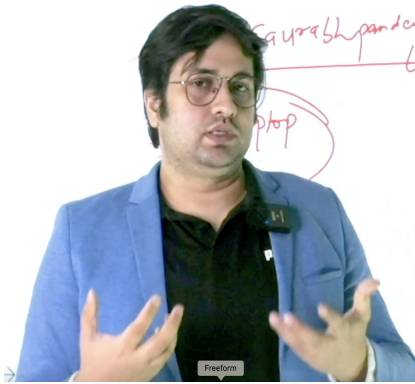
Topics - MINDS MAPS included (Daily current affairs 14th th March 2025

- SpaDex Mission
- Quantum Hubs in India
- Polypharmacy
- INDIAN PM VISIT TO MAURITIUS
- The Rise of Electricity Demand in India
- MAINS



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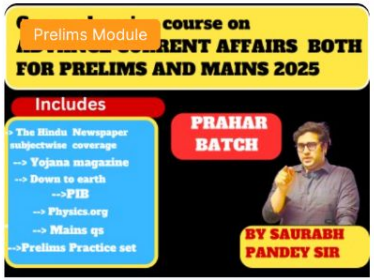

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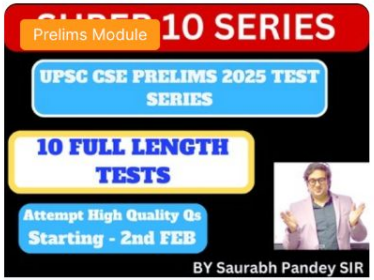

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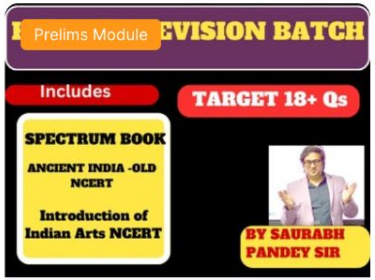

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ISRO undocks SpaDex satellites in first attempt

The Hindu Bureau
BENGALURU

Nearly two months after the Indian Space Research Organisation (ISRO) carried out the docking of the two satellites which are part of the Space Docking Experiment (SpaDeX) mission, the space agency on Thursday accomplished their undocking.

"The undocking of the satellites took place in a 460 km circular orbit with 45-degree inclination. The satellites are now orbiting independently and their health is normal," the agency said.

FULL REPORT
» PAGE 6

Topic - SpaDex Mission

The Indian Space Research Organisation (ISRO) has recently made headlines with the successful undocking of its Space Docking Experiment, known as SpaDex. This accomplishment is not just a technical feat; it signifies a leap forward in India's ambitions for upcoming missions, such as *Chandrayaan-4*.

The SpaDex Experiment Explained:

The SpaDex experiment is a pioneering initiative aimed at advancing India's capabilities in space docking technologies. Here's what you need to know:

- Objective: SpaDex aims to demonstrate the feasibility of docking and undocking satellites in space, which is crucial for future missions.
- Technical Aspects:
  - The experiment involved two satellites that were docked in orbit.
  - The undocking process was successfully executed, showcasing ISRO's growing expertise in autonomous space operations

- **The Space Docking Experiment mission was launched on December 30, 2024 from the Satish Dhawan Space Centre. Two satellites SDX01 and SDX02, also known as Chaser and Target, were docked on January 16.**
- **India is the fourth country in the world to achieve successful space docking after the United States, Russia, and China.**

The Future of SPADEX and Indian Space Exploration:

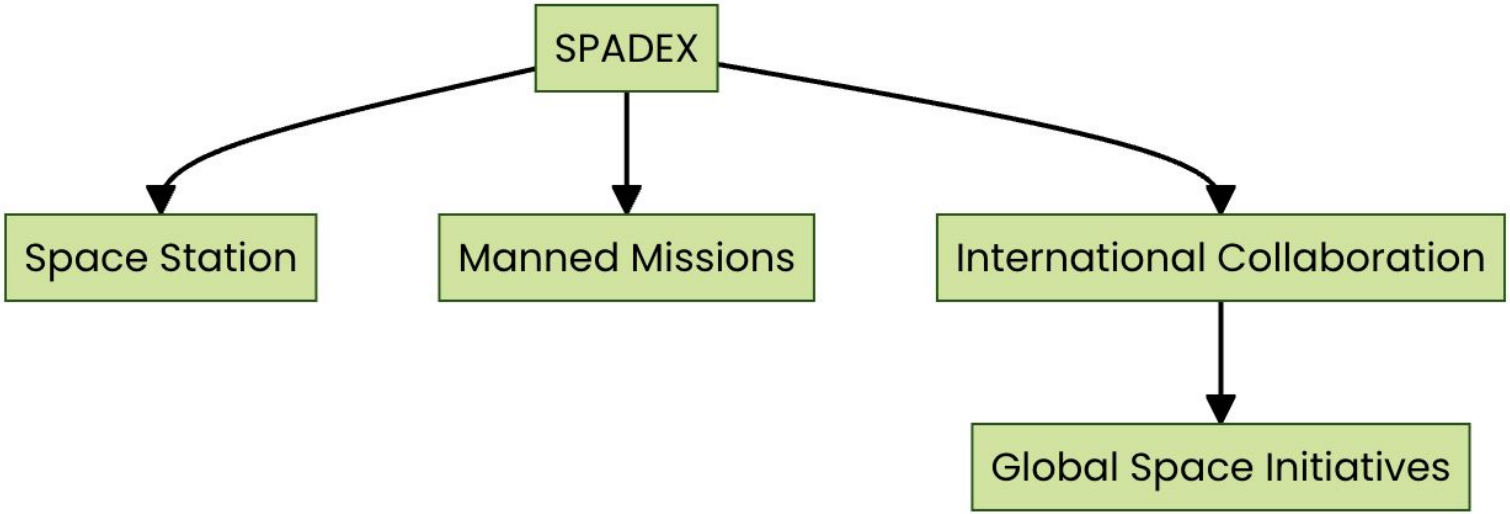
The SPADEX mission is not just about current achievements; it's about laying the groundwork for future explorations. The technology developed during this mission will be essential for:

Space Station Initiatives: Contributing to the establishment of India's own space station.

Manned Missions: Preparing for potential human missions to space.

International Collaborations: Enhancing India's position in global space exploration endeavors.

Figure 2.1: Future Mission Pathways



‘Hubs to develop quantum technology made operational’

Jacob Koshy
NEW DELHI

The Centre has made operational “hubs” in four leading institutions to develop quantum computer technology and earmarked funds for them, according to information made public in the Lok Sabha on Wednesday.

Uttar Pradesh, with an allocation of ₹28.7 crore during 2024-25, leads the States funded by the Department of Science and Technology (DST) for developing quantum computer technology. The next two highest-funded States are Maharashtra at ₹3.34 crore and Karnataka at ₹3.7 crore. Delhi and Tamil Nadu follow at ₹2.4 crore and ₹1.7 crore, respectively.

The National Quantum Mission (NQM) was approved by the Union Cabinet in April 2023 at an outlay of ₹6,003.65 crore for a period of eight years. Under the NQM, four Thematic Hubs (T-Hubs) have been established in key technology verticals of quantum computing, quantum communication, quantum sensing & metrology and quantum materials & devices. These T-Hubs consist of 14 technical groups, covering 17 States and two Union Territories. Activities in these T-Hubs would include technology development, human resource development, entrepreneurship development and industry collaborations and international collaborations, Union Minister Jitendra Singh said as part of a written response.

NQM was approved by the Cabinet in April 2023 at an outlay of ₹6,003.65 crore for eight years

Abhay Karandikar, Secretary, DST told *The Hindu* that the Indian Institute of Technology in Kanpur had been designated as a management coordinating centre for the hubs.

“Allocation to hubs, which started working two months ago, would be done in the forthcoming financial year and the money reflected was seed money for two months,” he added.

The four hubs were to be located at the Indian Institute of Science, Bengaluru; IIT-Bombay; IIT-Delhi and IIT-Madras. IIT-Kanpur was not one of the hubs. “All the hubs will get roughly equal amounts. The expected spend is nearly ₹1,500 crore in the coming year,” he said.

Quantum Hubs in India

The Indian government has embarked on a transformative journey to advance quantum computing technology. According to recent disclosures in the Lok Sabha, the Centre has established operational “hubs” in four prominent institutions, aiming to propel the development of quantum computing.

Leading States in Funding:

- Uttar Pradesh: ₹28.7 crore
- Maharashtra: ₹3.34 crore
- Karnataka: ₹3.7 crore
- Delhi: ₹2.4 crore
- Tamil Nadu: ₹1.7 crore

This initiative is a significant part of the National Quantum Mission (NQM), which aims to position India as a key player in the global quantum technology landscape.

The National Quantum Mission: A Game-Changer

The National Quantum Mission, approved in April 2023 with an impressive outlay of ₹6,003.65 crore, aims to span over eight years, facilitating rapid advancements in quantum technologies. The establishment of four Thematic Hubs (T-Hubs) in various key sectors will catalyze innovation.

Key Focus Areas:

- Quantum Computing
- Quantum Communication
- Quantum Sensing & Metrology
- Quantum Materials & Devices

These hubs will incorporate 14 technical groups across 17 states and two Union Territories, engaging in diverse activities such as technology development, human resource development, and fostering entrepreneurship.

Allocation of Resources and Future Prospects

As the T-Hubs commence operations, the allocation of funds will be pivotal in nurturing this burgeoning sector. Union Minister Jitendra Singh revealed that the hubs have already begun their operations and the allocation for the next financial year is expected to be substantial, with nearly ₹1,500 crore projected for expenditure.

Key Institutions Involved:

- Indian Institute of Science, Bengaluru
- IIT-Bombay
- IIT-Delhi
- IIT-Madras

Despite IIT-Kanpur not being a hub, it will serve as a management coordinating centre, ensuring seamless integration and collaboration among these institutions.

Conclusion

With the initiation of these hubs, India is poised to make remarkable strides in quantum technology. The collaborative efforts among leading institutions will not only enhance research capabilities but also foster a robust ecosystem for innovation and entrepreneurship in the quantum realm.

The prevalence of self-medication was 19.7%, associated with factors such as staying alone.

High rates of self-treatment among older adults: study

Serena Josephine M.

A cross-sectional study conducted among 600 older adults across six Indian cities has found that the prevalence of polypharmacy and unsafe self-medication is high in this population. Polypharmacy refers to the intake of five or more medications per day. Among those who self-medicated, a majority lacked knowledge about self-medication, and did not understand the risks associated with it, the study found.

In the study - *'Polypharmacy and self-medication among older adults in Indian urban communities - a cross-sectional study'* - published in *Scientific Reports*, researchers Das, S., Gnanavel, P., Smanla, S. et al. from the Department of Global Public Health, Karolinska Institutet, Stockholm, Sweden, the Indian Council of Medical Research - Centre for Aging and Mental Health, Kolkata and a number of medical institutions including the Department of Community Medicine, Government Medical College, Omandurar Government Estate, Chennai, have taken a close look at the medication usage and self-medication practices among older adults in New Delhi, Chennai, Kolkata, Ujjain, Patna and Guwahati.

A total of 100 older adults were recruited in each city. Of the 600, 477 were aged 60 to 80 years and 123 were the age of 80. More than half of them (353), were women. There were three or more co-morbid conditions in 423 of these individuals. The researchers used an updated screening tool, the Older Persons' Prescriptions and Screening Tool to Alert to Right Treatment, (STOPP-START) criteria to identify potentially inappropriate medications (PIM) and potential prescribing omissions (PPO) respectively.

Polypharmacy rates over 30%

The study found that the prevalence of polypharmacy was 33.7% with significant associations to multiple comorbidities, recent transition of care and recent hospitalisation. A total of 314 individuals were taking one to four oral allopathic medicines (solid formulations) daily.

The highest prevalence of polypharmacy was found in Guwahati (57%), while Ujjain had the lowest prevalence (11.7%). A total of 2,741 medicines were prescribed to all individuals. The most common were antihypertensive medicines followed by antidiabetic medicines, hypolipidemic medicines, calcium supplements and nonsteroidal anti-inflammatory drugs, the study said. The researchers found the proportion of prescriptions with PIM and PPO were 28.8% and 20.3% respectively.

A total of 164 persons were using concomitant traditional and complementary medicines mostly for chronic conditions. Of these, 80 persons used certain traditional and complementary solid oral formulations without names or labels. In fact, the authors observed that the presence of unlabelled solid oral formulations among traditional medications raised concerns regarding patient safety. The prevalence of self-medication was 19.7%, associated with factors, such as staying alone, multiple comorbidities and recent hospitalisations. The most common medicines that were self-medicated were nonsteroidal anti-inflammatory drugs (59%) followed by paracetamol (42.4%) and antibiotics for upper respiratory tract infection and diarrhoea (33.9%). A lack of awareness and unsafe practices were found among self-medicating individuals.

These findings emphasise the necessity for interventions to promote safe medication use in older adults, the authors said.

(serena.m@thehindu.co.in)

Polypharmacy

- Polypharmacy refers to the concurrent use of multiple medications by a patient, often defined as taking five or more prescriptions simultaneously.
- This practice is common among older adults who may have multiple chronic conditions requiring various treatments.
- While polypharmacy can be necessary for managing complex health issues, it also poses risks such as adverse drug interactions, increased side effects, and challenges in medication adherence.

What is Hantavirus and how does it spread?

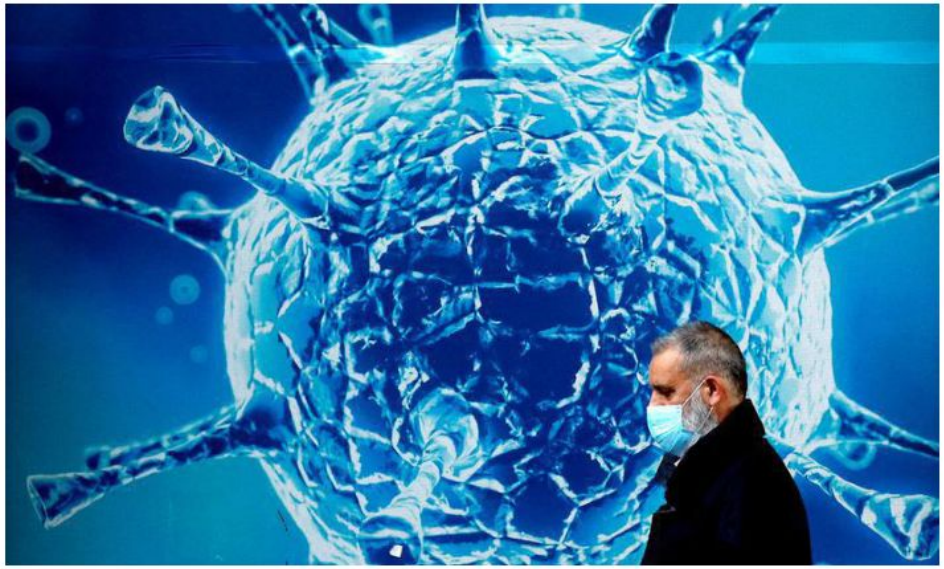
Athira Elssa Johnson

According to the U.S. Centers for Disease Control and Prevention (CDC), hantaviruses are a family of viruses that can cause severe, potentially fatal illnesses lncluding hantavirus pulmonary syndrome (HPS) and hemorrhagic fever with renal syndrome (HFRS), characterised by severe respiratory illness and internal bleeding with kidney failure.

The recent passing of Betsy Hackman, wife of renowned American actor Gene Hackman, has drawn attention to this deadly virus. Although cases are rare, the severity of the illness makes understanding its spread, symptoms, and treatment options crucial.

How does hantavirus occur?

Hantaviruses are a family of viruses carried by certain rodents, such as deer mice, white-footed mice, rice rats, and cotton rats. According to the CDC, humans typically contract hantavirus through contact with infected rodent waste, primarily via aerosolisation when disturbing contaminated materials, such as sweeping or cleaning infested areas.



Hantavirus has no specific cure, but early medical care can improve survival rates. REUTERS

According to the World Health Organisation's manual, hantaviruses are a family of viruses with several strains exhibiting varying degrees of severity.

The infection cause flu-like symptoms such as fever, muscle aches, and fatigue within 1-8 weeks of exposure, followed by a severe respiratory phase characterised by shortness of breath, coughing, and chest tightness, which can rapidly escalate to acute respiratory distress and potentially fatal outcomes without prompt medical intervention.

High-risk groups include people who work or live in rodent-prone areas, such as farmers, construction workers, campers, and homeowners with rodent infestations.

The infection cause flu-like symptoms such as fever, muscle aches, and fatigue, followed by respiratory phase characterised by shortness of breath, coughing

The CDC also emphasis that children under five, pregnant women, and individuals with weakened immune systems should avoid handling pet rodents .

What are the treatment options?

Currently, even though there is no specific antiviral treatment or cure for hantavirus, medical care focuses on managing symptoms and supporting the patient through the most dangerous phases of the illness. In cases of HPS, patients are often given oxygen therapy to ease breathing difficulties. Severe cases may require intensive care, including mechanical ventilation to assist lung function.

Early detection and immediate medical attention are crucial for preventing severe respiratory distress. Preventive methods through rodent control and adherence to proper sanitation protocols is crucial.

(athira.elssa@thehindu.co.in)

What is Hantavirus?

Hantavirus refers to a collection of viruses carried by specific rodent species. These viruses can induce severe illness in humans, particularly two notable forms:

Hantavirus Pulmonary Syndrome (HPS): Characterized by respiratory distress and high mortality.
Hemorrhagic Fever with Renal Syndrome (HFRS): Associated with internal bleeding and kidney failure.

The recent death of Betsy Hackman has reignited awareness about these viruses, underscoring the need for vigilance and understanding.

How Does Hantavirus Occur?

Hantavirus is primarily transmitted to humans via contact with infected rodents or their droppings. Here's how infection typically occurs:

Aerosolization of Contaminants: Disturbing contaminated environments, such as cleaning or sweeping rodent-infested areas, can release virus-laden particles into the air.

Direct Contact: Handling infected rodent waste or saliva can also lead to transmission.

Old ties, new priorities

The Modi visit to Mauritius focused on present-day imperatives

Prime Minister Narendra Modi's visit to Mauritius this week, and his meeting with its newly elected Prime Minister Navin Ramgoolam, marked a decade since his last visit. His trip aimed to strengthen the India-Mauritius strategic partnership and launch new economic and development initiatives. While Mr. Ramgoolam's previous tenure (2005-14) overlapped briefly with Mr. Modi's, the two leaders have maintained close ties. Even during India's strict COVID-19 lockdown, the Indian government facilitated Mr. Ramgoolam's medical evacuation to India. Acknowledging this support, Mr. Ramgoolam warmly welcomed Mr. Modi as a guest at Mauritius' National Day celebrations where he was also conferred the highest national award. Though not India's closest geographical neighbour, Mauritius remains deeply connected to India. Over 70% of Mauritians are of Indian descent, with enduring cultural ties to India. While Mr. Modi's engagements highlighted these shared historical and cultural bonds, the visit was primarily focused on strategic priorities. India seeks to strengthen its partnership with Mauritius as a key player in the Indian Ocean, an African nation, and a link to the Global South.

As part of this deepening partnership, the two leaders upgraded their strategic ties and committed to increased defence cooperation. India also announced several major economic initiatives, that include bilateral trade in national currencies, support for a new Mauritius parliament building, and a ₹487 crore credit facility to improve water infrastructure. These projects build upon previous Indian-led developments, such as an airstrip and jetty in the Agalega islands, the Mauritius Metro rail project, and the New Supreme Court Building. The visit also carried geopolitical implications. Mr. Ramgoolam has expressed a desire to renegotiate Mauritius' agreement with the U.K. regarding sovereignty over the Chagos Archipelago, home to a U.S. military base in Diego Garcia. While India helped broker the previous deal under Prime Minister Pravind Jugnauth's government, it has assured Mr. Ramgoolam of its full support in whatever course he chooses. Meanwhile, India is also watching China's growing footprint. China's strategic partnership with Mauritius includes a free trade agreement and bilateral trade worth $1.1 billion – double that of India-Mauritius trade at $554 million. With the PLA Navy's increased presence in the Indian Ocean, Mr. Modi's announcement of the MAHASAGAR doctrine is significant. At a time when shifting U.S. foreign policy threatens the international rules-based order, disrupts trade, and risks fragmenting global alliances into rigid spheres of influence, Mr. Modi's visit has underscored India's commitment to strengthening regional ties and reinforcing partnerships with trusted friends.

INDIAN PM VISIT TO MAURITIUS

Prime Minister Narendra Modi's recent visit to Mauritius was not just a routine diplomatic engagement; it marked a significant milestone, a decade since his last visit. The meeting with newly elected Prime Minister Navin Ramgoolam aimed to fortify the India-Mauritius strategic partnership and herald new economic and developmental initiatives.

Historical Ties: The bond between India and Mauritius runs deep, with over 70% of the Mauritian population tracing their roots back to India.

Celebration: PM Modi was honored as a guest at Mauritius' National Day celebrations, receiving the highest national award as a gesture of appreciation for India's support, especially during the COVID-19 pandemic.

Strengthening Strategic Partnerships:

The primary focus of Modi's visit was to amplify strategic ties, recognizing Mauritius as a pivotal player in the Indian Ocean and a vital link to the Global South.

Defense Cooperation: The leaders upgraded their strategic ties, committing to enhanced defense collaboration.

Economic Initiatives: Modi announced significant economic initiatives, including:

- Bilateral trade in national currencies.
- A ₹487 crore credit facility aimed at improving water infrastructure.
- Support for constructing a new parliament building in Mauritius.

Geopolitical Implications:

Modi’s visit also harbors significant geopolitical implications, particularly in the context of the growing influence of China in the region.

Chagos Archipelago: Ramgoolam expressed intentions to renegotiate the agreement with the U.K. concerning the sovereignty over the Chagos Archipelago, which is crucial due to the U.S. military base located there.

China's Presence: With China's strategic partnership with Mauritius encompassing a free trade agreement and bilateral trade worth $1.1 billion, India is keenly observing this growing footprint

Reaffirming Regional Ties:

At a time when global power dynamics are shifting, PM Modi's visit underscores India's unwavering commitment to strengthening regional ties and reinforcing partnerships with trusted allies.

> **MAHASAGAR Doctrine:** Modi’s announcement of the MAHASAGAR doctrine during this visit signifies India's strategic intent to foster stability in the Indian Ocean region amidst evolving global alliances.

How can India meet its rising power demand?

Besides economic growth and urbanisation, climate change-induced heat stress is one of the key factors driving electricity demand. Episodes of power shortages in the last two years amid rapid growth in demand pose an important question. How should India act and plan to meet its rising energy demand reliably and cost-effectively?

EXPLAINER

Shalu Agrawal
Disha Agarwal

As the fastest-growing major economy in a rapidly heating world, India's electricity demand is growing fast. Since FY21, India's electricity consumption has risen at approximately 9% per annum, compared to an average of 5% annually in the preceding decade. The Central Electricity Authority (CEA) had projected electricity demand to grow at a 6% CAGR between 2022 and 2030. However, recent trends suggest a strong likelihood of overshooting these estimates. Can India's power sector keep up with this demand and transition to renewables at the same time?

What's driving India's electricity demand?

Besides economic growth and urbanisation, climate change-induced heat stress, marked by increasingly hotter summers, is one of the key factors driving electricity demand. Currently, industries, households, and agriculture comprise 33%, 28%, and 19% of total electricity use in India, respectively. Yet, household electricity demand has grown the fastest over the past decade. The summer of 2024 witnessed a 40-50% year-on-year growth in room air conditioner sales, driven by rising incomes and record-breaking temperatures. All-India peak demand crossed 250 GW on May 30, 2024, which was 6.3% higher than projections. In 2025, after recording the warmest-ever February in 125 years, India must now brace for extended heatwaves and a peak electricity demand growth of 9-10%.

In short, India's electricity demand is growing fast and becoming more and more uncertain.

How has India met rising demand so far?

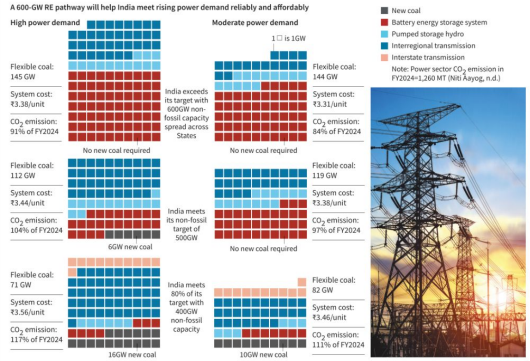
Since the early 2000s, power generation capacity has quadrupled to 460 GW, making India the third-largest electricity producer globally. Driven by the imperatives of clean energy transition, India's power sector is undergoing a major shift with the rise of Renewable Energy (RE) technologies like solar and wind. In 2010, the Indian government set a target of 20 GW of RE by 2020, which was revised upwards in 2014 to 175 GW by 2022. In 2021, India further amped its target to achieve 500 GW of non-fossil fuel power capacity by 2030.

The government has continuously adopted several long-term and short-term measures to meet the spikes in demand. For instance, to manage the peak in 2022, it increased coal allocation to the power sector and prioritised its transportation through railways. It also directed imported coal-based power plants to operate at full capacity. States that have added substantive solar capacities utilised the surplus solar power to meet day peaks. Nights peaks continue to pose a challenge.

In many ways, 2024 was a landmark year – India added a record 28 GW of new RE capacity, bumping up the share of RE in the electricity mix to 13.5%. The share of coal in the capacity mix fell below half, though it still caters to 75% of power demand. India's RE capacity now stands at 165 GW. Another 32 GW of RE is expected to be commissioned in 2025. In the following five years, India would need to add about 50 GW of RE every year to meet its 2030 goal.

The electric demand

Driven by the imperatives of clean energy transition, India's power sector is undergoing a major shift with the rise of Renewable Energy (RE) technologies like solar and wind



Source: How can India meet its rising power demand? (2025)

Why should India further raise its clean energy ambitions?

Episodes of power shortages in the last two years amid rapid growth in demand pose an important question. How should India act and plan to meet its rising energy demand reliably and cost-effectively?

A new study by the Council on Energy, Environment and Water (CEEW) answers this question by simulating six scenarios of India's power sector in 2030. CEEW found that failure to achieve 500 GW of clean energy capacity by 2030 will lead to power shortages and higher power costs, even if demand grows moderately. For instance, 0.26% of the demand will not be met if we achieve only 400 GW. Just this small percentage alone could impact the power supply to ~1 million households for 2.5 hours daily. States in northern India would be the worst affected because of network constraints.

If demand grows faster (at 6.4% CAGR between 2023 and 2030 instead of 5.8%) and the 500 GW target is achieved, India will still need additional generation capacity to avoid major power shortages. Here, India has two choices – add six GW of new coal (beyond the under-construction capacities now) or 100 GW of new RE capacity (beyond the stated 500 GW). The first choice will meet the demand, but the coal fleet will remain under high stress with a likelihood of increased downtime. This could result in sudden shortages and increased costs. The study finds that the latter choice of 100 GW of new RE capacity, distributed across States, is a better option.

How can India aim for 600 GW by 2030?

India must achieve 600 GW of clean energy by 2030 to keep pace with demand. This will help the country deliver reliable power at lower costs, saving up to ₹42,400 crore ($5 billion) in procurement costs in 2030 alone. It will also yield higher social and health benefits, with 1,00,000 new jobs (during 2025-2030) and up to 23% lower emission of air pollutants in 2030.

However, a 600 GW target would require 70 GW of RE addition annually until 2030 which may sound wishful. Several on-ground and grid-related challenges are already restricting the pace of RE deployment and have dwindled offtake interest among distribution companies. These include delays in securing suitable and conflict-free land, delays in the availability of transmission equipment, uncertainty around incentives for inter-State RE plants, and complexities of grid balancing. Given these challenges, relying on polluting coal power plants may seem more tenable. However, this approach would neither be affordable nor reliable. Historical trends show that coal projects take over seven years to start operations. In comparison, RE plants, being modular, could be deployed faster and supply cheaper electricity.

How can India add renewables faster?

Scaling to 600 GW is urgent and possible with the right market signals. Below are three key strategies to unlock the pace of RE deployment in India.

First, new RE projects should be spread across more Indian States. Currently, five Indian States house three-fourths of the total RE capacity. State-agnostic reverse bids and complete waiver of inter-State transmission system (ISTS) charges have crowded investments to a few regions, putting pressure on land. The government must work with more States, like Odisha, Madhya Pradesh, Bihar, Punjab, and Kerala, to create a conducive RE environment. For this purpose, the ISTS waiver should not be extended beyond June 2025, barring storage plants, which would also encourage distributed RE plants under the PM-KUSUM (Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan) and PM Surya Ghar Scheme.

Second, the Central and State governments must promote the co-location of wind and energy storage systems with existing and new solar projects. This would help effectively utilise land and transmission networks and support grid integration of renewables. CEEW's study estimates that India will need 280 GWh of battery energy storage systems (BESS) and 100 GWh of pumped hydro storage to integrate 600 GW of RE by 2030. Here, we must prioritise BESS, which can be built within six months and is quickly becoming affordable.

Third, there is an urgent need for innovation in bidding and contract designs for faster RE procurement and RE availability in power exchanges. Several large solar and hybrid RE tenders, concluded in FY24 by intermediaries like the Solar Energy Corporation of India, did not generate offtake interest from States. The Union government must work with States to generate demand for RE procurement, devise suitable tender designs, and proactively resolve bottlenecks. Besides bilateral RE procurement, we must improve RE availability on our power exchanges. Here, the government could consider supporting a Contract-for-Difference pool that can de-risk merchant RE capacities.

India's tryst with RE has seen many successes in the last decade. Hopefully, it can also achieve the unthinkable – double the share of clean energy in its generation mix from 25% to 50% by 2030.

Disha Agarwal is senior programme lead and Shalu Agrawal is Director of Programmes at CEEW. Views are personal.

THE GIST

- The summer of 2024 witnessed a 40-50% year-on-year growth in room air conditioner sales, driven by rising incomes and record-breaking temperatures. All-India peak demand crossed 250 GW on May 30, 2024, which was 6.3% higher than projections.
- CEEW found that failure to achieve 500 GW of clean energy capacity by 2030 will lead to power shortages and higher power costs, even if demand grows moderately.
- The Central and State governments must promote the co-location of wind and energy storage systems with existing and new solar projects. This would help effectively utilise land and transmission networks and support grid integration of renewables.

The Rise of Electricity Demand in India

In the face of rapid economic growth and escalating temperatures due to climate change, India's electricity demand is on an exponential rise. Since FY21, consumption has surged by approximately 9% annually, significantly higher than the previous decade's average of 5%. The Central Electricity Authority (CEA) estimated a 6% CAGR in demand from 2022 to 2030, but recent trends suggest an impending overshoot of these projections.

Key Drivers of Demand:

- Economic expansion and urbanization.
- Climate change-induced heat stress leading to increased reliance on air conditioning.
- Industries, households, and agriculture account for 33%, 28%, and 19% of total electricity use, respectively.

The summer of 2024 marked a pivotal moment, witnessing a staggering 40-50% year-on-year growth in air conditioner sales, ultimately pushing peak demand beyond 250 GW on May 30, 2024

Meeting the Demand: India's Current Approach

India's power generation capacity has seen a remarkable increase, quadrupling to 460 GW since the early 2000s. This advancement has solidified India's position as the third-largest electricity producer worldwide. The Indian government has set ambitious renewable energy targets, initially aiming for 20 GW by 2020, later revised to 175 GW by 2022, and finally striving for 500 GW by 2030.

Short-term Measures:

Increased coal allocation during peak demand periods.

Operating imported coal-based power plants at full capacity.

In 2024, India achieved a milestone by adding a record 28 GW of new renewable energy capacity, raising the share of renewables in the electricity mix to 13.5%. Despite this progress, coal remains a dominant force, supplying 75% of power demand.

Strategies for Accelerating Renewable Energy Deployment

To achieve a staggering 600 GW of clean energy by 2030, India must implement strategic approaches:

Diversification Across States:

Currently, five states account for three-fourths of total RE capacity.

Expansion into states like Odisha, Madhya Pradesh, and Bihar is crucial.

Co-location of Wind and Solar Projects:

Integrating energy storage with renewable projects enhances grid stability and resource efficiency.

An estimated requirement of 280 GWh of battery energy storage systems to integrate 600 GW of RE.

Innovative Bidding and Procurement Designs:

Addressing bottlenecks and generating demand for renewable procurement is essential.

The government should facilitate better availability of RE on power exchanges.

By embracing these strategies, India can aim to double the share of clean energy in its generation mix from 25% to 50% by 2030, positioning itself as a global leader in renewable energy.

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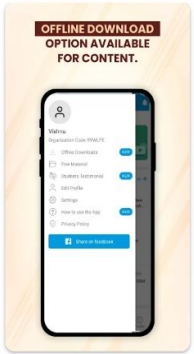

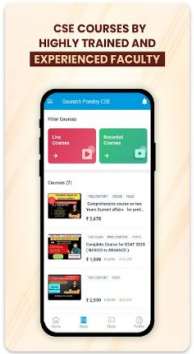

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