026-27 to 2030-31, with an outlay of ₹2,584.60 crore and a target of approximately 1,500 MW of new Small Hydro Power capacity. The Scheme will also incentivise States to prepare Detailed Project Reports for about 200 projects, thereby creating a pipeline of Small Hydro Power projects for future development.

The Minister stressed that Government support alone cannot unlock the full potential of the sector and called for a strong partnership among the Central Government, State Governments, developers, financial institutions, technology providers and investors. He emphasised the need for policy certainty, streamlined approvals, improved ease of doing business, stronger Centre-State coordination and better bankability of projects.

Shri Naik said that the Curtain Raiser Programme marks the beginning of an important national conversation on how India can make fuller and smarter use of its Small Hydro Power potential. He said the dedicated Small Hydro Power session at the Bharat Renewable Energy Summit & Expo 2026, to be held from 2nd to 5th November 2026 at Bharat Mandapam, New Delhi, will provide an important platform to deliberate on policy reforms, investment, financing, technology and partnerships.

The Minister invited all stakeholders to participate in this national endeavour and work together to harness India's river systems, geographical diversity, indigenous technological capabilities and modern innovation to build a cleaner, stronger, more self-reliant and sustainable India.

Shri Santosh Kumar Sarangi, Secretary, Ministry of New and Renewable Energy (MNRE), extended a warm invitation to participate in large numbers in the forthcoming Bharat Renewable Energy Summit and Expo 2026.

The Secretary highlighted the long lead time in starting hydropower projects as a key challenge, noting that delays in obtaining forest, environment and right-of-way clearances adversely impact timely project execution. He said that while the Ministry of New and Renewable Energy (MNRE) has been

assured by the Ministry of Environment, Forest and Climate Change (MoEFCC) of timely clearances, particularly for small hydropower projects, a mechanism should be developed to generate and escalate alerts in cases of undue delays.

Emphasising the need to improve the bankability of small hydropower projects, the Secretary said that their unique cash-flow profile necessitates access to long-term patient capital. He urged the Indian Renewable Energy Development Agency (IREDA) to take the lead in working with banks and multilateral development institutions, including the Asian Development Bank (ADB) and the World Bank, to facilitate greater availability of patient capital for project developers.

He urged the stakeholders to share their ideas and experiences and suggest what else could be done to promote hydropower, particularly small hydropower, in the country.

Solar Energy Corporation of India Limited will continue to play a central role towards achievement of India's clean energy vision: Shri Shripad Yesso Naik

"SECI's 15-year journey stands as a reflection of India's growing leadership in the global renewable energy transition," said Shri Shripad Yesso Naik, Minister of State, Ministry of New & Renewable Energy and Power while addressing the gathering at the celebration of the 15th Foundation Day of Solar Energy Corporation of India Limited (SECI) recently as the Chief Guest.

Shri Naik said that SECI has consistently delivered on the nation's clean energy vision and expressed confidence that the corporation will continue to play a central role towards its achievement.

The event was also graced by Shri Ghanshyam Prasad, Chairperson, CEA, Shri Mayank Tewari, Additional Secretary, MNRE and Shri Vivek Jain, Chairman, INOXGFL Group along with other senior officials of the Renewable Energy sector.

Speaking at the event, Shri Akash Tripathi, Managing Director, SECI, said that SECI remains committed to open new opportunities in the

renewable energy sector, working closely with all stakeholders and innovating with market's requirements. These 15 years have been a testament to SECI's dedication and the nation's collective will towards sustainable energy. We are thankful to all our stakeholders for putting their faith in us.

The Stakeholders' Meet featured two thematic sessions, "Reimagining Industry through Green Molecules" and "The Changing Energy Landscape: Distributed Renewables and New Energy Markets," bringing together policymakers, industry leaders and financial institutions to deliberate on emerging opportunities and challenges shaping India's energy transition.

The first session, "Reimagining Industry through Green Molecules," explored the role of green hydrogen and its derivatives in decarbonising hard-to-abate sectors and creating new avenues for industrial growth. The session covered opportunities for domestic production and emerging applications, along with the policy support, infrastructure, technology and financing required to develop green molecule markets on a scale.

The second session, "The Changing Energy Landscape: Distributed Renewables and New Energy Markets," examined the evolving role of distributed RE in India. Key areas of discussion included greater consumer participation, integration of distributed energy resources and emerging market mechanisms, as well as the policy and regulatory frameworks needed to facilitate their effective integration and support the expansion of renewable energy.

As SECI marks 15 years of service to the nation, its cumulative achievements stand at over 41 GW of renewable energy generation capacity commissioned through third-party developers, power sale agreements of over 67 GW signed with various DISCOMs/consumers, and cumulative market investments enabled for about ₹3.6 lakh crores. The company is rapidly scaling with its own projects' portfolio as well and is also active in promoting energy storage, green hydrogen and allied areas.

Incorporated on September 20, 2011, SECI, a Navratna CPSE under the Ministry of New and Renewable Energy, began as the country's dedicated implementing agency for the National Solar Mission and has since grown into the foremost CPSE focused exclusively on Renewable Energy, with a mandate spanning the complete Renewable Energy ecosystem.

India to add about 8 GW wind energy capacity in FY27: MNRE



India will add 7.5-8 GW wind energy capacity addition in the current fiscal year, said Rajesh Kulhari, Joint Secretary in the Ministry of New & Renewable Energy recently.

Kulhari was addressing the EU-India Wind Energy Business Summit 2026 at WindEnergy Hamburg. He added that India has added over 6 GW of wind energy capacity in 2025-26. He said the sector was gaining momentum with limited fiscal support from the government.

Wind projects require investment of around ₹7 crore per MW, which means annual additions of 7 GW would entail investments of roughly Rs 50 crore per annum.

India currently has about 24 GW of wind manufacturing capacity, significantly higher than the domestic annual deployment requirement. This creates scope for manufacturers to increase exports, Kulhari said.

"Last year also we achieved approximately ₹12,000 crore of exports," he said, adding that Indian companies are mainly exporting wind components and the domestic ecosystem has the capacity to support further growth in exports.

Kulhari also highlighted opportunities for greater cooperation between Indian and European wind energy companies, particularly in offshore wind. According to him, India can leverage Europe's experience and technology in offshore wind, while Indian companies offer advantages in scaling up projects, deployment speed and availability of skilled manpower.

"Europe is having, since they are the pioneers in the technology, we can learn from them especially for offshore wind technology," he said.

India is preparing to develop its first offshore wind projects and is looking to draw on the experience of European companies in developing the sector, Kulhari said.

India's long coastline and favourable wind conditions could also make offshore wind commercially viable, he said. The country has more than 7,000 km of coastline, while wind speeds identified offshore Tamil Nadu are above 10 metres per second.

Kulhari said such wind speeds could result in a capacity utilisation factor of around 55%, helping bring down the levelised cost of electricity to a level acceptable to consumers

"Wind velocity is concentrated in certain pockets, may it be offshore, may it be onshore," he said.

The government is therefore looking to accelerate deployment while expanding the domestic manufacturing and export ecosystem, as it seeks to reach 100 GW of wind capacity by 2030.

Delhi Cabinet approves revised solar policy, targets free 3 KW panels for 2.30 lakh consumers

The Delhi Cabinet has approved a revised solar policy under which households with monthly electricity consumption of 400 units or above will be eligible for free installation of 3 KW rooftop solar panels, Chief Minister Rekha Gupta said recently. The Delhi government has set a target to install the panels in approximately 2.30 lakh households across the city by March 2027, Gupta said, adding that the move is aimed at reducing electricity bills and supporting installation costs for households that could not afford the upfront expense.

"Our target is not only to reduce people's electricity bills but also to support the installation cost of solar panels. The government will provide free rooftop solar panels to all households with monthly electricity consumption of 400 units or above. The facility will

benefit people who could not install rooftop solar panels earlier due to high upfront cost," Gupta said at a press conference.

"This is a big announcement for our government's 'Green Delhi' initiative," she said.

Currently, around 10,000 buildings in Delhi have solar energy generation capabilities, most of which are government buildings, Gupta added.

India soon to be 3rd largest wind energy player: Govt official

India will soon surpass Germany to become the third-largest wind energy producer in the World, as the nation is poised to achieve 107 GW capacity by 2030, a senior government official said recently.

Speaking at the curtain raiser of the 8th edition of Windenergy India 2026, Joint Secretary in the Ministry of New & Renewable Energy Rajesh Kulhari said India's energy transition is no longer just about adding megawatts.

It is about building a complete industrial ecosystem that creates skilled jobs, drives wind manufacturing exports, guarantees energy security, and lowers system costs by reducing dependence on fossil fuels, he added.

About India surpassing Germany in terms of installed wind capacity, he said, "We have surpassed Brazil this year. We are at 58 GW while Germany is currently at 77 GW, we are on track to surpass Germany before 2030 with more than 107 GW (wind capacity)".

Presently, China is at the top with installed wind energy capacity nearing 700 GW, followed by the US at over 160 GW. Germany stood at the third position on the chart, followed by India. Dinesh Jagdale, Secretary, Indian Wind Turbine Manufacturers Association (IWTMA) and President - Corporate Affairs & Retail Business at Suzlon Energy, said the path ahead is clear: 100 GW by 2030 and 155 GW by 2035.

Getting there needs collaboration between manufacturers, developers, policymakers, and innovators working together, he added.

India's domestic turbine-making capacity has grown to 24 GW annually, up from 10 GW in 2014, with 70–80 per cent domestic value addition. Wind equipment exports crossed Rs 12,000 crore in FY2025-26, up nearly 50 per cent, and MNRE has launched WT-MARUT, India's first wind supply-chain portal, built with IWTMA positioning India as both a rapid-deployment market and a global export hub.

"This reflects a sector coming of age. As we export oriented companies continue to scale manufacturing and expand exports from India, we remain committed to strengthening the country's position as a global wind export hub and to contributing meaningfully to India's broader export ambition," said Suman Nag, Global Business Development, Envision Energy India and EC Member, IWTMA.

Organised by IWTMA and PDA Ventures, supported by the Ministry of Power and MNRE, the event brings 20,000 attendees, 400 delegates and 350 exhibitors from 30 countries, with Suzlon India as Platinum Partner, Envision and Senvion as Gold Partners, Venwind and Renfra as Silver Partners and country pavilions from Germany, Denmark and Spain. (PTI)

India to add about 8 GW wind energy capacity in FY27: MNRE

India will add 7.5-8 GW wind energy capacity addition in the current fiscal year, said Rajesh Kulhari, Joint Secretary in the Ministry of New & Renewable Energy recently. Kulhari was addressing the EU-India Wind Energy Business Summit 2026 at WindEnergy Hamburg. He added that India has added over 6 GW of wind energy capacity in 2025-26.

He said the sector was gaining momentum with limited fiscal support from the government. Wind projects require investment of around ₹7 crore per MW, which means annual additions of 7 GW would entail investments of roughly Rs 50 crore per annum.

India currently has about 24 GW of wind manufacturing capacity, significantly higher than the domestic annual deployment requirement. This creates scope for manufacturers to increase exports, Kulhari said.

"Last year also we achieved approximately ₹12,000 crore of exports," he said, adding that Indian companies are mainly exporting wind components and the domestic ecosystem has the capacity to support further growth in exports.

Kulhari also highlighted opportunities for greater cooperation between Indian and European wind energy companies, particularly in offshore wind. According to him, India can leverage Europe's experience and technology in offshore wind, while Indian companies offer advantages in scaling up projects, deployment speed and availability of skilled manpower.

"Europe is having, since they are the pioneers in the technology, we can learn from them especially for offshore wind technology," he said.

India is preparing to develop its first offshore wind projects and is looking to draw on the experience of European companies in developing the sector, Kulhari said.

India's long coastline and favourable wind conditions could also make offshore wind commercially viable, he said. The country has more than 7,000 km of coastline, while wind speeds identified offshore Tamil Nadu are above 10 metres per second. Kulhari said such wind speeds could result in a capacity utilisation factor of around 55%, helping bring down the levelised cost of electricity to a level acceptable to consumers.

"Wind velocity is concentrated in certain pockets, may it be offshore, may it be onshore," he said.

The government is therefore looking to accelerate deployment while expanding the domestic manufacturing and export ecosystem, as it seeks to reach 100 GW of wind capacity by 2030.

Coal to supply half of India's power through 2035-36 as demand surges

India expects coal to supply about half its electricity through 2035-36 as surging power demand forces the country to rely on thermal generation alongside a rapid expansion of renewable energy, senior power ministry officials said recently.

"Thermal is here to stay for a long time," said Aadhar Raj, joint secretary in India's Ministry of Power, at an industry event by the Federation of Indian Chambers of Commerce and Industry.

India's first priority was ensuring adequate electricity supplies, followed by making power affordable, sustainable and reliable, Raj said, describing energy security as a national security issue.

India is also looking beyond burning coal for electricity and towards coal gasification to produce hydrocarbons, which Raj said could replace imports. The comments highlight the challenge facing India as rapidly increasing electricity consumption requires it to expand coal-fired generation even as the world's third-largest greenhouse gas emitter accelerates the addition of cleaner power sources.

Coal will still account for about half of India's electricity generation in 2035-36, said Praveen Gupta, a senior official at the Central Electricity Authority, an adviser to the power ministry. India currently has around 224 gigawatts of coal-fired capacity and plans to raise that to about 315 GW by 2035-36.

India has about 50 GW of coal capacity under construction, including 31 GW awarded over the past two years, Gupta said. Another 15 GW has been awarded but construction has yet to begin, while about 10 GW to 11 GW of additional capacity needs to be awarded, with potential projects at various stages of approval, Gupta said.

Commercial Coal Mine Auctions: Powering Aatmanirbhar Bharat Through Transparency

Coal block allocation in India has undergone a significant transformation over the past decade. Following the Supreme Court's cancellation of 204

coal blocks in 2014, allocation moved to a transparent, rules-based process. The launch of commercial coal mine auctions by the Prime Minister Shri Narendra Modi on 18 June 2020 marked the next major step. Six years on, it has become one of the most consequential structural reforms in the mining sector, delivering benefits shared transparently across industry, the exchequer and coal-bearing communities.

The entire process has been kept transparent. Bidding is conducted online in two stages on the MSTC platform, with bid documents decrypted and opened live in front of bidders. There is no end-use restriction, 100% FDI is allowed through the automatic route, and upfront payments are kept low and adjustable against future revenue share, keeping the field open to smaller and newer players. The Policy has been such a success that 147 coal mines have been auctioned till date with 44 new companies winning a coal mine. The Policy has not only attracted private players but also legacy coal PSUs like Coal India's own subsidiaries — Western Coalfields Limited (WCL) and Northern Coalfields Limited (NCL), traditionally only producers and sellers of coal — have themselves stepped in as bidders for blocks in recent rounds, competing on exactly the same terms as private players.

Every auctioned block contributes a strong share to the states in the form of revenue share (the competitively bid revenue share, additional to royalty), Royalty (statutory, to the state), DMF contributions (ploughed back into the mining district via PMKKKY), NMET contributions (funding future exploration) and GST. Since 2020, 147 coal blocks have been auctioned across nine states, projected to generate approx. ₹47,500 crore in annual revenue, ₹55,000 crore in capital investment and 4.9 lakh jobs. In the Financial Year 2025-26, the total revenue generated (from upfront & premium payment) from allocated commercial mines was about Rs. 3090 Cr.

The revenue story runs alongside a production story. Coal output from only commercial mines grew from 12.55 million tonnes in FY 2023-24 to 23.51 million tonnes in FY 2024-25. Captive and commercial blocks together produced about 210 MT in FY 2025-26, crossing the 200 million tonne mark for the first time. A decade earlier the figure stood at 28.8 MT,

hence showcasing a compound annual growth of about 22 per cent over the period. Every additional tonne mined domestically is a tonne that need not be imported, directly supporting India's push toward self-reliance in coal.

Transparent, technology-enabled bidding that keeps attracting new entrants; a level playing field open enough that even government miners now compete for blocks rather than being handed them; and a revenue-sharing design — royalty, premium, DMF and NMET stacked together — that has nearly tripled states' coal revenue in a decade: together, these make the commercial coal mine auction regime a genuine win-win for states, industry, local communities and the nation's energy security alike.

Commercial coal auctions expected to generate ₹47,500 crore revenue, ₹55,000 crore investment: Ministry

The 147 coal mines auctioned for commercial mining since 2020 are projected to generate around ₹47,500 crore in annual revenue, attract ₹55,000 crore in capital investment and create 4.9 lakh jobs across nine states, the coal ministry said recently.

According to the official press release, the projected revenue will accrue to states through competitively bid revenue share, royalty, contributions to the District Mineral Foundation and National Mineral Exploration Trust, besides GST, the government said.

The government said 44 new companies have won coal mines through the auction process, indicating wider participation in the sector.

Commercial coal mine auctions allow producers to sell coal without end-use restrictions and permit 100 per cent foreign direct investment through the automatic route. The government has also kept upfront payments low and adjustable against future revenue share.

Revenue generated from upfront and premium payments from allocated commercial mines stood at about ₹3,090 crore in FY26, according to the government.

The auction regime has also attracted participation from Coal India subsidiaries, with Western Coalfields and Northern Coalfields bidding for commercial coal blocks alongside private companies in recent rounds.

The expansion of commercial mining has been accompanied by higher output. Production from commercial mines rose to 23.51 million tonnes in FY25 from 12.55 MT in FY24. Captive and commercial mines together produced about 210 MT in FY26, crossing the 200 MT mark for the first time.

The government said the increase in domestic production would help reduce the country's dependence on imported coal and strengthen energy security.

Coal Distribution Over the Years: From Allocation to Auction, Powering India's Growth

Every unit of electricity has a journey behind it. Before a light comes on in a home, machinery starts inside a factory, or a steel or cement plant begins production, a much larger chain of activity is already in motion. Behind India's growing demand for electricity lies another equally important story: the journey of coal from the mine to the consumer, and the distribution system that keeps this journey moving. Over the past decade, Coal India Limited (CIL) has reshaped this journey. A system once driven largely by traditional linkages (allocated on nomination basis) has evolved into a broader framework of long-term supply assurance, competitive auctions, digital interfaces and greater flexibility.

A channel for every consumer

CIL serves consumers through a diversified set of supply channels designed around different requirements.

For the power sector, Fuel Supply Agreements (FSAs) remain the foundation of long-term coal availability. The introduction of the SHAKTI policy in 2017, followed by its revision in 2025, brought greater transparency and competitiveness to coal allocation for power producers.

For non-power consumers, linkage auctions introduced in 2016 created a competitive route for industries such as cement, steel, sponge iron, captive power and others to secure long-term supplies. The increased transparent and efficient allocation mechanism led to a situation where cumulative power-sector linkages stand at around 643 MT, while non-power linkages are around 119 MT.

While long-term demand is addressed through linkages and FSAs, short-term requirements are met through e-auctions. These auction-based mechanisms where all consumers, traders, exporters etc are allowed to participate on a common platform, not only cater to short term coal requirements but also enable the growth of vibrant and dynamic spot markets in the country. Smaller MSME consumers requiring less than 10,000 tonnes annually are having the option of being served through State-Nominated Agencies (SNAs).

Together, these channels have created a more responsive distribution framework, allowing coal supply to better reflect consumer needs across sectors and time horizons.

Making coal procurement easier

The evolution of coal distribution has also been driven by efforts to make coal procurement simpler, more efficient and more consumer friendly.

For the Power FSAs, CIL has revised the FSA structure and now for the first time in the country, the FSAs have the contractual agreement to deliver a fixed amount of Gross Calorific Value to the consumer as against the previous FSAs where contracts were based on tonnage of the fuel being supplied. CIL has also reduced interest rates on delayed payments from around 14.65%, to about 8.25%. This has improved liquidity and eased the financial burden on the power sector.

Since 2014, CIL has rationalised around 105 MT of coal linkages, with potential annual savings of more than ₹7,500 crore for the power sector through lower transportation costs and more efficient utilisation of domestic coal.

For non-power consumers, measures such as e-BG facilities, pre-auction coal-quality testing, registration

of multiple end-use plants under a single bidder ID, and greater choice of transportation modes have simplified procurement.

Much of this transformation is now digital. Online information systems, online reconciliation facilities, integration of Third-Party Sampling Agencies portals with the buyers and sellers, grievance-redressal portals, SAP integration and customer interfaces along with integration with Railways portals have changed the way producers, consumers and logistic service providers interact from the comforts of their workplaces.

Coal distribution is therefore no longer only about moving coal. It is increasingly about making access simpler, more transparent and easier to manage.

From mine to market: expanding evacuation

Producing coal is only half the journey. The other half begins when coal leaves the mine and how it travels to the consumers.

Rail mode despatch increased from 272.9 MT in FY 2015–16 to 414.0 MT in FY 2025–26, a growth of around 52%. Average rake loading increased from around 212.8 rakes/day to 338 rakes/day, representing a growth of nearly 59%. Road mode despatch for consumers in the vicinity of the mines increased from 156.1 MT to 221.8 MT, while movement through Merry-Go-Round (MGR) systems increased from 92.3 MT to 97.1 MT.

The next phase is centered on First Mile Connectivity (FMC), mechanised loading, silos and multimodal logistics. CIL has undertaken 72 FMC projects with a planned capacity of 843 MT. Together with 20 existing CHP-silos with a capacity of 151 MT, mechanised and rapid-loading capacity is expected to reach around 994 MT by FY 2028–29.

These investments are intended to make evacuation faster, more reliable and better aligned with future production levels.

A distribution system evolving with India

The progress of coal distribution is increasingly reflected in the way different parts of the value chain are coming together.

Production must remain aligned with demand, allocation with consumer requirements, logistics with output, and infrastructure with future scale. Digital systems are helping make this entire process simpler, faster and more transparent.

Coal distribution has thus evolved beyond a system focused primarily on allocation into an increasingly integrated framework connecting production, supply, access, logistics and consumer needs.

As India's energy requirements continue to grow, this integrated framework enables CIL to respond with greater agility and consistency across the coal value chain.

With a strong mine-to-market network, Coal India Limited continues to enhance the reliability, efficiency and transparency of coal supply, supporting the country's expanding energy and economic needs.

Coal Ministry Urges UP to Develop Captive Coal Block for Fuel Security

The Coal Ministry has urged Uttar Pradesh to prioritise the early development of its captive coal block to strengthen long-term fuel security for the state's thermal power plants and reduce dependence on external coal sources. The advisory follows media reports suggesting that Uttar Pradesh was facing a severe power shortage due to disruption in coal supplies. The ministry, however, said the available data did not indicate a critical coal shortage at the plants.

According to the ministry, none of the thermal power plants operated by Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited (UPRVUNL) was in the critical-stock category as of September 15. Coal stocks at the plants also improved from 7.25 lakh tonnes on September 1 to 8.41 lakh tonnes on September 15. During the preceding seven days, average daily coal receipts of around 0.90 lakh tonnes exceeded consumption of about 0.83 lakh tonnes, indicating continued stock accumulation.

The ministry highlighted the Saharpur Jamarpani coal block in Dumka district, Jharkhand, which was allotted to UPRVUNL in 2015 under the Coal Mines

(Special Provisions) Act, 2015. The block has reserves of more than **973 million tonnes** and was specifically allotted to meet the coal requirements of UPRVUNL's thermal power projects. The ministry said the block has not been operationalised more than a decade after allotment, while 14 other captive power-sector coal blocks allotted subsequently have already started production.

The Coal Ministry also pointed to operational constraints at UPRVUNL generating stations, including unloading limitations that can affect railway rake placement and restrict further coal supplies. Despite coal stocks exceeding 8 lakh tonnes, the current-month Plant Load Factor (PLF) of UPRVUNL's thermal plants was around 48 per cent. The ministry said improving generation would therefore require addressing operational constraints and ensuring optimal utilisation of available coal stocks, while Coal India Limited continues to meet the state's coal requirement.

The Coal Ministry has stressed that faster development of Uttar Pradesh's captive coal resources, alongside improvements at thermal plants, can strengthen fuel security and support more reliable power generation.

Scheme for Promotion of Surface Coal/Lignite Gasification Projects: Ministry clarifies position on applications

Reference is drawn to reports appearing in a section of the press suggesting that the ₹37,500 crore Scheme for Promotion of Surface Coal/Lignite Gasification Projects has not attracted any applications. The Ministry of Coal wishes to place the correct facts on record and clarify that such reports are premature and do not reflect the status of the Scheme or the application process.

The Scheme for Promotion of Surface Coal/Lignite Gasification Projects was approved by the Union Cabinet on 13 May 2026 with a total financial outlay of ₹37,500 crore. The Scheme is aimed at accelerating the development of coal and lignite gasification in the country and promoting the conversion of domestic coal and lignite into higher-value products, including syngas, methanol, ammonia and urea. By facilitating greater utilisation

of domestic resources for production of such value-added products, the Scheme seeks to reduce dependence on imported feedstock and strengthen India's energy and economic security.

Following approval of the Scheme, the Ministry of Coal undertook sustained outreach and stakeholder engagement to encourage participation from potential project developers. Roadshows were organised in New Delhi on 28 May 2026, Hyderabad on 11 June 2026 and Mumbai on 18 June 2026. These events brought together representatives from State Governments, public and private sector companies, technology providers, investors, financial institutions and other stakeholders. The events were attended by the Union Minister of Coal and Mines and senior officials of the Ministry, reflecting the Government's emphasis on building awareness and facilitating industry participation in the Scheme.

The Request for Proposal under the Scheme was issued on 7 July 2026, following which the online portal for submission of applications was launched. To facilitate greater clarity and ensure that prospective applicants had an opportunity to seek clarifications, a pre-application conference was held on 20 July 2026. During the conference, prospective applicants raised queries and sought clarifications relating to various provisions of the Scheme, eligibility requirements and the application process. The Ministry has also continued to engage with interested stakeholders to facilitate their participation.

The first-round deadline for submission of applications is 7 September 2026. Accordingly, the number of applications received in the first round cannot be assessed or stated conclusively until the application window closes. Any conclusion that the Scheme has received no applications, while the first application window is still open, is therefore premature and does not represent the actual position.

Further, based on discussions with stakeholders, the Ministry has been informed that Talcher Fertilisers Limited (TFL) and NTPC Limited have already submitted their respective applications through the online portal. This itself demonstrates that the

assertion that the Scheme has received "no takers" is factually incorrect. The Ministry is also in communication with other prospective applicants who are at various stages of project preparation and application finalisation.

Given the significant scale and complexity of the projects envisaged under the Scheme, prospective applicants are required to undertake substantial preparatory work, including preparation of Pre-Feasibility Reports, assessment of technology options, identification of coal/lignite and other feedstock arrangements, evaluation of project economics and preparation of detailed project proposals. It is therefore expected that additional applicants may finalise and submit their proposals as the deadline approaches.

Importantly, the Scheme has been structured to provide industry with multiple opportunities to participate. Application rounds will operate on a rolling basis. Upon closure of the application window for one round, the subsequent round will open from the very next day and remain open for a period of two months. This ensures that companies that may require additional time to complete project preparation are not excluded merely because they are unable to participate in an earlier round. The rolling-round mechanism has been deliberately incorporated in view of the substantial preparation and investment requirements associated with large-scale coal/lignite gasification projects.

The Ministry remains confident of strong industry participation in the Scheme. The initiative is expected to catalyse investments of approximately ₹2.5 lakh crore to ₹3 lakh crore across nearly 25 projects and generate around 50,000 direct and indirect employment opportunities. The Scheme will also contribute significantly towards the Government's broader objective of achieving 100 million tonnes of coal gasification capacity by 2030.

The Ministry reiterates that the Scheme is at an early stage of implementation and that the first application window remains open until 7 September 2026 and therefore, it is not appropriate to characterise the Scheme as having received "no takers" at an interim stage. Its success and level of participation should be assessed after completion of the prescribed

application process and subsequent rounds, rather than on the basis of premature assessments.

The Ministry remains confident that the Scheme will receive sustained industry participation and will provide a significant impetus to the development of coal and lignite gasification in India.

Coal India Expands into Renewables, Gasification, Critical Minerals

Coal India Limited is expanding its business portfolio beyond conventional coal mining, with initiatives spanning coal gasification, thermal power, renewable energy, battery storage, critical minerals and advanced materials. The company's diversification strategy is organised around five platforms: coal gasification and coal-to-chemicals, thermal power, renewable energy and storage, critical minerals and advanced materials, and diversified minerals.

The company has projects of national scale across these areas, including approximately ₹69,346 crore across four coal-to-chemicals initiatives. These include Talcher Fertilisers Ltd., Bharat Coal Gasification & Chemicals Ltd., Coal Gas India Ltd. and the CIL-BPCL Chandrapur coal-to-SNG initiative. Coal gasification converts coal into synthesis gas, or syngas, which can be used to produce products such as synthetic natural gas, ammonia, urea, ammonium nitrate and methanol. CIL is focusing on adapting technologies to high-ash Indian coal, localising critical equipment, improving process controls and strengthening water, ash and emissions management.

CIL is also expanding its presence in power generation and renewable energy. It and Damodar Valley Corporation are pursuing a proposed 50:50 joint venture for a 2×800 MW ultra-supercritical brownfield expansion at Chandrapura in Jharkhand. In solar energy, around 550 MW of capacity has been commissioned, while additional rooftop, ground-mounted, captive, interstate and market-linked projects are under development. CIL is also developing a 20 MW AC floating solar project at Chilwa Taal in Gorakhpur. Its Battery Energy Storage System initiatives include the TGGENCO Choutuppal project in Telangana and an 80 MW/320

MWh Odisha BESS portfolio spread across four locations.

Another major area of diversification is critical minerals, which are important for batteries, electric vehicles, renewable-energy equipment, electronics, advanced manufacturing, aerospace and defence. CIL is pursuing domestic opportunities involving graphite assets in Madhya Pradesh and Chhattisgarh, along with rare earth element and rare-metal opportunities in Andhra Pradesh and Maharashtra. The company is also testing underground coal gasification at the Kasta West Block of Eastern Coalfields as a phased pilot, while emphasising that wider replication of emerging technologies will depend on verified operating and commercial performance.

Coal India's diversification strategy is creating a broader portfolio across energy, minerals, materials and technology, while retaining coal as its core business. The expansion includes both established projects such as solar and power generation and emerging areas such as gasification, BESS and critical minerals.

Coal India, HURL sign MoU to explore coal gasification-based urea plant at Sindri, Jharkhand

State-run miner Coal India Ltd has entered into a non-binding Memorandum of Understanding with Hindustan Urvarak & Rasayan Ltd to explore setting up a coal gasification-based urea production plant at Sindri in Jharkhand.

According to an exchange filing, the tie-up marks a step forward in assessing alternative, cleaner avenues for coal utilisation. Under the framework of the agreement executed on September 29, 2026, both entities will initially focus on evaluating the technical, commercial, and implementation modalities of the proposed venture.

The non-binding pact will also facilitate the preparation of a Preliminary Feasibility Report to gauge the overall project viability before taking the partnership to subsequent stages, the Maharatna company informed recently.

Natural gas imports rise despite price surge

India's natural gas imports continued to grow despite a sharp rise in prices this fiscal year. Demand got a boost from a subsidised fertiliser sector, growing CNG vehicle sales, limited supply of alternative fuels such as LPG and falling domestic gas production.

However, a recent surge in spot liquefied natural gas (LNG) prices to \$25 per mmbtu may partly dent demand or push consumers towards alternative fuels, said industry executives. With Gulf gas supplies disrupted due to the Iran war, India is currently sourcing about 35-40 per cent of its imports from the spot market. Asian spot benchmark JKM averaged \$19 per mmbtu in the April-August period, up from \$12 in the same period last year.

Spot LNG has been pricier than those procured under long-term contracts where rates are linked to crude oil or the US gas benchmark and have risen far less. At an April-August Brent average of \$90 per barrel, LNG could have cost \$11-12 per mmbtu, while the US gas benchmark has remained largely unchanged from last year. Some local suppliers have been blending volumes from expensive spots and cheaper long-term contracts to keep LNG rates acceptable to customers. LNG imports rose 5 per cent year-on-year by volume and 25 per cent by value to \$5.6 billion during April-July, according to oil ministry data. August imports rose 5 per cent over July, according to Kpler.

Overall domestic gas consumption has also held up, rising about 0.5 per cent year-on-year to 22.9 billion cubic meters (bcm). "The resilience in India's LNG imports is being driven primarily by continued growth in city-gas demand and broadly stable fertiliser consumption," said Sonal Ranjan, analyst at analytics firm Kpler. "These are relatively price-insulated parts of India's gas market: city gas benefits from priority domestic gas allocation, while fertiliser is heavily supported through government subsidies."

The fertiliser sector was the largest driver of imports, accounting for a quarter of total LNG imports in the April-July period.

Its imported gas consumption was 5 per cent more than last year, which, at this year's higher prices, would inflate the government's fertiliser subsidy bill.

India's petroleum exports rise 46% in April-August, Singapore overtakes Netherlands as top buyer: CRISIL

India's petroleum exports have staged a sharp turnaround this fiscal, growing 46 per cent year-on-year between April and August, reversing three straight years of decline, according to a Crisil report released recently.

According to the report titled 'Barrelling Ahead', the rebound has been a key driver of India's overall merchandise export growth of 18.8 per cent during the period, even as non-oil exports grew at a comparatively slower 14.4 per cent.

"This marks a reversal of the persistent weakness seen over the previous three fiscals, when petroleum exports declined by an average of 17.8 per cent annually," it added.

India's oil terms of trade have improved since the conflict erupted, turning a potential trade shock into what rating and research agency Crisil describes as a "pleasant surprise at a time when the West Asia conflict was expected to disrupt global trade flows".

The report said that while crude oil import prices have risen sharply, export prices of refined petroleum products have increased even faster. Export volumes have also recovered in recent months after an initial disruption caused by the conflict.

The reversal has provided an indispensable lift to total export earnings, playing a central role in keeping the widening merchandise trade gap in check despite higher import costs.

"An analysis of petroleum export destinations shows that shipments to newer markets have accelerated this fiscal, offsetting weakness in some traditional markets. This reflects supply disruptions faced by key exporters such as West Asia and Russia amid geopolitical tensions and reduced refining capacity," it added.

Destination mix transformed

The report flagged a significant shift in India's export destinations, with newer markets stepping in to offset weakness in traditional ones. Singapore has overtaken the Netherlands as India's largest petroleum export market, with exports to Singapore, Tanzania and South Africa all rising more than 150 per cent between April and June this year.

Tanzania and South Africa have consequently entered the top five destinations for the first time, together accounting for about 17 per cent of India's petroleum export value in the April-June quarter, per Crisil data.

In contrast, exports to the UAE fell 40.9 per cent on-year over the same period, while shipments to the US declined 41.5 per cent — both likely reflecting disruptions to regional shipping routes tied to the West Asia conflict, the report said.

New PNG Scheme Offers CGD Firms Incentive to Expand Domestic Connections

The Centre has launched a new incentive scheme to accelerate the expansion of domestic Piped Natural Gas (PNG) connections, with the aim of making piped cooking fuel more accessible to households across India.

The Incentive Scheme for Promotion of Domestic PNG Connections was launched on August 18, 2026, and came into effect on September 1. It will be implemented in two tranches over a six-month period.

How the PNG Incentive Scheme Works

The scheme provides incentives to authorised City Gas Distribution (CGD) entities for increasing active domestic PNG connections and extending networks to new areas.

Key features include:

A minimum connection threshold has been fixed for each Geographical Area (GA).

CGD entities will have to add billed domestic connections beyond the prescribed threshold during the performance period.

For every incremental eligible connection, an additional allocation of 200 Standard Cubic Metres (SCM) of domestically produced APM gas will be provided.

The additional APM gas is intended to replace costlier LNG currently sourced by CGD entities for their Compressed Natural Gas (Transport) segment. According to the government, the lower-cost gas allocation is expected to reduce the cost of sourcing gas for CGD entities and shorten the payback period on capital invested in domestic PNG connections from around 10 years to nearly three years.

1.74 Crore Domestic PNG Connections Already in Place

The City Gas Distribution network covers pipelines and related infrastructure supplying households, commercial establishments and industries.

The Petroleum and Natural Gas Regulatory Board (PNGRB) has authorised CGD entities across 309 Geographical Areas, covering the entire mainland of India.

As of August 18, 2026, the country had 1.74 crore domestic PNG connections.

Government Measures to Expand PNG Access

The government has also outlined several measures aimed at supporting the expansion of domestic PNG infrastructure:

Accelerated approvals: A new framework provides priority processing and defined timelines for approvals related to pipeline development.

- **Uniform RoW charges:** The 2026 order introduces uniform Right-of-Way charges for laying PNG pipelines.
- **Lower VAT:** States have been encouraged to reduce VAT on natural gas to 5%, with several states already adopting the rate.
- **National PNG Drive 2.0:** A nationwide campaign was conducted from January 1 to June 30, 2026, to accelerate domestic PNG connections.
- **Unified registration portal:** A single-window digital platform is being developed for applying for and tracking new PNG connections.

PNG as an Alternative to LPG Cylinders

PNG is supplied through underground pipelines and billed according to metered consumption. The government highlights several household advantages, including:

- Continuous supply without cylinder booking or storage.
- Payment based on actual consumption.
- Lower handling requirements compared with LPG cylinders.
- Cleaner combustion with fewer pollutants than conventional cooking fuels.
- Reduced dependence on cylinder-based fuel delivery.
- The new incentive mechanism is intended to encourage CGD companies to expand household connections while supporting the government's broader push for greater use of natural gas in domestic energy consumption.

GAIL CMD Deepak Gupta calls diversification key pillar of LNG procurement strategy



Deepak Gupta, Chairman and Managing Director (CMD) of GAIL (India) Limited, named diversification as a key pillar of the company's approach to liquefied natural gas (LNG) at Gastech 2026 in Bangkok. According to a statement GAIL

issued recently, Gupta "highlighted diversification as a key pillar of GAIL's approach to navigating an increasingly dynamic LNG environment."

The statement set out what that diversification involves. "Expanding sourcing across geographies, enhancing trading capabilities and making greater use of spot cargoes can provide the flexibility needed to respond to changing market conditions," it said. Spot cargoes are single shipments bought outside long-term supply contracts.

Gupta made the remarks on a Strategic Conference panel titled "The New LNG Order: Leadership Strategies for Energy Security and Growth." He shared the stage with three other speakers: Olalekan Ogunleye, Executive Vice President for Gas, Power and New Energy at Nigeria's NNPC Limited, Jaffee

Arizon Suardin, Director of Integrated Logistics and Infrastructure at Indonesia's Pertamina, and Sue-Ern Tan, Head of the International Energy Agency's (IEA) Regional Cooperation Centre. Amena Bakr, Head of Middle East and OPEC+ Insights at Kpler, moderated the session. Gastech 2026 runs in Bangkok from September 14 to 17.

Flexibility in destination and pricing

The panel looked at the pressures reshaping the global LNG trade. According to GAIL, these ranged "from changing supply routes and geopolitical developments to evolving demand patterns, affordability considerations and the growing need for flexibility across the LNG value chain."

Two contract terms came up as ways to make supply more resilient. "The discussion also underscored the importance of destination flexibility and diversified pricing/indexation structures in strengthening supply resilience while keeping LNG accessible and competitive," the statement said. Destination flexibility lets a buyer send a cargo to a market other than the one named in the contract. Indexation refers to the benchmark an LNG price is linked to.

Shifting demand centres

Demand is the other side of the market GAIL expects to change. "As new LNG projects commissioned over the past decade add to global supply and consumption patterns continue to evolve, understanding emerging demand centres will be critical to shaping the next phase of the LNG market," the statement said.

For India, the statement expects LNG to stay central. "For India and other emerging Asian economies, LNG is expected to remain an important enabler of energy security, economic growth and the transition towards a lower-emission energy mix," it said.

GAIL said its own priorities follow the same line. The company "remains focused on building a diversified and resilient LNG portfolio, expanding its global partnerships and strengthening its presence across the LNG value chain," according to the statement.

Oil India to invest Rs 15,000 crore over three years in deepwater exploration, eyes eight wells



Oil India plans to spend around Rs 15,000 crore over the next three years on deepwater exploration, Chairman Ranjit Rath said recently. The company plans to drill eight wells, although the actual number will depend on its interpretation of seismic data from the fields, Rath said.

The government is pushing deepwater exploration in India and encouraging both domestic and foreign companies to participate. Under its Rs 84,000-crore Samudra Manthan scheme, the government plans to bear up to half the drilling costs for deepwater wells.

It is also planning massive investments in seismic data acquisition to help explorers identify prospects. Oil India plans to partner with foreign companies to bid in the 10th and 11th rounds of exploration licensing, Rath said.

Current global market conditions, which have driven up oil prices, are providing an incentive for oil companies to invest in exploration, he said.

India Drives Russia's Record August Fuel Imports with 120,000 Tonnes: Report

India emerged as the dominant overseas supplier of oil products to Russia in August, accounting for nearly 70 per cent of the country's record imports as disruptions at Russian refineries forced Moscow to turn to international markets to meet its fuel requirements. The sharp increase in imports highlights the extent to which operational setbacks in Russia's domestic refining network are reshaping regional fuel trade flows, with India stepping in as a significant source of refined petroleum products.

According to the Centre for Research on Energy and Clean Air (CREA), Russia imported around 172,000 tonnes of oil products in August, the highest monthly volume on record and more than seven times its

previous record. India supplied approximately 120,000 tonnes, all of it gasoline, valued at around EUR 78 million, making it the largest contributor to Russia's emergency overseas fuel purchases during the month.

Vadinar Refinery Supplies Gasoline to Russia
The fuel came from the Vadinar refinery in Gujarat, operated by Nayara Energy. Russian oil giant Rosneft owns a 49.13 per cent stake in the company.

The development has created an unusual trade flow. India has been buying large volumes of Russian crude, processing it at domestic refineries and exporting some of the refined fuel back to Russia.

CREA said the rise in Russian fuel imports came after Ukrainian drone attacks disrupted several Russian refineries. The attacks reduced domestic refining capacity and contributed to tighter fuel supplies.

Gasoline made up 74 per cent of Russia's oil-product imports in August. That compares with an average share of just 6 per cent between 2023 and 2025.

India Remains Key Buyer of Russian Crude
India continues to be one of Russia's biggest buyers of oil. The country imported EUR 4.8 billion worth of Russian hydrocarbons in August, including around EUR 4.1 billion of crude oil.

However, Indian imports of Russian crude fell 24 per cent from July after reaching record levels in the previous two months.

The latest data highlights the changing nature of the India-Russia energy relationship. India remains a major buyer of Russian crude, while its refineries have also become an important source of fuel for Russia at a time when its own refining network is facing disruptions.

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Webinar on

“Digital Transformation of Power Distribution: AI, Smart Technologies and the Road to a Reliable & Efficient Distribution System”

30th September 2026 at Webex

The Transmission and Distribution Group of the India Energy Forum (IEF) held a webinar on “Digital Transformation of Power Distribution: AI, Smart Technologies and the Road to a Reliable and Efficient Distribution System” on Wednesday, 30 September 2026. About 275 participants joined, reflecting strong interest among engineers and other power sector professionals in the subject. The discussion brought together utility leaders, policymakers, regulators, technology providers and other sector professionals. Its central message was that digital tools must deliver measurable improvements in reliability, efficiency, financial performance and consumer service.

The programme comprised opening remarks, three technical sessions and a special address on the needs of distribution utilities. Speakers discussed practical uses of AI, how to draw value from smart meters, and the regulatory conditions needed for wider adoption.

Opening Remarks

Shri I. S. Jha, Chairman of IEF’s T&D Group and former Member, CERC, welcomed the participants. **Shri R. V. Shahi**, President, IEF and former Secretary (Power), Government of India, delivered the opening and presidential address. The opening discussion placed the focus on rising electricity demand, renewable energy and distributed resources, storage, electric mobility, changing consumer expectations, and the need for reliable and financially sound distribution utilities.

AI Applications in Distribution

Shri H. C. Sharma, Chief, Technical Services and Advanced Grid Management, Tata Power Delhi Distribution Limited (TPDDL), spoke on the use of AI to improve reliability, efficiency and asset performance. He covered demand forecasting, power purchase optimisation, predictive maintenance, outage management and loss reduction. He also discussed uses in procurement, including preparation of bills of quantities and technical evaluation of bids.

The practical examples showed how AI can reduce repetitive work and human error while making decisions easier to review. The discussion also stressed that useful results depend on good data, integration with utility systems and appropriate human oversight.

Smart Metering and Consumer Service

Shri Abhishek Sharma, Co-founder and CEO of Apparent Energy Solution Pvt. Ltd., emphasised that installing a smart meter is only the beginning. Value is realised when the full chain works: the meter, communication network, head-end and meter data management systems, analytics, and action by the utility in the field. Timely, complete interval readings are essential for accurate billing and useful analysis.

He explained that feeder, distribution transformer (DT) and consumer meters must be time-synchronised and mapped to the correct network hierarchy. Only then can a utility locate losses at feeder or transformer level instead of relying on an average for a whole division. Meter events can also help identify tampering and outages and prompt field action. His presentation pointed to the gap between meters installed and meters actually used in prepaid mode, where the benefits for collection and working capital can arise.

The challenges include communication gaps, consumer acceptance, privacy, integration with older billing systems and cost recovery. He placed particular emphasis on data quality: missing readings, clock drift and event alerts that lead to no action can undermine the benefits of the programme. He suggested tracking read completeness, communication success, estimated billing and the field tasks generated from meter events. Open data models and interoperability would also help utilities avoid dependence on a single supplier. Smart metering should therefore be judged by fewer billing disputes, better energy accounting, lower losses and improved service, not installations alone.

Regulation for digital distribution

Shri Abhishek Ranjan, CEO of BSES Rajdhani Power Limited (BRPL), discussed how regulators can support AI, smart metering and utility digitalisation. He described the pressures facing utilities, including volatile peak demand, prosumers and distributed resources, higher service expectations, commercial losses and growing cyber

risks. His presentation showed how DT metering and analytics can give utilities earlier visibility of outages and asset problems; BRPL cited a reduction in DT failures following its use of these tools.

He urged regulators to assess performance alongside infrastructure investment. This includes setting standards for communicating meters, data quality and interoperability; allowing recovery of prudent expenditure on software, analytics and cybersecurity; and tracking outcomes such as loss reduction and reliability. He also proposed time-bound pilots for new tariffs and services, with results reviewed before wider adoption. Data access, consumer privacy, human oversight of AI, cyber audits and incident reporting need clear rules so that digital systems remain trusted and secure.

Emerging needs and challenges of DISCOMs

Shri Swapan Debbarma, General Manager (Technical), Tripura State Electricity Corporation Limited (TSECL), delivered the special address. He outlined Tripura's work on smart meters, advanced distribution management, EV charging, rooftop solar and storage. He stressed that reliable supply and financial health must advance together with digitalisation. He also called for continued staff training and supportive policy and regulation.

Closing remarks

In his concluding remarks, **Shri R. V. Shahi** appreciated the views and practical examples shared by all the speakers. He acknowledged the progress made by many DISCOMs in reducing AT&C losses. At the same time, he noted that several utilities continue to face serious financial difficulties despite the number of government schemes introduced to support the sector. He emphasised that digitisation must be used to improve day-to-day operations, reduce losses, strengthen finances and provide better service to consumers.

Shri Shahi also noted that the participation of about 275 people was an excellent response and reflected the keen interest of engineers and other sector professionals in improving distribution. The webinar reinforced the need to turn investment in AI, smart meters and digital platforms into measurable results, backed by good data, cybersecurity, skilled staff and appropriate regulation. **Dr Subir Sen**, Convenor of IEF's T&D Group, proposed the vote of thanks.

Key takeaways

- The future of distribution depends on the effective use of AI, smart metering and digital platforms, supported by cybersecurity, suitable regulation and skilled people.
- Distribution is the part of the power sector that serves consumers directly. Reducing aggregate technical and commercial (AT&C) losses is essential to its financial health and service quality.
- Several better performing urban utilities have brought AT&C losses to around 5–6%. State distribution utilities should work toward comparable performance through measures suited to their networks and consumers.
- Practical barriers to the use of IT and AI need focused solutions. Researchers, utilities and technology providers should work together on tools that meet distribution utilities' operational needs.
- Technical capability must be matched by managerial skills so that new systems lead to decisions, field action and sustained improvement.
- Digital technology needs a reliable communication network. Its success should be measured by lower losses, more reliable supply, better operational and financial performance, and improved consumer service.

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

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