



Volume 18, Issue 5

August 2024



## IEF Gets New Office Premises in Nehru Place

INDIA ENERGY FORUM 908 Chiranjiv Tower, 43 Nehru Place, New Delhi 110 019

## Managing Energy Transition In Developing Countries: World Bank Study Focuses on Distribution Utilities

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In the previous article on Managing Energy Transition: Challenges and Opportunities, in Indian context, the focus was on supply side of energy, particularly electricity. The paper examined the issues concerning the desired and expected rates of growth of electricity generation, the fossil and non-fossil fuel structure, the desirability of balancing the growth of coal centric power, nature of

emphasis on renewables, technical issues concerning managing the transmission grid particularly from the point of view of large scale expansion of solar associated with its non-availability in evenings, difficulties associated with backing down of coal based thermal power plants, challenges associated with development and installation of technology, in the time frame required, to function effectively as storage for solar power, and a few other related issues. This paper is an attempt to examine the issues concerning sustainability of large scale expansion of power generating capacity and the financial burdens on and required capabilities of distribution utilities to support sustainability such expansions. In this context, the recent Report of the World Bank on "Empowering Utilities for Energy Transition Management is quite relevant" the thrust of this Report is "The energy transition and universal access to electricity cannot be achieved without well-performing power utilities."

India Energy Forum organised a Panel Discussion on this subject and to particularly also discuss the analysis and findings presented in the World Bank Report. The structure of the Panel Discussion which was shared with the Panelists is given below

1. First Round - Each Panelist to briefly give an Overview of and Comments on the WB Report.

2. Second Round - SPECIFIC ISSUES TO BE DELIBERATED,

- i. If we project next 15 and 25 years (in 2040 and 2050), projecting estimate of - Per Capita Power Consumption, Capacity Profile Mix - Thermal, Gas, Hydro, Nuclear, Solar, Wind, etc., Power Generation Mix.
- ii. Are the present Projections on Renewables over estimated, particularly from the point of view of rate of expansions? Why and why not?
- iii. In the Time frame we are focusing on, where do we see Nuclear, which is carbon free power, to be playing a meaningful role?
- iv. India's excessive dependence on petroleum fuels and gas is a cause of concern considering particularly the emerging geo political dynamics, what needs to be done in the time frame we are considering?
- v. Considering that Coal may continue to be relevant during the time frame we are considering, what specific, what Technology and other Options we must pursue to address the challenge of carbon emissions?
- vi. The central point of WB Report is Challenges for Utilities due to expansion of Renewables. Besides Technical issues, the Report comments on huge Capex and Capital Intensities. How should India address this challenge? What Strategies India needs to follow on T & D fronts?

The World Bank Report covers the situations in low income group and medium income group countries. However, most of the findings also relate to the Indian context, though in varying degrees. The Report emphasises "As the stewards of the world's power grids, utilities will be at the heart of efforts to decarbonize electricity supply and electrify energy demand (referred to jointly in this paper as the "energy transition"). Utilities will need to significantly increase the share of renewable energy in their generation mixes, modernize networks to integrate these variable power sources into the grid, and manage the ever-more varied and complex power needs of industry, households, and transportation."

Post enactment of Electricity Act 2003 and many other associated Policies and Rules, the enhanced level of confidence of Investors, Developers, and Banking Sector led to several positive outcomes. The

country could provide access to electricity, particularly, in rural areas and also in all towns and cities, and power supplies have improved considerably, enabling the governments in states to be thinking in terms of 24x7 power supply. Prior to the implementation of the Act, the overall supply was merely about 70 GW (the overall capacity itself was about 100 GW). This has increased to a peak load of more than 240 GW. and installed capacity of the order of over 440 GW. Private Sector role in generation has increased from less than ten percent to more than fifty percent. Opening up of Transmission has also led to competition and Private Sector has achieved more than ten percent role as developers. While the Financial Sector has supported thus far, the deteriorating performance of a large number of government distribution companies, and excessive accumulated losses are serious causes of concern obviously, going forward the financial challenges for the distribution utilities will be much more demanding. There is an urgent need to give a serious thought to avoid repetition of crisis faced, during the days of beginning of this century, when Finance Sector had almost abandoned power sector

The Report rightly emphasises "Meeting these demands while ensuring reliable and affordable electricity service will require well- performing, financially sustainable utilities that i) are able to access inexpensive long- term financing; ii) are viable off-takers for private power investors; iii) make efficient use of any public finance they receive; and iv) have the technological and managerial capacity to harness the opportunities created by an increasingly modern, distributed power system." The Report brings out the financial and operational performance of more than 180 utilities in over 90 countries. Only about 40% of utilities are able to collect revenue to meet their annual operating and debt service costs. In the Indian context also this problem does exist but not to the same degree. However, it is the massive task of accelerated growth which will require Distribution business structure to be progressively overhauled in a manner that it supports adequately the massive investments- present and future both- in the entire value chain.

India has made plans for massive expansion of renewables, and has made good success in this

direction. In the future the capacity addition programmes for renewables, particularly solar and wind, is being accelerated further. The system would require commensurate financial investments not only for power generation projects, but also for corresponding expansion, on the higher side of it, on the transmission projects. Deteriorating financials of distribution utilities will obviously pose a greater challenge to inspire investors and lenders to provide finance for this sector for these capital expenditures. The Report brings out "The energy transition and the push to universal access will create new challenges for utilities, further threatening their performance. For many utilities, achieving the energy transition and universal electricity access will require massive upfront capital investment." However, the Report falls short in suggesting the way out on the institutional changes in the distribution business. Not only in India but in most of the developing countries distribution utilities are Government organisations and, therefore, are subject to constraints created by and compulsions of political considerations in economic and commercial management of the power supply business.

India cannot afford to allow a slower growth of power supply than required for a respectable growth of economy. Our excessive obsession to continue with the age old legislations viz. Electricity Act 1910 and Electricity Supply Act 1948, which provided for State Electricity Boards, as the main instrumentals to develop and manage electricity business, left the country far behind. The country - the people, the agriculture, the industry and business continued to suffer electricity shortages but the development of this most important and vital infrastructure continued to remain a "licensed "activity depriving completely a reasonable supply - demand market to develop. It took the country more than fifty years to recognise this fallacious structure when the new Act delicensed power generation.

The following Table reveals the economic consequences of keeping the Power Sector under Licence shackle. Though belated, toward the end of the last century, a very satisfying resolve emerged - Let us not have Electricity Board (SEB) and have a new Legislation, open up the Power Generation Sector, open up Transmission and many more facilitations. The very satisfying outcomes of these

initiatives are there to see. These could have been better if the Distribution Sector could, by their performance, inspire and raise confidence of the stakeholders. In the beginning of the last decade of the previous century, India and China were at par, in fact, India was ahead. The following Tables reveal the impact of energy, particularly electricity, in terms of economic growth.

Country	(USD)	Capita (USD)
#1 USA	\$28.78 trillion	\$85.37 thousand
#2 China	\$18.53 trillion	\$13.14 thousand
#3 Germany	\$ 4.59 trillion	\$54.29 thousand
#4 Japan	\$ 4.11 trillion	\$33.14 thousand
#5 India	\$ 3.94 trillion	\$2.73 thousand

Per Capita Income of India and China	
1990	2024
India: \$ 375	India: \$2,731
China: \$ 347	China: \$12,115
It's time to bridge this gap	

India has an Aspirational Target of Economic Growth. Over next few decades, its economy can and will cross its position in the world from fourth, to third and to second, if not to first. To achieve what the country is aspiring for we need to secure more than 10% growth of power sector. CEA has projected the following plan. This will need substantial upward revision. It must, however, be added that CEA Plan still at draft stage, has been structured considering several prevailing constraints and compulsions.

Demand Projection in 2046-47 vis-à-vis 2022-23 (as per CEA estimate)						
Sl. No	Year	Electricity Requirement (BU)	Peak Electricity Demand (GW)	Sl. No	Source	Installed Capacity (GW) As on 30.06.2024
1	2023-24	1750	242	1	Nuclear	54.4
2	2046-47	4582	697	2	Coal	235.3
3	2049-50	5173	777	3	Gas	10.4
				4	Biomass	23
				5	Hydro	99
				6	Wind	434.9
				7	Solar	1186.8
				8	Total	2043.9
				9	PSP (GW/GWh)	116.1/702.9
				10	ESS (GW/GWh)	359.6/1983.9

\* Large Hydro only  
\*\* Includes Small Hydro, Lignite and Diesel also

Ambitious plans will need massive investments. This will require confidence of bankers and investors about the ability of Distribution utilities to service these investments, about the stability of government policies and predictability of regulatory interventions. On all these fronts, there are numerous instances of

uncertainties. In order to jack up the growth rate and also address the additional financial burdens to back up the required pace of adding Renewable energy, suitable financial incentives may have to be provided for expansions to move at faster rates. The WB Report has rightly highlighted this.

“Governments have a crucial role in lowering the costs to utilities of achieving the energy transition and reaching universal access. They need to create robust policy and legal frameworks that reduce private investors’ risk and develop new infrastructure based on least- cost planning and transparent procurement”.

“...it will fall to governments to manage sensitivities around phasing down fossil fuel generation and phasing out distortionary subsidies. Public policies and incentives focused on energy efficiency can help mitigate some of the impacts of rapidly growing demand”.

Similarly, Regulatory Institutions also need to be sensitive to the continuing need for investments and borrowings for a projected growth profile, for which predictability and stability of policies will be essential, of course with due regard to safeguarding the interests of various stakeholders. The World Bank Report has highlighted the expectations from Regulators.

“Regulators need to ensure that utilities are able to recover reasonable costs through tariffs, including the costs of achieving universal access and the energy transition. They will also need to adopt innovations in tariff design that efficiently and fairly allocate these additional costs between utilities and their customers”.

The financial stresses in state owned Distribution Companies are attributable to operational inefficiency, political interventions, skewed subsidies, unreasonable consumer expectations, and also, in many cases, inadequate regulatory response and actions. Most importantly the present market structure of Distribution, as mentioned earlier, needs major changes.

Note. There are a few other issues which will be covered in another piece. \*\*\*\*

## From the Desk of the Honorary Secretary General



Dear Colleagues

Greetings!

I am pleased to share with you the August Issue of our monthly e-magazine TOTAL ENERGY. It covers the energy sectoral news and views and activities of the India Energy Forum.

As of August 2024, the Ministry of New and Renewable Energy (MNRE) reported the following statistics:

- Solar power: 87.21 GW of cumulative solar capacity including 67.52 GW ground mounted and 13.40 GW grid connected rooftop, 2.59 GW hybrid projects, and 3.70 GW off-grid solar
- Renewable energy: 128% increase in installed capacity since 2014, including large hydro
- Wind power: India ranks fourth globally in wind power capacity
- Solar PV deployment: India ranks fifth globally as of the end of 2022

The MNRE also has also set o goal for boosting manufacturing:

- Investing INR 4,000 crore in the RE equipment manufacturing sector by 2024 and INR 10,000 crore by 2027

The gas production in the country has gone up from 28.7 BCM in 21-22 to 36.43 BCM in 2023-24. The gas production is expected to touch 45.3 BCM by 2026.

This month Government extended JI-VAN Yojana to 2028-29, aims for 20 percent ethanol blending by 2025-26.

This month on 16th August India Energy Forum has shifted to its own Premises at 908 Chiranjiv Tower, 43 Nehru Place, New Delhi. The inauguration was done by Shri Pankaj Kumar IAS, Secretary, Ministry of Power in the presence of Shri R V Shahi, President, IEF and other Executive Committee members. Mr Agarwal in his inaugural address shared the the present landscape of India's energy sector with the Executive Committee Members.

The next flagship event of IEF i.e. '23rd India Power Forum" on the theme ""Net Zero Compliant Power Sector for Developed India" will be held on 21st October 2024 at Hotel Le Meridien, New Delhi. Members may kindly pencil the date in their Diary.

With best wishes

**K S Popli**

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

on behalf of  
INDIA  
**ENERGY**  
FORUM

Registration No. DELENG/2007/20915

303 PHD House, 4/2 Siri Institutional Area, August Kranti Marg, New Delhi – 110 016

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## India's renewable energy space received Rs7 trillion investment in past 10 years: Pralhad Joshi



India's renewable energy sector has received investments of about Rs 7 trillion between 2013-2014 and 2022-23, said Pralhad Joshi, Union minister for new and renewable energy, adding that the country is set to revitalise its renewables sector.

During a discussion in the Rajya Sabha, Joshi said recently that the way forward for the renewable energy sector was to address present challenges as well as leverage opportunities for growth.

"I am confident that by addressing these areas, India can and India will achieve its ambitious renewable energy targets," Joshi said.

"India witnessed a significant shift in investment dynamics of RE projects with a funding of around ₹7 lakh crores during last 10 years, i.e., FY2014-FY2023," he said.

India aims to increase its non-fossil energy capacity to 500 GW by 2030, up from the current installed renewable energy capacity of about 180.79 GW.

Joshi added that the government plans to set up 13,000 MW renewable capacity, including 9,000 MW of solar and 4,000 MW of wind energy, along with a 12,000 MWh battery energy storage system in Ladakh.

"An inter-state transmission system is to be set up for power evacuation and grid integration of the 13 GW RE projects in Ladakh and dispatch of power to other parts of the country," Joshi said.

Since 2014, India's installed renewable energy capacity has increased by 165%, from 76.38 GW in 2014 to 203.1 GW.

"For the first time ever in the country, we have crossed 200 GW capacity from non-fossil fuel sources. That includes 85.47 GW of solar power, 46.93 GW of large hydro, 46.66 GW of wind power, 10.95 GW of bio power, and 5.00 GW small hydro power," Joshi said.

India's installed solar energy capacity increased from 2.82 GW in March 2014 to 85.47 GW in June 2024, and the installed wind energy capacity from 21.04 GW to 46.66 GW, he said.

Total renewable energy generation in India has increased from 193.50 billion units (BU) in 2013-14 to 359.89 BU in 2023-24, with an increase of 86%, while the solar power tariff has come down from ₹10.95 per unit in 2010-11 to ₹2.60 in 2023-24, the minister added.

"India has achieved fourth position globally in RE Installed capacity. We stood fourth in wind power capacity and fifth in solar PV capacity," Joshi said.

## India's installed solar power capacity reaches 85.47 GW, wind power at 46.65 GW: Minister



The government recently informed that the total installed capacity of solar photovoltaic (PV) power in the country stands at 85.47 gigawatt (GW) and wind power at 46.65 GW. The Centre has undertaken several measures and initiatives to promote the

development of renewable energy (RE), including solar and wind power.

These measures directly or indirectly incentivise industries to increase the use of RE against the consumption of energy from conventional coal-thermal-based power, according to Shripad Yesso Naik, Minister of State for New and Renewable Energy. The minister told the Rajya Sabha that the country aims to achieve 500 GW of installed electric capacity from non-fossil sources by 2030. Towards

that goal, the Centre has permitted foreign direct investment (FDI) up to 100 per cent under the automatic route.

The Ministry of New and Renewable Energy has also waived Inter-State Transmission System (ISTS) charges for inter-state sale of solar and wind power for projects to be commissioned by June 30, 2025, for Green Hydrogen projects till December 2030 and for offshore wind projects till December 2032. "To boost RE consumption, Renewable Purchase Obligation (RPO) trajectory has been announced till 2029-30 including separate RPO for decentralised Renewable Energy," the minister informed.

A project development cell for attracting and facilitating investments has also been set up. There are other schemes such as Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM), PM Surya Ghar Muft Bijli Yojana, National Programme on High-Efficiency Solar PV Modules, National Green Hydrogen Mission, and the development of 1GW Offshore Wind Energy Projects, etc. According to the Economic Survey 2023-2024, India has a well-established infrastructure to attract FDI in sectors like greenfield projects such as renewable.

Top American and European companies in the renewable energy sector, such as First Solar, Vesta, and Scatec, have established their operations in India to take advantage of the growing demand for green technologies. According to experts, the Union Budget will steer India towards a sustainable path. Climate and energy experts said the Budget highlighted several key initiatives like energy transition pathways, climate finance, improving water resources management, and measures related to irrigation and flood management that will boost India's fight against the impacts of climate change.

### India's rooftop solar capacity rises by 26% to 1.1 GW in Jan-Jun: Mercom



India added 1.1 GW of rooftop solar capacity from January to June 2024, marking a 26 per cent increase from the 873 MW added in the same period

last year, US-based research firm Mercom Capital said in a report recently.

The report titled – 'India Rooftop Solar Market' - noted that in the second quarter of 2024, 731 MW of rooftop solar was installed. This is an 89 per cent jump from 388 MW Year-on-Year.

Till June, the country's total rooftop solar capacity touched 11.6 GW. The industrial sector contributed over 23 per cent of the new installations. The commercial sector added 4 per cent, and the government sector contributed 0.7 per cent, it said.

The Narendra Modi government has been pushing to increase India's renewable energy capacity amid threats from challenges such as climate change.

### UP plans to install solar power plants along 296-km Bundelkhand Expressway

The Uttar Pradesh government plans to install solar power plants along both sides of the 296-km Bundelkhand Expressway. According to GEAPP (Global Energy Alliance for People and Planet) -- a global alliance for green energy transition -- it has conducted a study and found that 450 MW solar power plants can be installed on both sides of the highway.

GEAPP said it has also prepared a detailed project report (DPR) which has been approved by the state government.

"In the study, we found that 450 MW solar power plants can be installed on both sides. We presented the study to the state government and they have approved it," Saurabh Kumar, vice-chairman of GEAPP, told PTI recently.

On August 9, Industrial Development Minister Nand Gopal Gupta Nandi and Chief Secretary Manoj Kumar Singh spoke to various stakeholders and solar energy experts in Lucknow and made them aware of every aspect of this project.

"We are now assisting UPEIDA (Uttar Pradesh Expressways Industrial Development Authority) in bidding for the project and we hope that the project will be ready for commissioning in the next 15

months," said Kumar, who is also a retired IAS officer.

Kumar said that UPEIDA has asked GEAPP to conduct similar studies for four other expressways in the state.

In a way, this will become a model for future expressways, he said, adding, "according to our estimate, the cost of this project will be around Rs 1,800 crore and the rate of electricity produced from it will be Rs 4 to 4.50 per unit. This will also be a model of land use for energy projects." Kumar further said that solar power plants will be installed on 15 metres of space along both sides of the 296-km Bundelkhand Expressway. This can lead to electrification of the entire expressway.

Besides, the installation of electric charging stations along the highway can also be encouraged, which will help in removing the biggest obstacle towards adoption of electric mobility i.e. lack of adequate charging facilities.

He said that this is the first project of its kind in India on this scale. This project will also be beneficial for the nearby villages, as they will get access to clean energy. This will increase the beauty of the expressway as well as provide employment.

Asked about the major areas that need to be focused to make Uttar Pradesh a hub of renewable energy, Kumar said, "Arid areas like Bundelkhand have immense potential for renewable energy. But the main challenge in the state is the availability of land because a large part of it is agricultural land. There is a need to identify such opportunities where we can get maximum benefit in small pieces of land." GEAPP, founded by Rockefeller and Ikea foundations and the Bezos Earth Fund, is an alliance of entrepreneurs, governments, technology, policy, and financing partners working together to help developing countries in their green energy transition journey.

## SECI to launch project offering 1,200 MW solar energy, including 600 MW storage



The Kerala State Electricity Board (KSEB) held talks with officials of Solar Energy Corporation of India (SECI) regarding the launch of a solar project offering 1,200 MW, including 600 MW storage also known as Battery Enabled Storage System (BESS). As it's not possible to utilise solar power after dusk, with the BESS technology,

the KSEB aims to store solar power so that they can provide 500 MW-600 MW to consumers during peak hours from 6pm to 12am.

According to top board officials, the power entity is experiencing significant surplus during day time and shortage of 500 MW-1000 MW during peak hours which led them to tap on solar energy options. "We are anticipating a demand-supply gap during peak hours which might go up in future. The board is expecting to launch the solar project having a generation of 500 MW-600 MW, including Rooftop Solar (RTS) and Business As Usual (BAU) Solar, before 2026," a top board official told TNIE.

The official further said that the execution risks and gestation period for the BESS projects remain relatively low compared to Pumped Storage Power (PSP) hydro, a configuration of two water reservoirs at different elevations that can generate power.

Though Kerala is aiming to become 100% sustainable on renewable energy by 2040, the current available capacity of solar energy is 886 MW. This makes up only 15 % of the solar energy requirement. At a recent presentation by KSEB officials before the board of directors it was decided that BESS is urgently required for meeting peak deficiency of power. "The SECI held talks with KSEB board officials and has promised solar power which can be utilised for two hours. They have identified six locations in the state to generate solar power," added the official.



## India installed 15 GW of solar in first half of 2024

India installed solar projects totaling 14.9 GW in the first half of the current calendar year 2024, topping all previous half-yearly and annual PV installations in 1H 2023, according to Q2 2024 *India Solar Market Update* by Mercom India Research.

The Mercom analysts said the commissioning of several previously delayed projects contributed to capacity additions in H1 2024.

"2024 is shaping up to be a breakout year for India's solar industry, with an impressive first half. However, to ensure that the strong pipeline of projects and ramped-up tender activity translate into timely installations, it is critical that we tackle the component supply and grid connectivity challenges with urgency so we can meet the 280 GW target by 2030," said Raj Prabhu, CEO of Mercom Capital Group.

As of June 2024, India's cumulative installed solar capacity reached 87.2 GW with utility-scale projects contributing nearly 87% and rooftop solar over 13%. Solar energy accounted for 19.5% of India's installed power capacity and over 44% of the total installed renewable energy capacity.

Rajasthan, Gujarat, and Karnataka were the top three states in cumulative large-scale solar installations, accounting for 29%, 15%, and 14% of the country's installed capacity.

In the second quarter ending June, 5 GW of solar capacity was commissioned. Installations dropped over 49% quarter-over-quarter (QoQ) compared to 9.9 GW installed in Q1 2024.

In Q2 2024, 4.3 GW of large-scale solar projects were commissioned, including nearly 1.8 GW of open access solar projects. Large-scale solar capacity additions fell more than 55% QoQ compared to 9.5 GW in Q1 2024 and rose over 191% YoY compared to 1.5 GW in Q2 2023.

The analysts said project delays due to grid connectivity and transmission infrastructure issues significantly affected quarterly additions for large-

scale solar projects. The reimposition of the Approved List of Models and Manufacturers (ALMM) order further impacted the viability and commissioning of several open access projects, contributing to substantial delays during the quarter.

## Reliance to commission first solar giga-factory in FY25



Reliance Industries Ltd, India's most valuable company, plans to commission its first solar gigafactory in the current fiscal as it pivots a green pathway to achieve net zero carbon emissions from operations by 2035. In its largest annual report, the firm said it is targeting to commission the first train of 20GW solar PV (photovoltaic) manufacturing by the end of the 2024-25 fiscal (April 2024 to March 2025) and scale up to 20GW in a phased manner over 2026.

The solar giga factory will include the manufacturing of PV modules, cells, wafers and ingots, polysilicon, and glass at a single location. The modules convert sunlight into electricity.

It is also targeting industrialising sodium-ion cell production at the MW level in 2025 and the first 50 MWh a year lithium battery cells pilot in 2026.

Reliance had in 2021 announced plans to invest USD 10 billion over three years to develop a new fuels business based on 100 GW of renewable power capacity by 2030. The plan involves setting up four giga factories for manufacturing renewable equipment, battery storage, fuel cells and hydrogen at Jamnagar in Gujarat.

"We have made significant progress in establishing factories that will be part of our Integrated Solar PV Manufacturing," the firm said in the annual report. "New Energy will be commissioning its first train of Module and Cell Manufacturing in FY25."

Solar panels manufactured in Jamnagar have obtained BIS certification. "Parallely, work on

renewable energy development has commenced and Reliance has been allotted land in Gujarat," it said. "We aim to become the largest renewable energy (RE) developer in India." Besides commissioning the first train of module and cell of 20GW of solar PV manufacturing, 2024-25 may also see industrialised sodium ion cell production at a MW level. Next year, PV factory is to be scaled to 20GW in a phased manner, and a battery giga factory will start with a 50 MWh a year lithium battery cells pilot set-up.

In FY27, it plans to establish a cell-to-pack manufacturing facility of 50 GWh and will set up 100 GW of renewable energy capacity by 2030.

The 100GW target will propel the company into the front rank of renewables ambitions globally, joining the likes of Enel, Iberdrola and oil players TotalEnergies and BP in the scale of capacity additions envisaged.

Reliance said fossil fuels have historically fed India's power requirements. "Structural inefficiencies combined with rising costs of fossil fuel has resulted in expensive power for commercial and residential customers - average tariff of Rs 10 per kWh (unit)."

Therefore, it is not feasible for India to keep relying on fossil fuels for its growth, it said, adding the use of fossil fuels-based energy increases dependence on imports and results in the drain of foreign exchange.

"Stable and round-the-clock cost-efficient green power is the need of the hour. India needs to solve this problem to maintain its growth trajectory and reach USD 32 trillion GDP by 2047," it said.

Reliance said over the next 12 months, its focus is to bring new energy manufacturing facilities on-stream, operate them efficiently and start developing renewable energy generation projects. "Simultaneously, we would develop the supply chain locally for self-sufficiency and reduce the reliance on imports," it said. The firm aims to partner with leading global climate technology and product companies and develop a business model which is flexible and adaptable to different technologies and future-proofed to be always lowest life cycle cost and best in class.

Reliance has snapped up multiple partnerships in the clean energy space, such as solar and electric mobility while pursuing its oil and petrochemical plans. Jamnagar, the world's biggest single, site integrated refinery complex, has two refineries - one domestic-focused and a newer one only for exports - that together can process low-grade crude and switch between fuels depending on prices.

### Tamil Nadu sets new record in solar power generation



Solar power generation and absorption touched a new peak in Tamil Nadu recently. Generation peaked at 5,979 MW. Previously, peak

generation of 5,704MW was recorded on Aug 2. Similarly, solar power absorbed into the grid also reached an all-time high of 41.40 million units (mu) recently. Previously, 40.9 mu was the maximum power absorbed on Aug 3.

Tangedco officials said this is the first time both peak generation and maximum absorption happened on the same day. Clear skies helped consistent generation all day. On the other hand, power generation from wind farms dwindled even though it is the season of winds, said Tangedco Officials.

Recently, Tangedco absorbed 51.27mu of wind power.

Tangedco officials said rain hampered wind speed, thus reducing generation. "When there is rain, the power demand too comes down, which can be managed without the help of wind power," said Tangedco officials.

Recently Tamil Nadu consumed 352.20mu of power and the maximum demand for the day was 16,237 MW.

## India's wind capacity needs to grow from 2.8 GW to 9.3 GW annually to hit 2030 goal

India faces a significant challenge in meeting its 2030 wind energy targets, according to a new report by energy think tank Ember. India aims to build 509 GW of renewables by 2030, including 110 GW of wind, but current installation rates fall short. In 2023, India added only 2.8 GW of wind capacity, far below the required annual addition of 9.3 GW from 2024 to 2030.

The global picture also reveals shortfalls. While global wind capacity is projected to double by 2030, reaching 2,157 GW, this is a 2.4 times increase from the 901 GW recorded in 2022. However, an additional 585 GW is needed to achieve the tripling target necessary to meet climate goals.

"Governments are lacking ambition on wind, and especially onshore wind," said Dr. Katye Altieri, electricity analyst at Ember. "Amidst the hype of solar, wind is not getting enough attention, even though it provides cheap electricity and complements solar."

At the UN's COP28 climate change conference in December, countries agreed to triple global renewables capacity by 2030. The International Energy Agency (IEA) declared this action as the 'single most important lever' to cut emissions this decade and keep the 1.5C goal within reach. According to the IEA, wind capacity should also at least triple to meet this goal.

"Governments are lacking ambition on wind, and especially onshore wind," said Dr. Katye Altieri, electricity analyst at Ember. "Amidst the hype of solar, wind is not getting enough attention, even though it provides cheap electricity and complements solar."

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The report analyzed 2030 national wind targets in 70 countries plus the EU, which collectively represent 99% of current global wind capacity. The analysis suggests that global wind capacity will double, primarily due to China's expected over-delivery, while the rest of the world is on course to under-deliver. Industry forecasts indicate that China is set to triple its wind capacity by 2030, continuing to account for over half of global wind additions annually from 2024 to 2030.

In contrast to India's struggles, other countries show varied progress. The US does not have an explicit target, but modeling suggests an increase in wind capacity from 142 GW in 2022 to 369 GW in 2030, requiring 32 GW of wind annually from 2024 to 2030. However, the US added only 6.4 GW in 2023, indicating a need for a substantial ramp-up.

Brazil needs to build 0.3 GW of wind annually from 2024 to 2030 to meet its targets. In 2023, Brazil added 5 GW, and per IEA forecasts, it will continue to add an average of 2.4 GW per year until 2030. Türkiye aims to generate 12% of its electricity from wind by 2030, a target it has nearly achieved, though its potential suggests it could aim higher.

Solar and wind are expected to provide over 90% of the growth in renewables capacity needed for a global tripling. To achieve this with increased efficiency, a rapid scale-up in wind power is essential. The growth in a few countries and upward revisions of forecasts in key regions indicate that with the right combination of policy, regulatory, and financial support, rapid and large-scale wind growth is feasible.

"Wind energy must be at the heart of the energy transition," said Ben Backwell, CEO of GWEC. "Every gigawatt installed is another step towards a confident green world. Targets play a key role in setting out a direction of travel, but the only thing that truly fights climate change, delivers clean industry, and provides secure energy is genuine action that delivers on those targets."

## PM KUSUM scheme faces implementation hurdles, only 30 per cent targets met as deadline nears: Report



The PM KUSUM scheme, which aims to promote solar energy in agriculture in India, has achieved only 30 per cent of its targets, according to a new report. Launched in 2019, the Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM KUSUM) scheme's goal is to help farmers switch to solar power, making farming more sustainable and reducing dependence on traditional energy sources.

The report by the think tank Centre for Science and Environment (CSE) outlines findings from surveys conducted in Haryana, Punjab, Rajasthan, and Chhattisgarh and says the scheme has achieved only 30 per cent of its targets after six years, with the 2026 deadline fast approaching.

"As climate change continues to have increasingly widespread impacts, it is more critical than ever to invest in sustainable practices, especially in key sectors like agriculture," said Nivit Kumar Yadav, programme director for industrial pollution and renewable energy at CSE.

"In this context, schemes like PM KUSUM can significantly advance India's climate action efforts, but only if implemented with care and precision," he said.

The scheme is divided into three parts: Component A - installing mini-grids on unused lands, Component B - replacing diesel water pumps with off-grid solar pumps and Component C - replacing electric water pumps with on-grid solar pumps and installing mini-grids for agricultural solarization.

The CSE said that progress has been slow, with most efforts focused on Component B. States like Haryana, Rajasthan, Maharashtra, and Uttar

Pradesh are leading in implementation, while Components A and C have seen minimal progress.

Farmers who have switched to solar water pumps are happy as these allow daytime irrigation and eliminate inconvenient night-time schedules and power cuts. For example, a farmer from Aterna village in Haryana praised the scheme for making farming activities easier and more efficient. Farmers who switched from diesel to solar pumps save significantly, with some farmers in Haryana saving up to Rs 55,000 annually.

According to the CSE, one of the principal challenges the scheme faces is the availability of cheap electricity for farmers, which diminishes the incentive to shift from electric water pumps to solar water pumps. Also, farmers are often forced to opt for pump sizes larger than needed for their land.

Debajit Palit, professor of energy at the NTPC School of Business in Noida, said the scheme needs to be tailored to meet farmers' specific requirements to be financially viable.

"If pump sizes are based on the land size and water requirements of different areas, rather than being kept uniform throughout the country, farmers could avoid the extra expenditure," he said. Another challenge is the centralisation of the implementation model in some states.

In Punjab, the CSE report said, the scheme's implementation is overseen by the Punjab Renewable Energy Development Agency, in contrast to Rajasthan, where each component has a different implementing agency. Yadav said that a decentralised model is important to truly realise the potential of the PM KUSUM scheme.

"State implementing agencies with the necessary knowledge about each component should be responsible for the components within their expertise," he said. The CSE suggested that farmers should be allowed to pay for solar pumps in instalments, which will make it financially more viable for them. The central government should increase financial support to states, especially to cover the rising costs of solar modules post-Covid, it said.

## Govt fast-tracks rail projects to speed up coal movement to power plants



The government has accelerated the development of coal evacuation infrastructure for bolstering India's energy security and ensuring a

consistent and reliable supply of coal to meet the growing demands of the country's power plants and industries, the Ministry of Coal said recently.

As part of this strategy, the Ministry has identified 38 priority rail projects under the coal logistics plan that will be fast-tracked in close coordination with the Ministry of Railways. These projects are essential for improving rail connectivity, ensuring timely coal supply, and reducing logistics costs, thereby enhancing the overall efficiency of coal transportation across the country. Among these priority projects, the government has recently approved two significant rail projects in Odisha: The Sardega-Bhalumuda double line and the Bargarh Road-Nawapara Road single line.

The 37.24-km-long Sardega-Bhalumuda new double line, passing through various coal blocks of the IB Valley and Mand-Raigarh Coalfield, will facilitate the evacuation of coal from mines operated by Mahanadi Coalfields Ltd (MCL) and several private mines. This project is particularly strategic as it reduces the transportation distance to power plants in northern India from Sardega, thereby enhancing efficiency.

Similarly, the 138.32 km long Bargarh Road-Nawapara Road new single line will significantly improve coal evacuation from the Talcher coalfield, providing a direct and shorter route towards Nagpur and the western regions. This project is expected to substantially reduce logistics costs and improve the overall efficiency of coal transportation from the Talcher region.

The Ministry of Coal is fast-tracking these and other critical projects, ensuring that India's coal sector not only meets the current energy demands but also sets the foundation for a sustainable and developed

nation. This endeavour aligns with the PM Gati Shakti vision of "Integrated planning and synchronised time-bound implementation," a pivotal approach to realising the ambitious vision of Viksit Bharat 2047, the Ministry added.

## Centre working on measures to boost R&D in coal sector

The Centre recently said that it has sought suggestions for preparing the future course of research and development (R&D) in the coal sector

During a special meeting of the Standing Scientific Research Committee (SSRC) convened recently several suggestions like setting up a single platform for all R&D activities in the coal and lignite sector and an advisory committee to sensitise students and researchers to ongoing R&D activities and challenges in the coal and energy sector was made.

During the meeting it was also suggested that Central Mine Planning & Design Institute Ltd (CMPDI), a fully-owned subsidiary of Coal India Ltd, should visit mining institutes and research organisations across the country to raise awareness about R&D activities in the coal and energy sector, the coal ministry said in a statement.

## Coal production increases by 6.69% to 74.07 mn tonnes in July: Govt

India's coal output rose by 6.69 per cent year-on-year to 74.07 million tonnes (MT) in July, the government said recently. The country's coal production was 69.42 MT in the corresponding month of the previous fiscal, the coal ministry said in a statement.

Cumulative coal dispatch witnessed a significant boost in July 2024, touching 79.54 MT, compared to 76.05 MT recorded in July 2023, registering a growth rate of 4.58 per cent.

In a separate statement, the ministry said that vesting orders were issued for 10 strategically important coal mines, marking a significant advancement in the nation's coal production capabilities.

This initiative, which includes one fully explored and nine partially explored mines, is set to enhance energy security and drive economic growth across the states of Jharkhand, Chhattisgarh, West Bengal, and Madhya Pradesh, it said.

Coal and mines minister G Kishan Reddy urged the successful bidders to focus on increasing coal production and reducing imports.

### Reliance Industries to invest Rs 1,000 cr to stem coal bed methane output fall



Reliance Industries Ltd (RIL) would be investing over ₹1,000 crore in its coal bed methane (CBM) blocks in Sohagpur,

Madhya Pradesh as the company looks at increasing CBM gas production from the fields, according to industry sources aware of the development.

"RIL is seeing a decline in its CBM production and will be drilling multiple new wells to up production target to 1 million standard cubic meters (mscmd) per day over the next three years," said an industry official aware of the development, adding that RIL would be investing over ₹1,000 crore in the process.

CBM is natural gas stored in coal seams, extracted by drilling wells into coal seams and used as compressed natural gas for various domestic and industrial purposes.

RIL has two CBM blocks in Madhya Pradesh spread across 995 square kilometre. In its annual report for FY24, RIL said over 300 wells are in production, with an average output of 0.64 mscmd of gas during the year. In FY23 and FY22, RIL's average production from the block was 0.73 mscmd of gas. In FY21 and FY20, it was at 1 mscmd.

In an emailed response, a RIL spokesperson said that to augment the production and reserves of CBM, RIL has embarked on a multi-lateral well (MLW) programme.

"The performance of the first 20 wells has been quite encouraging as we have seen a significant increase in the production," the spokesperson said, adding that CBM has marketing freedom, and is sold pursuant to auction guidelines issued by the govt.

The spokesperson added that the company will continue to drill MLW wells to augment production and reserves of CBM from the asset.

This February, RIL held an online auction to sell the 0.90 million standard cubic meters of gas per day that it will produce from the Sohagpur block. The majority of the gas has been taken by state-owned gas utility Gail (India) Ltd and city gas distributor Indraprastha Gas Ltd. The bid was made at \$11 per million British thermal unit.

"Reliance Gas Pipeline Limited, a subsidiary of RIL, operates the 302-km Shahdol-Phulpur Pipeline from Shahdol (MP) to Phulpur (UP) connecting the CBM gas fields with the national gas grid. This provides access to consumers across the country," RIL added in its annual report.

### National coal index dips 3.48% as coal production sees double-digit growth

The National Coal Index (NCI) recorded a 3.48% drop in June 2024, standing at 142.13 points compared to 147.25 points in the same month last year, the ministry of coal said in a statement. This decline is indicative of a robust coal supply in the market, meeting the increasing demands of the nation.

The NCI, which aggregates coal prices from various sales channels such as notified prices, auction prices, and import prices, reflects transactions across coking and non-coking coal in both regulated sectors like power and fertilizer and non-regulated sectors. It serves as a crucial barometer of market dynamics, illustrating price fluctuations since its establishment in the fiscal year 2017-18.

This period also saw a notable increase in coal production, with a growth rate of 14.58% compared to June last year. This surge in production is ensuring a stable supply of coal to various industries reliant on

this critical resource, enhancing the overall energy security of the country.

Furthermore, the sharp decline in coal auction premiums underscores the current adequacy of coal availability. With the NCI's downward trajectory, the market is moving towards a more balanced interaction between supply and demand, paving the way for a sustainable and resilient coal industry in India.

### Coal imports rise by 6 pc to 75.26 MT in April-June



India's coal import rose by 5.7 per cent to 75.26 million tonnes (MT) in the first quarter of the current fiscal compared to 71.16 MT of coal in the same period of the previous fiscal. Coal imports in June were also higher by 6.59 per cent at 22.97 MT compared to

21.55 MT in the same month of the previous fiscal, according to data compiled by mjunction services ltd, a B2B e-commerce platform from a joint venture between Tata Steel and SAIL.

mjunction MD and CEO Vinaya Varma said that given the surplus coal available in the system and the slowdown in industrial activity during monsoon, import demand is likely to remain subdued in the coming month.

Of the total imports in June 2024, non-coking coal imports stood at 14.19 MT, higher than 13.29 MT imported in June last year. Coking coal imports were at 5.45 MT, against 5.33 MT imported in June 2023.

During April-June 2024, non-coking coal imports were at 49.12 MT, higher than 46.53 MT imported during the same period last year. Coking coal imports stood at 15.45 MT during April-June 2024, against 15.20 MT recorded for April-June 2023.

India's coal import rose by 7.7 per cent to 268.24 million tonnes in FY24 driven by softness in seaborne prices and likelihood of increase in power demand during summer. The country's coal import was 249.06 MT in FY23.

Coal Minister G Kishan Reddy had earlier said that India should increase domestic production of fossil fuel and reduce coal imports. The domestic coal production rose by 11.71 per cent to 997.828 MT in 2023-24 compared to 893.191 MT in 2022-23.

### CIL, GAIL enter JV pact to set up coal to-synthetic natural gas project

State-owned CIL recently said it has entered into a joint venture agreement with GAIL (India) Ltd to set up a coal-to-synthetic natural gas project in West Bengal. While Coal India Ltd (CIL) will have 51 per cent shareholding in the joint venture, GAIL, the nation's largest gas transportation and distribution firm, will have 49 per cent.

The joint venture will be incorporated as a private limited company. The initial paid-up share capital is Rs 1 lakh, CIL said in a BSE filing. The registered office of the joint venture will be in West Bengal and CIL and GAIL each will have the right to nominate three executives as directors of the JV.

Earlier this year, the Cabinet Committee on Economic Affairs had approved setting up a coal-to-synthetic natural gas project through a joint venture between CIL and GAIL, and a coal-to-ammonium nitrate project through a venture between CIL and BHEL.

CIL will set up two coal gasification plants as part of efforts to achieve the target of 100 MT coal gasification by 2030. CIL accounts for over 80 per cent of the domestic coal output.

## Around 3,37,900 MW power capacity to be added by 2032: MoS Shripad Naik



India is set to add 3,37,900 MW of power capacity by 2032, enhancing its current capacity which saw a notable increase over the past decade. The additions will come from a mix of thermal, hydropower, nuclear, and renewable energy

sources, with detailed figures provided by Union Minister of State for Power Shripad Naik said in a reply to the Rajya Sabha.

The total generation capacity increased by 79.5 per cent from 2,48,554 MW in March 2014 to 4,46,190 MW in June 2024, he said, adding that "the total anticipated capacity addition by 2032 will be 3,37,900 MW".

Of the total anticipated capacity addition, 80,000 MW will be thermal, 25,010 MW hydropower, 14,300 MW nuclear and 50,760 MW of pump storage plants (PSP) capacity, the minister said.

Further, 510 MW of small hydro capacity is expected to be added by 2032, besides 1,43,980 MW of solar power and 23,340 MW of wind power.

### India identifies 1.33 GW of hydropower potential

India has identified 133,410 megawatts (MW) of large hydroelectric potential and 176,280 MW of pumped storage potential, according to a recent assessment by the Central Electricity Authority (CEA). This information was provided by the Minister of State for Power, Shripad Naik, in a written reply in the Lok Sabha today. CEA data reveals that over the past decade, 24 hydroelectric schemes, including PSPs with a total capacity of 15,569 MW, have been approved. Currently, 17 hydroelectric projects (11,376 MW) and 38 PSPs (55,330 MW) are under survey and investigation for DPR preparation.

The Ministry of Power announced several initiatives to harness this hydro potential, including a new Power Purchase Agreement (PPA) for the Ratle Hydroelectric Project. The PPA, signed on January 3, 2024, between Ratle Hydro Electric Power Corporation Limited (RHPCL) and Rajasthan Urja Vikas, IT Services Limited, spans 40 years with tariffs set by the Central Electricity Regulatory Commission (CERC). This agreement is part of broader governmental efforts to classify large hydropower projects (above 25 MW) as renewable energy sources.

Key measures include Hydro Purchase Obligations (HPO), tariff rationalization, budgetary support for infrastructure and flood moderation, and the issuance of guidelines for Pumped Storage Projects (PSPs). The government has also waived Inter State Transmission System (ISTS) charges for hydroelectric projects and PSPs and expedited the approval timeline for Detailed Project Reports (DPRs).

State-wise data shows significant hydro potential across various regions. The northern region, including Jammu & Kashmir and Himachal Pradesh, has a combined conventional potential of 46,971 MW and 30,900 MW for pumped storage. In the western region, Maharashtra and Madhya Pradesh lead with a total potential of 7,824 MW conventional and 66,580 MW pumped storage. The southern region, featuring Andhra Pradesh and Karnataka, totals 12,570 MW conventional and 60,475 MW pumped storage. The eastern region, with states like Odisha and West Bengal, has a potential of 10,115 MW conventional and 11,795 MW pumped storage. The north eastern region, led by Arunachal Pradesh, contributes 55,930 MW conventional and 6,530 MW pumped storage to the national tally.

India's focus on enhancing its renewable energy capacity aligns with global trends towards sustainable energy solutions, underscoring the country's commitment to leveraging its natural resources for future energy security.



## India's power consumption rises 3.5% to 145.40 billion units in July

India's power consumption rose a meagre 3.5 per cent to 145.40 Billion Units (BU) in July compared to the year-ago period as rainfall brought down temperatures from the scorching heat. In July 2023, the power consumption stood at 140.41 BU, according to official data. The highest supply in a day (peak power demand met) also rose to 226.63GW in July 2024 against 208.95 GW in the year-ago month.

The peak power demand touched an all-time high of 250.20 GW in May this year. The previous all-time high peak power demand of 243.27 GW was recorded in September 2023.

Earlier this year, the power ministry projected a peak power demand of 235 GW during daytime and 225 GW during evening hours for May and 240 GW during daytime and 235 GW during evening hours for June 2024. The ministry also estimated that peak power demand may hit 260 GW this summer.

Experts said with the onset of the monsoon in the country, the consumers got relief from the scorching heat and humidity which led to lesser use of cooling appliances like air conditioners and desert coolers.

This led to a decline in power consumption as well as growth in power demand in the country, they pointed out.

## National committee for transmission recommends projects worth Rs.22,540 crore for power ministry's approval

The National Committee for Transmission (NCT) has recommended transmission projects worth ₹22,540 crore for the Ministry of Power's approval, marking a significant push towards enhancing India's power infrastructure. Among the key proposals are two major transmission initiatives in Gujarat and Tamil Nadu, each estimated to cost around ₹6,000 crore. These projects are aimed at integrating the initial offshore wind projects into the national grid, a crucial step in advancing India's renewable energy ambitions..

The ₹22,540 crore recommendation encompasses a diverse range of projects. Notably, the Gujarat Offshore Wind Project, with an estimated cost of ₹6,900 crore, focuses on transmitting power from proposed offshore wind farms along the Gujarat coast. Similarly, the Tamil Nadu Offshore Wind Project, pegged at ₹6,242 crore, is designed to establish transmission infrastructure for offshore wind energy along the Tamil Nadu coast.

Additionally, the committee has proposed a project worth ₹1,663 crore to enhance transmission infrastructure in the Western Region, specifically targeting the power generated from upcoming pumped storage projects. Another critical component is the augmentation of the Bhuj-II Substation, which will involve an investment of ₹587 crore to increase transformation capacity and add bus reactors.

These initiatives are aligned with the Central Electricity Authority's (CEA) draft plan, which outlines a requirement of ₹4.75 trillion by 2027 to develop India's transmission infrastructure. This investment is seen as vital to support the expected growth in renewable energy capacity and to ensure reliable power transmission across the country.

The NCT emphasized the urgency of rapid development in transmission capabilities to meet India's ambitious renewable energy targets. "The integration of offshore wind projects and pumped storage capacity is pivotal for achieving the nation's energy transition goals," the committee stated in its meeting. The proposed transmission projects in Gujarat and Tamil Nadu are considered essential in this broader strategic expansion.

The meeting also reviewed the progress of previously approved transmission schemes, discussing modifications to existing projects such as the transmission system strengthening at Koppal-II and GadagII. These adjustments are aimed at better integrating renewable energy generation projects into the grid.

Furthermore, the committee addressed the logistical challenges that could impact the timely implementation of these projects. The transportation of large equipment, in particular, was identified as a potential bottleneck, requiring careful management to keep project timelines on track.

With these comprehensive plans, the NCT's recommendations are poised to significantly bolster India's power transmission infrastructure, supporting the country's shift towards a more sustainable and reliable energy future.

### Nepal to export 1,000 MW electricity to India, says EAM Jaishankar



Nepal will export close to 1,000 megawatts of electricity to India, External Affairs Minister S Jaishankar said recently after holding comprehensive talks with his Nepalese counterpart Arzu Rana Deuba. Jaishankar described Nepal's decision to export the electricity to India as a "new milestone".

In their talks, the two ministers also focused on boosting cooperation in areas of trade, connectivity and infrastructure.

Deuba began her five-day trip to India recently in her first official trip abroad after assuming the responsibility.

"Discussed the multifaceted India-Nepal cooperation including in energy, trade, connectivity and infrastructure development," Jaishankar said on 'X'.

"Glad to note that Nepal will be exporting close to 1000 MW of electricity to India, a new milestone," he said.

"Our Neighbourhood First policy and unique people-to-people & cultural connect propels our relationship forward," he added.

On her part, Deuba described the talks as "productive".

"Had a productive meeting with @DrSJaishankar in New Delhi. We discussed bilateral interests, various aspects of Nepal-India relations, and the exchange of mutual cooperation," she said on 'X'.

"I am confident this visit will further strengthen the centuries-old bond between Nepal and India," Deuba said.

The Nepalese foreign minister's visit comes a week after Foreign Secretary Vikram Misri travelled to Kathmandu.

Nepal is an important neighbour for India in the context of its overall strategic interests in the region, and the leaders of the two countries have often noted the age-old "Roti Beti" relationship between the two sides.

The country shares a border of over 1,850 km with five Indian states -- Sikkim, West Bengal, Bihar, Uttar Pradesh and Uttarakhand. Land-locked Nepal relies heavily on India for the transportation of goods and services.

### Nepal to export additional 251 MW of hydropower to India

The Designated Authority for Cross-Border Trade of India has approved an additional 251 MW of power exports from 12 hydropower projects in Nepal.

For the first time, Nepal will be exporting power to Bihar through a medium-term power sales agreement. This approval increases the total allowed quantum from 690 MW from 16 projects to 941 MW from 28 projects.

Earlier, Nepal had already become a net exporter of electricity, generating net revenue in the last fiscal year by selling electricity worth NPR 16.93 billion.

In October 2021, India approved 39 MW of power exports from Nepal for the first time. In less than three years, this figure has grown by more than 24 times. Nepal began its power exports by selling in the Day Ahead Market of the Indian Energy Exchange. Since then, India has also granted access to the Real-Time Market.

The Nepal Electricity Authority has also entered into medium-term power sales agreements with distribution companies in Haryana and Bihar.

Additionally, India has introduced a provision that allows hydropower imports from Nepal to count

towards the Hydropower Purchase Obligation (HPO) for buyers in India, further incentivizing buyers to purchase power from Nepal.

## India & Sri Lanka sign agreement for power generation



The Sri Lankan government and a state-run Indian firm recently signed an agreement to develop infrastructure for storage, regasification and LNG supply for a combined cycle power plant in the island nation, according to the power and energy ministry here. The memorandum of understanding (MoU) was signed between Sri Lanka's LTL Holdings Limited and India's Petronet LNG Limited for the infrastructure development of the Sobadhanavi Combined Cycle Power Plant at Kerawalapitiya, north Colombo. The Sri Lankan Minister of Power and Energy, Kanchana Wijesekera, and the Deputy High Commissioner of India, Satyanjal Pandey, signed the MoU at a ceremony here.

Wijesekera said the power generation could be as low as fifty per cent less here than generation through fuel usage. "MOU for the development of Storage facilities, Regasification unit in Kerawalapitiya and the supply of LNG for the Yugadhanavi, Sobadhanavi & other LNG power plants in Sri Lanka was signed today," Wijesekera said in a post on X. He said the initiative will "reduce the cost of energy from thermal power generation to the consumer from 2026, contribute towards the clean energy transformation, stabilise the grid for renewable energy integration, create a domestic market for LNG, facilitate LNG bunkering in the future & domestic other LNG requirements."

"MOU between LTL Holdings Ltd Sri Lanka & Petro Net LNG of India aims to invest in development and implement the 18-month programme from the signing of the MOU to facilitate the LNG requirements through ISO container from Petro Net LNG Kochi Terminal to Port of Colombo and

Kerawalapitiya to 1000 MWs of LNG power plants," he said.

The 350 MW LNG-based Combined Cycle Power Plant 'Sobadhanavi' is a landmark power project currently underway in Sri Lanka, according to the [adaderana.lk](http://adaderana.lk) news portal.

"Once commissioned, it would be the largest IPP (independent power producer) in the country and the first power plant to operate with LNG, paving the way for the country to transition to greener forms of power generation from conventional thermal power," it said.

## Bangladesh's Summit reviewing cross-border power deals after India rule change

Bangladesh's 's Summit Group plans to renegotiate preliminary deals to import renewable power from India after a recent rule change by New Delhi allowed generators that exclusively export their electricity to sell locally, the utility's chairman said.

India amended its power export rules less than a week after Prime Minister Sheikh Hasina fled Bangladesh early this month amid deadly protests, enabling Adani Power to connect its Godda coal-fired plant - the only generating station under contract to export all its output - to India's domestic grid.

"After the policy change, my partners in India might be more willing to sell in India. Our company will be investing in transmission in Bangladesh and we will have to assume more risks," Summit Group Chairman Aziz Khan told Reuters.

The conglomerate, which operates over a dozen fossil fuel-based power generation plants, signed preliminary deals with Indian partners including Tata Power Renewable Energy Ltd last year to construct and source supply from 1,000 megawatts (MW) of renewable projects.

Green power imports are crucial for slashing emissions in Bangladesh, which gets nearly 99 per cent of its electricity from fossil fuels. Land scarcity in the densely-populated country of over 170 million has constrained higher solar additions.

Summit Power International, the Singapore-based holding company for Summit Group's power

generation assets, is exploring options including delaying investments until there is more policy clarity, and renegotiating financial terms to account for higher risks, Khan said.

"Such quick changes in policies are always a matter of concern as they have long-term implications," Khan said, referring to India's rule change.

Summit's plans to import clean electricity via India from 700 megawatts of hydro power plants it planned to build in Bhutan and Nepal as a part of \$3 billion in regional clean power investments also face uncertainty due to a new government in Bangladesh, Khan said.

No final decisions on the cross-border investments have been taken yet, Khan said, adding that the company would continue to invest within Bangladesh.

Khan said the new Bangladesh government's decision to suspend a law allowing awards of power supply contracts without tenders also contributed to his decision to review projects.

## India, US explore tech exchange to upgrade grid transmission



India and the US have discussed and explored the possibility of technical exchanges on efforts to upgrade grid transmission to handle

future load growth during ministerial-level deliberations.

In a bid to enhance bilateral cooperation in the energy sector, Union Minister for Power Manohar Lal, accompanied by Minister of State for Power and New & Renewable Energy Shripad Naik and senior officials held a productive discussion with the US delegation led by John Podesta, Senior Advisor to the President for International Climate Policy, it stated.

During the discussion, Lal emphasized the longstanding bilateral partnership between India and the US, highlighting the shared commitment to a

'clean' energy future that fosters economic growth and development.

The union minister further stated that Ministry of Power is committed to strengthening this partnership.

He also said India and US engagements under the 'Power & Energy Efficiency Pillar', which is led by Ministry of Power under the Strategic Clean Energy Partnership (SCEP), are important to realize the goals to achieve energy transition.

Podesta, in his remarks said that India is a valuable partner and both the countries support each other in building resilient supply chains and investment led partnership strategy.

He also remarked that India and the US can collaborate on areas like clean energy, energy storage systems and energy efficiency.

He further said that the US can support India in enhancing its manufacturing capacity.

The ministers discussed about the opportunities to build India's manufacturing capacity in critical areas. The talks also delved into the possibilities of state-to-state partnerships on long-duration energy storage studies, with further collaboration on grid-scale battery storage solutions.

The discussions also highlighted the importance of stimulating manufacturing projects and policies to increase India's capacity to build, deploy, and export high-efficiency air conditioning systems and fans.

The meeting underscored the importance of the India-US partnership in driving the global clean energy transition, with both sides expressing their commitment to deepening cooperation in these critical areas, it said.

## Central Electricity Authority (CEA) accords concurrence to two Hydro Pumped Storage Plants

India needs Hydro Pumped Storage Projects (PSPs) to support faster energy transition with large scale

integration of renewable capacity in the country and also ensuring energy security.

In order to ensure that Hydro PSPs get commissioned on a fast track, thereby accelerating the growth of India's renewable energy and energy storage capacity, Central Electricity Authority (CEA) has accorded concurrence to two Hydro PSPs namely, 600 MW Upper Indravati in Odisha being developed by OHPC Ltd (A Government of Odisha Undertaking) and 2000 MW Sharavathy in Karnataka being developed by KPCL (A Government of Karnataka Undertaking) in record time. CWC, GSI, CSMRS and the stakeholders have jointly fully supported CEA on mission mode.

CEA has also received huge number of proposals of Hydro PSPs (worth around 60 GW), under Survey & Investigation, which are at various stages of preparation of DPR. After preparation of DPRs, these PSPs will be uploaded by the developers on ONLINE Portal (<https://ceaclearance.gov.in/hydro/>) for concurrence by CEA under section 8 of Electricity Act, 2003. CEA assures for faster concurrence of these PSPs, which is need of the hour to fulfil energy storage demand of the country.

To fast track the concurrence process of PSPs in line with ease of doing business drive of Govt. of India, CEA has further revised the guidelines to simplify the process for preparation of DPRs of PSPs and its concurrence.

The major highlights of the revised guidelines are:

1. Inclusion of Checklist of Documents required for examination of various aspects of DPRs. The earlier checklist has been shortened.
2. The developers are now allowed to submit the DPR online with completion of first 12 design chapters. The some of the chapters have been dispensed with. So the DPR has been made shorter.
3. No mandatory requirement of approval of Cost & Financial Chapters. These chapters to be submitted only for reference and record to meet the requirement of the Act.

4. For Off Stream Hydro PSP, there is no requirement to submit the alternative location plan for reservoirs.
5. Inclusion of an undertaking from developer stating that the DPR submitted is in line with pre-DPR clearances issued by the appraising groups of CEA, CWC, GSI, CSMRS. This obviates the requirement of again sending the DPR for re-examination. This is expected to save around 4 to 5 months' time in concurrence process.
6. The process for giving the early excavation permission at the risk and cost of the developers have been streamlined so that advance action can be taken by the developers to start the work at the site. This is expected to save around 6 to 8 months' time in execution of the project.
7. The developers have also been advised to carry out the investigations in time and submit the investigation reports to all the appraising agencies so that parallel activities can be done by the appraising agencies. This is also expected to save around 1 to 2 months' time.

The government has prioritized the development of Energy Storage Systems, particularly PSPs to ensure the energy security of the country. As per Nation Electricity Plan (Generation), the installed capacity of Energy Storage Systems including BESS is projected as 74 GW by 2031-32. It is worth to mention that there is potential of about 176 GW of Hydro PSPs in the country, out of which 4.7 GW are under operation, 4 GW under construction, 3.6 GW concurred (construction to be started) and around 60 GW under survey and investigation.

CEA with support of CWC, GSI, CSMRS, MoEF&CC and the Hydro PSP developers will endeavour to achieve this requirement in Mission mode.

## PM Modi hails record gas production



Prime Minister Narendra Modi recently hailed the record gas production in the country and said self-reliance in the energy sector is very important in achieving the resolve of a developed India. His remarks came in response to a post by Petroleum Minister Hardeep

Singh Puri stating that the country has achieved a new record in the field of gas production.

The gas production in 2020-21 was 28.7 BCM and increased to 36.43 BCM in 2023-24. The data shared by the Union Minister projected that the gas production in 2026 will be 45.3 BCM. In a post on X, Modi said, "Many congratulations to the people of the country for this achievement! Our self-reliance in the field of energy is very important in achieving the resolve of a developed India."

"This record in gas production is a direct proof of our commitment in this direction," the PM said.

## Bill to amend delinking petroleum operations from mining introduced in Rajya Sabha by Hardeep Puri



Union Minister for Petroleum and Natural Gas Hardeep Singh Puri recently introduced the Oilfields (Regulation and Development) Amendment Bill, 2024 in Rajya Sabha.

The salient features of the amendments proposed in the said Bill, introduced in the Upper House today, are delinking petroleum operations from mining operations; broadening the scope of the expression 'mineral oils'; introducing the concept of "petroleum lease"; and granting lease on stable terms.

The introduced Bill is also aimed at strengthening petroleum operations through rules framed for governing various functional aspects, such as, grants of leases or licenses, their extension or renewal, and

sharing of production and processing facilities including infrastructure and safety at oilfields; dispute resolution; and creating an environment for facilitating energy transition by enabling the development of comprehensive energy projects for harnessing wind and solar energy along with mineral oils at oilfields.

Originally, oilfields, mines, and minerals were comprehensively regulated together through the Mines and Minerals (Regulation and Development) Act, 1948.

Subsequently, in 1957, the Mines and Minerals (Development and Regulation) Act, 1957 was enacted for the development and regulation of mines and minerals under the control of the central government.

The original Act of 1948 was also renamed as the Oilfields (Regulation and Development) Act, 1948, (the said Act) and made applicable to mineral oils only.

The said Act, which provides for a very different global energy context, requires to be amended to meet the needs and aspirations of the country for energy access, energy security, and energy affordability.

Further, the government, in the Bill said, there is an urgent and pressing need to increase domestic production of oil and gas to meet the rising demand for energy and reduce import dependence of the country.

"In order to unlock valuable mineral oil resources, it is necessary to attract investment in the sector to infuse necessary capital and technology for expediting petroleum operations in the country by creating an investor-friendly environment that promotes ease of doing business, prospects for exploration, development and production of all types of hydrocarbons, ensures stability, promotes adequate opportunities for risk mitigation, addresses energy transition issues including next-generation cleaner fuels and provides for a robust enforcement mechanism for ensuring compliance of the provisions of the said Act," the bill read.

## Cabinet extends JI-VAN Yojana to 2028-29, aims for 20 percent ethanol blending by 2025-26

As India targets a 20percent ethanol blending rate by the end of the Ethanol Supply Year (ESY) 2025- 26, the Union Cabinet, led by Prime Minister Narendra Modi, has approved modifications to the Pradhan Mantri JI-VAN Yojana, extending its timeline until 2028-29. The ethanol blending in petrol has already reached 15.83percent in July 2024, and the cumulative blending percentage has surpassed 13percent in the ongoing ESY 2023-24.

The modified scheme will now cover advanced biofuels produced from lignocellulosic feedstocks such as agricultural and forestry residues, industrial waste, synthesis gas, and algae. The inclusion of "Bolt on" plants and "Brownfield projects" aims to utilize existing infrastructures to improve their viability and leverage their operational experience.

Project proposals that incorporate new technologies and innovations will receive preference under the scheme, fostering diversity in technological approaches and feedstock utilization. The scheme's goal is to offer fair income to farmers for agricultural residue, tackle environmental pollution, generate local employment opportunities, and bolster India's energy self-reliance and security.

The initiative also supports the development of advanced biofuel technologies and promotes the Make in India mission. Additionally, it aligns with India's goal to achieve net-zero greenhouse gas emissions by 2070.

Public Sector Oil Marketing Companies (OMCs) have significantly increased the blending of ethanol with petrol—from 38 crore litres in ESY 2013-14 to over 500 crore litres in ESY 2022-23. To meet the future blending targets, an estimated 1,100 crore litres of ethanol will be needed during ESY 2025-26, requiring the installation of 1,750 crore litres of ethanol distillation capacity.

To further boost the ethanol production capacity, the government is also focusing on second-generation (2G) ethanol derived from surplus biomass, agricultural waste, and industrial waste.

The first 2G Ethanol Project initiated under this scheme by Indian Oil Corporation Limited in Panipat, Haryana, was inaugurated by the Prime Minister on August 10, 2022. Other 2G commercial projects by BPCL in Bargarh, Odisha, HPCL in Bathinda, Punjab, and NRL in Numaligarh, Assam are nearing completion, marking significant strides towards enhancing India's biofuel infrastructure under the expanded Pradhan Mantri JI-VAN Yojana.

## India's crude oil production falls 2.9% in July 2024; petroleum product output sees 7.1% growth



India's crude oil and condensate production declined by 2.9% in July 2024, registering a total output of 2.4 million metric tonnes (MMT), according to data released by the Petroleum Planning and Analysis Cell (PPAC). The decline is in comparison to July 2023, where production figures were higher. State-owned Oil and Natural Gas Corporation (ONGC) led the production figures with 1.6 MMT, followed by Oil India Limited (OIL) at 0.3 MMT, and Production Sharing Contracts/Revenue Sharing Contracts (PSC/RSC) contributing 0.5 MMT.

In contrast, the total crude oil processed in the country saw a 3.2% rise in July 2024, reaching 22.6 MMT compared to the same period last year. Public sector undertakings (PSUs) and joint venture (JV) refiners processed 15.3 MMT, while private refiners accounted for 7.3 MMT. Of the total processed crude, 2.1 MMT was indigenous, with the remaining 20.5 MMT being imported.

The production of petroleum products saw a significant increase, rising by 7.1% to 24.4 MMT in July 2024 compared to July 2023. Refinery production accounted for 24.1 MMT, while fractionators contributed 0.3 MMT. High-speed diesel (HSD) constituted 42.4% of the total production, followed by motor spirit (15.7%), naphtha (7.3%), aviation turbine fuel (6.1%), and petcoke (5.3%).

Crude oil imports experienced a marginal decline of 0.7% in July 2024 but showed a 2.5% increase during the April-July period compared to the same period in the previous year. In contrast, imports of petroleum products surged by 15.5% in July 2024 and by 11.8% during the April-July period. The increase in petroleum product imports was driven primarily by higher imports of liquefied petroleum gas (LPG), petcoke, and lubricating oil base stocks (LOBS).

On the export front, petroleum product exports decreased by 4.3% in July 2024. However, there was a slight increase of 0.4% in exports during the April-July period. The rise in exports was attributed mainly to increased shipments of petcoke, carbon black feedstock (CBFS), and fuel oil.

### India's July fuel use gains over 7% y/y

India's fuel consumption, a proxy for oil demand, rose by more than 7% year-on-year to 19.653 million metric tons in July, oil ministry data showed recently. On a monthly basis, demand fell by 1.7% in the world's third-biggest oil importer and consumer.

### India's gas consumption doubles to 189 MMSCMD, pipeline network extends to 24,000 km



The Petroleum and Natural Gas Regulatory Board (PNGRB) is intensifying collaboration with state governments to enhance gas access across India,

significantly increasing the number of geographical areas (GAs) covered by city gas distribution (CGD) networks from 34 to 307 since the regulator's inception.

At the FICCI's City Gas Distribution Summit 2024, PNGRB member Gajendra Singh highlighted the regulator's commitment to expanding gas availability. "Our goal is to provide access to gas for all consumers, whether for PNG (Piped Natural Gas),

industrial and commercial use, or CNG (Compressed Natural Gas)," Singh said.

The CGD sector has witnessed remarkable growth, with national gas consumption rising from 86 million metric standard cubic metres per day (MMSCMD) in 2007 to 189 MMSCMD currently. This growth accompanies a significant expansion of the national gas pipeline network, which has grown from 14,000 km in 2018 to 24,000 km today.

The expansion is notably driven by the surge in industrial and commercial users, predominantly utilizing Regasified Liquefied Natural Gas (RLNG). Additionally, the infrastructure for CNG has also seen substantial growth, with the number of stations increasing from 280 in 2006 to 7,000 in 2024.

### India's petroleum product consumption rises 7.4% in July, led by LPG and Petrol

India recorded a 7.4% increase in petroleum product consumption in July 2024, consuming 19.65 million metric tons (MMT) compared to 18.29 MMT in the same month last year, the Petroleum Planning and Analysis Cell (PPAC) said in a report. The growth in consumption was primarily driven.

The growth in consumption was primarily driven by higher usage of LPG and petrol, with LPG consumption registering a 10.1% increase to 2.63 MMT and petrol consumption rising 10.5% to 3.30 MMT. Diesel usage also saw a rise, with consumption increasing 4.5% to 7.20 MMT.

However, not all sectors experienced growth. The consumption of bitumen and kerosene declined, with bitumen recording a slight de-growth of 1.2% and kerosene consumption falling by 18%, mainly consumed through the Public Distribution System (PDS).

In addition to petroleum, natural gas consumption in July 2024 also showed a 5.8% increase to 5733 million standard cubic meters (MMSCM). For the fiscal year to date, total natural gas consumption stood at 23364 MMSCM, marking an 8.6% rise over the same period the previous year.



The ethanol blending rate in petrol achieved 15.83% in July, with 15,493 retail outlets now selling E20, indicating progress in the country's adoption of biofuels.

The domestic passenger vehicle sector also reflected modest growth, with sales increasing 1.2% to 3.97 lakh units in July 2024 compared to 3.93 lakh units in July 2023.

Power consumption in the country rose by 3.5% to 145.40 billion units in July, supported by easing cooling demands due to increased rainfall. The peak power demand reached 226.63 GW, up from 208.95 GW in the previous July, though still below the record high of 250.20 GW set in May 2024.

As of 31st July 2024, the total number of active domestic LPG connections stood at 32.73 crore, with 10.33 crore connections under the Pradhan Mantri Ujjwala Yojana (PMUY).

### ONGC to increase gas production in Tripura to feed power plants: Official



Oil and Natural Gas Corporation (ONGC) has intensified operations to increase gas production in Tripura to feed power generation plants in the northeastern state, an official said recently. The decision comes amid reports of a reduction in gas supply to various gas-based power generation plants in the state.

ONGC produced 1,527 million standard cubic metres (MMSCM) of gas in Tripura in the 2023-24 fiscal, while it has set a target of extracting 1,675 MMSCM gas in the current fiscal.

"ONGC has been working to increase gas production so that sufficient gas is supplied to the gas-based power plants in Tripura. We have already set a target of extracting 1,675 MMSCM of gas during the current fiscal year (2024-25) while the production was 1,527 MMSCM in 2023-24," ONGC's Tripura Asset Manager Krishna Kumar told PTI.

He said that ONGC will dig as many as 20 new wells for gas exploration in the financial year 2024-25 and one more rig will be added shortly to boost the exploration drive. At present, six rigs are being used by ONGC to explore natural gas in the northeastern state.

Besides new exploration, ONGC has also initiated the process of cluster drilling to extract gas using old well sites as existing wells already have facilities and approval for exploration.

"Due to rapid urbanisation in Tripura, ONGC is focusing on cluster drilling to extract gas by using old wells because facilities are already available there. Also, we don't need to get fresh approval from the state for gas exploration or extraction in those sites. There is also no need to acquire land which has become a costly affair," he said.

Despite these advances, challenges remain, particularly in the adoption of PNG for domestic use, which currently stands at 1.31 crore connections. "Replacing LPG with PNG is a bit of a difficult job," admitted Singh, pointing to consumer hesitancy and the costs associated with new connections.

To overcome these barriers, PNGRB is actively engaging with state authorities to address tax disparities and infrastructure challenges. "We are meeting with state government officials to discuss how we can reduce taxes," Singh explained, indicating a proactive approach to fostering a more favorable regulatory environment.

Singh also reassured that there are no significant constraints on the supply front, with a balanced mix of 52% domestic gas and 48% RLNG available to meet demand.

The summit also featured insights from Deepak Mahurkar, Partner- Fuels & Resources at PwC India, who emphasized that customer economics primarily drive gas adoption, with cost being a decisive factor. He noted the government's dual goals of increasing gas consumption and reducing supply chain carbon costs.

A joint FICCI-PwC Knowledge Paper titled "Charting the Path Forward in CGD: Emerging Trends and Insights" was also unveiled during the event,

providing a comprehensive analysis of the sector's challenges and opportunities in the natural gas adoption landscape.

### OVL secures contract extension for Vietnam oil blocks



India's flagship overseas oil firm ONGC Videsh Ltd has secured a 16-year contract extension for producing oil and gas in Vietnam, alongside getting three more years to explore a separate block in the contested waters of the South China Sea, officials said.

Vietnamese authorities have extended the production sharing contract (PSC) for the producing Block 06.1 in the offshore Nam Con Son basin till 2039. They have also granted an eighth extension for exploring for oil and gas in Block 128 in the South China Sea, according to officials.

OVL, the overseas investment arm of state-owned Oil and Natural Gas Corporation (ONGC), holds a 45 per cent stake in Block 06.1, an offshore block located in Vietnam's Nam Con Son Basin. Acquired in 1988, the block has Zarubezhneft EP BV as the operator with 35 per cent interest and PetroVietnam holding the remaining 20 per cent.

The block, which produces about 1 million tonnes of oil and oil equivalent gas, recently got a 16-year extension of the production sharing contract effective from May 19, 2023.

For Block 128, the seventh extension to explore for oil and gas was till June 15, 2023, and OVL had sought a three-year extension, officials said, adding that Vietnamese regulator PVN has extended the license till June 15, 2026.

The company has so far not found any commercially recoverable oil and gas reserves in the block for the last 18 years it has been exploring, but has continued presence there because of India's strategic interest in the South China Sea.

Vietnam too wants the Indian firm to counter China's interventions in the contested waters.

OVL had signed a production sharing contract with Vietnam's national oil firm PetroVietnam for deepwater exploratory Block-128, having an area of 7,058 square kilometres in Offshore Phu Khanh Basin, Vietnam, in May 2006.

An investment licence was issued to it on June 16, 2006, thereby giving effect to the PSC.

The firm has completed the licence requirement of shooting 3D seismic data and reprocessing of 2D seismic data as well as drilling of the committed one well.

Officials said OVL acquired 3D seismic data and reprocessed 2D seismic data to fulfil a part of the minimum work programme of the phase-1 of exploration period. Also, petroleum system modelling studies have been carried out based on data provided by PetroVietnam.

To further assess the prospectivity of the block and mitigate potential risks, the company has now sought seismic data in the eastern and western regions of the block from PVN.

OVL first took a two-year extension of the exploration period till June 2014 and then another for one year. A third extension was granted on May 28, 2015, and a fourth in 2016.

It got the fifth extension for two years in 2017 and a sixth from June 16, 2019, to June 15, 2021. The seventh extension for two years was till June 15, 2023. Another official said the company had a couple of years ago drilled a well on the block, but it could not reach the target depth. So, it now has to drill the well all over again.

The company has not found any hydrocarbon in the block but is continuing to stay invested to maintain India's strategic interest. The block lies in the part of the South China Sea over which China claims sovereignty.

## India's second 700 MW nuclear power KAPS-4 plant starts operations at full capacity

India's second home-built 700 MW nuclear power reactor at Kakrapar Atomic Power Station (KAPS) in Gujarat recently started operating at its full capacity, the plant operator said. The Nuclear Power Corporation of India Limited (NPCIL) said Unit 4 at KAPS had been operating at 90 per cent capacity before raising it to full power of 700 MWe.

"The full power operation of KAPS-4 after the smooth operation of its twin unit KAPS-3 at full power demonstrates the strength of the first of a kind indigenous 700 MW Pressurised Heavy Water Reactor (PHWR) design," the NPCIL said.

The KAPS-4 unit achieved first criticality on December 17 last year and commenced commercial operations on March 31.

The power level of the unit, which commenced commercial operation on March 31, 2024 was raised in line with the permissions of the regulatory authority, the Atomic Energy Regulatory Board (AERB). India is building 14 more 700 MW nuclear power reactors of the same design which are expected to commence operations progressively by 2031-32.

The NPCIL presently operates a fleet of 24 reactors with a total capacity of 8180 MW and has eight units with a capacity of 6800 MW under construction.

In addition, 10 more reactors with a total capacity of 7000 MW are in pre-project activities. These are expected to be completed progressively, taking the installed nuclear power capacity in the country to 22480 MW by 2031-32, the NPCIL said

## Energy | Anil Kakodkar: How India can capitalise on its Thorium reserves



India's atomic energy programme has had some very distinctive achievements. It has enabled us to emerge as a nuclear weapon state (including nuclear submarine capability)

while also delivering pressurised heavy water reactors (PHWRs) and associated nuclear fuel cycle technology that is commercially successful and is performing with global standards. India now operates 19 PHWRs of 220, 540 and 700 MWe (MegaWatt electric) unit sizes with 14 more 700 MWe units under construction in fleet mode. We are also close to commissioning the 500 MWe prototype fast breeder reactor and its fuel cycle as the next step in our three-stage strategy, aimed at ensuring long-term energy security for India based on our vast thorium reserves, which are the largest in the world. Thorium is also the preferred fuel for high-temperature nuclear reactors required for producing cheaper clean hydrogen to meet industry needs.

India has only modest quantities of uranium, the only naturally available resource for obtaining fission energy. This has necessitated our thrust towards converting thorium into uranium-233. The fissile material so generated can efficiently produce energy in situ or in a sustainable breeder cycle with thorium. In uranium reactors, use of thorium also enables advantages such as augmented accident tolerance and improved reactor parameters that augment safety and proliferation resistance. Further, in PHWRs, thorium can increase the fuel burn-up to the level of other water reactors reducing the spent fuel arising by a factor of seven. These features can considerably soften the barriers to large-scale deployment of nuclear energy in emerging economy countries where the need for additional clean energy is the strongest in the context of realising net zero globally. India can thus become the energy capital of the world leveraging her thorium resources much the same way as major oil and gas-producing countries are today.

**Viksit Bharat's energy requirement:** Can this ever happen? The answer to this question lies in India's resolve to become a Viksit Bharat despite the net zero challenge and determination to develop thorium technologies for the purpose. To be viksit, one should realise a human development index of around 0.95, on par with developed nations. That would require per capita energy access beyond a minimum threshold. This threshold is around 2,400 kgoe (kilograms of oil equivalent) per year per capita. Since one expects a significant movement towards better energy efficiency through greater use of electricity and other measures, this threshold could

significantly come down. Assuming that it would come down to around 60 per cent, the total energy requirement of Viksit Bharat would be around 28,000 TWh/yr (terawatt hour per year).

We are rightly engaged in rapid renewable energy development. However, the total renewable energy potential in the country, including large hydro, is not likely to exceed 8,000 TWh/yr. This quantum of energy may be sufficient to meet today's energy needs. But how do we get two and a half times additional clean energy needed for Viksit Bharat? Clearly, thorium is the only answer. While we are progressing with accelerated deployment of PHWRs and even imported LWRs (light water reactors) to meet urgent clean energy needs, quicker introduction of thorium in PHWRs would address the potentially unmanageable issue of large spent fuel inventory arising as a result of the use of natural uranium on one side and make our PHWRs an attractive proposition for emerging economy countries on the other. In terms of economics and performance, they already are very competitive. Leveraging thorium thus helps address both domestic needs and support our export ambition. Since we must master the fuel recycle technologies of stage two and three in any case, this approach is also consistent with our planned three-stage programme.

**Leveraging civil nuclear cooperation:** We must also recognise the importance of leveraging our international civil nuclear cooperation, particularly with the United States, in realising such twin objectives. Nuclear fuel supply eventually becomes the larger business as compared to supply of nuclear reactors. High assay low enriched uranium (HALEU) is fast becoming an attractive proposition worldwide for various emerging nuclear reactor technologies. There is thus an urgent need for early demand signal for HALEU production infrastructure to grow. Deployment of thorium in PHWRs as highlighted earlier is precisely aligned to such an objective and can be deployed quickly through collaborative efforts between the two countries. As we approach net zero, the rising demand for clean energy would put global uranium supplies under considerable strain. India is thus well positioned to leverage her thorium resources and PHWR expertise to address the energy security of India and the world.

### **Redesigned Reactors to be ready in a year**

India's 220 MW capacity Pressurized Heavy Water Reactors (PHWRs), which are being modified as Bharat Small Reactors (BSRs) to boost captive power generation, will be ready in a year, said Dr R B Grover, member of the Atomic Energy Commission (AEC) of India and emeritus professor at the Homi Bhabha National Institute (HBNI). He was speaking at IIM Ahmedabad (IIM-A) recently on the sidelines of an event to launch the report on net zero emissions transition for India.

### **“India has 220 MW capacity Pressurized Heavy Water Reactors”**

India has 220 MW capacity Pressurized Heavy Water Reactors (PHWRs) installed at several places such as Narora, Kakrapar, Kalpakkam and Kaiga to name a few. India is modifying these reactors as captive power plants primarily for the private sector companies that need hydrogen for industrial use. Nuclear Power Corporation of India Ltd (NPCIL) will design them for electricity generation,” said Grover.

“We expect the redesigned reactors to be ready in a year. These will have steel liners to make them safer and a new design for control and instrumentation,” he added. The Union Budget had mentioned plans for developing Small Modular Reactors (SMRs) and Bharat Small Reactors (BSRs) with govt partnering with the private sector to accelerate development and deploy nuclear tech as a “reliable and cleaner energy source”.

Answering a question on apprehensions regarding radiation leaks, Dr Grover said that except Chernobyl, where the design was faulty, there are not many instances globally of power plants causing radiation leaks. “India cannot neglect any energy source to address its growing needs in coming years. We will have to speak to citizens and educate them,” he added.

Along with the installed capacity, we must also look at energy efficiency — solar has about 20%. Considering that our growth rate has been 5.13% for the past 10 years and that we need to maintain momentum, we must take into account all sources of energy,” he added.

## NTPC, Nuclear Power Corp. to Start Project by March, Spending Rs.50,000 Crore

In a move to expedite the nuclear power capacity addition, NTPC Ltd and Nuclear Power Corp of India (NPCI) through its joint venture Anushakti Vidhyut Nigam is expecting to invite bids and start construction of its Mahi Banswara nuclear power plant before the end of current fiscal 2024-25.

“We plan to lay the foundation stone of the project in the next two to four months and start work by this financial year,” said a senior executive of the company who did not wish to be identified. The project cost of the plant with said capacity of 2.8 gigawatt (GW) is expected to be Rs 50,000 crore.

Earlier, NTPC had signed a supplementary joint venture agreement with Nuclear Power Corp of India for the development of Mahi Banswara project and another nuclear plant in Chutka in Madhya Pradesh with a capacity of 1.4 GW. However, the Chutka project will now be undertaken by NPCIL independently, the source said.

The company also aims to foray into setting up of Bharat Small Reactors as announced in the Budget. The move comes amidst the company’s plan to add 60 GW of green energy capacity by 2032. As per the National Electricity Plan, the country aims to add 19.7 GW of nuclear capacity by 2032.

In nuclear energy, apart from its announced project in Rajasthan in collaboration with the Nuclear Power Corporation of India, the company is now looking to develop nuclear power plants in Tamil Nadu, Karnataka, Jharkhand, Chhattisgarh, and Gujarat among other states and is in the process of identifying potential sites and getting requisite approvals.

NTPC Ltd has over the years diversified into renewable energy sources including wind, solar, hydro, nuclear energy, and chemicals like ethanol and methanol. The company is now also planning to set up a pumped storage plant of 1,000 megawatt (MW) capacity in Tamil Nadu.

The company also intends to come out with the IPO of its green arm NTPC Green Energy Ltd in November this year aiming to offer 10% ownership through new shares in the firm.

At the time of IPO, NGEL is expected to have 4 GW of operating capacity, with 8 GW under-construction, and another 8 GW under various stages of development, as per the official.

“Our balance sheet is very robust and healthy, and we can raise money easily. However, as a stated objective, we will go for 10% to start with, followed by 15% through OFS (Offer for Sale) and raise about a billion dollars,” the company’s chairman and managing director Gurdeep Singh had earlier told FE.

The CMD had said that the company plans to raise close to Rs 8,000 crore from its initial public offering of NTPC Green Energy Ltd. NTPC has also awarded a tender for purchase of 1 million tonne of coal from a commercial mining company for the first time in an attempt to reduce its imports.

## Railways plans to go nuclear as part of its green drive

Indian Railways is exploring the use of nuclear power through captive units as it seeks to increase reliance on non-fossil fuel sources and renewable ones.

The Railways plans to become a net zero carbon emitter by 2030. And it expects to need 30,000 MW of renewable capacity by 2029-30 to achieve this.

Senior officials told recently that discussions would be taken up with the Nuclear Power Corporation of India (NPCIL) shortly.

### Previous Attempts to Go Nuclear

The Railways had previously explored usage of nuclear power.

In 2013, officials said, when peak power requirement of Indian Railways was around 4000 MW, there were preliminary discussions with NPCIL for setting-up 400 MW nuclear power plant capacity. But, reportedly in 2017, the Department of Atomic Energy’s efforts to forge a JV received a setback with the Railways declining a partnership offer.

**Shri Pankaj Agarwal IAS, Secretary, Ministry of Power inaugurated IEF New Office, on 16th August 2024**

India Energy Forum has got its own new office space situated at 908 Chiranjiv Tower, 43 Nehru Place, New Delhi 110 019. The inauguration of the new office was done by Shri Pankaj Agarwal IAS, Secretary, Ministry of Power in the presence of Shri R V Shahi, President, IEF and Former Secretary, Ministry of Power and Members of the Executive Committee.

Glimpses of the programme are given below:

