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Securing Reliable Power and Resilient Infrastructure for Viksit Bharat

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Large Scale Curtailment of Renewable Power: Concerns, Challenges, Options and Actions

R.V. Shahi

Headline news recently highlighted about the large scale curtailment of Renewable Power, particularly Solar Power and resultant "loss of Rs. 629 Crore in FY – 2026". In a power generation process, considering the situation of the Grid, which is managed with due recognition to demand and supply situation, the inevitability of cutting down generation is a common phenomenon. On the supply side several power generation units could be in the running condition, would be generating power as per their capacity or below capacity, would be facing maintenance problems, and situation of reducing generation due to technical reasons. Similarly, on the consumption side there would be variations on minute to minute basis, and even larger variations during different seasons. Keeping all these challenges – both on generation and supply side and on consumption side - the task and management of Grid is to appropriately tackle all such dynamic situations. As a matter of fact, apart from several fluctuations on the power generation side and on consumption side, there could be situations of technical availability of certain segments of transmission system itself, which would also create a challenge to balance consumption and supply side to maintain safe and healthy operations of the Grid. Given all these facts and realities why then this great concern on solar curtailment? There are valid reasons. What is different in case of Solar Power, as also in case of Wind Power, which is leading to such headlines, is the fact that both these systems, once capital has been invested, run on energy which practically does not cause any additional cost burden. Therefore, the concern arises from "Could we have availed of this power which is practically free of variable component of cost?" This concern is further emphasised that if power demand was there, perhaps we could have reduced generation elsewhere, where generation cost is not merely the cost of equipment, but also the additional cost of fuels. Another concern, which has also emerged, emanates from the inadequacy of the transmission system in the situation of demand being there, Solar system could provide power but it is the non-availability of transmission system which prevents the full utilisation of renewable generation. Yet another situation which has surfaced, and might get aggravated with solar capacity rising, is about whether there would be commensurate rise in power demand.

India's plan to enhance renewable capacity upto 500 GW by 2030, and going beyond this level during subsequent periods, is being viewed considering the above challenges which have surfaced. According to one school of thought, learning out of experience there could be a case for the balancing the pace of growth of renewable generation so that the situation of curtailment is minimised and the concern of monetary loss is addressed. The argument in this case is based on the understanding of the supply demand mismatch during day time. Another school of thought attributes this challenge to be caused due to inadequate transmission infrastructure which is lagging behind the development of solar capacity. Both these arguments are valid. It is obvious that during day time when solar generation will be at its peak, if not now very soon in the future when the solar capacity becomes much more than now, demand in the system may be lacking. The concentration of Solar Power potential in Gujarat and Rajasthan is indeed a great advantage in view of availability of land and also the solar irradiation. But the inadequacy of Load Centres in these areas require transmission infrastructure to take power to major Load Centres in other States. India already experienced this type of problems during 80's and 90's, while developing Super Thermal Power Projects of large capacities near the Coal Pit Heads and taking power to different parts of the country. However, the scales of potentials for solar capacities are comparably much larger. The challenge thus gets compounded in view of the fact that such large capacity transmission systems are to be designed for huge solar capacities in the range of 30 to 50 GW in one region and, then, the solar generation stops

beyond sunset. Obviously, the task of transmission planning assumes a different challenge.

One of the solutions which has been deployed elsewhere in the world, and is also being deployed in India, is to develop large capacity storage systems – Battery Energy Storage, Concentrated Solar Power, and Hydro Pump Storage. Development of Battery Energy Storage has already been started and is picking up fast. At this stage this option is totally dependent on import with a reasonably good possibility of progressively reducing the import component with indigenous manufacturing. The Government Schemes of production linked incentives for indigenisation will reduce the import burden. But the real solution lies in further research on Iron Air Battery Technology, whose relevance has been established with reference to different types of applications. Even for Lithium Battery the plan should consist of having access to Lithium reserves elsewhere in the world with attempt to acquire equity position, so that security of supply is ensured. The approach of India exploring its own potentials of different minerals within the country more aggressively has to gain momentum. Also, attempts to simultaneously establish equity positions for different minerals in the world, preferably in countries where diplomatic relations are good need to be accelerated. Energy Security in today's context goes far beyond the objective of India to become a developed nation. The chain begins with enhancing exponentially energy (more particularly electricity) demand on per capita basis. This will need massive manufacturing which, in turn, will need mineral security.

The economics of Solar Power and the potentials that India possesses are so compelling that any recommendation on slowing down the growth needs to be very carefully evaluated. But the time period has to be so adjusted that all the elements in the chain are made to move in a harmonious manner, so that any major disconnects are avoided. Even in the case of manufacturing of Solar Modules, whose capacity in India is already substantially higher than the annual projection of Solar Power capacity addition, there is a strong case for further enhancing the indigenous components in solar manufacturing. This again needs global collaboration on mineral acquisition. The approach to address the Mineral Security concerns is three fold – (a) Aggressive Domestic Exploration, (b) Global Equity Acquisition of Mineral Reserves, and (c) Long Term Mineral Trades Arrangement.

Hydro Pump Storage with potential of more than 250 GW will emerge as the most reliable indigenous solution to the challenge of balancing the renewables with the demands and the Grid. The Government of India initiatives in this regard are timely. However, unless all the related administrative Ministries and Departments at the Center, and, more importantly, in States are appreciative of this technology, its relevance in the management of energy security in the country, are fully appreciative of the Government of India plans, despite the policy being progressive, implementation is likely to be, and is being, adversely affected. Projects are many, opportunities are great, harnessing these potentials will encourage domestic manufacturing of plant and equipment, domestic supplies and large scale employment besides providing the strongest back up for solar expansion during evenings and nights.

Battery Energy Storage Systems (BESS), Hydro Pump Storage, and Concentrated Solar Power – all of these will need Solar Power during the day time to store the energy to be deployed when needed. These will balance the supply – demand – Grid capacity in the system to a great extent. Battery Energy Storage is the fastest to be installed since, at this stage, it is totally import dependent. The country will obviously need a well-structured strategy and plan to progressively reduce import components. Concentrated Solar Power is another option that can be deployed. This does need a few further refinements and scale of demand. Hydro Pump Storage System will provide the long standing security. It carries the advantage of being totally indigenous. Execution strategy, right from the stage of site investigation, various clearances and construction management will need significant improvements, so that the cycle time for commissioning of Pump Storage projects is substantially reduced. All these have to be integrated with the objective of expansion of power

generation capacity to enhance per capita consumption which will require various measures as mentioned earlier to raise consumption and demand.

Transmission System Development will need to be oriented in integration with the above overall strategy. It will have to factor in the realistic assumptions about initiation and execution of all the above strategies. Reasonable degree of risk factors emanating from likely delays in one or more of the above strategies and implementation steps will need to be suitably dovetailed in transmission planning. Development of transmission systems itself has thrown enormous challenges. Most of the transmission systems in the country, right from the stage of identification of the projects to the stage of implementation and commissioning are facing delays at various stages. It will be necessary to dispassionately evaluate factors which are controllable and those which are completely uncontrollable. Various measures will need to be evolved, so that execution is faster. Detailed analysis indicates that there is a good possibility of drastically reducing these delays. Pre-construction risks will need to be planned more or less on the pattern of preparatory phase of Ultra Mega Power Projects, which were put to bidding for tariff with advance preparations. There is a possibility of further improvements in that approach. There is a tremendous opportunity of drastically cutting down delays in Environment and Forest Clearances. A public communication drive in an organised an extensive manner can definitely reduce the public resistance on the ground of ROW (Right of Way) and other such factors. There is also a need and scope to organise interventions to develop competent and reliable Contractors who should own up responsibility for supply, erection, and commissioning, and also site execution related problems including logistic and local issues. Shortage of Manpower in all categories, including even Unskilled and Semi-Skilled, with construction activities all around, has emerged as another major challenge, requiring strong and impactful intervention.

The Solar Power curtailment challenge mitigation has also a part solution in how conventional Thermal power generation technology is reinvented, redesigned and retrofitted. In order to avail full benefit of solar power installed capacity, Thermal power plants will need to be made more flexible in their capacity utilisation. Future plants will need to be designed with such flexibility. Existing plants will need to be retrofitted. Both these will have to be planned and executed over a five to ten year time frame. A powerful beginning has to be made. Besides these major technology interventions, the one relating to capturing carbon emission - Carbon Capture Storage and Utilisation - will need major push to make these happen.

In this paper a few important and major concerns and challenges, with reference to the growth of solar power capacity, have been identified. An attempt has been made to also explore possible options and, more importantly, suggest needed actions. A few options and actions go beyond realm of energy and power. Energy Security with Renewables at the core requires integration with Consumption and Demand, with Storage Security, with Domestic Manufacturing requiring Mineral Security, with commensurate but ahead of curve Transmission Infrastructure and, above all, a very strong support from coal based power in its new form- new design and heavy dose of existing retrofitted power plants. A proper and balanced mix of all these together with the planned high growth nuclear power capacity, will need to be appropriately orchestrated in terms of the size of interventions, the pace and the time frame.

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Dear Reader,

Following new members have joined IEF:

Shri Arun Goyal, Former Member, CERC and Former Secretary, Govt of India; Shri V Chitti Babu, Sr General Manager, Greenko Group; Shri Ashok Kumar Rajput, Former Member (PS), CEA; Shri C B K Rao, Former Director, Delhi Metro Rail Corpn; Shri M N Rai, Consultant (Power), Ex-GM, HFCL; Shri Akhil Pande, Ex Tata Group; Shri Surendra Singh, Ex HOD, Jharkhand Electricity Board and Shri Bijoy Kant, Ex Chief Engineer, Ministry of Urban Affairs.

IEF welcomes them and looks forward to utilizing their vast experience and knowledge to further the activities of its various verticals.

The June sultry weather lingering across much of the country has pushed India's peak power demand back mostly above 250 GW in the last two weeks. Peak power demand touched 264.8 GW this month and returned to 250.6 GW. The government's projection for the next three months, which coincide with the monsoon period, is 247- 278 GW amid forecasts of below-normal rains, whereas the generation capacity is almost around 525GW, evacuation and grid stability focus is needed. Storage capacity from RE generation sources is in urgent need of rapid expansion. IEF has recently focused this issue in its platforms.

Emphasis on Non-Fossil Fuel based energy has become all the more important in view of the recent oil crisis due to the middle east conflict, GOI is being supported by private companies to rapidly ramp up the capacity with the help of all RE technologies. There is renewed focus on Nuclear Power World over and SHANTI ACT is enabling enhanced involvement of private power producers. Already ADANI Power, Tata Power, Reliance etc have shared their plans for Nuclear, Solar, Wind Energy areas, besides very encouraging targets by NTPC. Energy Storage and PSP are getting enhanced focus. “Viksit Bharat by 2047” vision of GOI is on track.

Role and utility of IEF in such a scenario with its vast base of very senior energy specialists assures much higher significance. All its verticals are focusing on Debates, Conferences, Webinars etc. to pool in expertise and contribute to energy policy perspectives. We invite more prosperous to join IEF and contribute to its utility and importance.

Next 9 months are going to be busy with our verticals planning conferences on various subjects i.e. Nuclear, Oil & Gas, Power, RE, Technology and Research as per following tentative schedule:

1. Nuclear Energy Conference – October 2026
2. National Conference on Oil and Gas – November 2026
3. 25th National Conference on Power – 11th December 2026
4. National Conference on Clean Energy Technologies – January 2027
5. National Conference on Renewable Energy – February 2027
6. National Conference on Coal – April 2027

S M Mahajan

Tarapur reflects the India’s progress from technology acquisition to technological self-reliance for Viksit Bharat: Secretary, DAE

Dr. Ajit Kumar Mohanty, Secretary, Department of Atomic Energy (DAE) and Chairman, Atomic Energy Commission (AEC), visited Tarapur Atomic Power Station (TAPS) recently and reviewed the recently granted 10 years life-extension of the world’s oldest operating twin reactors, TAPS 1and2.

Dr. Mohanty interacted with scientists, engineers and personnel of Nuclear Power Corporation of India Limited (NPCIL), and commended their dedication towards ensuring the safe, reliable and efficient operation of India’s first nuclear power station. During the visit, Dr. Mohanty inaugurated the Primary Coolant Pump Test Facility (PCPTF) in presence of Shri V. Rajesh, Chairman & Managing Director, NPCIL (Additional Charge)

Speaking on the occasion, Dr. Mohanty said: "The continued operation of the world’s oldest running nuclear reactors TAPS Units 1 and 2 is a testimony to the dedication of generations of scientists, engineers and operators, and the maturity of our regulatory and technological capabilities. The life-extension of a decade reflects India's transformation from technology acquisition to technological self-reliance and inspires confidence in our ability to build a sustainable and energy-independent Viksit Bharat."

Tarapur occupies a unique place in India's nuclear journey. Commissioned in 1969, TAPS 1&2 marked the beginning of commercial nuclear power generation in the country and established Tarapur as the first nuclear power station in Asia outside the Soviet bloc. Over the past five and a half decades, the station has played a foundational role in shaping India's nuclear engineering capabilities, operational practices and safety culture.

Emphasising continuous innovation and safety enhancements by NPCIL, Shri Rajesh stated that "Tarapur Atomic Power Station Units 1&2 stand as a testament to India’s enduring commitment to nuclear safety and engineering excellence. Through continuous upgrades, innovation, and a strong safety culture, these units have successfully transitioned from pioneering installations to resilient assets supporting the nation’s clean energy goals."

The recent approval by the Atomic Energy Regulatory Board for continued operation of TAPS 1&2 marks a significant milestone for India's nuclear power programme. The approval follows an extensive life-extension and modernisation programme undertaken under stringent regulatory oversight and guided by a strong safety-first philosophy.

Underscoring the significance of the achievement, Shri Ajay Kumar Bhole, Site Director, Tarapur Maharashtra Site said, "The successful life-extension and modernisation of TAPS 1&2 reflect NPCIL’s technical maturity and its unwavering focus on safety. The project-mode execution with a ‘Zero Harm’ philosophy demonstrates how legacy nuclear assets can be revitalised to meet present-day regulatory and technological expectations."

The life-extension programme involved comprehensive inspection, refurbishment, replacement and renewal of critical systems and components, deployment of advanced indigenous technologies for reactor integrity assessment, modernisation of electrical systems and implementation of measures to further enhance long-term operational reliability and safety. Over the years, TAPS 1&2 have generated more than 100 billion units of clean electricity, contributing significantly to the nation's energy security while avoiding over 86 million tonnes of carbon dioxide equivalent emissions.

Highlighting the role of TAPS 1&2, Shri Vinay Thattey, Station Director, TAPS 1&2 said, "TAPS 1&2 have played a foundational role in shaping India’s nuclear engineering capabilities. From indigenous innovations to advanced inspection and safety enhancements, the station continues to serve as a model for ageing management and sustainable nuclear operation."

Tarapur is more than India's first commercial nuclear power station. It is a living symbol of our scientific vision, engineering excellence and commitment to clean energy. The approval for continued operation of TAPS 1&2 demonstrates how well-maintained nuclear assets, supported by continuous modernisation and rigorous safety oversight, can continue serving the nation safely and efficiently for decades.

The continued operation of TAPS 1&2 reinforces India's commitment to clean energy, energy security and sustainable development while preserving the legacy of one of the nation's most significant scientific and technological achievements.

As India advances towards the vision of Viksit Bharat, nuclear power will play an increasingly important role in delivering reliable, round-the-clock and low-carbon electricity.

India's nuclear journey took another giant leap forward, two advancements mark a new era

The future of energy is not just being imagined… it is being engineered. A powerful milestone for India's nuclear journey as indigenous capabilities take another giant leap forward, at Heavy Water Board facilities in Vadodara, two strategic advancements mark a new era of nuclear innovation:

Versatile deuterated Compounds Production Plant (VDPP)- strengthening India's ability to produce specialised deuterated compounds for advanced research, strategic applications, and frontier technologies.

24kA prototype sodium cell- a major step towards large-scale indigenous production of nuclear-grade sodium, a critical material for India's Fast Reactor Programme.

These achievements represent more than technology.

They represent:

- Self-reliance in critical nuclear materials
- Advanced manufacturing capability
- Clean energy security for generations
- A stronger foundation for future reactors and emerging technologies

The world is entering an era where energy security, climate responsibility, and technological sovereignty will define nations.

India's nuclear ecosystem is rising with a clear message: Innovation has no boundaries. The atom can power progress.

From heavy water to advanced materials, from research laboratories to future reactors — every indigenous breakthrough moves humanity closer to a cleaner, smarter, and more sustainable planet.

A proud moment for every scientist, engineer, and innovator contributing to the nuclear renaissance.

IGCAR Kalpakkam Hydrogen Plant: India inaugurates world's first hydrogen plant that uses nuclear reactor heat instead of electricity

The Department of Atomic Energy (DAE) has inaugurated what it describes as the world's first hydrogen production facility based on the Copper–Chlorine (Cu–Cl) thermochemical cycle that uses nuclear process heat from the Fast Breeder Test Reactor (FBTR). The facility was opened at the Indira Gandhi Centre for Atomic Research (IGCAR) in Kalpakkam and was inaugurated on June 26 by Dr. Ajit Kumar Mohanty, Secretary, DAE and Chairman of the Atomic Energy Commission. The project has been developed as a technology demonstration plant to validate hydrogen production using nuclear energy. The Cu–Cl thermochemical process used in the facility was developed indigenously by the Bhabha Atomic Research Centre (BARC), Mumbai, according to an official statement.

A step towards clean hydrogen production Hydrogen is considered an important fuel for the future as countries look for cleaner energy options. According to DAE, the new facility demonstrates how nuclear energy can be used not only for electricity generation

but also for producing hydrogen without relying on fossil fuels.

The Copper–Chlorine thermochemical cycle is viewed as a promising hydrogen production method because it operates at relatively lower temperatures and offers higher thermodynamic efficiency compared to some alternative technologies. By using nuclear process heat from fast reactors, the process avoids greenhouse gas emissions associated with conventional hydrogen production methods.

Joint effort by BARC and IGCAR
The commissioning of the facility follows years of research, engineering design, equipment fabrication, installation and testing carried out jointly by BARC and IGCAR. Officials said the plant will help researchers gain operational experience, improve the Cu–Cl process and support future work on scaling up nuclear-assisted hydrogen production for larger applications.

What DAE chairman said
Addressing the gathering, Dr. Ajit Kumar Mohanty said: "The integration of nuclear energy with emerging clean energy technologies such as hydrogen production represents a strategic pathway towards a sustainable energy future. Nuclear power, with its unique ability to provide reliable carbon-free electricity as well as high-temperature process heat, is ideally suited to support large-scale hydrogen production while contributing to India's energy security, decarbonization goals and long-term sustainable development objectives."

Built on decades of fast reactor experience
IGCAR has been a key institution in India's fast breeder reactor programme since 1971. The centre designed, built and operated the Fast Breeder Test Reactor, which has supported the development of fuels, materials and technologies required for advanced reactor systems for more than four decades.

The experience gained through FBTR has also contributed to the development of the 500 MWe Prototype Fast Breeder Reactor (PFBR), which forms part of the second stage of India's three-stage nuclear power programme.

IGCAR highlights broader role of nuclear energy

Speaking at the event, IGCAR Director Shri Sreekumar G. Pillai said: "This achievement builds upon more than four decades of operational experience and technological excellence gained through the Fast Breeder Test Reactor programme at IGCAR. The successful demonstration of hydrogen production using nuclear process heat showcases the versatility of advanced nuclear systems and underscores IGCAR's commitment to developing innovative technologies that contribute to India's clean energy transition and long-term energy security."

Significance for India's Nuclear Programme
The hydrogen production facility expands the role of nuclear energy beyond electricity generation and supports research into clean hydrogen technologies. DAE said the project reflects India's efforts to strengthen indigenous technology development while exploring new applications of nuclear energy for a low-carbon future.

The inauguration also marks a new milestone in India's three-stage nuclear programme, with researchers seeking to combine advanced reactor technologies and clean hydrogen production to support long-term energy needs.

India sets sights on easier N-plant site selection

India is looking to simplify site selection process for setting up new nuclear power plants, as part of an ambitious effort to boost atomic energy generation, said people familiar with the development.

The government is exploring the possibility of moving to a simplified checklist-based approach for approving locations of nuclear power projects, the people told ET. Discussions are on to see if the Site Selection Committee framework of the Department of Atomic Energy (DAE) can be simplified to cut the time for site selection work and some related approvals, they said.

New Delhi implemented the SHANTI Act last December, allowing the private sector to participate

in nuclear energy generation for the first time, and limiting liability of equipment suppliers, towards achieving its goal of 100 GW of installed capacity by 2047.

One of the persons cited said companies are doing their independent rigorous studies to identify project locations, and that the Centre is examining ways to expedite the process.

Eventually, the entire process and studies have to be mandatorily evaluated by the Atomic Energy Regulatory Board (AERB) and the DAE for licensing work and clearances such as licence to establish and operate the plant, and safety licence.

Bio-geophysical criteria
"The AERB will anyway do all the detailed assessments at a later stage," said the person cited above. "Basically, this just lets the developers take the risk and not be held up to proceed with discussions with states, authorities, etc".

The DAE didn't respond to ET's email query.
Site selection for a nuclear power plant requires a complex balance of safety-related, technical, and socioeconomic parameters. Broad regions are thoroughly investigated to meet strict bio-geophysical criteria, such as the availability of cooling water, proper topography, access to the electrical grid, and a total absence of seismic faults within a certain radius.

Nuclear capacity currently stands at 8.78 GW, which is projected to rise to 22.38 GW by 2031-32.

According to a joint report from the government on the country's nuclear energy roadmap for 100 GW by 2047, a site takes around 4-6 years to reach construction after state consent and regulatory clearances, while plant construction requires another 5.5-6 years, stretching the total nuclear project timeline to 11-12 years — very high compared to other power projects like coal and hydro.

As per the proposed simplification, the nuclear plant developer will have the core responsibility of evaluating the site and adhering to the AERB guidelines, and bear any risk involved in the process, a second person said.

The industry has flagged difficulties in undertaking site studies and engaging with various stakeholders in the absence of formal rules and the requirement for DAE concurrence. The department has, however, assured developers they can approach it for a 'letter of comfort' to facilitate engagement with states and ministries for site selection, the person said.

SMRs key to India's energy security, defence manufacturing and digital infrastructure: Experts

Small Modular Reactors (SMRs) could emerge as a critical pillar of India's energy security strategy, supporting the country's expanding defence manufacturing ecosystem and rapidly growing data centre sector, experts said at a policy dialogue in the national capital recently.

The Policy Dialogue on Small Modular Reactors for Defence Manufacturing and Data Centre Operation was jointly organised by the Chintan Research Foundation (CRF) and Finovista, in association with Manthan, an initiative led by the Office of the Principal Scientific Adviser, at the India Habitat Centre.

The discussions focused on the increasing demand for reliable, clean and uninterrupted electricity in strategic sectors and examined the role of nuclear energy, particularly SMRs, in meeting India's long-term energy requirements.

Delivering the keynote message of the event, Prof. R. Srikanth, Dean of the School of Natural Sciences and Engineering at the National Institute of Advanced Studies (NIAS), stressed the central role of nuclear power in India's energy transition.

"We cannot have energy transition without nuclear," Prof. Srikanth said, underlining the need for a balanced energy mix to support economic growth while reducing carbon emissions.

In his address, CRF President Shishir Priyadarshi highlighted India's rapidly rising future energy needs and said nuclear power would have an important role in meeting industrial and strategic demand.

He noted that while SMRs offer significant opportunities, questions relating to costs, fuel security, regulatory frameworks, deployment timelines, waste management and safety must be addressed to facilitate large-scale adoption.

Vimal Kumar, Co-Founder of Finovista, said SMRs have the potential to provide a reliable and precision-oriented electricity supply for defence manufacturing facilities.

He observed that deploying such reactors in emerging defence industrial corridors could significantly strengthen mission-critical operations that require uninterrupted power.

Former NTPC Parmanu Urja Nigam Ltd. Chief Executive Officer Prasenjit Pal, in his special address, argued that India's target of achieving 100 GW of nuclear power capacity should now be viewed as a strategic necessity rather than a distant aspiration.

Highlighting the sector's low carbon footprint, he said nuclear energy would be indispensable for strengthening India's long-term energy security while supporting sustainable development goals.

He said dependable and diversified energy sources would be crucial for ensuring the uninterrupted operation of critical digital infrastructure and e-governance platforms, adding that SMRs could play a significant role in providing stable power supplies for such systems.

A panel discussion chaired by Dr Debajit Palit, Centre Head of the Centre for Climate Change and Energy Transition at CRF, brought together experts from the nuclear energy, defence, digital infrastructure, finance and policy sectors.

The panel examined the role of SMRs in India's low-carbon development pathway and discussed how nuclear power could complement renewable energy sources in addressing rising electricity demand and overcoming intermittency challenges.

A major focus of the discussion was the growing need for a high-quality power supply in strategic sectors. Experts noted that for defence manufacturing facilities, data centres and other mission-critical infrastructure, the challenge extends beyond generating adequate electricity to ensuring uninterrupted, resilient and reliable power delivery.

The panel highlighted that mission assurance and energy resilience are becoming increasingly important for strategic industries where even brief disruptions can have significant operational consequences.

The experts also discussed challenges facing SMR deployment in India, including high tariffs, financing requirements, public awareness issues and regulatory preparedness. They stressed the need for continued policy support, stakeholder engagement and robust regulatory frameworks to facilitate the responsible expansion of SMR technology.

Adani Group charts nuclear power foray with 10 GW goal by 2035

The Adani Group has entered the nuclear energy sector through Adani Atomic Energy and is targeting 10 GW of capacity by 2035, Chairman Gautam Adani said recently, outlining the conglomerate's plans to expand its presence across India's energy value chain.

Adani said land has already been identified for the proposed nuclear projects as the company positions itself to address India's growing demand for round-the-clock clean power. "With land identified and a 10 gigawatt targeted capacity by 2035, we are positioning ourselves early to solve the growing national demand for clean round-the-clock power," Adani said.

The nuclear foray comes as the group accelerates investments across power generation, transmission, hydroelectricity and gas distribution, reinforcing its strategy to build an integrated energy platform.

Adani said the group is implementing what he described as India's largest-ever private sector power capital expenditure programme through Adani Power, involving investments of more than ₹2 lakh crore. The company is targeting 45 GW of generation capacity over the next five years.

Govt considering policy to support affordable adoption of E85 fuel: Hardeep Singh Puri

The government is examining a policy to support accelerated affordable adoption of E85 fuel (85 per cent ethanol blended petrol) Petroleum and Natural Gas minister Hardeep Singh Puri said recently.

Addressing an event organised by Hero MotorCorp, Puri further said unveiling of India's first flex fuel motorcycles fully compatible with ethanol-blended fuels ranging from E20 (20 per cent ethanol blended petrol) to E85 (85 per cent ethanol by Hero MotorCorp is a new chapter in India's energy history).

He said E85 fuel will be substantially cheaper than normal fuel.

"We are actively examining a supportive policy for accelerated affordable adoption of E85 fuel," Puri said. India is the largest manufacturers of two-wheeler vehicles in the world.

The minister said even if 1 per cent of E85 is adopted in the 2026-27 supply year, 4 crore litre ethanol demand will be generated.

"Then our farmers who are now aanadata, will become urjadaata," he said.

The Ministry of Road Transport and Highways has proposed amendments to vehicle emission rules to widen the scope for higher ethanol blends and alternative fuels, paving the way for flex-fuel and pure biofuel vehicles across vehicle categories.

The draft changes to the Central Motor Vehicles Rules, 1989 aim to provide for wider use of fuels, such as E85 (a blend of 85 per cent ethanol with petrol) and E100(which would allow vehicles to run on nearly pure ethanol), as well as B100 biodiesel and hydrogen-CNG combinations.

India has already achieved 20 per cent blending of ethanol (produced from biomass like sugarcane, corn or rice) with petrol to create a cleaner-burning fuel, reducing reliance on imported crude oil and cutting carbon emissions.

Also, speaking at the event, Union road transport and highways minister Nitin Gadkari said he has raised the issue of higher GST (18 per cent) on fuel having ethanol blending of more than 20 per cent in petrol.

"The finance minister assured me that she will discuss this issue of higher taxes on E30 and above with state governments in the GST Council meeting," Gadkari said.

GST on E20 fuel is 5 per cent.
Diversification of agriculture towards energy and power is the future, Gadkari said, adding that ethanol is a better fuel and not inferior. The road transport and highways minister said his ministry is exploring the option of building concrete roads.

Government Withdraws Temporary Curbs on Commercial Petrol and Diesel Sales from July 1

The Central Government has decided to withdraw the temporary restrictions on the retail sale of petrol and diesel to commercial consumers with effect from July 1, 2026, restoring normal fuel purchases for industries, institutions and transport operators across the country.

According to a government order issued recently, commercial consumers will once again be allowed to purchase petrol and diesel from retail fuel stations without any quantity restrictions, bringing an end to temporary measures introduced earlier this month to safeguard domestic fuel supplies.

The restrictions had been imposed through the Motor Spirit and High-Speed Diesel (Temporary Regulation of Supply through Retail Outlets) Order, 2026, which came into effect on June 12, 2026 amid concerns over global energy trade disruptions and unusual fuel demand patterns.

Normal Fuel Purchases Restored

With the withdrawal of the temporary order, industrial users, institutional consumers, commercial establishments and transport operators will be able to purchase petrol and diesel from retail outlets without any restrictions on quantity.

The move also removes the earlier cap of 200 litres of diesel per customer or vehicle per day, allowing businesses to resume normal refuelling operations.

The decision is expected to provide relief to logistics operators, commercial vehicle owners, industries and bulk fuel users who had been affected by the temporary restrictions.

Why Were the Restrictions Imposed?
The Ministry of Petroleum and Natural Gas had introduced the temporary measures to prevent black marketing, fuel hoarding and diversion of diesel supplies from retail fuel stations.
The Ministry had clarified at the time that the restrictions were purely precautionary and did not indicate any shortage of petrol or diesel in the country.

Officials had stated that the order was intended to maintain smooth fuel availability for the general public while addressing unusual purchasing patterns observed at several retail outlets.

The restrictions could have remained in force for up to 90 days, if required.

Shift from Bulk Fuel to Retail Outlets
According to the Ministry, the temporary curbs became necessary after several industrial and bulk diesel consumers shifted their purchases from dedicated consumer pumps to public retail outlets. The shift was primarily driven by a significant price difference between retail diesel and bulk diesel supplies.

Retail diesel prices were reportedly around ₹40 per litre lower than bulk diesel prices, as bulk supplies continued to reflect prevailing international fuel prices.

This led to higher-than-normal demand at retail outlets, prompting the government to temporarily regulate commercial purchases to prevent supply imbalances.

Government Reassures Consumers
Throughout the period of restrictions, the government consistently maintained that India had adequate fuel stocks and that there was no need for public concern regarding petrol or diesel availability.
Officials emphasized that the measures were designed solely to ensure orderly fuel distribution, discourage speculative buying and safeguard uninterrupted supplies for retail consumers.

The withdrawal of the restrictions reflects improved confidence in the country's fuel supply situation and stabilising global energy market conditions.

The decision is expected to improve operational convenience for commercial consumers while supporting uninterrupted economic and logistics activities across sectors.

Conclusion
The government's decision to lift temporary restrictions on commercial petrol and diesel purchases restores normal fuel supply arrangements for industries, institutions and transport operators. With quantity limits removed and retail fuel sales returning to normal from July 1, businesses can resume regular operations while the government continues to monitor domestic fuel availability and energy security.

Ethanol Blending in Petrol is Scientifically Validated and Safe, Says Government

The Ministry of Petroleum and Natural Gas (MoPNG) has reiterated that India's Ethanol Blending Programme (EBP) for petrol is scientifically validated and implemented through a robust framework involving extensive testing, technical evaluations and stakeholder consultations. The clarification comes amid the circulation of misleading and unverified claims on social media regarding ethanol-blended petrol.

According to the Ministry, certain social media posts and videos have attempted to create confusion by spreading misinformation about E20 fuel, including claims related to engine damage, vehicle breakdowns, insect attraction and direct mixing of sugarcane juice with petrol. The government has

categorically stated that such claims are misleading, baseless and unsupported by scientific evidence.

The Ethanol Blending Programme was launched in 2003 with the objectives of reducing India's dependence on imported crude oil, enhancing energy security, supporting environmental sustainability and promoting the use of renewable fuels. The programme was implemented in a phased manner and culminated in the nationwide rollout of 20 percent ethanol blending (E20) from 2023 onwards.

The Ministry emphasized that the implementation of the programme is continuously monitored in consultation with oil marketing companies (OMCs), automobile manufacturers, fuel testing agencies and other stakeholders. It noted that since the introduction of E20 petrol, no widespread incidents of engine failure or vehicle breakdowns attributable to ethanol blending have been reported.

One of the claims circulating online relates to the hygroscopic nature of ethanol, which means it can absorb moisture from the atmosphere. The Ministry clarified that water contamination is undesirable in any fuel system, regardless of whether the fuel contains ethanol. Modern vehicles are designed with safeguards and engineering features that prevent water ingress into fuel tanks and fuel systems.

The government also rejected videos that falsely suggest sugarcane juice is directly mixed with petrol. It explained that fuel-grade ethanol is produced through highly regulated industrial processes involving fermentation, distillation and purification. Ethanol may be derived from feedstocks such as sugarcane juice, molasses, maize and broken rice, but the final ethanol product bears no resemblance to the original agricultural feedstock and conforms to strict fuel quality standards before blending.

The Ministry further clarified recent viral claims involving ants gathering near vehicle fuel tanks. In response to these reports, Bharat Petroleum Corporation Limited (BPCL) explained that fuel-grade ethanol contains no residual sugars because the fermentation and distillation processes eliminate such substances. In addition, fuel ethanol contains denaturants that are generally repellent to insects. Therefore, there is no scientific basis to suggest that E20 fuel attracts ants or insects.

Similarly, concerns that the use of E20 fuel could invalidate vehicle insurance policies have also been found to be incorrect. Relevant stakeholders have clarified that there is no evidence supporting such claims.

The Ministry highlighted that ethanol blending is a globally accepted practice and is successfully implemented in countries such as the United States, Brazil and Japan. Brazil, in particular, has adopted higher blending levels, with E27 (27 percent ethanol blend) serving as its standard petrol fuel.

Beyond energy security, the Ethanol Blending Programme has delivered significant economic benefits. According to the government, the initiative has helped India save more than ₹1.4 lakh crore in foreign exchange by reducing crude oil imports. The programme has also generated sustained demand for agricultural feedstocks used in ethanol production, thereby strengthening farmers' incomes and boosting the rural economy.

Additionally, ethanol blending contributes to lower carbon emissions, supports India's climate commitments and advances the country's transition towards cleaner and more sustainable mobility solutions.

The Ministry reaffirmed that the rollout of higher ethanol blending levels has been undertaken only after comprehensive technical evaluations and consultations with automobile manufacturers and industry stakeholders, ensuring compatibility, safety and operational reliability.

Conclusion

The Government of India has reaffirmed that ethanol-blended petrol is safe, scientifically validated and widely accepted globally. By reducing crude oil imports, supporting farmers, lowering emissions and enhancing energy security, the Ethanol Blending Programme continues to play a critical role in India's clean energy transition and sustainable economic growth strategy.

Petroleum vulnerability rising, India must build crude buffers and cut import dependence, EY cautions

India needs to "augment its strategic crude oil reserves to reduce its vulnerability to external shocks" and reverse the trend of growing dependence on imported crude, EY said in research report, warning that petroleum remains a key external risk for the domestic economy.

"Going forward, India may need to augment its strategic crude oil reserves... Further, India may develop a detailed strategy for maintaining crude oil reserves which spells out the volume of reserves, strategy of purchases and releases from such reserves taking into account the relevant carrying costs," the report stated. It added that the country should also "continue to augment its refining capacity" and "accelerate the shift towards greener options and other alternative sources of energy, including nuclear energy."

EY's analysis, titled India's petroleum economy: Coping with vulnerabilities, highlights two structural features. "First, its high dependence on imports of crude oil. The contribution of domestic production of crude oil has remained quite limited. Second, its domestic capacity to refine this imported crude oil and its ability to export these refined PoL products... The first dimension is a vulnerability, and the second dimension is strength," the report said.

The report noted that India's degree of dependence on imported crude "has increased in a secular way, rising from 55% in FY1999 to slightly above 90% in FY26." Domestic crude production, after peaking at 35.9 million metric tons in FY12, has eased to 26.0 million metric tons in FY26, while consumption of petroleum products surged from 90.6 MMT in FY1999 to 243.2 MMT in FY26.

On a positive note, EY said "the efficiency in producing petroleum products through India's domestic refining process has increased over time," with the efficiency parameter rising from "just above 0.95 in FY1998 to 1.27 in FY26," amounting to "about 33% improvement in petroleum refining efficiency." Energy intensity of GDP has also fallen, which "augurs well for sustaining an energy-efficient growth at a reasonably high level for a relatively longer period."

Yet forex pressures are mounting. The report shows a "widening gap between the value of imported crude vis-a-vis exported PoL products by India in US$ terms," driven by global prices and volumes. Growth in domestic consumption of PoL products was at a CAGR of 3.9% over FY06 to FY26, compared with 2.1% for exports.

EY flagged India's thin buffer stocks as a concern. "As per information available from the US EIA, India's strategic oil inventories at 21 million barrels are significantly lower than that of China at 1,397 million barrels," the report said, noting India's reserves "suffice only for about five days of consumption." It recommended that "as soon as the global crude situation begins to normalize, India may start investing in building up its crude oil reserves."

EY said the trend of dependence "needs to be reversed by emphasizing the exploitation of domestically available crude, while accelerating the shift towards greener options and other alternative sources of energy, including nuclear energy."

ONGC Eyes 8% Gas Output Growth as New Wells Boost Production, ₹33,000 Crore Projects Underway

State-run energy major Oil and Natural Gas Corporation (ONGC) is optimistic about the future of its natural gas business, with the company projecting annual gas production growth of 7-8 percent as several new wells are scheduled to begin production during the next financial year. The development reinforces ONGC's strategic shift toward becoming a more gas-focused energy company amid rising domestic demand and supportive government policies.

ONGC Chairman Arun Kumar Singh stated that production from 'new well gas' is increasing rapidly and currently contributes around one-fourth of the company's total gas output. This share is expected to rise to 30-36 percent in the near future, eventually becoming the dominant source of gas production as output from mature fields naturally declines.

The company continues to maintain an aggressive exploration and development programme, drilling approximately 500 wells annually, including exploratory and production wells. ONGC also reported a reserve replacement ratio exceeding 1.1 in FY25-26, indicating that it is successfully adding more reserves than it produces, thereby strengthening its long-term resource base.

To sustain production growth, ONGC is executing offshore projects worth nearly ₹33,000 crore. These investments are focused on boosting production from key offshore assets and improving recovery rates from mature fields, particularly in the Western Offshore region, which remains the backbone of the company's hydrocarbon production.

A major component of this strategy is the ongoing Technical Service Partnership (TSP) with global energy major BP, aimed at enhancing production efficiency and maximizing output from Western Offshore assets. According to Singh, the collaboration has already delivered encouraging operational improvements.

While ONGC expects its crude oil production to remain largely stable, the company sees natural gas as the principal driver of future growth. Singh emphasized that favorable government measures such as reduced royalties, market-linked gas pricing reforms, and support for deepwater exploration have significantly improved the economics of upstream gas production.

The company's international portfolio also remains a key contributor. Production from Russia's Sakhalin project continues to remain stable, while the Mozambique LNG project is progressing toward a potential completion timeline of 2028. ONGC also expects higher output from its Venezuelan assets if regulatory conditions become more favorable.

Beyond conventional hydrocarbons, ONGC is focusing on diversification. The company expects improved performance from its petrochemical subsidiary OPaL (ONGC Petro additions Limited) and accelerated growth in ONGC Green, which aims to achieve nearly 3 GW of renewable energy capacity by next year.

Conclusion

ONGC's growing emphasis on natural gas reflects a significant transformation in India's largest energy producer. Supported by strong policy reforms, expanding offshore investments, rising domestic demand, and renewable energy diversification, the company is positioning gas as the key driver of its future growth while maintaining long-term energy security objectives.

Oil India reports natural gas presence in third exploratory well in Andaman offshore block

State-owned explorer-producer Oil India confirmed the presence of natural gas in the third exploratory well it drilled, that is, Vijayapuram-3, in the Andaman shallow offshore block.

With the latest exploration, OIL has established hydrocarbon presence in two of the three exploratory wells it has drilled in the block so far. It had earlier reported the occurrence of natural gas in the second exploratory well September last year.

In a statement issued Friday, confirming the presence, the explorer-producer held, "Initial production testing of the well at the depth of 1,900 plus meters in the Eocene formation has established the presence of natural gas through continuous flaring," adding, "Post perforation, immediate pressure build up was observed and well started to produce."

Union Petroleum Minister Hardeep Singh Puri congratulating Oil India on the discovery held, "This presence of natural gas will help us in taking forward our exploration ambitions in coordination with global

deepwater exploration experts like Petrobras, TotalEnergies, BP India, Shell and ExxonMobil."

Providing an update, Mr. Puri informed, "Oil India is carrying out gas sampling to assess the composition & calorific value of gas and to carry out isotope studies to understand the genesis of the gas."

Oil India Friday also informed that it has already started the appraisal program for the second exploratory well.

"Reprocessing of available 2D seismic data and acquisition of additional 600 square kilometre of 3D seismic data is already completed, and processing of acquired and vintage 3D seismic data is ongoing," he stated.

Privatisation of India's oil giants could cripple energy security, critics warn amid global turmoil

Every time India has faced a major crisis - whether devastating floods, a once-in-a-century pandemic or the latest conflict in West Asia that threatened global oil supplies - it has been the country's state-run oil companies that have quietly kept fuel flowing.

For decades, India's public sector oil marketing companies (OMCs) have often been criticised for low returns, government intervention in fuel pricing and bloated operations. They have twice been put on the block for privatisation, with plans to sell Bharat Petroleum Corp Ltd (BPCL) and Hindustan Petroleum Corporation Ltd (HPCL) gathering momentum in 2002 before being halted by a Supreme Court ruling and again in 2020, before the process was abandoned after failing to attract enough bids.

Yet every national emergency has reinforced why governments have been reluctant to loosen their grip on companies that control the country's energy lifeline, analysts and industry officials said.

When unprecedented floods submerged Chennai in 2015, Indian Oil Corp (IOC), BPCL and HPCL scrambled to move fuel through alternative routes, restore inundated depots and keep emergency services supplied even as roads disappeared under water and retail outlets shuT.

During the COVID-19 pandemic, the companies operated virtually uninterrupted despite nationwide lockdowns. Fuel stations remained open, refineries continued operating with skeletal staff, LPG cylinders were delivered to millions of households under strict mobility restrictions and aviation fuel supplies were maintained for relief and medical flights, they said.

Engineers isolated operating teams inside refineries for weeks to ensure continuous production, while tanker drivers and LPG delivery personnel worked through curfews and containment zones.

The latest conflict in West Asia once again highlighted its strategic importance.

As the Iran war disrupted crude trade routes and raised concerns over supplies through the Strait of Hormuz, India's state refiners rapidly reconfigured operations. They increased LPG production by diverting refinery streams away from petrochemicals, diversified crude procurement across geographies, optimised refinery runs based on available feedstock and coordinated fuel supplies nationwide to avoid local shortages.

"The result was that no corner of the country went without fuel. Unlike several countries, including those in the neighbourhood, India did not see any rationing of fuel," an industry official said.

The companies also leaned on India's strategic petroleum reserves and commercial inventories, while working closely with the government to reassure markets that adequate supplies would be maintained.

All this they did while passing on the least minimum impact of the spurt in global oil prices to consumers. For a good two-and-a-half months, the three firms absorbed the more than 50 per cent spurt in international oil prices and then raised petrol and diesel prices by ₹7.50 a litre each, LPG rates by ₹ 89 per cylinder and CNG by ₹6 per kg - much lower than the increase seen in major economies around the globe.

The response reflected a playbook honed over decades: absorb global shocks first and shield consumers for as long as possible.

That came at a cost. Even as IOC, BPCL and HPCL await full government compensation for selling subsidised cooking gas in 2025-26, they chose to hold petrol and diesel prices steady through more than three months of turmoil in West Asia, sacrificing earnings to cushion consumers.

According to Crisil Ratings, the three state-run retailers are estimated to have incurred net underrecoveries of ₹40,000-45,000 crore between March and May, after accounting for inventory gains - almost equivalent to their combined annual profits.

Private-sector fuel retailers, by contrast, passed on higher costs more quickly. Companies, such as Nayara Energy and Shell, raised pump prices by a steeper margin during the period, industry officials said.

A similar pattern played out during the COVID-19 pandemic. As demand collapsed and fuel marketing became unviable, several private retailers put up "no stock" signs at outlets across the country. State-run OMCs continued supplies, with the government invoking emergency provisions to ensure private outlets were also supplied with fuel, even if at prices higher than those charged by public-sector retailers.

Industry officials said India could have faced a very different situation had either BPCL or HPCL, which together account for roughly half of the country's fuel retail network and around a quarter of sales each, been privatised under the government's disinvestment plans in the early 2000s or again two decades later.

Unlike state-owned firms, private owners would have been under little obligation to sell petrol, diesel or LPG below market prices or absorb prolonged under-recoveries in the national interest, they said.

"What that would have meant for a country as dependent on imported oil as India can only be imagined," one official said, arguing that public ownership has enabled the companies to prioritise energy security over profitability during successive crises.

Unlike purely commercial energy companies, India's state-run refiners are expected to fulfil a strategic mandate alongside generating profits.

Together, IOC, BPCL and HPCL account for nearly 90 per cent of the country's fuel retail network, operate most of its refining capacity, maintain extensive pipeline infrastructure and supply petroleum products to every corner of the country, including remote regions where private operators often have little commercial incentives to serve.

Their nationwide footprint also enables governments to rapidly execute emergency policy decisions. Whether distributing subsidised LPG cylinders during the pandemic, ensuring diesel availability during natural disasters or managing inventories during periods of global supply disruption, public sector companies have often functioned as an extension of the state's crisis-response machinery.

That strategic role has repeatedly complicated efforts to privatise them.

Successive governments have continued to open fuel retailing to private players and encourage competition, but have stopped short of relinquishing control over the public sector companies that remain central to India's energy security architecture.

With India importing more than 88 per cent of its crude oil requirements and geopolitical disruptions becoming more frequent, policymakers increasingly view energy resilience as a strategic capability rather than simply a commercial business.

For investors, state ownership can sometimes constrain profitability through government-directed interventions. For policymakers, however, the same ownership provides something difficult to replicate through markets alone: an integrated nationwide energy network that can be mobilised at short notice when a crisis strikes.

Time and again, India's public sector oil companies have demonstrated that while their commercial role may be debated, their strategic value becomes most visible when the country's energy security is under stress, analysts added.

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India prepares for 300 GW power capacity as demand surges: Union power minister

India successfully met its all-time peak power demand of 271 GW in May this year and is preparing for a 300 GW capacity next year as electricity consumption continues to rise, union power minister Manohar Lal Khattar said recently.

Addressing the inaugural session of the Vibrant Gujarat Regional Conference in Vadodara, Khattar said the country had created capacity for 284 GW this year to avoid shortages and was gearing to add 30 GW, driven largely by demand from data centres and expanding industries.

He attributed the achievement to reforms and strategic investments undertaken over the past 12 years under Prime Minister Narendra Modi's leadership.

"In 2014, the country's peak demand was 136 GW and even that could not be fully met. Today, demand has doubled and India is reliably supplying power to its growing economy," Khattar said.

The minister said India maintained energy security despite geopolitical uncertainties in West Asia and continued to strengthen its power infrastructure. He added that distribution reforms had improved the financial health of power utilities while ensuring better services for consumers.

Khattar said Gujarat, with more than 50 GW of renewable energy capacity, was leading the country's transition towards green manufacturing and playing a key role in developing the ecosystem required for the Green Hydrogen Mission.

Union Min Manohar Lal chairs parliamentary consultative committee meeting on future Ready Power Grid

Chandigarh, Union Minister Manohar Lal recently chaired a parliamentary consultative committee meeting under the Power Ministry, where discussions centred on creating a robust, future-ready power grid to support India's clean energy initiatives.

"Our discussions focused on building a robust and future-ready power grid to support India's clean energy ambitions," Lal said.

The members also exchanged views on enhancing grid resilience through transmission expansion, energy storage, renewable integration, advanced forecasting, and deployment of technologies that strengthen system stability, the minister said after the meeting.

The meeting focused on grid stability amid rising electricity demand, large-scale renewable energy integration, and the increasing share of inverter-based resources.

Lal highlighted the importance of a reliable, flexible, and resilient grid to support India's clean energy transition.

Interacting with the media after the meeting, he said the peak electricity demand was 270.8 GW (gigawatt) on May 21, 2026, less than the generation capacity of 283 GW and the demand was met.

In 2024, peak power demand had reached 250 gigawatt, he added. "Next year, it is estimated that even if 330 GW peak demand comes, we will meet it," the minister said.

He said that the emphasis is on solar power generation.

Transmission system needed to evacuate it from one state to another, battery storage, pump storage to use that solar power, all these things are being taken care of to ensure seamless evacuation of power, he said.

He further emphasised the need for phased rollout of prepaid smart metering, beginning with government consumers, followed by high-end consumers with more than 10kW load, with appropriate incentive mechanisms for voluntary conversion.

The meeting was attended by Shripad Yesso Naik, Union Minister of State for Power, MPs, who are members of the Consultative Committee, the Secretary, Ministry of Power, and senior representatives from key power sector institutions, including the Central Electricity Authority, Grid Controller of India Limited and Central Transmission Utility of India Limited.

The committee deliberated on the emerging requirements of grid stability in view of India's growing electricity demand, large-scale renewable energy integration and increasing share of inverter-based generation resources and bulk loads, according to an official statement.

Discussions covered secure renewable integration, transmission strengthening, energy storage, dynamic reactive power support, grid flexibility, compliance with technical standards, forecasting, power quality and resilience of the grid.

It was noted that grid stability is central to energy security and that India's clean energy transition must be supported by a reliable, flexible and resilient power grid.

Various measures for ensuring grid stability, such as avoiding a mismatch between commissioning of transmission lines and RE generation projects to avoid curtailment and encouraging suitable bulk consumers closer to large renewable generation complexes to optimise transmission investments, were appreciated.

The committee hailed the record renewable capacity integration of more than 50 GW in a year.

Recently the Union minister chaired a review meeting here to assess the performance of Haryana's power utilities and various centrally sponsored schemes.

Power demand tops 250 GW as weak monsoon keeps heat on

The sultry weather lingering across much of the country has pushed India's peak power demand back mostly above 250 GW in the last two weeks, even as the progress of the southwest monsoon remained sluggish. Peak power demand touched 264.8 GW recently and returned to 250.6 GW.

The government's projection for the next three months, which coincide with the monsoon period, is 247- 278 GW amid forecasts of below-normal rains, according to a government official.

The power ministry, through the Grid Controller of India, will continue to assess rainfall projections, including the weather office's forecast next month, to evaluate any potential impact on power generation, ET reported on June 20.

A deficient monsoon could keep electricity consumption elevated for cooling and irrigation, particularly in August and September, according to an industry official.

The India Meteorological Department has forecast rainfall during the June-September southwest monsoon to be 90 per cent of the long-period average.

To ensure uninterrupted supply, the power ministry has put in place contingency plans to maximise, if required, the availability of coal-fired power by deferring planned maintenance of the plants, especially to meet demand during non-solar hours.

The government may also consider directing gas-based power plants to operate at optimum levels under special provisions of the Electricity Act, if needed, the official said. Such a direction would enable generators to recover the higher cost of using imported natural gas.

Gas-based plants account for nearly 25 GW of the installed capacity but typically operate at low plant load factors because of expensive fuel.

According to officials, adequate coal stocks are available at thermal power stations and there is coordination among power generators, transmission utilities and grid operators to maintain reliable supply throughout the season.

India has witnessed several record peak demand cases this year driven by prolonged heatwaves,

recording the highest demand met at 270.1 GW in May.

Draft National Electricity Data Sharing Framework unveiled

The power ministry recently unveiled a draft National Electricity Data Sharing Framework to create a common architecture for sharing electricity sector data, proposing standardised datasets, privacy safeguards and consent-based access to support planning, grid operations, regulation and research. The last date to submit stakeholders' views is July 21.

The framework will apply to all electricity sector data created and maintained by power generating companies, transmission licensees, distribution licensees, load despatch centres, regulatory commissions, government agencies including Central Electricity Authority, Grid India and power exchanges, among others. The framework provides broad principles and institutional structures to enable structured, secure, and transparent data sharing in the electricity sector. The idea is supporting non-discriminatory access while protecting critical information infrastructure. Adoption of the framework will be voluntary for the sectoral entities. However, the National Electricity Data Centre and the National Electricity Data Portal proposed as part of the framework will be established to create an ecosystem for data sharing.

West Bengal Set to Host 750 MW/3,000 MWh BESS Project with Multiple Tenders

West Bengal has issued multiple Battery Energy Storage System (BESS) tenders across Jeerat, Hooghly, and DPL. According to the tender documents, bids have been invited for a 100 MW/400 MWh Battery Energy Storage System each across the three facilities in West Bengal by POWERGRID.

Across separate tenders, POWERGRID has issued varied bid submission end dates for each BESS project. For instance, for the 100 MW/400 MWh Battery Energy Storage Project at Hooghly, West Bengal, the bids are due by June 22, 2026, and for the DPL BESS project. For the JeeratBESS project, it sought bids till June 23, 2026. These multiple tenders issued by POWERGRID are associated with the development of 750 MW/3,000 MWh of standalone Battery Energy Storage Systems across multiple locations in West Bengal.

About The Tender
The Department of Power, Government of West Bengal, will act as the Bidding Agency and Bid Process Coordinator (BPC), responsible for managing the bidding process on behalf of the West Bengal State Electricity Distribution Company Limited (WBSEDCL). The Department of Power, Government of West Bengal, has issued a Request for Selection (RfS) for the project, and the bidding process is currently underway, with POWERGRID participating in the tender.

The facilities are expected to be completed, commissioned, and taken over by the employer within 15 months following commissioning. Furthermore, the facility would be taken over, and the contractor would be responsible for the comprehensive maintenance of the facility.

India-Bhutan Clean Energy Partnership: How BHEL Built the Milestone 720 MW Mangdechhu Hydro Project

In the realm of cross-border infrastructure, few partnerships are as successful as the renewable energy alliance between India and Bhutan. A major milestone in this relationship is the 720 MW Mangdechhu Hydroelectric Project, an engineering feat executed by state-owned engineering giant Bharat Heavy Electricals Limited (BHEL) under highly demanding Himalayan terrain conditions.

The project—featuring four 180 MW power generation units—stands as a premier example of bilateral cooperation. Jointly inaugurated by the Prime Ministers of both nations, the plant has become a cornerstone of Bhutan’s green economy and a symbol of India's role as a dependable global development partner.

Overcoming Himalayan Engineering Hurdles
Building a massive runaway-of-the-river power plant in the deep gorges of central Bhutan required navigating extreme geographical challenges. BHEL's

engineering teams had to transport heavy, high-tech turbine components through narrow, landslide-prone mountain roads and execute complex underground excavations.

Despite these difficult conditions, the project was successfully commissioned, showcasing India's advanced heavy-engineering capabilities. Today, the clean energy generated by the Mangdechhu plant not only illuminates thousands of Bhutanese homes but also exports surplus power to India, creating a sustainable revenue stream for the Bhutanese government.

Powering Over 90% of Bhutan's Grid
BHEL's footprint in the Bhutanese power sector is remarkably deep. With the successful integration of Mangdechhu, infrastructure built by BHEL now powers more than 90% of Bhutan's total electricity generation capacity.

Geographic Reference
This deep-rooted technological collaboration spans multiple decades and includes several iconic projects, including Chkha, Tala, and Malana. By consistently delivering high-performance hydro turbines, generators, and control systems, BHEL has cemented its position as the primary architecture partner for Bhutan's green energy grid.

Beyond the raw megawatts and commercial numbers, the Mangdechhu project represents a deeper story of shared water resources and diplomatic trust. It highlights how public sector enterprises can drive sustainable regional growth, turning environmental engineering into long-term international friendship.

Securing Reliable Power and Resilient Infrastructure for Developed India

The march toward a developed India requires balancing aggressive renewable energy (RE) integration with absolute grid stability. Massive injections of intermittent green power force conventional thermal stations into punishing cyclic operations, accelerating equipment fatigue, lowering efficiency, and increasing coal consumption. To prevent clean energy curtailment, Indian states must be incentivized to absorb RE through waived transmission charges, fiscal benefits tied to strict Renewable Purchase Obligations, and mandatory Time-of-Day tariffs that shift demand blocks to peak generation hours. Simultaneously, grid congestion must be managed by accelerating Green Energy Corridors and utilizing Dynamic Line Rating to optimize transmission capacity safely across the country.

Operational flexibility and fleet-wide efficiency are vital to defending against RE intermittency. India's thermal units require technical retrofitting to operate safely at a forty percent minimum technical load, supported by fast-ramping capabilities and hydro pumped storage for rapid peak-load response. Baseline efficiency must be driven through renovation, modernization of legacy units, biomass co-firing, and strict adherence to specific energy consumption targets. Aligning commercial interests with operational excellence through heat-rate incentives, availability-based tariffs, and strict merit order dispatch ensures that India's most efficient plants clear the market first.

Future infrastructure resilience relies on adopting advanced technologies, modular capacity planning, and grid digitalization. Advanced Ultra Super Critical (AUSC) technology operates at extreme temperatures to achieve forty-six percent gross efficiency, slashing emissions and coal consumption for India's power sector. This hardware is complemented by data governance and artificial intelligence, deploying predictive maintenance to prevent plant failures and machine learning for accurate load forecasting. Furthermore, next-generation interventions like digital twins, silt-resistant hydro coatings, and dry cooling systems optimize generation efficiencies across both thermal and hydro fleets.

To adapt dynamically to variable demand, India is shifting toward lower unit capacity additions. Installing smaller, modular units of two hundred and fifty to three hundred megawatts allows for faster synchronization times to catch abrupt demand spikes

and reduces transmission reliance when placed near local load centers. Finally, Battery Energy Storage Systems (BESS) serve as the ultimate catalyst for national grid resilience. BESS provides rapid peak shaving by shifting midday solar energy to evening surges, offers instantaneous frequency regulation to stabilize the grid within milliseconds, and defers expensive transmission capital expenditure by managing localized peak loads seamlessly.

POWERGRID Commissions 3,500 MW Solar Transmission Project in Andhra Pradesh

POWERGRID has successfully commissioned the Transmission Scheme for Solar Energy Zones in Ananthapur and Kurnool, Andhra Pradesh, marking a major boost for renewable energy evacuation infrastructure in the state. The project, designed to support 2,500 MW solar capacity in Ananthapur and 1,000 MW in Kurnool, became fully operational on June 24, 2026.

According to the company, the Notification for Commercial Operation (DOCO) was issued on June 25 and received by POWERGRID on June 26, 2026.

The transmission project was originally assigned to POWERGRID Ananthpuram Kurnool Transmission Limited, a wholly owned subsidiary of Power Grid Corporation of India Limited. Following a restructuring exercise, the company was merged with POWERGRID Khawda II-C Transmission Limited with effect from March 1, 2026, under an order issued by the Ministry of Corporate Affairs.

The commissioning of the project is expected to strengthen power transmission infrastructure and facilitate the evacuation of renewable energy generated from solar parks in Andhra Pradesh, supporting India's clean energy and sustainability goals.

PFC-REC Boards Approve Merger, Forming India's Largest Power Sector Financier

The boards of state-owned Power Finance Corporation (PFC) and REC have approved a scheme to merge REC with PFC, paving the way for the creation of a government-owned non-banking financial company (NBFC) with a combined loan book of more than Rs 11 lakh crore.

The merger, approved on Sunday, is proposed under Sections 230 to 232 of the Companies Act, 2013. The scheme is subject to approvals from shareholders, creditors and relevant regulatory and government authorities before it can take effect.

Under the proposed share swap arrangement, REC shareholders will receive 88 equity shares of PFC for every 100 equity shares of REC held. The record date for determining eligible shareholders will be announced later by the boards of the two companies. PFC said the merger will also be contingent on the merged entity continuing to qualify as a government company under the Companies Act, with the Government of India retaining majority ownership and voting control.

Deloitte Touche Tohmatsu India has been appointed as the transaction and tax adviser, while Cyril Amarchand Mangaldas is serving as legal adviser to both companies. RBSA Valuation Advisors LLP and Ernst & Young Merchant Banking Services LLP have prepared the joint valuation report for PFC and REC, respectively. SBI Capital Markets and Nuvama Wealth Management have provided fairness opinions for the transaction.

75 Lakh Households Targeted for Rooftop Solar Installations by December 2026: Union New & Renewable Minister, Shri Pralhad Joshi

PM Surya Ghar: Muft Bijli Yojana has already crossed 40 lakh beneficiary households within 2 years and I am hopeful that by the end of 2026, we will cross 75 lakh households by December 2026, said Union Minister for New and Renewable Energy and Consumer Affairs, Food and Public Distribution, Shri Pralhad Joshi while participating in a fireside chat programme organised during 'Two years of PM Suryaghar Muft Bijli Yojana: Scaling the solar home to 1 crore rooftops' event here today.

Shri Joshi said the Utility-Linked Aggregation (ULA) model is designed to accelerate implementation, particularly among underserved households. Under the model, around 30 lakh rooftop solar installations have already been planned across States, with utilities playing a key role in facilitating faster adoption and execution. He noted that the initiative will particularly benefit families consuming between 1 kW and 3 kW of electricity and help ensure wider access to affordable clean energy. With more than 65 lakh applications already in the pipeline, the scheme is witnessing strong public participation and unprecedented momentum across the country.

The Union Minister said India's solar growth is accelerating rapidly. He highlighted that the first 50 GW took 96 months. The next 50 GW took 36 months and growth from 100 GW to 150 GW took only 14 months. Adding on he said that May 2026 was the strongest month since launch of PM Suryaghar Muft Bijli Yojana with a record 3.16 lakh rooftop solar installations in a single month and 15,000 households added in just one day.

The Minister reiterated that the pace of adoption has increased automatically from 118 days to add one lakh households to less than eight days today. He said more than ₹22,750 crore in subsidies has been dispersed, including ₹2,743 crore in May 2026 alone. "PM Suryaghar Muft Bijli Yojana is creating one of the world's largest residential solar markets while advancing India's clean energy transition and energy self-reliance," he said.

Shri Joshi said that at a time when the world is facing energy uncertainties due to the West Asia Crisis, initiatives like PM Suryaghar Muft Bijli Yojana are strengthening India's energy security and strategic resilience. He said rooftop solar installations have increased from about 7000 per month before the scheme to over three lakh per month today. More than 17 lakh households have achieved zero electricity bills, demonstrating direct savings from families.

The Minister is confident that by 2047, every household will have rooftop solar and said, "PM Suryaghar Muft Bijli Yojana will become people's movement." The Minister also said that looking ahead, we will integrate Battery Energy Storage Systems as storage costs decline and expand adoption through the Model Solar Village initiative.

Secretary New & Renewable Energy, **Shri Santosh Kumar Sarangi** along with other senior officers was also present during the event.

Launched on 13 February 2024 with an outlay of ₹75,021 crore, PM Surya Ghar: Muft Bijli Yojana has become the world's largest domestic rooftop solar programme. Over 1 crore households have registered on the National Portal, with more than 33 lakh rooftop systems installed as of May 2026, adding over 12 GW capacity. Rooftop solar now accounts for nearly 45% of residential solar capacity, with deployment growth rising to 85% during 2024–2026. The scheme contributes to India's progress towards its 500 GW non-fossil capacity target by 2030, with total solar capacity crossing 150 GW as of March 2026, while enhancing energy access and reducing subsidy burden on DISCOMs.

Shri Joshi launched PM Surya Ghar logo and WhatsApp bot. He felicitated PM Surya Ghar Awards to top-performing States/UTs, DISCOMs, banks, vendors, and other stakeholders, including outstanding performers during the "Month of Solar" campaign in May 2026.

The Union Minister also launched two reports by CEEW (Council on Energy, Environment and Water)

(i) “What Drives Rooftop Solar Installation Decisions in Indian Homes? Understanding Household Decision Making through a Pan-India Survey”, and (ii) “Maximising Rooftop Solar Performance by Enabling a Robust O&M Ecosystem – A Multi-Billion Market Opportunity in India’s Residential RTS Segment”, which highlighted the need for improved maintenance and the potential to generate over 3.3 lakh jobs annually as deployment scales.

The programme also featured two high-level plenary sessions, focusing on the future trajectory of rooftop solar in India. The first plenary session, “From 40 Lakh to 1 Crore: The PM Surya Ghar Journey”, brought together senior representatives from the Ministries of New and Renewable Energy, Power and Finance, along with leading financial institutions, to deliberate on policy, financing and implementation priorities for scaling adoption to one crore households. The second plenary session, “Subnational Frontiers: Powering the State-Led Solar Surge”, convened senior state energy leaders to discuss cross-state learnings, innovative incentive models, and strategies to balance rooftop solar expansion with DISCOM sustainability and state-level energy priorities.

India Emerges as Global Renewable Energy Leader Backed by Strong Policy Ecosystem: Secretary, Ministry of New & Renewable Energy

The Ministry of New & Renewable Energy co-organised a panel discussion on “Energy Security through Renewable Energies” under the 10th edition of the Green and Sustainable Development Partnership (GSDP) Conversation Series here today.

The panel discussion featured Shri Santosh Kumar Sarangi, Secretary, Ministry of New and Renewable Energy (MNRE), H.E. Dr. Philipp Ackermann, Ambassador of Germany to India and Bhutan, Ms Vaishali Nigam Sinha, Co-founder and Chairperson of Sustainability, ReNew and Ms. Aparna Roy, Fellow and Lead, Climate Change and Energy, Observer Research Foundation (ORF) The discussion was moderated by Ms. Shreya Jai, Energy Lead, Climate Trends.

In his keynote address, Secretary, MNRE highlighted India’s remarkable Renewable Energy journey over the past decade, which has positioned the country as one of the global leaders. He attributed this progress to a robust and enabling policy ecosystem comprising Renewable Purchase Obligation (RPO)/ Renewable Consumption Obligation (RCO), Standard Bidding Guidelines for tariff based competitive bidding process for procurement of Power from Grid Connected Solar, Wind, Wind-Solar Hybrid and Firm & Dispatchable Renewable Energy, permitting up to 100 per cent Foreign Direct Investment under the automatic route, targeted measures to strengthen domestic manufacturing through initiatives such as the Production Linked Incentive (PLI) Scheme and the Approved List of Models and Manufacturers (ALMM),etc.

He further noted that flagship programmes such as PM Surya Ghar: Muft Bijli Yojana and PM-KUSUM have brought states, households and farmers to the forefront of India’s renewable energy transition, while upcoming interventions such as Agri-PV and floating solar are expected to unlock new avenues for clean energy deployment.

Highlighting the strategic importance of the National Green Hydrogen Mission, he noted its potential to reduce India’s dependence on imported fossil fuels, while creating new opportunities for industrial decarbonisation and energy security. Looking ahead, he emphasized that grid modernisation, accurate forecasting and scheduling, circular economy approaches for clean energy technologies, and enhanced mobilisation of climate finance will be critical for building a resilient, secure and future-ready renewable energy ecosystem.

Speaking during the panel discussion, Secretary, MNRE highlighted that the Government’s policy interventions have been carefully designed to make India’s renewable energy growth story increasingly market-driven. Secretary, MNRE further underscored the importance of initiatives such as the Production Linked Incentive (PLI) Schemes, which are fostering indigenous manufacturing capacities, enhancing self-reliance, and supporting the

development of a robust Renewable Energy ecosystem.

H.E. Ambassador Dr. Philipp Ackermann highlighted that India and Germany share a vital, common aspiration to achieve energy security, particularly in light of today's complex geopolitical landscape. He emphasized that true self-reliance can be unlocked through strong bilateral partnerships, noting that India's massive scale and dynamic private sector offer immense opportunities to deepen relations. Furthermore, the Ambassador reflected on how India's ongoing energy transition journey can provide valuable lessons and serve as a model of global best practices for other nations charting their own paths toward sustainability.

The discussion also explored the next growth frontiers for India's renewable energy sector, the opportunities that lie ahead for the industry and the pathways to balance the imperatives of energy transition and energy security.

The event reaffirmed the significance of the India–Germany Green and Sustainable Development Partnership as a vital platform for deepening bilateral cooperation and fostering knowledge exchange in the Renewable Energy sector.

As India accelerates Renewable Energy deployment while ensuring reliable and affordable energy access the panel discussion brought together policymakers, international partners, industry leaders and think tanks to deliberate on the potential of Renewable Energy to strengthen energy security, enable a balanced and holistic energy transition, and power India's long term economic growth and development aspirations.

NLC India and Indian Oil Sign MoU to Develop Large-Scale Renewable Energy Projects in Tamil Nadu

NLC India Limited (NLCIL) and Indian Oil Corporation Limited (IOCL) have taken a significant step towards accelerating India's clean energy transition by signing a Memorandum of Understanding (MoU) for the formation of a Joint Venture (JV) to develop large-scale renewable energy projects in Tamil Nadu.

The MoU was signed in New Delhi on June 22, 2026, by Shri Anurag Mittal, Chief General Manager (Commercial and Business Development), NLC India Limited, and Shri Manoj Nanda, Chief General Manager (Alternate Energy), Indian Oil Corporation Limited, in the presence of senior officials from both organizations.

The strategic partnership aims to establish a comprehensive portfolio of renewable energy projects, including solar power, wind energy, hybrid renewable projects, Battery Energy Storage Systems (BESS), Pumped Hydro Storage Projects (PHSPs) and integrated clean energy solutions. The Joint Venture will also explore future opportunities based on techno-commercial feasibility and evolving market requirements.

Under the agreement, the two public sector giants will work together to develop renewable power projects for supplying electricity to commercial and industrial (C&I) consumers, distribution companies (Discoms), power exchanges and e-mobility applications. The partnership will additionally explore opportunities across the clean energy value chain, including green hydrogen, green synthetic fuels, green chemicals and solar module manufacturing.

The collaboration aligns with the Government of India's vision of "Viksit Bharat", energy security and the country's long-term commitment to achieving Net Zero carbon emissions. It also reflects the growing role of public sector enterprises in driving investments in renewable energy and sustainable infrastructure.

NLC India Limited, a Navratna Central Public Sector Enterprise under the Ministry of Coal, has a distinguished legacy spanning nearly seven decades in mining and power generation. While maintaining its leadership in conventional power generation, the company has significantly expanded its renewable energy portfolio in recent years.

NLCIL is actively pursuing investments in solar energy, wind power, pumped hydro storage, Battery Energy Storage Systems (BESS), green hydrogen, low-carbon round-the-clock power

solutions and waste-to-energy projects. The company has emerged as a key contributor to India's renewable energy expansion strategy.

Speaking on the occasion, Shri Prasanna Kumar Motupalli, Chairman and Managing Director of NLC India Limited, described the partnership with IOCL as a major milestone in NLCIL's diversification into sustainable energy sectors. He emphasized that the collaboration will enable the development of renewable energy projects using multiple technologies, including solar, wind, hybrid systems, battery storage, pumped hydro storage and green hydrogen, while also exploring emerging clean energy technologies in the future.

The partnership leverages the complementary strengths of both organizations. While NLCIL brings extensive experience in power generation and renewable energy development, IOCL contributes its vast energy infrastructure, market reach and growing expertise in alternative energy solutions.

The Joint Venture is expected to create a robust renewable energy ecosystem in Tamil Nadu and support India's transition towards cleaner and more sustainable energy sources. It will also contribute to reducing carbon emissions, enhancing energy security and promoting technological innovation in the renewable energy sector.

The collaboration represents a significant step in strengthening India's renewable energy landscape and demonstrates the commitment of major public sector enterprises towards sustainable development, climate action and nation-building through green energy initiatives.

Conclusion

The MoU between NLC India Limited and Indian Oil Corporation Limited marks a major advancement in India's renewable energy journey. By combining expertise in power generation, clean energy technologies and infrastructure development, the two PSUs are poised to accelerate the deployment of large-scale renewable energy projects and contribute significantly to India's Net Zero ambitions and sustainable growth objectives.

Ministry of New and Renewable Energy Organizes National Workshop on Small Hydro Power Development Scheme

The Ministry of New and Renewable Energy (MNRE), Government of India, organized a National Workshop on the Small Hydro Power (SHP) Development Scheme here today. The workshop brought together representatives from State Governments, State Nodal Agencies, public sector undertakings, developers, technical institutions, industry associations and other stakeholders associated with the Small Hydro Power sector.

In his welcome address, Shri Rajesh Kulhari, Joint Secretary highlighted the significance of the newly approved Small Hydro Power Development Scheme in unlocking the vast untapped hydro potential of the country. He emphasized that Small Hydro Power is an important component of India's renewable energy portfolio and can contribute significantly to energy access, local economic development, grid stability and sustainable growth, particularly in hilly, remote and border regions. He underscored the need for active participation of States and stakeholders to ensure timely implementation of projects under the Scheme.

Addressing the gathering, Shri Akash Tripathi, Managing Director, Solar Energy Corporation of India Limited (SECI), highlighted the role of Small Hydro Power in supporting India's clean energy transition and strengthening renewable energy diversification. He emphasized the importance of effective coordination among implementing agencies, developers and State Governments for successful execution of the Scheme and assured SECI's commitment towards efficient implementation and facilitation of eligible projects as the National Programme Implementing Agency (NPIA) of the Scheme.

A major highlight of the workshop was the formal launch of the Small Hydro Power Development Scheme Guidelines (FY 2026-27 to FY 2030-31) by Shri Santosh Kumar Sarangi, Secretary, MNRE, along with the dignitaries present on the dais. The launch marks an important milestone in the revival and expansion of the Small Hydro Power sector in the country.

The newly launched Scheme aims to support installation of approximately 1,500 MW of new Small Hydro Power capacity. With a total financial outlay of ₹2,584.60 crore, the Scheme provides Central Financial Assistance (CFA) for SHP projects, support for preparation of Detailed Project Reports (DPRs), assistance to technical institutions, and support for capacity building, awareness generation, international cooperation and project monitoring activities.

Delivering the keynote address, Shri Santosh Kumar Sarangi, Secretary, MNRE, stated that India's clean energy transition requires diversification of renewable energy sources and greater focus on region-specific solutions. He emphasized that Small Hydro Power is a mature, reliable and environmentally sustainable renewable energy technology that can play a crucial role in strengthening energy security, supporting rural development and promoting balanced regional growth. He noted that despite an estimated Small Hydro Power potential of around 21 GW in the country, only a fraction has been harnessed so far, presenting a significant opportunity for future development.

Secretary further stressed the importance of close collaboration among Central and State Governments, developers, financial institutions, technical organizations and local communities. He encouraged States to proactively identify viable project sites, facilitate statutory clearances and create an enabling ecosystem for accelerated project implementation. He mentioned that the National Online SHP portal will be launched shortly.

During the technical session, officials from SECI made a detailed presentation on the key features of the Small Hydro Power Development Scheme Guidelines, covering eligibility criteria, Central Financial Assistance structure, project timelines, implementation mechanisms and institutional arrangements. Participants were apprised of various provisions aimed at promoting project development, reducing tariffs and improving project viability, particularly in hilly and North-Eastern regions.

Officials from the National Informatics Centre (NIC), MNRE, subsequently demonstrated the online SHP Portal, which will serve as the digital platform for implementation of the Scheme. The presentation covered portal architecture, registration procedures, application workflows, document submission processes, project monitoring mechanisms, fund release modules and grievance redressal features. Stakeholders were informed that all activities under the Scheme will be undertaken through the online portal to ensure transparency, efficiency and real-time monitoring.

The workshop also featured an extensive interactive session, during which representatives from States, developers, industry associations and other stakeholders raised queries and provided suggestions relating to project allotment, clearances, DPR preparation, financial assistance, implementation timelines and portal functionalities. The discussions provided valuable feedback for effective implementation of the Scheme.

In his concluding remarks, Shri Kulhari thanked all participants for their active engagement and constructive suggestions. He reiterated MNRE's commitment to working closely with States and stakeholders for accelerating Small Hydro Power development in the country and ensuring successful implementation of the Scheme.

The workshop concluded with a shared commitment among stakeholders to leverage the opportunities provided under the new Scheme and contribute towards sustainable development of the Small Hydro Power sector as part of India's broader renewable energy transition.

Serentica Renewables to invest ₹1 lakh crore in Rajasthan clean energy sector

Serentica Renewable recently announced plans to invest ₹1 lakh crore in Rajasthan's clean energy space. The company's strategy is focused on enabling hard-to-abate sectors through firm and dispatchable renewable energy solutions that combine scale, reliability and affordability. "Underscoring its long-term commitment, Serentica has announced plans to invest ₹1 lakh crore in coming years in the state of Rajasthan, with more

than ₹10,000 crore already deployed," the statement said.

The company said Rajasthan now accounts for over 50 per cent of its total solar portfolio, with major assets located in Bikaner and Jaisalmer. The portfolio is expected to expand to Bhadla in the next phase. Together, these projects are part of the company's planned renewable energy pipeline of 27,000 MW. Serentica Renewables is a renewable independent power producer committed to decarbonise hard-to-abate industries by providing firm dispatchable renewable energy (FDRE) solutions.

Renewable energy will be used to generate green hydrogen

During the monsoon there may be less sunlight because of cloud cover, but wind, waves and ocean currents are stronger. During the non-monsoon period, solar generation increases while wave and current energy may reduce. Together, these systems complement one another and provide a more reliable source of renewable energy," Singh said.

The pilot project is expected to come up off the South Goa coast, where wind conditions are considered more favourable than in other parts of the state. The platform will be anchored offshore using mooring systems while retaining flexibility to adapt to changing sea conditions.

A prototype is expected to be ready within a year.

"We are very excited about this project. The pilot version should be visible within a year, although several engineering challenges remain," Singh said.

He said that designing a structure capable of withstanding rough seas remains one of the key challenges. "If the platform is completely rigid, powerful waves and strong winds could damage it. Future designs will allow the structure to flex and adapt to changing sea conditions," the CSIR-NIO director said.

Initially, researchers will test a smaller platform, which may be shifted closer to the coast during severe monsoon for safety. In the long term, however, the team aims to develop a permanently deployed system capable of operating throughout the year.

Singh said future versions of the platform could incorporate offshore hydrogen production units. Instead of transmitting electricity to shore through expensive subsea cables, the power generated offshore could be used to produce green hydrogen directly on the platform.

The concept involves desalinating seawater and using renewable electricity to generate green hydrogen, which can then be stored and transported for industrial and energy applications. "Hydrogen is a future energy carrier. Rather than bringing electricity to shore transmission cables, we may produce hydrogen directly at sea," he further said.

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Coal gasification project to strengthen India's energy security: G Kishan Reddy

Union Coal and Mines Minister G Kishan Reddy recently said the beginning of the coal gasification project marks a historic step towards converting India's abundant coal resources into value-added products, which will strengthen the country's energy security and promote import substitution.

Reddy said this after Prime Minister Narendra Modi virtually laid the foundation stone for the Rs 25,000 crore Coal-to-Ammonium Nitrate Project of Bharat Coal Gasification and Chemicals Limited (BCGCL) in a meeting at Rairangpur in the presence of President Droupadi Murmu.

The Union minister attended the meeting by physically remaining present at the project site in Lakhanpur in Jharsuguda district. "The project is targeted for commissioning by September 2029," an official said.

Reddy, in a post on X, said: "The project will strengthen India's energy security, promote import substitution, reduce dependence on critical imported chemicals and feedstocks, generate employment opportunities, and support the vision of Aatmanirbhar Bharat through the cleaner and more efficient utilisation of domestic coal resources. The ammonia produced through this project will support fertiliser manufacturing, benefiting farmers and strengthening India's agricultural self-reliance through the efficient utilisation of domestic coal resources."

The Union Coal and Mines minister told reporters at the project site that "This joint venture between Coal India Ltd and BHEL marks the beginning of a new era of coal processing in the country, which will promote indigenous coal gasification technology and facilitate the conversion of India's abundant coal resources into value-added chemicals."

He said the project is expected to generate significant employment for regional youth, promote skill development, and drive regional economic growth through the development of ancillary industries and services.

BCGCL is a joint venture company formed between Coal India Limited (CIL) and Bharat Heavy Electricals Limited (BHEL), with CIL holding 51 per cent equity and BHEL holding 49 per cent equity.

Mahanadi Coalfields Limited (MCL), a subsidiary company of Coal India Limited, is contributing approximately 350 acres of its coal-bearing land in Lakhanpur, Jharsuguda district of Odisha, where the BCGCL project will be constructed. This apart, MCL will meet the coal requirement for this project, supplying 0.79 Mty (Million Tonnes per Year) of washed coal and 1.19 Mty of reject from its Ib Valley washery, officials said.

They said that the project is aligned with the Centre's National Coal Gasification Mission and is expected to serve as a model for future coal-to-chemicals projects across the country.

This project is aimed to produce approximately 0.66 million tonnes per annum (MTPA) of technical grade ammonium nitrate through coal gasification and represents one of India's pioneering commercial-scale initiatives utilising domestically developed pressurised fluidised bed gasification (PFBG) technology for chemical production, an official statement said.

Meanwhile, the Rs 25,000 crore project has received Single Window Clearance from the HighLevel Clearance Authority (HLCA), of the Odisha government and has also been granted financial incentives of Rs 1,350 crore by the Ministry of Coal. These approvals provide a major impetus to the commercialisation of indigenous coal gasification technology, officials said.

With all key statutory and environmental approvals, major clearances in place, financial support secured, and lump sum turnkey execution packages awarded, the project is targeting a commissioning schedule by September 2029 and is expected to emerge as a flagship project demonstrating India's capability in converting coal into high-value chemical products through indigenous technology, they said.

India nears 50% domestic coal use in import-based power plants, sources say

India is increasing the use of domestic fuel to more than 50% at power plants designed to run on imported coal, as the world's second-largest thermal coal importer seeks to curb costly overseas purchases, government and industry officials said. The South Asian nation is already using domestic coal for operating 5.7 gigawatts capacity so far this year of the total 18.7 GW capacity at imported coalbased power plants, they said. Trials are underway to expand the switch to another 4.3 GW of capacity.

Import-based coal plants have previously relied on coal from Indonesia, South Africa and Russia, among others. Imports from Indonesia and South Africa fell about 21% and 68%, respectively, in January through April from a year earlier, data from Indian coal trader iEnergy Natural Resources shows. Higher power generation from renewable sources is freeing up domestic fuel supplies, allowing more local coal to be diverted to coastal plants that were built to run on imports.

India has for years tried to reduce coal imports for power generation, but efforts were constrained because imported coal-based plants were designed for highergrade fuel and struggled to process lower-quality domestic supplies.

Operators have gradually modified units to handle greater volumes of local coal, which has higher ash content, one government official said.

The companies are using a mix of imported and domestic supplies to optimise operations, with some facilities now using as much as 70% local coal, the sources said. "The coal ministry has offered doorstep supply to imported-coal plants, which could take care of the quality and quantity needed without any issues," another official said. Imported coal-based plants have already booked 16 million metric tons of domestic coal for their needs, a third official said. The officials could not be named as they are not authorised to speak to the media. India's coal-fired generation rose 10% in May from a year earlier, the highest growth since May 2024, as utilities increased generation to meet electricity demand, Grid-India data showed. India's thermal coal imports fell to a four-year low of 65 million metric tons in January to May due to higher local output and rising renewable energy generation, commodities consultancy BigMint said last week.

How coal gasification valleys could reshape India’s industrial geography

The government’s projects of 100 million tonnes capacity under the National Coal Gasification Mission would be started by 2030, though they will be at different stages, Balasaheb Darade, Founder and Managing Director, New Era Cleantech, told ETEnergyWorld.

He said that in the current scheme for ₹8,500 crore, there are 8 projects in progress which will gasify about 12 tonnes of coal. Under the new scheme, the government has allocated ₹37,500 crore which could be further increased.

With no operational coal gasification capacities at this point of time, the 100 million tonnes target may seem ambitious, but Balasaheb Darade, Founder and Managing Director of New Era Cleantech says, “We believe that by 2030 India will have 100 million tonnes coal gasification capacities at different stages of development”.

He added that China processes about 350 million tonnes of coal per annum but for them too this has been a long journey that started in 1995. “According to our company’s internal calculation, by 2047, there is an opportunity to gasify about 250 million tonnes of coal which can lead to import substitution to the tune of ₹5,000 crore to ₹7,000 crore,” he said.

Projected forex savings from these ongoing projects to produce downstream products, ammonium nitrate, synthetic gas, ethanol, hydrogen and direct reduced iron will lead to savings to the tune of ₹15,900 crore through import substitution according to the Ministry of Coal.

Decoupling growth from global energy volatility India produces nearly 0.5 million bpd of oil while consuming close to 5 million bpd. Similarly, India produces around 35 BCM of gas against consumption of nearly 70 BCM, resulting in

significant dependence on oil and gas imports. Events such as COVID-19 followed by the Russia-Ukraine war and now the West Asia crisis have exposed India's vulnerability to market volatility arising from this high dependence on imported hydrocarbons. Beyond these base hydrocarbons, India also imports large volumes of chemicals used across industrial applications, many of which can potentially be produced domestically through the syngas route enabled by coal gasification. A high-level committee on implementation of the Viksit Bharat goals has estimated that by 2030, India can reduce chemical imports by nearly ₹3,65,354 crore through syngas-based coal gasification pathways. This opportunity also extends to ammonia and urea, which serve as the foundational building blocks for fertiliser production.

Globally, ammonia and urea represent one of the largest and most commercially viable applications of coal gasification due to assured offtake. China, for instance, produces nearly 70 million tonnes of coalbased urea, making it the global leader in this segment.

In the Indian context, urea remains a major challenge. Fertiliser subsidy increased from ₹1.5 lakh crore to ₹2.5 lakh crore in 2022, and is expected to rise further as India imported nearly 11 million tonnes of urea in FY26. Urea presents a dual dependency challenge for India. Not only does the country import urea, but domestic urea production itself depends heavily on imported natural gas, since most fertiliser plants in India are gas-based and domestic gas production remains insufficient. According to the Ministry of Coal, producing ammonia and urea through the syngas route could reduce India's urea import bill by nearly ₹21,667 crore by 2030.

Decoupling of India's economic growth from volatile global oil and gas supply chains can be a game changer for LPG considering India imports 22 MMT of LPG per year. Di-methyl-ether (DME) produced through methanol route during coal gasification can be blended in LPG, which can lead to significant imports reduction. As per BIS standard, 20 per cent of blending of DME is allowed in LPG which can save ₹34,200 crore per year for the country according to the report by EY Parantheon and New Era Cleantech. India has made significant progress with ethanol blending in petrol and can possibly follow the same path to blend DME in LPG, starting with 5 per cent to 8 per cent and increasing to 20 per cent which can significantly bring down the imports.

Additionally, India has nearly 20 GW of gas based power plants that can generate around 105 TWh per year which can be commissioned with retrofitting the syngas combustor. According to the Ministry of Coal, syngas retrofitting can enable about 25 BCM per year of natural gas substitution. An equivalent import substitution of ₹99,000 crore to ₹1,17, 000 crore per year creating stable offtake for domestic coal or lignite gasification.

Making coal gasification bankable in India

Traditionally, India's coal sector has been a regulated sector with the mining rights reserved for the Indian government. Sasol Synfuel International, a subsidiary of Sasol and TATA Steel had formed a JV in 2008 to develop India's first coal to liquids project. However, this project could not take off due to challenges with the coal guarantees, significant capes and broader structural constraints. It was only in 2020 that the government opened the sector to private and international miners after introducing the policy reforms that renewed investor interest in coal gasification in India.

Like any industrial project, coal gasification requires assured input, land and environment clearances, technology, offtake guarantees and capital. While technology selection is the core for successful implementation of coal gasification projects and demands careful due diligence while selection, securing input availability and offtake guarantees is even more critical to ensure predictable cash flow for these high capex projects and improve their attractiveness to potential investors.

To put it in perspective, if a developer produces chemicals via coal gasification that are produced at cheaper rates in the countries with access to natural gas or by China where the coal to chemicals industry has matured, the developer in India would require offtake support. However, in case of direct reduced iron (DRI), the offtake is guaranteed as it is used as a raw material to produce steel, which is the end

product. JSPL is one good example as it is setting up 2 MMTPA DRI capacity for captive consumption.

The Ministry of External Affairs can facilitate international collaboration and global technology transfer. The Ministry of Environment Forest & Climate Change will become extremely important as the discussions expand to marine decarbonisation which is transforming methanol from a chemical feedstock to low carbon marine fuel. And the Ministry of Civil Aviation has an important role to play as the conversations gain momentum to diversify sustainable aviation fuel and include e-SAF produced through coal gasification.

“Since the coal gasification projects are highly capital intensive, the Department of Economic Affairs should facilitate its inclusion in the infrastructure sector which can help the investors access financing at lower interest rates. China had adopted this approach which helped accelerate the growth of the coal gasification sector in the country,” said Darade.

Though the Ministry of Coal is very much driving the initiative, the active participation of other ministries will be equally important to ensure the commercial viability of projects and strengthen investors’ confidence.

Gasification valleys: Building India’s next generation industrial ecosystems

Coal gasification projects are highly cost intensive and their success will depend on being developed at scale with integrated downstream value chains. Rather than standalone plants, these projects need to evolve into integrated industrial ecosystems similar to large scale integrated refinery complexes that achieve stronger economics by producing multiple products and maximising resource utilization. In the Indian context such gasification valleys have the potential to shape industrial geography by creating new manufacturing clusters around domestic coal resources and linking energy, fertilisers, fuels and advanced materials into the single value chain.

Integrated with carbon capture and utilisation (CCU), coal gasification can become a key enabler for India's Green Hydrogen Mission. Assured hydrogen offtake is one of the current challenges facing large scale green hydrogen projects. Co-locating the coal gasification units and green hydrogen facilities can create powerful industrial synergies. Hydrogen produced from the electrolyser can be combined with the carbon monoxide (CO) produced from the coal gasifier to produce methanol and downstream chemicals thus creating demand centres for green hydrogen while reducing the overall system costs.

For every 1 kg of green hydrogen, an electrolyser produces 8 kg of pure oxygen as a by – product which further extends integration opportunity. Instead of treating oxygen as waste and treating it as a co-product can create a more efficient and circular ecosystem. Oxygen is amongst the largest inputs and capital cost drivers after coal in a coal gasification facility as conventional air separation units consume 200-250 KWh of electricity to produce one tonne of pure industrial grade oxygen which otherwise if sourced from the electrolyser can optimize capex as well as opex.

For coal gasification, CCU and hydrogen to succeed at scale, integration across technologies and optimisation of capex and opex will be critical. In isolation, every technology may look attractive but the true value will only be realised when developed as an interconnected ecosystem capable of delivering higher efficiency, lower costs and stronger commercial outcome.

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