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ENERGY SECURITY CHALLENGES FOR INDIA: WAY FORWARD

Energy Security Challenges for India: Way Forward

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Energy is the prime mover for the economy – in fact the main force which drives not only the economy but the entire society and civilization itself. Right from the Stone Age and Iron Age, the discovery of energy emerged as the starting point and lifeline of civilisations.

Its availability and supply, in a reliable manner with required level of predictability, is as essential as its existence. Energy security, therefore, signifies that its timely availability, not only sufficient for the requirement but also for growth, is secured. In fact, the concept of energy security goes beyond just its availability and includes the continuity of supply as well as the logistic interdependence. Another way of looking at energy security is to term it as “Energy Independence”. The extent of dependence on others will obviously dilute the degree of energy security.

Business and Trade among different countries in the world in limited ways were always there from centuries. During the 1980's, President of USA Ronald Reagan introduced several economic reforms to promote and support international trade and business. The economic development of different nations, and the Business and Trade on international level, started receiving global attention. It is not to say that Business and Trade were not happening from one country to another. What is meant to convey is that globalization of Business and Trade as a concept, and as a practice, assumed a much larger and formal dimension during 80's when the international trade became a culture for

enhancing international cooperation, sharing of resources, and optimization of economic and industrial development at global level. This gave rise to several forms of international agreements and institutions like World Trade Organisations (WTO) and also Bilateral and Multilateral Agreements. These practices got strengthened over last forty years. Countries felt assured that such Agreements and undertakings would ensure the required degree of certainty of implementation and, therefore, reliability of supply. Interdependence in business emerged as an acceptable and comfortable way of running business and trade – purchase and sales across the countries together with required logistics of transportation including smooth movement through maritime infrastructure and system.

The globalisation of business and trade, on the above template, became the international norm, with very few exceptions of deviations with little effect on the level of confidence about the reliability of supply. These shortcomings for other products and commodities could have a numerous optional strategy to deal with. In case of energy, however, such uncertainties will impact adversely and such derailments in smooth implementation of commercial agreements would obviously have much larger consequences. During last few years, the geopolitical developments have been unprecedented and unpredictable creating altogether a different scenario. The fast changing developments have been cutting at the very basic roots and fundamentals of globalization of trade and business, which worked quite well for almost four decades. As mentioned, an insecure energy supply arrangement would have serious economic and social consequences. Ukraine – Russia War, limited to these two countries, but a number of countries getting affected by US Sanctions, did lead to the highly negative situation of energy security, consequential unpredictability about availability and supply, and fluctuating price

behaviours etc. The energy security gets under threat if the country is not self-contained and hence is faced with major challenges. The intensity of this new and completely unpredictable approach, which started with Ukraine – Russian War - Sanctions on different countries, conduct of their trade and business, massive restructuring of tariff on export and import, all these are attacking the roots of globalisation, and have started demonstrating the severity of impact.

The intensity of energy insecurity has further heightened with the current West Asia War. This scenario relates to almost all countries in the world with varying degree of impact. West Asia occupies a very prominent position in global context in so far as energy is concerned. Over 30% of global energy, viz. Crude is supplied from West Asia, more than 50% of oil reserves are in West Asia. Qatar is a major LNG exporter; major sea route supplies are passing through West Asia. Strait of Hormuz handles 20% of global oil trade. With all these, the impact of West Asia War on economies of all countries in the world can be well appreciated. Thankfully and gratifyingly Indian Government has been able to secure smooth passage of the vessels carrying Petroleum fuels meant for India, a rare and satisfying success. India has larger number of positives than negatives from Energy Security point of view. However, India's dependence on other countries for energy supply does have direct impact on some of the sections of society which gets affected. The arrangements made by the Government have been working well on Gas and Fuel supply to domestic consumers due to special arrangement made out of reserves created by the Government in the past as also short term arrangement being worked out to source supplies from other countries. Continuity of the West Asia conflict will affect the Energy Security of a large number of countries including G7 and G20 nations. The fast changing geopolitical situations during last five years have definitely raised the level of nature

and challenges of energy security for India. Due to the current West Asia conflict, within a month, crude prices have increased progressively from about \$70 per barrel in February end to \$ 115 per barrel by the end of March, 2026. According to a detailed Report by the Financial Express (1st April 2026), on LPG imports have reduced from 2.23 million tonne as in January, 2026 to just 1.12 million tonne in March, 2026. This is bound to have supply problems to the consumers particularly in the middle and lower income groups who continue to depend on LPG. The challenge has been partly addressed by alternate arrangements, but continued West Asia War is likely to aggravate the situation.

On the Power Sector front, the country is well placed. With 520 plus GW of installed power capacity, Solar Power capacity expansion moving in the right direction, Wind Energy expansion to tap the untapped potentials growing in a significant way, Bio Gas moving fast to cross the level of critical mass and move forward, renewed priorities for development of untapped Hydro Power potentials, a very powerful take off of developing Hydro Pump Storage Projects, Battery Energy Storage System at take off stage - all these are major initiatives which have taken off with demonstrated outcomes in a significant way. The consequential challenges of expanding Solar capacity with back up of Energy Storage System and massive expansion of Transmission Infrastructure, will ensure that the energy security challenges are addressed adequately and domestically, in so far as power supply is concerned. Appropriate calibrations with required changes, relative priorities of these segments will need periodic review and alterations. Coal based Thermal Power will continue to grow for at least couple of decades to provide the required level of energy security for which a moderate growth rate of Thermal Power capacity addition perhaps may be necessary. It needs to be emphasized, however, that while the country needs to continue with its

only major resource which is Coal, the technology development is essential for addressing carbon emission challenge – both at pre-combustion phase of coal and post combustion of CO₂. Technologies have been talked about for decades, what is needed is to seriously move on actions. Inevitability of coal to secure a respectful energy security level should not be used by Thermal Power technology specialists to further delay these technological advancements.

India's energy security compulsion faces the most major challenge in the Petroleum Sector. This challenge has been there, its impact has always been felt, Economic Surveys and RBI Reports have been highlighting the dependence on import, not necessarily from energy security point of view, but mainly from the prism of its financial consequences including the Foreign Exchange obligation. These observations in themselves have been weighty enough, what has made the present situation in relation to the Petroleum Sector is the over dependence and likelihood of highly unpredictable level of supply coupled with excessively rising prices. This is the biggest challenge in so far as India's energy security is concerned. Several measures taken by the Government through appropriate and timely initiatives have worked well, and it is hoped that it will continue to address the situation in the future. However, excessive financial burden cannot be ruled out. This issue has not only been flagged in the past on several occasions, even without the current grave geopolitical situation, the need for reducing Petroleum import dependence has been emphasized by Hon'ble Prime Minister himself. The current level of more than 88% of demand to be met through import is totally unsustainable. The measures suggested during various debates and discussions and writings have been as follows:

1) Unexplored part of India to search for Crude and Gas will need massive programmes of

investigations. Experts from the respective fields have indicated that technologies deployed in the past have undergone change, and it is expected that detailed proper investigation will definitely lead to the potentials being discovered. These will need to be followed by actions for production. Obviously, this will take several years, but it must be carried out both for Oil and Gas.

- 2) Even in the case of Gas import dependence is more than 50%. The demand will keep increasing unless several sections of consumptions of Petrol and Diesel are replaced by electricity. Transport including road transport should plan for a faster shift from Petrol and Diesel to Electricity and Hydrogen. The rates of shifts to EV have been rather slow and should see an accelerated growth.
- 3) The Automobile manufacturers may be encourages to enhance their production, new manufacturers including from outside the country should be encouraged to set up facilities to add to the volumes of passenger and commercial vehicle.
- 4) The present pace of Metro Rail Transport System in Tier-2 and Tier-3 Cities must be accelerated to make a significant impact on consumption of Petrol and Diesel.
- 5) The major part of Diesel is consumed by road transport primarily the heavy transport for Coal, Goods, and Machinerics. This has happened over decades due to totally inadequate infrastructure development in Railway System. Railway used to have almost 70% of Goods Traffic with 30% being handled by Road Traffic. This ratio has just reversed with the consequence of tremendous burden on import of Petroleum fuels. There has to be a medium and long

term plan for large scale expansion of Railway transport which is proved to be, on a long term basis, most economical through Electric Traction. Railway Infrastructure development, with at least 20% growth rate, to clear up the backlogs of decades, will need to be opened up- sooner the better.

- 6) It is heartening that through the Decentralised Distributed Solar Power and through Solar Pumps the Agriculture Sector has started moving away from Diesel Pumps. This process should expedited and encouraged since it has also the advantage of the State run Distribution Companies being enabled to set right their financials.
- 7) The present Companies which are marketing Diesel and Petrol and are dependent, to the extent of 88% of import, should see that these developing scenarios of challenges have opportunities to shift to businesses in line with the consumption shift which have been outlined above.
- 8) Though the proportion of total consumption of Petrol and Diesel is not very high in the industry sector, yet, the industry sector, including manufacturing, could be advised to shift from Petrol and Diesel or Kerosene to alternate energy sources.
- 9) There seems to be no need for the kitchens – domestic or commercial - to depend on imported Gas or LPG. To the extent India can produce the proportion can be adjusted. It would take time to progressively shift from gas based kitchen to electric kitchen, but it should definitely be a good option which will have significant impact on reducing import burden. With Roof Top Solar this plan can easily be implemented.

- 10) Medium and long term solution have to be found out and implemented to ensure that Solar manufacturing and Battery Energy Storage System, both of which are largely dependent on import should undertake measures to radically increase the domestic proportions of manufacturing. India's plans for ambitious expansions of renewables have very laudable objectives aimed at enhancing energy supply as well as address the challenge of climate change. The specific measures cannot be allowed to be based largely on import dependence for a long time. This would cause similar problems as the energy system in Petroleum sector is faced with. The Bio Gas expansion plans have taken off - several Companies have to be encouraged to get into this initiative and deliver a very rapid growth of Bio Gas to tackle the energy security challenge in the Petroleum sector.

With all these measures, simultaneous with definite actions for enhancing domestic production, the energy security challenge, mainly on account of petroleum fuels, will be substantially addressed. If these programmes are pursued with earnestness and speed, India would succeed – it must succeed in a few years' time.

Dear Reader,



The current geo-political situation in West Asia has very seriously affected the world economy particularly the energy sector. India's need for crude oil and gas is largely dependent on substantial imports. Though India has diversified the supply

chain, the Gulf area still is a major supplier. Shortage of crude oil and gas and increased price will have a serious repercussion on the energy sector.

On 31st March 2026, India Energy Forum organized an online webinar on Energy Security Challenges likely to be faced as a result of the current geo-political situation. The Panelists included **Shri R V Shahi** and **Shri Anil Razdan** both former Power Secretaries, **Shri Deepak Gupta**, Former Secretary, MNRE and **Shri Balawant Joshi**, MD, Idam Infra. The current capabilities, challenges and plans needed to achieve energy security were discussed. Though, India's current requirement of oil and gas and petro products is being supplemented with reserve stocks, disruption in continuous supplies coupled with enhanced requirements in next few months of summer will put India's power supply systems under tremendous pressure. The focus on BESS, RE and Nuclear has to be much more and at a faster rate. India's manufacturing capacity for these areas needs to be enhanced substantially.

Detailed report of the Webinar will be published in the next issue. IEF will continue its endeavor to focus on Energy Security with continued such webinars/debates etc.

With increasing production of coal – currently one billion tonnes and projected to 1.5 B tonnes by 2030 – Coal will continue to be relied on for India's energy needs, though focus will be increasingly on Non-Fossil Fuels for ensuring energy security and achieving net zero by 2070. Clean coal technologies, use of coal gas, increased thermal efficiency will be areas of focus. IEF is organizing its 18th National Conference jointly with MGMI and ISMAA on 9th April 2026. The focus of the Conference is on “Transforming India's Coal Sector for a Net Zero Future”. All IEF Members are invited to join the Conference.

IEF will continue to focus on total energy issues and organize healthy debate on the issue/challenges faced by the energy sector and need to adapt new, advanced technologies to sustain energy security at an affordable price.

S M Mahajan

India's power capacity reaches 524 GW, country now power-sufficient: MoS Shripad Yesso Naik



There is adequate availability of electricity across the country as India's installed electricity generation capacity has reached 524 GW as of February 28, 2026, the Parliament was informed recently.

In a written reply in the Rajya Sabha, Minister of State for Power Shripad Naik said that the country has moved from power deficit to power sufficient after adding 296.388 GW capacity since 2014.

Naik added that the Centre has significantly strengthened the power sector over the years by expanding generation capacity and improving infrastructure.

"There is adequate availability of power in the country. As on February 28, 2026, installed generation capacity in the country is 524 GW," he said.

"The government has addressed the critical issue of power deficiency by adding 296.388 GW of fresh generation capacity since April, 2014 transforming the country from power deficit to power sufficient," he added.

He stated that electricity supply has largely kept pace with demand in the last three financial years and the current fiscal, with only minor shortfalls.

These gaps are generally linked to issues in state transmission and distribution systems rather than a shortage of power generation.

"Electricity being a concurrent subject, the supply and distribution of electricity is responsibility of the respective State Government / Distribution Utility," he added.

"Hence, it is the responsibility of the respective distribution utility to take necessary actions to provide reliable and quality power to the consumers," Naik noted.

To strengthen power supply in both urban and rural areas, the Centre has supported states through various schemes such as the Deen Dayal Upadhyaya Gram Jyoti Yojana, Integrated Power Development Scheme, Saubhagya scheme, and the ongoing Revamped Distribution Sector Scheme.

These initiatives aim to improve power infrastructure and ensure reliable and quality electricity for consumers.

Looking ahead, the government said that India's installed capacity is expected to rise further to 874 GW by 2031-32 as per the National Electricity Plan.

States have also been asked to prepare long-term resource adequacy plans to ensure that generation capacity remains ahead of rising demand.

Power ministry directs plants using imported coal to run at full capacity



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MINISTRY OF
POWER

The Power Ministry is believed to have directed imported coal-based thermal plants to operate at full capacity for three months from April 1, to avoid any electricity shortage amid the estimated peak demand of 270GW during this summer.

Sources said that in letters sent to imported coal-based plants in the country, the power ministry invoked Section 11 of the Electricity Act, asking them to run at full capacity.

The step has been taken to ensure optimal power availability, considering the prevailing demand-supply scenario and the expected rise in electricity demand in the coming months, according to the letter.

The ministry has estimated the peak power demand to be over 270GW during this summer season (April onwards).

However, during last summer (April 2025 onwards), the peak power demand was 242.77 GW in June, 2025.

According to government estimates, peak power demand was expected to touch 277 GW in the summer of 2025.

The peak power demand touched an all-time high of about 250 GW in May 2024. The previous all-time peak power demand of 243.27 GW was recorded in September 2023.

The peak power demand met or the highest supply during February rose slightly to 243.15 GW from 238.06 GW recorded in February 2025.

There are about 15 imported coal-based thermal power projects in the country which have got this directive from the power ministry, the sources said.

The order shall remain valid for the generation and supply of power from April 1, 2026, to June 30, 2026, they further stated.

Earlier this month, Tata Power arm Coastal Gujarat Power Ltd (CGPL), which operates the 4000 MW Mundra plant, informed about signing supplementary power purchase agreements (PPA) with GUVNL (Gujarat).

The plant supplies 50 per cent of the output to Gujarat. The company will ink supplementary PPAs with Maharashtra, Rajasthan, Punjab, and Haryana subsequently.

The company had suspended operations at all units of the Mundra plant on July 2, 2025 and has been suffering losses due to the temporary closure of the plant.

The 4,000 MW Mundra Ultra Mega Power Project (UMPP) in Kutch, Gujarat, is a coal-based thermal power plant with five 800 MW units providing electricity to Gujarat, Maharashtra, Punjab, Haryana, and Rajasthan.

India's inter-regional transmission capacity to hit 143 GW by 2027: Shripad Naik



The country's inter-regional transmission capacity will be increased to 143 GW by 2027 and 168 GW by 2032 to ensure reliable power flow across the regions, Parliament was informed recently.

At present, there is no transmission constraint existing at the national level, and the inter-regional transmission capacity stood at 120 GW as of December 2025, Union Minister Shripad Naik said in a written reply to the Rajya Sabha.

The capacity of the National Grid is expanded on a continuous basis, commensurate with the growth in electricity generation and electricity demand. The inter-regional transmission capacity will be increased to 143 GW by 2027 and further to 168 GW by 2032, the Minister of State for Power told the Upper House.

A peak electricity demand of 388 GW is expected by 2032, and under the NEP (Volume II Transmission), the transmission network (220 kV and above) is planned to expand to 6.48 lakh ckm by 2032, and the transformation capacity is to increase to 2,345 Giga Volt Ampere (GVA), the minister said.

Naik also said that there are delays in several inter-state transmission system (ISTS) projects due to right-of-way (RoW) issues.

He noted that electricity is a concurrent subject, and the planning, development and operation of the intrastate power grid and transmission infrastructure is primarily the responsibility of state governments.

Delays due to Right of Way (RoW) issues have affected the project timeline of as many as 25 ISTS projects, Naik added.

Power Generation Demand and Supply Gap

As on 31.01.2026, the total 'installed power generation capacity' in the country is 5,20,511 MW.

There is adequate availability of power in the country. Present installed generation capacity of the country is 520.51 GW (as on January, 2026). Government of India has addressed the critical issue of power deficiency by adding 296.388 GW of fresh generation capacity since April, 2014 transforming the country from power deficit to power sufficient.

The 'Power Supply Position' for last three financial years and the current financial year i.e. 2025-26 (up to February, 2026) is given at Annexure. The 'Energy Supplied' has been commensurate to the 'Energy Requirement' with only a marginal gap which is generally on account of constraints in the State transmission / distribution network.

The following steps have been taken to to bridge the gap during peak hours: -

- i. Hydro based generation is being scheduled in a manner so as to conserve water for meeting demand during peak period.
- ii. Planned maintenance of generating units is minimized during period of high demand.
- iii. Steady supply of coal to all the thermal power plants is ensured to prevent fuel shortages
- iv. All the GENCOs including IPPs and Central generating stations have been advised to generate and maintain full availability on daily basis excluding the period of planned maintenance or forced outage.
- v. A robust national grid has been established to facilitate the transfer of power from power surplus regions to power deficit regions. The capacity of National Grid is being expanded on a continuous basis commensurate with the growth in electricity generation and electricity demand.
- vi. Proactive monitoring of generation projects under construction to facilitate commensurate capacity addition.
- vii. The Electricity market has been reformed by adding the Real Time Market (RTM), Green Day Ahead Market (GDAM), Green Term Ahead Market (GTAM), High Price Day Ahead Market (HP-DAM) in Power Exchanges. Also, DEEP Portal (Discovery of Efficient Electricity Price) for e-Bidding and e-Reverse for procurement of short-term power by DISCOMs was introduced.

Further, the Government have taken the following steps to ensure uninterrupted power supply to all sectors:

1. Generation and Storage Planning:

- i. As per National Electricity Plan (NEP), installed generation capacity in 2031-32 is likely to be 874 GW. With a view to ensure generation capacity remains ahead of projected peak demand, all the States, in consultation with CEA, have prepared their "Resource Adequacy Plans (RAPs)", which are dynamic 10-year rolling plans and includes power generation as well as power procurement planning.
- ii. All the States were advised to initiate process for creating/ contracting generation capacities; from all generation sources, as per their Resource Adequacy Plans.
- iii. In order to augment the power generation capacity, the Government of India has initiated following capacity addition programme:

A. The projected thermal (coal and lignite) capacity requirement by the year 2034–35 is estimated at approximately 3,07,000 MW as against the 2,11,855 MW installed capacity as on 31.03.2023. To meet this requirement, Ministry of Power has envisaged to set up an additional minimum 97,000 MW coal and lignite based thermal capacity.

To meet this requirement, several initiatives have already been undertaken. Thermal capacities of around 18,160 MW have already been commissioned since April 2023 till 31.01.2026. In addition, 38,745 MW of thermal capacity (including 4,845 MW of stressed thermal power projects) is currently under construction. The contracts of 22,920 MW have been awarded and are due for construction. Further, 24,020 MW of coal and lignite-based candidate capacity has been identified which is at various stages of planning in the country.

- B. 12,723.50 MW of Hydro Electric Projects are under construction. Further, 4,274 MW of Hydro Electric Projects are under various stage of planning and targeted to be completed by 2031-32.
- C. 6,600 MW of Nuclear Capacity is under construction and targeted to be completed by

2029-30. 7,000 MW of Nuclear Capacity is under various stages of planning and approval.

D. 1,57,800 MW Renewable Capacity including 67,280 MW of Solar, 6,500 MW of Wind and 60,040 MW Hybrid power is under construction while 48,720 MW of Renewable Capacity including 35,440 MW of Solar and 11,480 MW Hybrid Power is at various stages of planning and targeted to be completed by 2029-30.

E. In energy storage systems, 11,620 MW/69,720 MWh Pumped Storage Projects (PSPs) are under construction. Further, a total of 6,580 MW/39,480 MWh capacity of Pumped Storage Projects (PSPs) are concurred and yet to be taken up for construction. Currently, 9,653.94 MW/ 26,729.32 MWh Battery Energy Storage System (BESS) capacity are under construction and 19,797.65 MW/ 61,013.40 MWh BESS capacity are under tendering stage.

2. Transmission Planning: Inter and Intra-State Transmission System has been planned and implementation of the same is taken up in matching time frame of generation capacity addition. As per the National Electricity Plan, about 1,91,474 ckm of transmission lines and 1,274 GVA of transformation capacity is planned to be added (at 220 kV and above voltage level) during the ten-year period from 2022-23 to 2031-32.

In addition to the above, the Ministry of Power has issued guidelines dated 14.06.2024, 21.03.2025 and 15.12.2025 regarding the payment of compensation for Right of Way (RoW) for transmission lines, wherein the land rate has been linked to the prevailing market rate. These guidelines address the key challenges of RoW arising from landowners demanding higher compensation than the rates determined by the State Government.

3. Promotion of Renewable Energy Generation:

i. 100% Inter State Transmission System (ISTS) charges have been waived for inter-state sale of solar and wind power for projects to be commissioned by 30th June 2025 (with waiver tapering off 25% annually till June

2028), for co-located BESS projects commissioned by June 2028, for Hydro PSP projects where construction work awarded by June 2028, for Green Hydrogen Projects commissioned till December 2030 and for offshore wind projects commissioned till December 2032.

- ii. Standard Bidding Guidelines for tariff based competitive bidding process for procurement of Power from Grid Connected Solar, Wind, Wind-Solar Hybrid and Firm & Dispatchable RE (FDRE) projects have been issued.
- iii. Renewable Energy Implementing Agencies (REIAs) are regularly inviting bids for procurement of RE power.
- iv. Foreign Direct Investment (FDI) has been permitted up to 100 percent under the automatic route. To augment transmission infrastructure needed for steep RE trajectory, transmission plan has been prepared till 2032.
- v. Laying of new intrastate transmission lines and creating new sub-station capacity has been supported under the Green Energy Corridor Scheme for evacuation of renewable power.
- vi. Scheme for setting up of Solar Parks and Ultra Mega Solar Power projects is being implemented to provide land and transmission to RE developers for installation of RE projects at large scale.
- vii. Schemes such as Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM), PM Surya Ghar Muft Bijli Yojana, National Programme on High Efficiency Solar PV Modules, New Solar Power Scheme (for Tribal and PVTG Habitations/Villages) under Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM JANMAN) and Dharti Aabha Janjatiya Gram Utkarsh Abhiyan (DA JGUA), National Green Hydrogen Mission, Viability Gap Funding (VGF) Scheme for Offshore Wind Energy Projects have been launched.
- viii. To encourage RE consumption, Renewable Purchase Obligation (RPO) followed by

Renewable Consumption Obligation (RCO) trajectory has been notified till 2029-30. The RCO which is applicable to all designated consumers under the Energy Conservation Act, 2001 will attract penalties on non-compliance.

- ix. “Strategy for Establishment of Offshore Wind Energy Projects” has been issued.
- x. Green Term Ahead Market (GTAM) has been launched to facilitate sale of Renewable Energy Power through exchanges.
- xi. Production Linked Incentive (PLI) scheme has been launched to achieve the objective of localization of supply chain for solar PV Modules.

The details of actual Power Supply Position of the country for last three financial years and the current financial year i.e. 2025-26 (upto February, 2026):

India’s Power Sector Nears a Turning Point in Energy Transition

India’s carbon dioxide (CO₂) emissions grew by 0.5% in the second half of 2025 and by just 0.7% in the year as a whole, the slowest rate in more than two decades. This is a sharp slowdown from the growth of 4-11% in the preceding four years and marks the lowest rate of increase since 2001, excluding the impact of Covid in 2020. This is the second in a new series of half-yearly analysis on India’s CO₂ emissions from fossil fuels and cement done by CREA (Centre for Research on Energy and Clean Air) for Carbon Brief . The analysis is based on official data for fuel use, industrial production and power output.

Other key findings for 2025 as a whole include:

- Emissions in the power sector fell by 3.8% as record clean-energy growth combined with weak electricity demand.
- New clean-energy capacity in 2025 will add a record 90 terawatt hours (TWh) of electricity output each year, double the previous record set in 2024.

- The largest reductions in coal power were in the states leading on wind and solar.
- Oil demand grew by 0.4% and gas fell by 4%, far behind recent growth rates.
- Steel production surged by 8% and cement by 10%.
- In total, CO₂ emissions went up slightly year-on-year, as increases from steel and cement outweighed the falls in gas demand and coal power.
- Consumption of imported coal at power plants fell by 20%, while gas imports fell by 6% and net oil imports were flat year-on-year, reducing India’s vulnerability to the impacts of the Iran war.

The analysis shows that India’s power sector is poised for a potential inflection point, where clean-energy additions can meet or exceed the growth in electricity demand.

If clean energy matches expectations, allowing this inflection point to take place, then coal-fired power output and the associated CO₂ emissions would see sustained falls.

In addition, oil demand is falling in the petrochemical industry and is expected to slow down in the steel and cement sectors.

Despite these trends, which could signal a lasting slowdown in emissions, India is planning major expansions in its capacity for coal power, petrochemicals and coal-based steel.

The country’s Paris Agreement targets for 2035, which were published yesterday, did not reflect the potential for slower emissions increases or continued clean-energy growth.

The path of India’s CO₂ emissions over the coming years depends on how it resolves these apparent contradictions regarding its future demand for fossil fuels.

Domestic coal production likely to grow 6-7% annually over next few years: Kishan Reddy



Domestic coal production is expected to grow 6-7 percent annually in the next few years to reach about 1.5 billion tonnes by 2029-30, Parliament was informed recently. The country's coal demand is expected to continue rising and is expected to peak around 2040, Union Minister for Coal and Mines G Kishan Reddy said in a written reply to the Rajya Sabha.

The Minister informed the house that "There is no scenario of transition away from coal that would impact workers and communities associated with coal mining in the short and medium time frame. India is presently augmenting its domestic coal production to meet the increasing energy requirements of the country.

To meet the future demand of coal through indigenous sources and to reduce non-essential import of coal, domestic coal production is expected to grow by 6-7 per cent annually in the next few years to reach about 1.5 billion tonnes by 2029-30, the Minister.

In 2024-25, India's coal production stood at about 1,047.69 MT, he said.

However, the sector also faces several challenges, Reddy said.

The rapid growth of renewable energy sources, with the declining cost of solar and wind power, has resulted in the accumulation of pit-head coal stock, he said.

Besides depletion of reserves at shallow and medium depths, and techno-economic viability issues in the extraction of coal beyond 300 metre depth are also a challenge.

There are also challenges in land acquisition and taking physical possession of tenancy land due to authentication issues of land records and resistance from landowner.

Coal Gasification Key to India's Energy Security and Industrial Growth: Union Minister G.Kishan Reddy

Union Minister for Coal and Mines, G. Kishan Reddy, today highlighted that coal gasification will be pivotal in strengthening India's energy security, reducing import dependence, and supporting industrial growth, while addressing the Bharat Electricity Summit 2026.

Addressing industry leaders, experts, start-ups, researchers, students, and policymakers, the Minister said India's rapidly expanding economy requires a balanced energy approach that aligns development with sustainability. He noted that under the leadership of Prime Minister Narendra Modi, the country is experiencing strong growth across manufacturing, infrastructure, digital connectivity, and innovation.

The Minister underlined India's robust coal reserves, estimating nearly 400 billion tonnes—among the largest globally—where coal accounts for about 55% of the energy mix and nearly 74% of electricity generation. With annual coal demand currently around one billion tonnes and expected to rise significantly by 2047, he emphasized the continued importance of coal. Even as India remains committed to achieving Net Zero emissions by 2070.

Describing coal gasification as a key transformative technology, he explained that it converts coal into syngas, which can be further used to produce cleaner fuels, chemicals, fertilizers, and hydrogen. This approach enables more efficient and sustainable use of domestic resources while enhancing economic resilience. He also pointed out India's dependence on imports—approximately 83% of crude oil, 50% of natural gas, and over 90% of methanol and fertilizers—making energy security a strategic priority.

To promote adoption, the Government has launched the National Coal Gasification Mission with a target of 100 million tonnes of gasification by 2030. An incentive framework of ₹8,500 crore has been introduced to support public and private sector projects, with several large-scale initiatives already underway and investments exceeding ₹64,000 crore

in the pipeline. Advanced technologies such as Underground Coal Gasification (UCG) were also highlighted for their potential to tap previously inaccessible reserves while reducing environmental impact.

India achieves 1 billion tonne coal production for 2nd consecutive year



India has achieved 1 billion tonne (BT) coal production for the second consecutive year amid heightened uncertainties in

global energy markets due to the West Asia crisis. "With sustained and coordinated efforts across the coal sector

India has achieved 1 billion tonne (BT) coal production for the second consecutive year amid heightened uncertainties in global energy markets due to the West Asia crisis.

"With sustained and coordinated efforts across the coal sector and the invaluable contribution of all stakeholders, the country has successfully achieved the landmark of 1 billion tonne (BT) coal production on March 20, 2026 for the second year in a row," the coal ministry said in a statement.

The higher and sustained coal output has helped the country meet rising energy demand and supported the power sector in maintaining record coal inventories at coal-based thermal plants, officials said.

This performance showcases strong planning, efficient execution and tighter coordination across the coal value chain, and is adding significantly to the nation's economic growth momentum, it said.

CIL hopes phased rollout of National Coal Exchange, stresses energy security safeguards

Coal India Limited (CIL) hopes that the National Coal Exchange may be implemented in phases, with necessary provisions to safeguard energy security,

as the company recently outlined its vision for the proposed platform, asserting that market reforms in the sector must be carefully balanced with the country's energy security needs.

Speaking at the mjunction-organised Indian Coal Markets Conference here, V S Maharaj, Executive Director (ICT) of Coal India, said the industry is moving from traditional e-auctions towards a more sophisticated, market-driven electronic trading platform.

"The shift toward a formalised coal exchange is no longer a distant concept. We are reform-aligned, not reform-resistant. We support modernisation, but reform must be calibrated, phased and aligned with national energy security," Maharaj said.

He cautioned that exposing long-term power assets to full market volatility could lead to electricity tariff fluctuations and uncertainty in energy security. Long-Term Fuel Supply Agreements (FSAs), he said, would continue to play a major role in ensuring stability for thermal power producers.

Describing Coal India's approach as "refined, not resistant", Maharaj said the company supports digital exchange-based trading but favours a phased introduction of coal sales through the proposed platform.

The proposed exchange aims to create a regulated electronic market, shifting the sector from a "one-to-many" auction system to a "many-to-many" price discovery model. Under the framework, coal producers, including CIL, would list availability, quantity and price, while buyers would transact at real-time market rates through automated digital systems.

A key feature of the exchange would be the determination of Market Clearing Price (MCP) and Market Clearing Volume (MCV).

Officials said both buyers and sellers would submit price expectations confidentially in a double-sided closed mechanism, with the process overseen by the Coal Controller to ensure transparency and objectivity.

Niladri Bhattacharjee, Partner at Grant Thornton Bharat, said a coal exchange would be more

successful in a supply-comfortable or surplus scenario.

"A surplus coal situation would be good for the coal exchange. It will help keep prices in check despite market transaction charges and encourage a shift from the current direct-to-consumer character of the market," he said.

Both Bhattacharjee and Maharaj indicated that prices could settle at lower levels during trades on the exchange under competitive conditions.

Maharaj also stressed the need for independent regulatory oversight to prevent speculative distortion and highlighted the importance of strengthening logistics infrastructure, including railway connectivity and quantity reconciliation mechanisms, before full-scale implementation.

Coal India aims to ensure power at just price amid West Asia Crisis: Official

State-owned Coal India Ltd aims to ensure power at a "just price" to the country amid the escalating West Asia crisis that endangers global shipping lanes and imported coal costs, a senior official of the company said. Coal India Ltd (CIL) contributes to 80 per cent of total domestic coal production and 75 per cent of total coal-based generation.

"As a low-cost coal producer, CIL aims to ensure power at a just price to the country," the official said, adding that the country has adequate coal sufficiency to meet the anticipated spike in summer demand, with Coal India maintaining robust stockpiles at pitheads and power plants. CIL's pitheads have an inventory of 122 million tonnes (MT) of coal, while domestic coal-based plants are stocked to the tune of 53 MT, officials said. In-situ coal exposure at CIL's mines stands at around 60 MT, ready for extraction and supply at short notice.

CIL's subsidiaries have also been directed to ramp up the frequency and quantum of coal dispatches under the single-window mode of agnostic auction mechanism, the official said.

A few days back, the government had said it was fully prepared to meet any unprecedented surge in coal demand. The government had said that this year,

coal production and supply have outpaced consumption, leading to record-high stocks at thermal power plants and coal mines.

Supplies to the non-regulated sector are up nearly 14 per cent over the previous year. Coal India has a target to produce 875 million tonnes of coal in 2025-26. The company is aiming to meet growing demand despite recent, slight monthly production dips in late 2025. The company produced 781.1 MT in FY25.

Coal India Subsidiary SECL Achieves Record Coal Offtake of ↑ 170.8 MT



South Eastern Coalfields Limited (SECL), a key subsidiary of Coal India Limited (CIL), has achieved a remarkable milestone by recording an offtake of

170.8 million tonnes (MT), surpassing the total coal offtake of the previous financial year. This milestone underscores SECL's operational efficiency and its critical role in powering India's energy needs.

The announcement on March 17, 2026, emphasized SECL's commitment to contributing to an "Energetic Nation", reinforcing the company's mission to support India's industrial growth and energy security. The record performance highlights strategic planning and dedication across SECL's coal mines and logistics network.

As a subsidiary of Coal India Limited, SECL continues to drive India's coal supply chain with a focus on sustainability, productivity, and meeting the nation's growing energy demand. This achievement also reflects the hard work of SECL's workforce and management in achieving excellence in India's coal sector.

This record sets a strong benchmark for the current financial year and reaffirms SECL's status as one of India's leading coal producers, contributing significantly to the nation's energy and industrial infrastructure.

India Targets 900 GW Non-Fossil Capacity by 2035-36 With Massive Grid Expansion Plan – CEA



India is planning a major expansion of its clean energy capacity, aiming to achieve more than 900 GW of non-fossil fuel power by 2035-36.

This target has been outlined in a roadmap prepared by the Central Electricity Authority, which focuses on meeting the country's rising electricity demand while supporting a shift toward sustainable energy sources.

According to the projections, India's peak electricity demand is expected to reach 459 GW by 2035-36. To meet this demand, the country will need a strong mix of renewable and non-fossil fuel sources such as solar, wind, hydro, and nuclear power. As of February 2026, India's non-fossil fuel capacity has already reached around 275 GW, which accounts for more than 52% of the total installed power capacity. This marks steady progress, but a significant scale-up is required over the next decade.

A large part of this future capacity will come from solar and wind energy. Together, these two sources are expected to contribute about 664 GW by 2035-36. Renewable energy projects like solar and wind farms can be developed relatively quickly. However, building the transmission infrastructure required to carry this electricity across regions takes more time. To avoid delays and congestion, the government is planning transmission systems well in advance.

The transmission roadmap includes a major infrastructure push. It proposes the addition of around 137,500 circuit kilometers of transmission lines and about 827,600 MVA of substation capacity across the country. This expansion is estimated to cost nearly ₹7,93,300 crores. The goal is to efficiently connect renewable energy-rich regions with demand centers across India.

States such as Rajasthan and Gujarat are expected to play a key role in this transition due to their high renewable energy potential. Rajasthan alone has an estimated potential of 58.7 GW, while Gujarat has around 64.8 GW. The plan also includes the development of offshore wind energy, especially

along the coasts of Gujarat and Tamil Nadu. In addition, regions like Andhra Pradesh and Karnataka will be important for scaling up renewable energy projects.

To support large-scale power transfer, the roadmap also considers the use of advanced technologies such as 1150 kV AC transmission systems. These high-voltage systems can carry large amounts of electricity over long distances, which is important for supplying power from renewable-rich areas to industrial zones, including emerging green hydrogen hubs.

Another key focus area is energy storage. Since renewable sources like solar and wind are not available all the time, storage systems are needed to ensure a stable power supply. The plan includes a target of achieving around 100 GW of capacity from Hydro Pumped Storage Projects by 2034-35. These systems can store excess electricity and supply it when needed.

The roadmap also highlights new operational measures to improve grid efficiency. Concepts such as "Solar Hour" and "Non-Solar Hour" have been introduced. These allow better use of existing transmission lines by enabling wind and battery storage systems to use the grid during periods when solar power generation is low.

Overall, this roadmap provides clear guidance for developers, investors, and policymakers. By aligning renewable energy generation with transmission infrastructure, India aims to build a reliable and modern power system. This approach will help the country move toward a cleaner and more sustainable energy future while ensuring that electricity demand is met efficiently.

India has potential in renewable energy manufacturing, project exports: MNRE Secretary



India has potential in renewable energy manufacturing, project development and exports as the country expands its clean energy capacity, according to Santosh Kumar

Sarangi, Secretary at the Ministry of New and Renewable Energy.

Speaking at the annual meet of the Sustainable Projects Developers Association in New Delhi, he said that clean energy will play a role in the country's development and energy security.

"As India advances toward its vision of becoming a developed nation by 2047, sustaining economic growth above 7.5 per cent will require significant expansion in manufacturing and electricity-intensive services such as AI, data centres and IoT. In this journey, reliable and clean energy will be indispensable," Sarangi said.

Changing demand profile Sarangi said that the renewable energy sector is expanding beyond utility-scale projects to distributed renewable energy, green open access and prosumer models supported by digital platforms and the India Energy Stack.

"As consumers evolve into producers through rooftop solar and storage solutions, peer-to-peer electricity trading can reshape traditional demand patterns," he said.

He added that demand for electricity is changing and hybrid and storage-integrated renewable solutions aligned with demand patterns are gaining traction, including in tenders by Solar Energy Corporation of India.

"This transition will require DISCOMs to reorient toward Electricity-as-a-Service (EaaS), similar to SaaS and infrastructure-based models, leveraging digital twin technologies, satellite mapping and smart asset monitoring to improve efficiency and optimise costs," Sarangi said.

Sector growth and targets

Vineet Mittal, chairman of the Sustainable Projects Developers Association and chairman of Avaada Group, said India's renewable energy sector has expanded in scale.

"India's renewable energy sector has demonstrated execution capability, moving from projects measured in single-digit megawatts to consistently

delivering capacity additions approaching 50 GW annually," Mittal said.

"The next phase must focus on deeper localization across the value chain — including critical balance-of-system components — and strengthen supply chain resilience, industrial depth and long-term energy security," he added.

Mittal said as India moves towards the target of 500 GW of non-fossil fuel capacity, demand creation, timely power purchase agreements and deployment of hybrid and storage-backed renewable projects will be required.

The association also elected Sandeep Kashyap, chief executive officer of Purvah Green Power, as president for a one-year term.

The Sustainable Projects Developers Association said it plans to focus on renewable energy, green hydrogen and related segments while expanding engagement with policymakers and industry stakeholders.

CERC Introduces New Tariff Rules 2026 To Boost Energy Storage Integration In India's Power Sector



The Central Electricity Regulatory Commission (CERC) has issued a new notification dated March 20, 2026, introducing the Terms and Conditions of Tariff (Second Amendment) Regulations, 2026. This move is seen

as an important step toward modernizing India's power sector by bringing energy storage systems into the existing regulatory framework for thermal power plants and interstate transmission networks.

A key highlight of the amendment is the introduction and formal recognition of Integrated Energy Storage Systems (IESS). These systems are designed to work alongside generating stations or transmission systems to improve grid reliability and support flexible operations. By storing electricity and releasing it when required, IESS can help balance

demand and supply more efficiently. The regulation also states that such systems can help delay or avoid the need for costly transmission infrastructure in the future.

The rules clearly include lithium-ion battery-based storage systems as part of IESS. These systems have been assigned a useful life of 15 years under the new framework. This provides clarity to developers and investors regarding long-term planning and cost recovery. With energy storage becoming a key part of renewable energy integration, this step is expected to encourage wider adoption of such technologies in India.

To address the financial aspects, CERC has introduced a supplementary tariff structure for these storage systems. Power generators and transmission companies will need to apply for this tariff within 90 days from the date of commercial operation of the storage system. The tariff is divided into two components. The first is the Supplementary Fixed Storage Charges, which cover the annual fixed costs and are calculated with a base Return on Equity of 14 percent. The second is the Supplementary Energy Charges, which include the cost of electricity used to charge the storage system. This cost is adjusted based on the Round Trip Efficiency, which must be at least 85 percent, along with auxiliary energy consumption.

The regulations also provide flexibility in sourcing electricity for charging the storage systems. Companies can use surplus power from their own plants, procure electricity from other generating stations, or purchase it from the open market. At the same time, priority is given to using storage systems to maintain the technical minimum operation of generating units, ensuring stable and continuous power supply to beneficiaries.

For existing projects, the amendment introduces a transparent and consultative approach. If a generating company plans to add an energy storage system, it must first share the proposal with its beneficiaries. These stakeholders are given 30 days to respond before the company can seek in-principle approval from the Commission. This ensures that both costs and benefits, including improved grid stability, are properly assessed.

The notification also includes changes related to integrated coal and lignite mines. It introduces a mechanism to share gains if production exceeds planned targets and clarifies how input fuel prices will be calculated for cost recovery. While most provisions come into effect immediately after publication, certain mine-related rules have been applied retrospectively from April 1, 2024.

CERC Approves 2,000 MW Solar Plus Storage Project to Strengthen India's Power Reliability

In a major move to strengthen India's renewable energy reliability, the Central Electricity Regulatory Commission has approved tariffs for a large 2,000 MW solar power project integrated with energy storage. The project has been developed under the leadership of the Solar Energy Corporation of India, aiming to make solar power more stable and available even after sunset.

This initiative includes 1,000 MW of energy storage systems, which will help convert solar energy into "firm and dispatchable" power. One of the biggest challenges with solar energy is that it is only generated during the day, but electricity demand often rises in the evening. By adding storage, excess power generated during the day can be saved and used later, especially during peak hours between 6:00 PM and midnight.

The project was awarded under the SECI-ISTS-XX tranche, following guidelines issued by the Ministry of Power for renewable energy projects combined with storage. The bidding process saw strong participation from 27 companies, showing high interest from the industry. After a competitive e-reverse auction held in October 2025, 11 developers were selected

Out of these, eight companies secured capacity at a tariff of ₹2.86 per kWh. Major developers such as Welspun Renewable Energy, Shivalaya Construction, and Purvah Green Power were among the winners. Other selected firms include MB Power, Oswal Cables, Banyan Insolation, LC Infra Projects,

and Stockwell Solar Services. Additionally, three companies—SAEL Industries, GH2 Solar, and Navayuga Green Energy—won capacity at a slightly higher tariff of ₹2.87 per kWh.

To ensure reliable performance, the project comes with strict operational conditions. For every 1 MW of solar capacity, developers must install at least 0.5 MW of storage capacity. This requirement ensures that sufficient energy is stored for use during non-solar hours. Developers must also maintain a minimum annual capacity utilization factor of 19 percent, which ensures that the plants generate a consistent amount of electricity throughout the year.

The financial structure of the project has also been clearly defined. SECI will act as an intermediary agency by signing long-term power purchase agreements with the developers for 25 years. It will then sell this power to distribution companies through separate agreements. The Commission has approved a trading margin of ₹0.07 per kWh for SECI, provided it maintains proper payment security mechanisms such as letters of credit. If these conditions are not fulfilled, the margin will be reduced to ₹0.02 per kWh.

This approval is an important step in improving the stability of India's power system. By combining solar energy with storage, the project helps ensure a steady supply of clean electricity even during peak demand hours. It also supports distribution companies in meeting their renewable purchase obligations while reducing dependence on fossil fuels.

Overall, the decision highlights how large-scale storage integration can make renewable energy more dependable. It sets an example for future projects and moves India closer to building a strong, clean, and reliable energy system.

Energy Transition and Renewable Capacity

India has achieved a landmark in its energy transition journey by reaching 50% of its installed electricity capacity from non-fossil fuel sources in June, 2025 – more than five years ahead of the target set under its Nationally Determined Contributions (NDCs) to the Paris Agreement. This significant milestone

underscores the country's steadfast commitment to climate action and sustainable development. Out of the total installed generation capacity of 484.82 GW (as on 30th June, 2025), the non-fossil fuel based installed capacity was 242.78 GW, which is 50.08% of the installed capacity.

The share of non-fossil fuel capacity in the total installed power generation capacity has increased from 32.54 % (as on 31.03.2014) to 51.93 % (as on 31.12.2026) and its details are given at **Annexure**.

Government of India has taken various measures to address the challenges of climate change through energy transition initiatives. The Government is implementing reforms towards a secure, affordable and sustainable energy system to power a robust economic growth and have taken several measures like increasing the share of installed RE capacity & its uptake and promoting energy efficiency in all sphere of life.

The Government of India has undertaken several initiatives to achieve 500 GW non fossil capacity by 2030. Steps taken by Government of India to promote and accelerate renewable energy capacity in the country include the following:

- i. 100% Inter State Transmission System (ISTS) charges have been waived for inter-state sale of solar and wind power for projects to be commissioned by 30th June 2025 (with waiver tapering off 25% annually till June 2028), for co-located BESS projects commissioned by June 2028, for Hydro PSP projects where construction work awarded by June 2028, for Green Hydrogen Projects commissioned till December 2030 and for offshore wind projects commissioned till December 2032.
- ii. Standard Bidding Guidelines for tariff based competitive bidding process for procurement of Power from Grid Connected Solar, Wind, Wind-Solar Hybrid and Firm & Dispatchable RE (FDRE) projects have been issued.
- iii. Ministry of New & Renewable Energy (MNRE) has issued Bidding Trajectory for issuance of RE power procurement bids of 50 GW per annum by 'Renewable Energy

- Implementing Agencies’ (REIAs) from FY 2023-24 to FY 2027-28.
- iv. Foreign Direct Investment (FDI) has been permitted up to 100 percent under the automatic route.
- v. Laying of new transmission lines and creating new sub-station capacity has been supported under the Green Energy Corridor Scheme for evacuation of renewable power.
- vi. To augment transmission infrastructure needed for steep RE trajectory, transmission plan has been prepared till 2032.
- vii. Scheme for setting up of Solar Parks and Ultra Mega Solar Power projects is being implemented to provide land and transmission to RE developers for installation of RE projects at large scale.
- viii. Schemes such as Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM), PM Surya Ghar Muft Bijli Yojana, National Programme on High Efficiency Solar PV Modules, New Solar Power Scheme (for Tribal and PVTG Habitations/Villages) under Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM JANMAN) and Dharti Aabha Janjatiya Gram Utkarsh Abhiyan (DA JGUA), National Green Hydrogen Mission, Viability Gap Funding (VGF) Scheme for Offshore Wind Energy Projects have been launched.
- ix. Government of India, in September 2023, approved a Viability Gap Funding (VGF) scheme for development of Battery Energy Storage Systems (BESS). BESS capacity of 13.22 GWh is under implementation with a budgetary allocation of Rs 3,760 Cr. under this scheme. Considering the increasing demand of BESS, Ministry of Power, in June 2025, has approved another VGF scheme for development of 30 GWh BESS capacity with a financial support of Rs 5,400 Cr from Power System Development Fund (PSDF).
- x. To boost RE consumption, Renewable Purchase Obligation (RPO) followed by Renewable Consumption Obligation (RCO) trajectory has been notified till 2029-30. The RCO which is applicable to all designated consumers under the Energy Conservation Act 2001 will attract penalties on non-compliance. RCO also includes specified

quantum of consumption from Decentralized Renewable Energy sources.

- xi. “Strategy for Establishments of Offshore Wind Energy Projects” has been issued.
- xii. To achieve the objective of increased domestic production of Solar PV Modules, the Govt. of India is implementing the Production Linked Incentive (PLI) scheme for High Efficiency Solar PV Modules.
- xiii. 12,723.5 MW of Hydro Electric Projects are under construction. Further, 4,274 MW of Hydro Electric Projects are under various stage of planning and targeted to be completed by 2031-32.
- xiv. Ministry of Power has initiated the steps to promote Pumped Storage Projects (PSPs) to support renewable energy integration and grid stability. At present, 10 Pumped Storage Projects totaling 11,870 MW are under construction in the country.

Further, Nuclear power has huge potential to ensure long term energy security and is vital for India’s clean energy transition towards Net Zero by 2070. It is a clean and environment friendly source of base load power. The lifecycle emissions of nuclear power are comparable to those of renewables like hydro and wind. The Government of India has set an ambitious target of 100 GW nuclear power capacity by 2047.

ANNEXURE

The details of the share of non-fossil fuel-based capacity in the total installed power generation capacity as on 31.03.2014 and 31.12.2025:

As on	Total Installed Capacity (GW)	Non-Fossil fuel-based Capacity (GW)	% share of Non-Fossil Capacity w.r.t. Total Installed Power Generation Capacity
31.03.2014	249.42	81.16	32.54%
31.12.2025	513.73	266.79	51.93%

This information was given by The Minister of State in the Ministry of Power, Shri Shripad Naik, in a written reply in the Rajya Sabha today.

SECI Explores Solar Collaboration with Bhutan to Support 5 GW Target by 2040



A high-level delegation led by the Solar Energy Corporation of India (SECI) has concluded a strategic visit to Bhutan to explore opportunities for collaboration in renewable energy development. The delegation included representatives from public sector undertakings (PSUs), private sector developers, and EPC contractors.

During the visit, SECI engaged with senior officials from the Royal Government of Bhutan (RGoB), including the Hon'ble Energy Minister, the Director General of the Department of Energy, members of the Bhutan Chamber of Commerce and Industry, and the Ambassador of India to Bhutan. Discussions centered on Bhutan's ambitious target of achieving 5 GW of solar capacity by 2040, alongside plans for large-scale infrastructure development.

SECI highlighted potential collaboration avenues under the Memorandum of Understanding (MoU) signed between India's Ministry of New and Renewable Energy (MNRE) and the RGoB. Key focus areas included the development of joint ventures in green energy projects to accelerate Bhutan's clean energy transition.

The delegation was led by Sivakumar V Vepakomma, Director (Power Systems), who presented an overview of India's renewable energy landscape and SECI's role in supporting regional decarbonisation efforts. The discussions also underscored Bhutan's position as a carbon-negative nation and the potential to further strengthen its sustainability trajectory.

The engagement is expected to pave the way for actionable partnerships aimed at enhancing regional energy security, supporting Bhutan's sustainability goals, and generating shared economic value. SECI reaffirmed its commitment to working closely with the

RGoB to develop scalable and innovative clean energy solutions for a resilient future.

SJVN Secures CERC Approval for ₹3.19 Tariff in 1200 MW Wind-Solar Hybrid Projects



The Central Electricity Regulatory Commission (CERC) has approved the adoption of tariffs for 1,200 MW of wind-solar hybrid power projects, marking an important step in India's shift toward cleaner energy. The approval came after a petition was filed by SJVN Limited under Section 63 of the Electricity Act, 2003, seeking formal recognition of tariffs discovered through a competitive bidding process.

SJVN, acting as the government's intermediary agency, launched the Hybrid-3 tender in June 2024 to procure hybrid renewable power. The tender attracted strong interest from the industry, with 15 companies participating and bidding for a total capacity of 3,700 MW. This was more than three times the offered capacity, creating intense competition among developers. The process eventually moved to an electronic reverse auction in November 2024, which helped discover competitive pricing.

The bidding process resulted in a uniform tariff of Rs. 3.19 per kWh. Five developers were selected to set up the projects across

different parts of the country. These include Gentari Renewables India Utilities 2 Private Limited with 400 MW, Juniper Green Energy Private Limited and EG Energy Development Private Limited with 300 MW each, Sunsure Solarpark RJ One Private Limited with 130 MW, and Adyant Enersol Private Limited with 70 MW. After the auction, SJVN issued Letters of Award to all successful bidders in December 2024.

These projects are planned to supply electricity for a period of 25 years, which will support distribution companies in meeting their renewable purchase obligations. The hybrid model, combining wind and solar generation, is expected to provide more stable and reliable power compared to standalone renewable projects.

During the regulatory review, a policy change took place when the Ministry of Power withdrew the Uniform Renewable Energy Tariff mechanism in August 2025. However, CERC clarified that this change would not impact the current projects. Since the bidding process had already been completed and awards had been issued, the discovered tariff remains valid and enforceable.

The Commission also examined whether the bidding process followed the required guidelines. It noted that SJVN had complied with all national competitive bidding rules and maintained transparency in both technical and financial evaluations. A dedicated tender committee with experts in finance and technology monitored the entire process to ensure fairness and accountability.

In its final order, CERC approved the tariff of Rs. 3.19 per kWh for the 1,200 MW projects. It also allowed SJVN to charge a trading margin of Rs. 0.07 per kWh, subject to maintaining proper payment security mechanisms for the developers.

With this approval, the way is now clear for signing Power Purchase Agreements and starting project construction. The development of these hybrid power projects is expected to strengthen India's electricity grid by adding reliable and clean energy capacity, while also supporting the country's long-term renewable energy goals.

Nepal plans to boost hydropower exports to India amid rising energy demand

Nepal is looking to sharply increase hydropower supplies to India to help meet rising electricity demand, as the conflict in West Asia complicates fuel availability and energy planning, Bloomberg reported.

The Himalayan nation plans to nearly double its contribution to India's grid to about 1.1 gigawatts (GW) this summer, when high temperatures are expected to push power demand to record levels, according to Hitendra Dev Shakya, managing director of state-run Nepal Electricity Authority. Over the next two years, exports could rise to around 2.5 gigawatts as transmission infrastructure improves.

The move comes at a time when tensions in the Middle East have disrupted energy markets, with India heavily dependent on the region for fuel supplies. Attacks on facilities and the closure of the Strait of Hormuz have tightened availability of gas and other fuels, testing the country's energy security during the peak consumption season.

Supply disruptions have affected liquefied petroleum gas used by more than 330 million households in India, while shortages of natural gas could also impact power generation, particularly at night when solar output falls.

Although Nepal's contribution would remain small compared with India's expected peak demand of about 283 GW this summer, additional hydropower imports could help offset shortfalls. Last year, Nepal supplied around 600 MW of round-the-clock power to India for six months through November, and it is now seeking buyers to export another 500 MW, added Shakya.



Shri G Kishan Reddy
Hon'ble Minister of Coal and Mines to
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Ethanol Blending Cuts Oil Imports by 4.5 Crore Barrels: PM Modi



The Indian Sugar & Bio-Energy Manufacturers Association (ISMA) has welcomed Prime Minister Narendra Modi's recent address in Parliament, where he outlined India's preparedness to tackle energy security challenges amid rising geopolitical tensions in West Asia and volatility in global crude oil markets.

Strategic Reserves and Refining Capacity Strengthened

In his address, Prime Minister Modi highlighted the country's efforts over the past decade to enhance its energy security framework. He noted that India has built a strategic petroleum reserve exceeding 53 lakh metric tonnes, with ongoing work to expand it beyond 65 lakh metric tonnes. These reserves are in addition to those held by oil marketing companies.

The Prime Minister also pointed to a significant increase in India's refining capacity over the past 11 years, positioning the country to better manage supply disruptions during periods of global uncertainty.

Ethanol Blending Emerges as Key Energy Lever

A major highlight of the address was the progress made in ethanol production and blending.

Modi stated, "In the last ten to eleven years, unprecedented work has been done on ethanol production and blending. A decade ago, the country had a capacity of only one per cent ethanol blending. Today, we are close to achieving 20 per cent ethanol blending in petrol."

He added that this transition has resulted in a reduction of approximately 4.5 crore barrels of crude oil imports in the past year alone, contributing to both energy security and foreign exchange savings.

The government, he said, is actively working across short-, medium-, and long-term horizons to mitigate the impact of global conflicts on India's economy,

while maintaining strong economic fundamentals and engaging with stakeholders across sectors.

ISMA Calls It Validation of Biofuel Push

ISMA said the Prime Minister's acknowledgement reinforces the role of ethanol blending as a strategic pillar of India's energy roadmap. The association noted that blending levels have increased from around 1.5 percent in 2014 to nearly 20 percent today, achieved ahead of schedule.

"The Prime Minister's acknowledgement that ethanol blending has already saved 4.5 crore barrels of crude imports is a powerful validation of biofuels as a strategic pillar of India's energy security," said Deepak Ballani, Director General, ISMA.

Industry Sees Scope for Higher Blends

According to ISMA, India currently has over 2,000 crore litres of domestic ethanol production capacity, significantly exceeding the 1,100 crore litres required to sustain 20 percent blending (E20).

The association said this surplus capacity positions the country to move towards higher ethanol blends such as E22 to E27, while also enabling the scaling up of flex-fuel vehicles capable of operating on E85 or E100 fuels.

ISMA added that advancing to higher blending levels could further reduce import dependence, enhance foreign exchange savings, and accelerate India's progress towards energy self-reliance.

Centre issues order to bolster natural gas pipeline infrastructure amid disruptions by Hormuz issue

The Ministry of Petroleum and Natural Gas recently issued an order to streamline and fast-track the laying and expansion of gas pipelines across the country, amid energy supply concerns following disruptions in the Strait of Hormuz during the West Asia conflict.

The ministry notified the Natural Gas and Petroleum Products Distribution Order, 2026 under the Essential Commodities Act, 1955, introducing a time-bound and simplified framework for pipeline

development. The move aims to address delays in approvals and land access, enabling faster expansion of natural gas infrastructure, including in residential areas.

Published in the Extraordinary Gazette of India, the order takes immediate effect and seeks to create a transparent and investor-friendly system for efficient gas distribution, infrastructure growth and wider access to cleaner energy.

The government said the order would help expand piped natural gas networks, improve last mile connectivity and promote cleaner fuels for cooking, transport and industrial use, strengthening energy security and supporting the shift towards a gas based economy.

"India's growing energy demand and evolving global energy landscape necessitate a resilient, diversified, and efficient energy system. This order addresses longstanding challenges in infrastructure development, regulatory uncertainty, and delays in approvals, while positioning natural gas as a key transition fuel," the government said in a statement.

The framework sets out clear and uniform rules for laying, building, operating and expanding pipelines, with standardised processes and timelines to reduce ambiguity and administrative discretion.

The move comes as disruptions in the Strait of Hormuz have impacted about 90% of India's LPG imports.

"At its core, the reform is designed to significantly improve ease of doing business by simplifying procedures, reducing regulatory bottlenecks, and creating a predictable and transparent operating environment for stakeholders," the government noted.

The order is expected to accelerate the rollout of City Gas Distribution networks and trunk pipelines, while improving last-mile connectivity and scaling up piped natural gas infrastructure.

Oil and Gas Adequacy in India

As of March 2026, the Government of India maintains that the country's oil and gas supply is fully secure, with enough stocks to meet domestic demand for approximately two months despite global geopolitical tensions. Officials have explicitly urged citizens to avoid "panic buying" triggered by social media rumours, asserting that all refineries are operating at high capacity and retail outlets have stable supplies.

Current Stock and Reserve Status

According to recent government briefings (March 2026), India's total energy reserve capacity can meet demand for roughly 74 days.

Crude Oil Inventory: Sufficient crude oil supplies for the next 60 days have already been tied up by Indian oil companies.

Strategic Petroleum Reserves (SPR): India has established over 5.3 million metric tonnes of strategic storage in underground caverns at Visakhapatnam, Mangalore, and Padur.

LPG Stocks: Domestic production has been ramped up by 40%, and there are roughly one month of assured supplies.

Supply Management Measures

To mitigate disruptions from the West Asia crisis and the closure of the Strait of Hormuz, the Ministry of Petroleum and Natural Gas has implemented several strategic measures:

Diversified Sourcing: India now imports energy from 41 countries (up from 27 a decade ago), including Russia, the US, and Australia, to reduce dependence on any single region.

Production Shifts: Refineries have been ordered to maximise LPG production and regulate supplies to industrial consumers at approximately 80% to protect residential and priority segments like hospitals.

PNG Expansion: The government is accelerating Piped Natural Gas (PNG) connections to reduce the burden on LPG cylinders, activating over 7,500 new connections in a single day recently.

Anti-Hoarding Actions: District-level monitoring committees have conducted thousands of raids and inspections at retail outlets to prevent black marketing and hoarding.

Key Statistics (as of March 2026)

Feature	Status
Total Reserve Cover	~74 days (Strategic + Commercial)
Crude Sourcing	41 Countries
Refining Capacity	~260 Million Tonnes Per Annum
LPG Daily Delivery	>50 Lakh Cylinders
Strategic Storage	5.33 MMT (Phase I)

While the Ministry of Petroleum and Natural Gas acknowledges that LPG availability requires close monitoring, it reiterates that no "dry-outs" have occurred at fuel pumps and supply lines remain functional.

Updates on Key Sectors of Oil and Gas in View of Developments in West Asia

In light of the ongoing developments in West Asia, the Government of India continues to closely monitor the situation and is taking necessary preparedness and response measures to ensure stability across critical sectors. An update on key aspects, including energy supply, maritime operations, and support for Indian nationals in the region, is provided below.

Energy Supply and Fuel Availability

With the Strait of Hormuz remaining closed, the Government of India has taken a series of measures to maintain uninterrupted supply of petroleum products and LPG across the country. The present status is outlined below:

Crude/Refineries

· All refineries are operating at high capacity, with adequate crude inventories in place. The country is also maintaining sufficient stocks of petrol and diesel.

· Domestic LPG Production from refineries has been increased to support domestic consumption.

Retail Outlets

· All Retail outlets are operating normally across the country.

· Panic Buying reported in Some areas – There were certain rumours which led to panic buying at some Retail outlets in few States, resulting in unusually high sales and heavy crowding at Retail outlets. However, it is informed that there are adequate stocks of petrol and diesel available at all Petrol Pumps in the country.

· The Government reiterates its advice to the public not to believe rumours.

Natural Gas

· Consumers have been prioritised with 100% supplies to D-PNG and CNG-Transport.

· Supplies to industrial & commercial consumers connected on grid is at 80% of their average consumption.

· CGD entities have also been advised by Govt. of India to prioritize PNG connections for commercial establishments such as restaurants, hotels and canteens across all their Gas, to address concerns regarding the availability of commercial LPG.

· CGD Companies like IGL, MGL, GAIL Gas and BPCL have offered incentives for taking domestic and Commercial PNG connections.

· Govt. of India has requested Govt. of States/UTs and Central Ministries to expedite approval of applications required for expansion of CGD network.

· Govt. of India vide letter dated 18.03.2026 has offered all States/UTs additional 10% allocation of commercial LPG to States provided they can help in long term transition from LPG to PNG.

· Some States have come up with policies for faster Right of User/Right of Way (RoU/RoW) permission, longer working hours and also rationalization of RoU/RoW charges.

· In response to above Govt. of India letter, Petroleum and Explosive Safety Organisation (PESO) has advised all its offices to dispose off CGD applications on priority i.e., within 10 days of receipt.

· PNGRB vide its order dated 23.03.2026 has directed all CGD entities to make all out efforts to connect residential schools & colleges, hostels, community kitchens, anganwadi kitchens etc. through PNG within 5 days, wherever pipeline infrastructure is available in near vicinity.

· Ministry of Road, Transport & Highways vide letter dated 24.03.2026 has stated that they have adopted “Accelerated Approval Framework for CGD Infrastructure with reduced timelines” as a special measure for 3 months wherein applications pertaining to CGD infrastructure shall be processed on priority.

· Govt. of India vide Gazette dated 24.03.2026 has notified the Natural Gas and Petroleum Products Distribution (Through Laying, Building, Operation and Expansion of Pipelines and Other Facilities) Order, 2026 under the Essential Commodities Act, 1955. The Order provides a streamlined and time-bound framework for laying and expanding pipelines across the country, addressing delays in approvals and access to land, and enabling faster development of natural gas infrastructure, including in residential areas. It is expected to accelerate PNG network growth, enhance last-mile connectivity, and support the transition to cleaner fuels, thereby strengthening energy security and advancing India’s gas-based economy.

· CGD entities have reported 11,089 PNG connections (new connections and old gas-in) in 110 focused Geographical Areas yesterday.

LPG

· Supply of LPG is affected due to prevailing geopolitical situation.

Domestic LPG Supply:

- No reported dry-out at LPG distributorships.
- Delivery of Domestic LPG Cylinders is normal.

Commercial LPG supply

· Govt. had already restored Partial Commercial LPG supply (20%) to consumers. Further, Govt. of India vide letter dated 18.03.2026 had proposed to allocate additional 10% of Commercial LPG to States/UTs based on ease of doing business reforms for PNG expansion.

· Govt. of India vide letter dated 21.03.2026 has allowed another 20% allocation of commercial LPG to States, which would take overall allocation to 50% (incl. 10% allocation based on ease of doing reforms for PNG expansion). This additional 20% allocation shall be given on priority to sectors like restaurants, dhabas, hotels, industrial canteens, food processing/dairy, subsidised canteens/outlets run by State Govt. or local bodies for food, community kitchens, 5 Kg FTL for migrant labourers.

· 27 States/UTs have issued orders to allocate the Non-domestic LPG in line with the guidelines issued by the Govt. of India. For rest of the States/UTs, PSU Oil Marketing companies are releasing Commercial LPG cylinders. A total of around 25,922 MT has been uplifted since 14th March 2026 by commercial entities in the States/UTs.

· Yesterday, more than 37,000 – 5 Kg FTL Cylinders have been sold.

Role of State/UTs-

· Under Essential Commodities Act, 1955 and LPG Control Order, 2000, State Govt. are empowered to act against any hoarding and black marketing. Govt. of States/UTs have to play a primary role in monitoring and regulating supply situation of essential commodities including Petrol, Diesel and LPG. Govt. of India has reiterated the same vide letter dated 13.03.2026 and 18.03.2026 to all States/UTs.

· Govt. of India has been emphasising the importance of States/UTs in controlling hoarding, black marketing and rumour mongering. Accordingly, a VC was conducted by Secretary, MoP&NG on 25.03.2026 with all Chief Secretaries, ACSs/Principal Secretary/Secretary Food & Civil supply of all the States/UTs and requested –

To institutionalize daily press briefings at State/District level and issue regular public advisories.

To setup dedicated control rooms/helplines
To actively monitor and counter fake news / misinformation on social media.

To intensify daily enforcement drives by District admin and to continue raids and inspections in coordination with OMCs

To issue Commercial LPG allocation orders within their States/UTs

To issue SKO allocation orders for additional SKO allotted to the States/UTs.

To fast track CGD expansion incl. expediting RoW/RoU permissions, 24x7 work permissions etc.
To promote PNG adoptions and alternate fuels.

India to offer 21 oil, gas blocks in OALP XI bidding round

India is preparing to roll out the next round of oil and gas exploration auctions, with 21 blocks identified for offering under OALP-XI, even as the previous round remains open for bids. The Directorate General of Hydrocarbons (DGH) has published details of the proposed acreage, spanning about 80,235 square kilometres across a mix of terrains. The offering includes 12 onland blocks, four in shallow waters, one deepwater block and four in ultra-deepwater regions.

“Bid submission start and closing dates (will) be announced soon,” the DGH said.

Different metrics to decide winners

The award framework varies by basin maturity, with more weight given to fiscal terms in proven regions and to exploration effort in less-developed areas. For Category-I basins — where commercial production already exists — blocks will go to bidders offering the highest revenue share along with a committed work programme. In contrast, for Category-II and III basins, bids will be evaluated primarily on the scale of proposed seismic surveys and drilling activity.

Category-II basins have known hydrocarbon accumulations but lack commercial development, while Category-III areas are yet to see any discoveries.

New round comes amid delays in OALP-X

The announcement of OALP-XI comes at a time when OALP-X — the largest round so far — is still awaiting bid closure after multiple deadline extensions. Launched in February 2025 at India Energy Week, the round has seen its closing date pushed repeatedly from July 2025 to October, then December, later February 2026, and now to May 29. OALP-X covers 25 blocks spread over nearly 191,986 sq km across 13 sedimentary basins, including a significant share in deepwater and ultra-deepwater areas.

Limited competition in recent rounds

While the government has steadily expanded the scale of acreage on offer, bidder participation has remained relatively limited. In OALP-IX, which preceded the current round, 28 blocks covering 1.36 lakh sq km were offered, attracting just four bidders — including ONGC, Oil India Ltd and Vedanta Ltd — with most blocks receiving only two bids.

The round also marked the first instance of a joint bid by Reliance Industries Ltd and BP Plc with ONGC for an offshore block in Gujarat.

ONGC emerged as the largest winner, securing 11 blocks independently and three with Oil India. Vedanta, despite bidding for all 28 blocks, won seven, while Oil India picked up six.

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India's nuclear plants generated 56,681 MU of power in 2024-25: Jitendra Singh



Total energy generation from India's nuclear power plants was 45,855 million units (MU) in 2022-23; 47,971 MU in 2023-24; and 56,681 MU in 2024-25, Union Minister Jitendra Singh said recently.

In a written reply in the Rajya Sabha, the minister said the country currently has an installed nuclear power capacity of 8,780 Mega Watts (MW) from 24 nuclear power plants, excluding the Rajasthan Atomic Power Station-Unit 1.

Eighteen nuclear power reactors with a total capacity of 13,600 MW are to be implemented. This consists of 10 nuclear reactors that are under construction (including a 500 MW Prototype Fast Breeder Reactor or PFBR) and eight reactors under pre-project activities.

"Bharatiya Nabhikiya Vidyut Nigam Limited is currently commissioning a 500 MW PFBR project at Kalpakkam in Tamil Nadu. The government has accorded approval to carry out pre-project activities for the 2x500 MW twin unit of fast breeder reactor 1 and 2 project at Kalpakkam," Singh said.

On attaining first criticality of PFBR, the government will be approached for financial sanction of fast breeder reactor 1 and 2, the minister added.

Zero duty on nuclear imports to aid power sector expansion: Union Minister Jitendra Singh

Zero customs duty on the import of goods required for nuclear power projects to boost nuclear energy development in the country, Union Minister Jitendra Singh said in a written reply in Parliament recently.

He said that the move aims to reduce overall project costs and the per-unit cost of electricity, making such projects more viable, particularly those involving foreign cooperation with substantial import content.

The minister said that the exemption of customs duty on nuclear fuels and reactor components will remain in place till 2035. He noted that the measure will help lower both project and electricity generation costs, improving the economic viability of nuclear power projects.

He also informed that Nuclear Power Corporation of India Ltd has taken several steps to strengthen the domestic supply chain for the ten newly approved 700 MW Pressurised Heavy Water Reactor units.

The measures include bulk ordering to ensure continuity, expanding the vendor base, promoting indigenous equipment for import substitution, reserving certain procurement for Class-I local suppliers, and encouraging MSME participation through vendor meets and bid preference.

Focusing on research and development funding for Bhabha Atomic Research Centre, the minister said the increased allocation is being utilised for multidisciplinary technology development aimed at achieving self-reliance.

Key focus areas include new research reactors, isotope production for cancer treatment, advanced reactor technologies including SMRs and hydrogen production, as well as accelerator, laser, and advanced materials technologies. The minister also said that there is currently no proposal to integrate the PM Gati Shakti framework with the construction and logistics of upcoming nuclear parks in coastal states.

PARLIAMENT QUESTIONS

Expansion of Nuclear Power Generation Capacity

The present installed nuclear power capacity in the country is 8,780 MW comprising of 24 nuclear power plants (excluding RAPS-1 – 100 MW).

The total generation from the nuclear power plants during the past three years have been 45855 Million Units (MUs) in 2022-23, 47971 MUs in 2023-24 and 56681 Mus in 2024-25.

At present, there are 18 nuclear power reactors with a total capacity of 13600 MW under implementation, comprising of 10 nuclear reactors under construction (including PFBR – 500 MW) and 8 reactors under pre-project activities.

BHAVINI is currently commissioning a 500 MWe Prototype Fast Breeder Reactor (PFBR) project at Kalpakkam, Tamil Nadu. Government has accorded approval to carry out pre-project activities for 2 x 500 MWe twin unit of FBR 1&2 project at Kalpakkam, Tamil Nadu. On attaining first criticality of PFBR, Government will be approached for financial sanction of FBR 1&2 projects.

This information was given by Union Minister of State (Independent Charge) for Science & Technology and Earth Sciences, and Minister of State in the Prime Minister's Office, Personnel, Public Grievances and Pensions, Atomic Energy and Space, Dr. Jitendra Singh, in a written reply in the Rajya Sabha recently.

Nuclear Energy Generations

In the year 2024-25, nuclear share in total electricity generation in the country was about 3.1%.

The nuclear share is proposed to be increased substantially by increasing the present installed nuclear power capacity of 8.78 GW (excluding RAPS-I) to about 22 GW by 2031-32 and 100 GW by 2047 progressively. The Government has drawn up a roadmap for reaching the 100 GW nuclear power capacity by 2047 as announced in the Nuclear Energy Mission. As per the roadmap, the present nuclear power capacity of 8.78 GW (excluding RAPS-1) is expected to reach about 22 GW by 2031-32 on progressive completion of projects presently at various stages of implementation. Another 32 GW of nuclear power capacity is envisaged to be set up beyond 2032 by NPCIL, comprising of indigenous Pressurised Heavy Water Reactors (PHWR) and Light Water Reactors (LWR) by 2047 taking the capacity to about 54 GW. As per the roadmap, the balance of 46 GW is expected to be set up by other Public Sector Enterprises (Central & State), State Governments, Private sector and Joint Ventures in different business models, comprising of reactors of different technologies. The Government has also enacted the SHANTI Act to enable wider

participation in nuclear power sector towards the accomplishment of the Nuclear Energy Mission.

BHAVINI is currently commissioning a 500 MWe Prototype Fast Breeder Reactor (PFBR) project at Kalpakkam, Tamil Nadu. Government has accorded approval to carry out pre-project activities for 2 x 500 MWe twin unit of FBR 1&2 project at Kalpakkam, Tamil Nadu. On attaining first criticality of PFBR, Government will be approached for financial sanction of FBR 1&2 projects.

Does not arise.

This information was given by Union Minister of State (Independent Charge) for Science & Technology and Earth Sciences, and Minister of State in the Prime Minister's Office, Personnel, Public Grievances and Pensions, Atomic Energy and Space, Dr Jitendra Singh, in a written reply to the Rajya Sabha recently.

Deployments of Small Modular Reactors

Under the Nuclear Energy Mission announced in the Union Budget 2025–26, a total budgetary provision of ₹20,000 crore has been made for the research, design, development, and deployment of Small Modular Reactors (SMRs). Department of Atomic Energy (DAE) has undertaken design and development works on indigenous SMRs namely;

- I. 220 MWe Bharat Small Modular Reactor (BSMR-200)
- II. 55 MWe Small Modular Reactor (SMR-55), and
- III. Up to 5 MWth High temperature gas cooled reactor meant for hydrogen generation.

The lead units of these SMRs will be established at DAE sites for technology demonstration.

The progress of these SMRs is as follows;

- BSMR-200: In-principle approval has been received for the project. Proposal for administrative & financial sanction is cleared by Atomic Energy Commission (AEC) for submission of the proposal to the Cabinet Committee.
- SMR-55: In-principle approval has been received for the project.

- HTGCR: In-principle approval has been received for the project. Detailed Project Report (DPR) has been prepared. Siting consent has been received and Terms of Reference (ToR) for obtaining environmental clearances has been received from Ministry of Environment, Forest and Climate Change (MoEF&CC).

The special material called “Advanced Purified Reactor Vessel Alloy (ApuRVA) and technology for forgings for reactor pressure vessels of BSMR-200 and SMR- 55 has been developed indigenously in collaboration with Indian Industries. The control rod drive mechanism has also been developed in-house.

Necessary technology for deployment of these reactors is available in the country. Majority of equipment are within manufacturing capability of Indian Industries with technological handholding by Bhabha Atomic Research Centre (BARC). Therefore, Indian industries will be engaged in manufacturing of equipment.

The Government has drawn up a roadmap for reaching the 100 GW nuclear power capacity by 2047 as announced in the nuclear energy mission. As per the road map, the present nuclear power capacity of 8.78 GW [excluding Rajasthan Atomic Power Station-I (RAPS-I)] is expected to reach about 22 GW by 2031-32 on progressive completion of projects, presently at various stages of implementation. Another 32 GW of nuclear power capacity is envisaged to be set up beyond 2032 by NPCIL, comprising of indigenous Pressurised Heavy Water Reactors (PHWR) and Light Water Reactors (LWR) by 2047 taking the capacity to about 54 GW. As per the roadmap, the balance of 46 GW is expected to set up by other Public Sector Enterprises (Central & State), State Governments, Private sector and Joint Ventures in different business models, comprising of different technologies.

Bharat Small Modular Reactor (BSMR) is being jointly designed and developed by Bhabha Atomic Research Centre (BARC) a constituent unit of DAE and Nuclear Power Corporation of India Limited (NPCIL) a PSU under DAE. Estimated time for construction of BSMR is 60 to 72 months from receipt of administrative & financial approval.

The expected investment allocated by BARC toward setting up indigenous SMRs is mentioned below:

Reactor	Cost Outlay (Rs Cr.)
Development and Construction of BSMR-200	5960
Development and Construction of SMR-55 (2 units)	7000
Design and construction of High Temperature Gas Cooled Reactor (HTGCR)	320
Design, engineering & development works for new reactors	800
Civil and General Infrastructure Development for reactors complex	452

Lead units of BSMR-200 and SMR-55 are proposed to be constructed at Tarapur Atomic Power Station site, Maharashtra whereas high temperature gas cooled reactor (HTGCR) is proposed to be constructed at BARC Vizag, Andhra Pradesh.

This information was given by Union Minister of State (Independent Charge) for Science & Technology and Earth Sciences, and Minister of State in the Prime Minister’s Office, Personnel, Public Grievances and Pensions, Atomic Energy and Space, Dr. Jitendra Singh, in a written reply in the Rajya Sabha recently.

Kazakhstan to supply fresh uranium to India under new deal to fuel nuclear power plants

Resource-rich Kazakhstan and world's top producer of uranium has agreed to supply a large quantity of uranium under a fresh contract to fuel India's nuclear power plants. The announcement was made by Kazakhstan's uranium company Kazatomprom recently after recent discussions with India's Department of Atomic Energy. India and Kazakhstan have been in talks for a uranium supply deal since the last contract expired a few years back, with negotiations gaining momentum in recent months.