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From the chairman's desk

Dear friends,

India, with an annual energy consumption of 1,596,300 GW hours, is the third largest energy-consuming country in the world. Its average per capita electrical power consumption is 936 kWh.

As you are aware, India aims to reach net zero emissions by 2070 and to meet 50% of its electricity requirements from renewable energy sources by 2030. In this context, the Central Electricity Authority (CEA) has made some key projections:

- Projected peak electricity demand for 2029-30 is likely be 334.8 GW and the electrical energy requirement would be 2,279.7 BU.
- The impact of EVs on all India demand in 2029-30 is likely to be 3 GW in peak demand and 15 BU in energy requirement.
- All India energy requirement offset due to solar roof top installation is estimated as 34.8 BU in 2029-30.
- All India energy requirement offset due to solar pump installation is estimated as 2.4 BU in 2029-30.
- Additional energy requirement for green hydrogen production of around 10 million tonnes (considering only 5 million tonnes load on grid) is estimated as 250 BU by FY 2029-30.

The implications of the above are that the annual energy consumption and per capita consumption are likely to double by 2029-30.

Based on the above, the optimum generation mix projected by the CEA is as under:

Likely Installed capacity (MW) in 2029-30

Resource	All India	Percentage of Total IC (%)
Hydro	53860	6.93%
Small Hydro	5350	0.69%
PSP	18986	2.44%
Solar PV	292566	37.65%
Wind	99895	12.85%
Biomass	14500	1.87%
Nuclear	15480	1.99%
Coal+ Lignite	251683	32.38%
Gas	24824	3.19%
Total#	777144	100%
BESS(MW/MWh)	41650/ 208250	

Excluding Hydro Imports of 5856 MW

Apparently, the estimate of the likely installed capacity of wind energy is based on projections provided to CEA by MNRE.

According to the International Energy Agency, India faces three principal challenges:

- how to expand reliable energy access and use while maintaining affordability for consumers and financial stability for the DISCOMs;
- how, at the same time, to integrate increasing shares of renewable energy in a secure and reliable manner; and
- how to reduce emissions to achieve ambitious social and climate objectives while meeting economic goals.

Another observation made by IEA is that "renewable energy penetration is highly variable by state in India. The share of solar and wind in India's ten renewables-rich states (Tamil Nadu, Karnataka,

Gujarat, Rajasthan, Andhra Pradesh, Maharashtra, Madhya Pradesh, Telangana, Punjab and Kerala) is significantly higher than the national average of 8.2%. Solar and wind account for around 29% of annual electricity generation in Karnataka, 20% in Rajasthan, 18% in Tamil Nadu and 14% in Gujarat (FY 2020/21). India's renewables-rich states already have a higher share of variable renewable energy than most countries internationally. As a result, many states are already facing system integration challenges."

The purpose of putting down these figures is to emphasise that whilst addressing the concerns of wind energy generators, it is also essential that we as an Association, adopt systems thinking in order that the solutions we seek are holistic, comprehensive and result in win-win outcomes for all stakeholders in the system. In this context, we look forward to hearing your views on how best to contribute to wind energy growth, whilst at the same time overcoming challenges and hurdles that currently beset the installed capacity.

With best regards

Prof Dr K Kasthurirangaian
Chairman

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India's energy transition and SDGs: Role of G20 – Vishnu Mohan Rao

India's G20 presidency comes at both opportune and challenging times from an energy transition perspective. India has committed to moving away from its traditional dependence on fossil fuels and embracing renewable energy sources. However, this transition needs to be just and balanced; and it is not just about installing solar panels and wind turbines. It needs to provide uninterrupted and quality power to all citizens while managing the intermittency of renewable energy sources. In essence, the transition must be just and equitable.

The 2022 G20 Bali Leaders Declaration also recognised that the key lies in promoting 'clean, sustainable, just, affordable and inclusive energy transitions and flow of sustainable investments'. More importantly, the declaration also sought to link their efforts with the Sustainable Development Goals (SDGs) especially SDG 7.

As part of its India's role in G20 presidency, seven-year action plan on the SDGs by the G20 countries has been prepared. Its main areas are fostering data for development, investing in women-led development and securing globally just transitions to help ensure the future survival of the planet.

India, as a signatory to these goals, has been making concerted efforts to align its national development strategies with both G20's goals and SDGs. The energy transition in India is intrinsically linked to several SDGs, particularly SDG 7 (Affordable and clean energy), SDG 9 (Industry, innovation and infrastructure), and SDG 13 (Climate action). There are, of course several linkages that can be fleshed out – SDG 8 (Decent work and economic growth), SDG 11 (Sustainable cities and communities) and SDG 12 (Responsible production and consumption).

SDG 13 – Climate action

It is pertinent to start with SDG 13 – Climate action – as the larger framework around which India's efforts to mitigate the efforts of climate change. India ratified the Paris Agreement in 2016, aimed at limiting global warming to well below 2°C compared to preindustrial levels. In its Nationally Determined Contributions (NDC), India committed to reducing the emissions intensity of its GDP by 33-35% below 2005 levels by 2030. It also set a target of achieving 40% of its electricity generation capacity from non-fossil-based energy resources by 2030. India also presented the following five nectar elements (panchamrit) of India's climate action at the 26th session of the Conference of Parties (COP26) to the United Nations Framework Convention on Climate Change (UNFCCC) held in Glasgow, United Kingdom.

- Reach 500 GW non-fossil energy capacity by 2030.
- 50% of its energy requirements from renewable energy by 2030.
- Reduction of total projected carbon emissions by one billion tonnes from now to 2030.
- Reduction of the carbon intensity of the economy by 45% by 2030, over 2005 levels.
- In 2021, India emitted 2.7 billion metric tons of CO2, accounting for 7% of the global total. Despite this,

the country has made significant progress in renewable energy capacity installation, ranking fourth in the world in 2022. The Indian government has implemented comprehensive policy measures to encourage renewable energy, including capacity targets, improvements to administrative processes, and incentives for the domestic production of solar technologies.

India's G20 presidency offers a unique chance to lead by example in climate action. It stands out as the only G20 country on track to meet its climate goals. Initiatives such as the International Solar Alliance, Coalition for Disaster Resilient Infrastructure, and National Green Hydrogen Mission further reinforce India's efforts to reduce emissions while fostering economic growth.

SDG 7 – Affordable and clean energy

Sustainable Development Goal 7 (SDG 7) aims to 'ensure access to affordable, reliable, sustainable, and modern energy for all' by 2030. This goal is central to India's energy transition, as the country seeks to balance its rapid economic growth and energy needs with environmental sustainability. The Indian government has set ambitious targets for renewable energy. By 2022, the goal is to achieve 175 GW of renewable energy capacity, and by 2030, the aim is to make 40% of installed power capacity come from non-fossil fuel sources. As of June 2023, India has made considerable progress towards these goals, with renewable energy capacity reaching 129.64 GW (excluding large hydro), which is about 31% of the country's total capacity. India has also achieved near-universal access to electricity, a significant milestone in its journey towards SDG 7.

However, achieving SDG 7 in India is not without challenges. The country's energy transition is taking place in the context of a rapidly growing economy and a large and diverse population with varying energy needs. Ensuring that the benefits of the energy transition are equitably distributed across the population is a key challenge.

Furthermore, the transition to renewable energy requires significant capital investment, and the availability of affordable finance is a critical factor in the pace and scale of the transition. According to the World Investment Report 2023 by UNCTAD, developing countries like India face an annual investment deficit of about USD 4 trillion as they work to achieve the SDGs by 2030. Another challenge is the intermittency of renewable energy sources, which can pose problems for grid stability and reliability. This necessitates investments in grid infrastructure, energy storage solutions and demand-side management strategies.

SDG 9 – Industry, innovation and infrastructure

Sustainable Development Goal 9 (SDG 9) aims to 'build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation'. This goal is particularly relevant to India's energy transition, as the country seeks to build a robust energy infrastructure that can support its transition to a low-carbon economy.

India's foreign direct investment (FDI) programme for renewable energy has been significantly reformed. As per the FDI Policy, 'FDI with up to 100% renewable energy industry under the automatic route, with no prior government approval needed. Up to 100% FDI is allowed under the automatic route for renewable energy generation and distribution projects subject to provisions of The Electricity Act, 2003'. As of 2023, FDI in renewable energy stood at USD 2.5 billion compared to USD 1.6 billion in 2022, representing 56% year-on-year increase.

In terms of promoting inclusive and sustainable industrialisation, India has been working to promote clean and efficient energy use in its industries. This includes initiatives to promote energy efficiency and reduce emissions, through the Bureau of Energy Efficiency's (BEE) Perform Achieve and Trade (PAT) scheme in

various industrial sectors. BEE has rolled out six PAT cycles till 31 March, 2020, with a total of 1,073 designated consumers (DCs) covering 13 sectors. It is projected that total energy savings of about 26 MTOE translating into avoiding of more than 70 million tonnes of CO2 will be achieved by March 2023.

Innovation is also a key part of India's energy transition. The country has been fostering innovation in areas such as battery storage, smart grids and electric mobility. India's National Mission on Transformative Mobility and Battery Storage, Smart Grid Mission, implementation of Smart Meters, Faster Adoption and Manufacturing of Electricity (FAME) are some examples.

However, achieving SDG 9 in the context of India's energy transition also presents significant challenges. These include the need for large-scale investment in energy infrastructure, the need to ensure that the transition to a low-carbon economy is inclusive and does not leave behind vulnerable groups, and the need to foster innovation in a way that is responsive to India's unique energy needs and challenges.

It also necessary to ensure that the energy transition leaves no one behind, especially women who are key actors in the clean energy value chains. They constitute and consume a significant proportion of energy. Therefore, women's participation in the energy sector is an important component to ensure the transition is not 'gender-neutral but must be gender-just'.

Cross cutting SDGs

SDG 8 – Decent work and economic growth: The energy transition is also creating economic opportunities. The renewable energy sector has become a significant job creator in India. As per the SDG7 Energy Compact of the Government of India, around 7,00,000 new jobs would be created by 2030. India's RE sector employs over 1,00,000 fulltime skilled and unskilled workers as of 2019-20. The Government of India launched Skill Council for Green Jobs (SCGJ) in 2015 to promote skills for green business industries and integrate environmental awareness into job training across skilling programmes. SCGJ's partnership with the International Solar Alliance (ISA) plays an important role in building green banking skills among several bankers of ISA member countries.

India has also recognised the importance of providing adequate and accessible green job skills through the Pradhan Mantri Kaushal Vikas Yojana. It can train lakhs of youth within the next three years with on-job trainings, industry partnerships, and alignment of courses with the needs of the industry. It is further expected that the green hydrogen sector will add six lakh persons through the National Green Hydrogen Mission. Industrial production and engineering, robotics and automation, modelling, and data analytics are some key skills needed in the emerging sectors.

However, several challenges exist, a) there is a need to integrate skill training into academic curriculums, b) shift from a skill supply-driven to a skill demand process, c) as decentralised renewable energy becomes crucial for India's energy access, it's vital to bring green skills development training to remote areas, which can create job opportunities in rural regions.

SDG 11 – Sustainable cities and communities: India is focusing on sustainable urban development, which includes the promotion of renewable energy and energy-efficient solutions in urban areas. The National Solar Mission aligns with India's goal to achieve 40 GW of grid-connected rooftop solar by 2026. The Ministry of New and Renewable Energy has also launched several programmes to promote the use of renewable energy in cities. For example, the Solar City Programme, which aims to reduce the consumption of conventional energy by at least 10% in urban areas by promoting renewable energy and energy efficiency. Grid Connected Rooftop Solar Scheme that gives financial assistance for rooftop solar installations. However, there are still challenges to the widespread adoption of rooftop solar in India, including high upfront costs, lack of awareness, and regulatory and technical challenges.

SDG 12 – Responsible production and consumption: The Indian government has implemented several initiatives to promote responsible consumption. These include the Street Lighting National Program (SLNP), which has installed over 12.18 million LED streetlights, resulting in significant energy savings and greenhouse gas (GHG) emission reduction. The Standards & Labelling (S&L) programme informs consumers about the benefits of energy-efficient products, leading to a reduction of CO2 emissions by 55.0 million tonnes annually. Furthermore, the Energy Conservation Building Code 2017 (ECBC) and Eco-Niwas Samhita 2021 promote energy efficiency in commercial and residential buildings, respectively. To promote consumer efforts towards responsible consumption and lifestyle, Mission LiFE (Lifestyle for Environment) was launched. It operates in three phases: nudging individuals to practice environment-friendly actions in their daily lives (Phase I), influencing industries and markets to respond and tailor supply and procurement as per the revised demands (Phase II), and triggering shifts in large-scale industrial and government policies that can support both sustainable consumption and production.

Conclusion

The complex relationship between SDGs and energy transition, marked by challenges such as renewable energy intermittency, substantial capital needs, and social implications of moving away from fossil fuels, requires a balanced approach. This balance must consider economic, social and environmental aspects, ensuring a just and inclusive transition.

India stands at the forefront of this global climate change mitigation effort during its G20 presidency. The forthcoming G20 Leaders' Summit 2023 will underscore the significance of SDGs within India's and the world's energy transition. As India navigates these challenges, there is hope that it will set a precedent for others, sustaining momentum and demonstrating how to effectively address these issues.

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G20 Leaders' Summit, New Delhi

The clean energy transition is at the heart of achieving the SDGs – Amisha Patel, Manas Hadkar, Martand Shardul

The world is facing an unprecedented challenge to mitigate climate change and transition to a sustainable energy future. Central to this effort are the Sustainable Development Goals (SDGs), a set of 17 global objectives outlined by the United Nations to address social, economic and environmental issues by 2030. Among these goals, renewable energy sources play a vital role, and wind energy stands out as a pivotal player in achieving multiple SDGs. The global community struggles with a variety of mutually reinforcing problems such as poverty, inequality and climate change. A comprehensive approach is necessary to effectively tackle these problems. The transition to clean energy is seen as a key tenet in the quest for a sustainable future and as a means of advancing the SDGs. This article examines the importance of SDGs in the context of the energy transition, with a particular emphasis on the significant contributions of wind energy.

The current global energy landscape relies heavily on fossil fuels, resulting in greenhouse gas emissions, environmental degradation and resource depletion. These pressing challenges have prompted the urgent need for a clean energy transition. The transition from conventional fossil fuel-based energy sources to renewables and sustainable energy sources is referred to as a 'clean energy transition'. This transition is vital for reducing the adverse consequences of climate change, stimulating economic growth and advancing social fairness on a global scale. Societies can cut greenhouse gas emissions and improve energy security while embracing a cleaner and greener energy future by adopting renewable energy technologies including solar, wind, hydro and geothermal power. The SDGs serve as a roadmap, guiding nations and stakeholders towards a future that prioritises renewable energy sources like wind power. Wind energy plays a central role in addressing many of the sustainable development goals simultaneously, showcasing its importance in the energy transition.

Wind energy is one of the fastest-growing renewable energy sources globally and for a good reason. Wind turbines harness the power of the wind to generate electricity without emitting greenhouse gases or depleting finite resources. By prioritising wind energy, countries can simultaneously make strides toward achieving several SDGs.

Climate action (SDG 13) is perhaps the most critical SDG when considering the future of our planet and the life of all species. Wind energy has a significant impact in this domain as it displaces fossil fuel-based electricity generation, resulting in reduced greenhouse gas emissions. By investing in wind power infrastructure, nations can substantially contribute to their carbon reduction targets and combat climate change effectively.

Ensuring access to affordable and clean energy (SDG 7) is fundamental to addressing energy poverty and promoting social and economic development. Wind energy projects can be deployed at various scales, from small community-based installations to large utility-scale farms. This versatility allows governments to provide clean energy to remote and underserved areas, boosting economic opportunities and improving the overall quality of life.

Sustainable economic growth (SDG 8) is intrinsically linked to clean energy development. The wind energy sector not only creates numerous jobs but also stimulates technological innovation and attracts investments. By fostering a robust wind energy industry, countries can advance their economic agendas while transitioning towards a more sustainable future.

Responsible consumption and production (SDG 12) are vital for resource conservation and waste reduction. Wind energy excels in this aspect since it does not consume water or produce hazardous waste during operation. Additionally, the materials used in wind turbines are recyclable, promoting a circular economy and reducing environmental impact.

Energy security is a crucial consideration for any nation's long-term development and stability. By diversifying their energy mix and relying on renewable sources like wind energy, countries can reduce their dependence on imported fossil fuels, thus enhancing energy security (SDG 7) and reducing geopolitical tensions. Most importantly, having access to adequate, reliable and affordable power fosters universal energy access targets by provisioning access to electricity for lighting, cooking and apart from augmentation of livelihood opportunities. Further, the deployment of modern windmills and associated advanced infrastructure in the grid system promotes efficiency.

Investments in wind energy infrastructure (SDG 9) drive innovation in renewable technologies and support the growth of a clean energy ecosystem. The ongoing development of more efficient turbines, improved grid integration and energy storage solutions further strengthen the viability and scalability of wind energy projects.

Having access to clean energy through wind power provisions the greening of the grid infrastructure and access to green electrons for irrigation. Motive power in agricultural processing units gets better yields to farmers and hence eradicates poverty (SDG 2). Most importantly, the abatement of toxic emissions from fossil fuel plants promotes good health and well-being (SDG 3). Across the wind value chain, there is growing emphasis on enhancing the participation of women. The Global Wind Energy Council (GWEC) is steering its global ‘Women in Wind’ initiative to promote women’s participation in the industry.

India, which is a signatory to the SDGs, has been undertaking pioneering efforts for addressing the SDGs while also expanding the share of non-fossil fuels, including wind energy, in its energy basket. The country is ranked fourth globally in terms of installed onshore wind energy capacity. The Government of India has set a target of adding a cumulative 140 GW of wind energy capacity by 2030 and has notified an indicative tender trajectory of 37 GW sea bed lease tender for harnessing offshore wind. Wind energy constitutes 10.3% of the country’s installed power generation capacity. To attain its SDGs, the country is prioritising both climate change mitigation and adaptation endeavours. It is also promoting the use of solar energy for irrigation, electric mobility across the country, and energy efficiency across all major verticals of electricity consumption – industrial, agricultural, residential and commercial sectors. Further, there is a range of cross-cutting ongoing initiatives undertaken by civil society, state governments and the central government agencies, that are addressing SDG 7 as well as other SDGs – for example, the electrification of schools and health centres.

The drive for national, regional and global clean energy transition is no longer a choice but a necessity, and the SDGs provide a comprehensive framework to guide nations towards a sustainable future. Among renewable energy sources, wind energy stands out as a key player in achieving multiple SDGs, from combating climate change and providing affordable and clean energy for all to promoting sustainable economic growth, and responsible consumption and production. By prioritising wind energy and aligning efforts with the SDGs, countries can lead the charge in the global transition towards a more sustainable and prosperous future for all.

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Clean Energy Ministerial – Advancing Clean Energy

As India holds the G20 presidency this year, the 14th Clean Energy Ministerial was conducted in Goa from 19–22, July. The Clean Energy Ministerial is an international forum that promotes clean energy transition, with the motto of 'Advancing Clean Energy Together'.

With 29 member countries and partner organisations such the World Bank and International Energy Agency, and recognising the efficiency of working together, the Clean Energy Ministerial (CEM) works with a framework developed in 2016.

CEM and Mission Innovation – another international initiative working towards making clean energy accessible and affordable – were held jointly with the G20 Energy Transition Ministerial Meeting in Goa. Energy transition is one of the 13 priority areas of the Sherpa track under India's presidency.

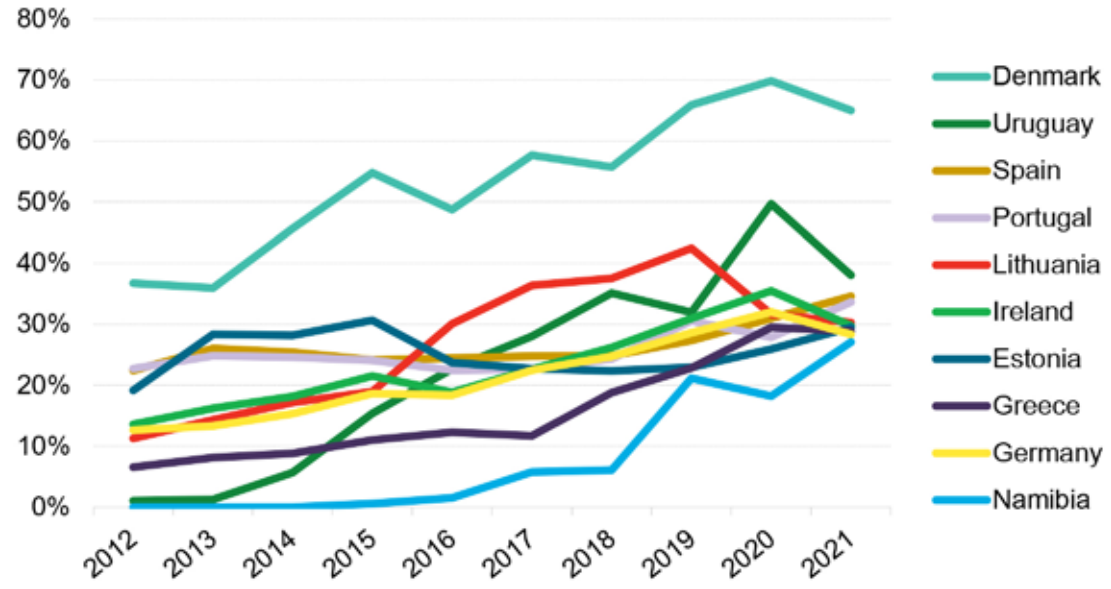
With all the G20 countries, except Mexico, and the invited ones, 28 countries participated at the Goa ministerial. The ministerial released factbooks and documents during the sessions and the final outcome document at the close of the event.

Snippets from CEM14 outcome document

BloombergNEF released a factbook produced exclusively for CEM14, illustrating the world's progress on the transition to net zero emissions (The report can be accessed at https://assets.bbhub.io/professional/sites/24/CEM-Factbook_2023.pdf). It identifies trends in the development and deployment of clean energy, including wind power, photovoltaics, electric vehicles and technologies in earlier stages of development, such as hydrogen and sustainable aviation fuels. The report also serves as a roadmap on the path to achieving net-zero emissions from clean energy by mid-century.

- In 2022 CEM members, including the European Union, attracted an investment of USD 1 trillion for energy transition technologies, which is a new record, and a 34% increase from 2021. The major investments were in renewables, power storage and electric vehicles.
- The renewable energy sector employed 12.7 million people in 2021 directly and indirectly.
- Solar and wind are expected to become the cheapest technologies by 2030 due to decreasing capex and improved efficiency in wind and solar.
- As the global economy recovered from the pandemic in 2021, CO2 emissions from the power sector jumped 7% from the previous year and reached a new all-time high of 13,601 million metric tons of carbon dioxide equivalent (MtCO2e). The total far surpassed the previous pre-pandemic high of 13,305 MtCO2e set in 2018. The jump was due to record volumes of generation from coal and natural gas in 2021.
- Installations of residential, commercial, industrial and utility-scale solar rose to 182 GW in 2021, a 26% increase from the previous year. However, wind power capacity addition of 90 GW was a 7 GW decrease from 2020.
- In 2021 10 nations met over a quarter of their electricity demand with wind and solar power, with Denmark leading at 65%. Most nations where the share of wind/solar is above 25% are in Europe, with the exception of Uruguay (38%) and Namibia (27%).

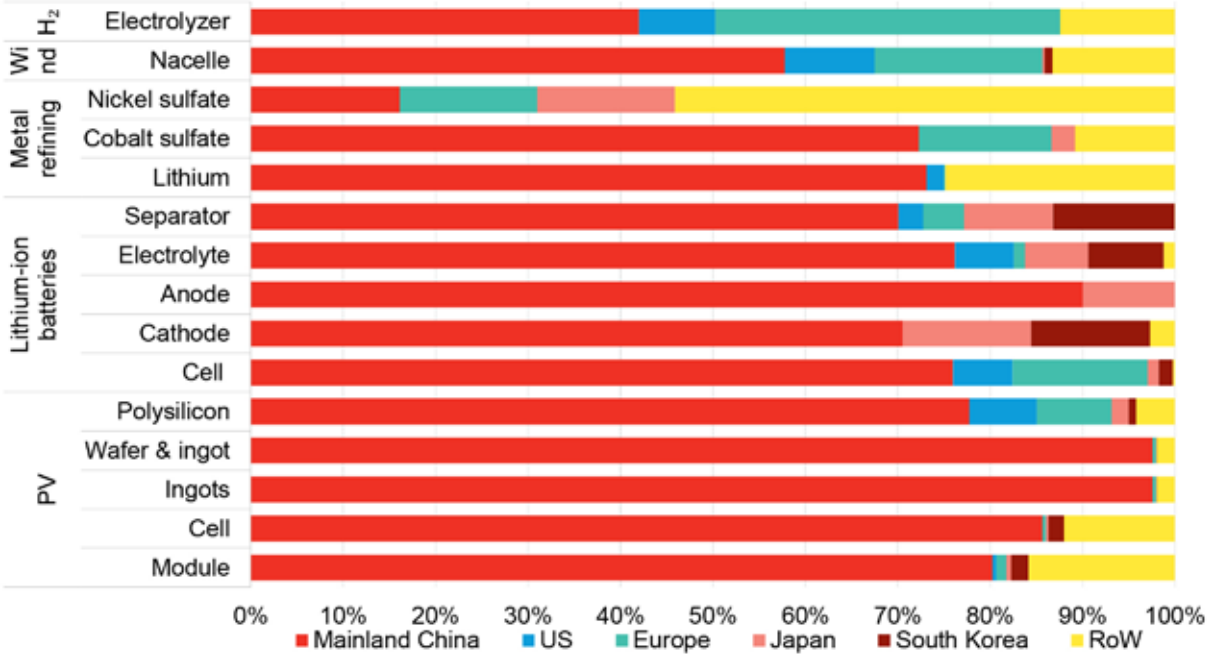
The world's top 10 nations for wind/solar penetration through 2021



Source: BloombergNEF

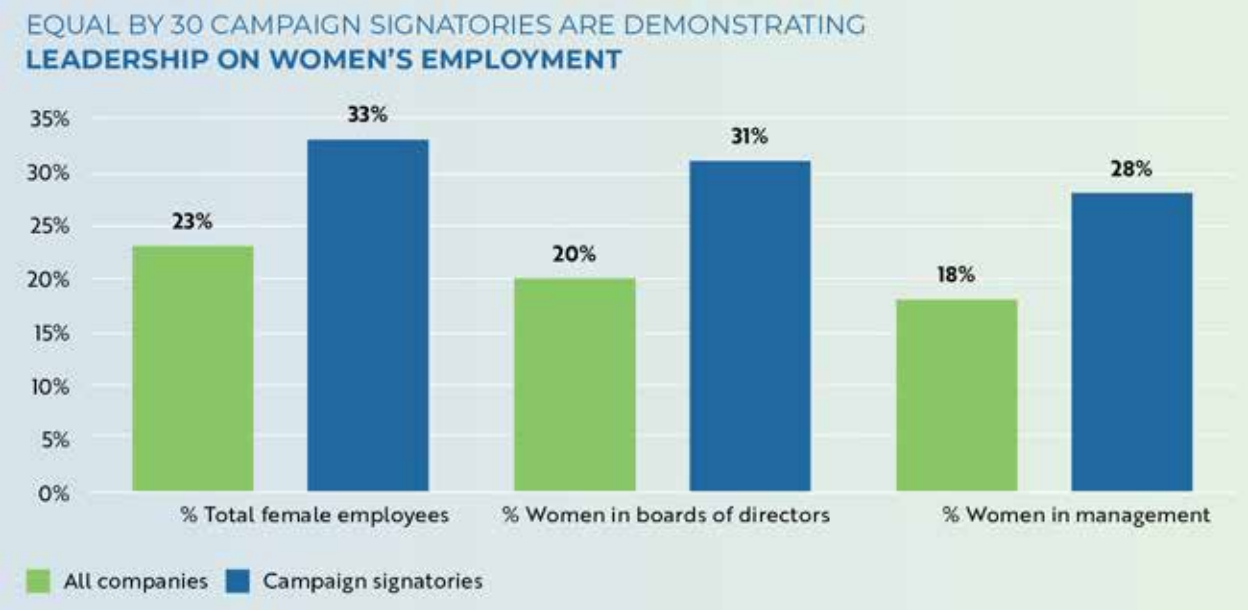
- Mainland China remains the dominant player in most segments of the battery and solar value chains. The global supply chain for wind turbine manufacturing is more geographically dispersed.

Clean energy manufacturing capacity by location, 2022



Source: BloombergNEF

- Brazil operates onshore wind projects with some of the highest capacity factors in the world. An impact report was also released during the ministerial. Some of the CEM impacts include preparing the world's workforce for an inclusive clean energy economy through its Empowering People Initiative; matching policymakers in developing countries and emerging economies with international policy experts, through CEM's Ask an Expert service, helping them identify and implement clean energy policy and finance solutions; and working towards equal pay, equal leadership and equal opportunities for women in the sector by 2030 through Equal by 30 Campaign launched at CEM9 in 2018 – CEM data indicating that the total number of women employees, women in management and women on boards of directors are more in the campaign signatories.



Source: CEM

One of the highlights of CEM14 was the joint declaration by 14 countries and launch of the International Hydrogen Trade Forum (IHTF) that will provide a platform to foster the dialogue between a wide group of governments on the nascent international hydrogen market. The governments acknowledge the pressing need to reduce greenhouse gas emissions and the vital role that hydrogen will play in shaping the global energy mix and building resilient economies.

Global cooperation and coordination are identified as critical elements to share valuable knowledge, experiences, best practices, and promote research, innovation and demonstration, while conforming to the rules of the World Trade Organization. In addition, the governments committed to supporting the Sustainable Development Goals by encouraging policies and regulations that promote the production, consumption and transborder trade of hydrogen as a reliable, clean and vital solution within the global energy system.

Recognising the critical role of decarbonised power systems in their overall decarbonisation goals, India, Australia, Chile, the European Commission and the United Kingdom announced the release of their decarbonisation action plans.

India's decarbonisation plan for the power sector (It can be accessed at https://www.nrel.gov/docs/fy23osti/86638.pdf) includes enhanced RE capacity of 500 GW by 2030, renewable purchase obligation

trajectory till 2030, replacing 58TWh of thermal energy by 30 GW of RE by 2026, enhancing transmission system to integrate 500 GW of RE by 2030 – this includes evacuation of 10 GW of offshore wind, and moving towards faster and granular scheduling and dispatch.

To take advantage of existing synergies, CEM and MI workstreams on power have agreed to further strengthen collaboration, including the organisation of joint webinars and regional workshops to share best practices and lessons.

The International Energy agency (IEA) launched Clean Energy Progress Report and Clean Energy Technology Guide.

ReNew Energy Global Plc signed MoUs worth Rs 640 billion with Power Finance Corporation (PFC) and Rural Electrification Corporation (REC) for its green energy projects during CEM14. Juniper Green Energy signed an MoU worth Rs 50 billion with PFC.

The G20 ministers adopted the outcome document and the Chair's summary at the end of the ministerial. There was consensus among the members that this document would form the basis for deliberations at COP28.

Wind pattern and power generation in Tamil Nadu – June 2023

Rainfall: As per historical data, the average Tamil Nadu sub-division rainfall expected in June was 50.7 mm; but recorded excess of 6% with 53.5 mm, which is a lower spell, compared to the last three years.

Western Ghats' wind pass-wise districts rainfall recorded were:

- Palakkad-Coimbatore 75.3 mm (-56%)
- Kambam-Theni 24.8 mm (-21%)
- Sengottai-Tenkasi 7.2 mm (-85%)
- Aralvaimozhi-Tirunelveli 7.0 mm (-70%)
- Palk Strait-Thoothukudi 10.9 mm (+79%)

Year	2022	2021	2020	2019	2018	2017	2016
Rainfall in mm	79.1	62.3	59.6	33.6	50.8	47.6	63.0

Historic rainfall

Wind activity during the month

- Cyclonic circulations: In June 2023, extremely severe cyclone Biparjoy named by Bangladesh – the name meaning is disaster in Bengali. It formed over Arabian Sea during 6 to 19 June. The remnants of cyclonic storm Biparjoy continued as a well-marked low pressure area and moved slowly from central parts of east Rajasthan to central parts of Uttar Pradesh across northwest Madhya Pradesh during 20 to 25 June, which helped establishment of the easterly/ southeasterly winds across north India. Southern peninsular region, especially in Tamil Nadu passes, wind pattern was affected slightly during the cyclone.

- El-Niño Southern Oscillation (ENSO): El Niño conditions were observed. Equatorial sea surface temperatures (SSTs) were above average across the east-central and eastern Pacific Ocean. The tropical Pacific atmospheric anomalies were consistent with weak El Niño conditions. El Niño conditions are expected to gradually strengthen into the Northern hemisphere winter 2023-24. The most recent Oceanic Nino Index (ONI) value (April '23 to June '23) is 0.5°C and for the Month of June, the value is 0.81°C.

- Indian Ocean Dipole (IOD): At present, neutral Indian Ocean Dipole (IOD) conditions are seen over Indian Ocean. The latest value for June is 0.17°C.

- Madden Julian Oscillation (MJO): The MJO index exists between phases 1 and 3 with an average amplitude of 1.23 for entire month of June 2023.

- Pass-wise average wind speed: Wind passes like Palakkad, Sengottai and Aralvaimozhi recorded average wind speeds of 8.5 m/s, 9.8 m/s and 7.3 m/s, respectively. However, the light peak average wind speed of Palakkad and Sengottai passes were 10 m/s. The maximum wind speed was 13.1 m/s at the Sengottai Pass on 10 June 2023.

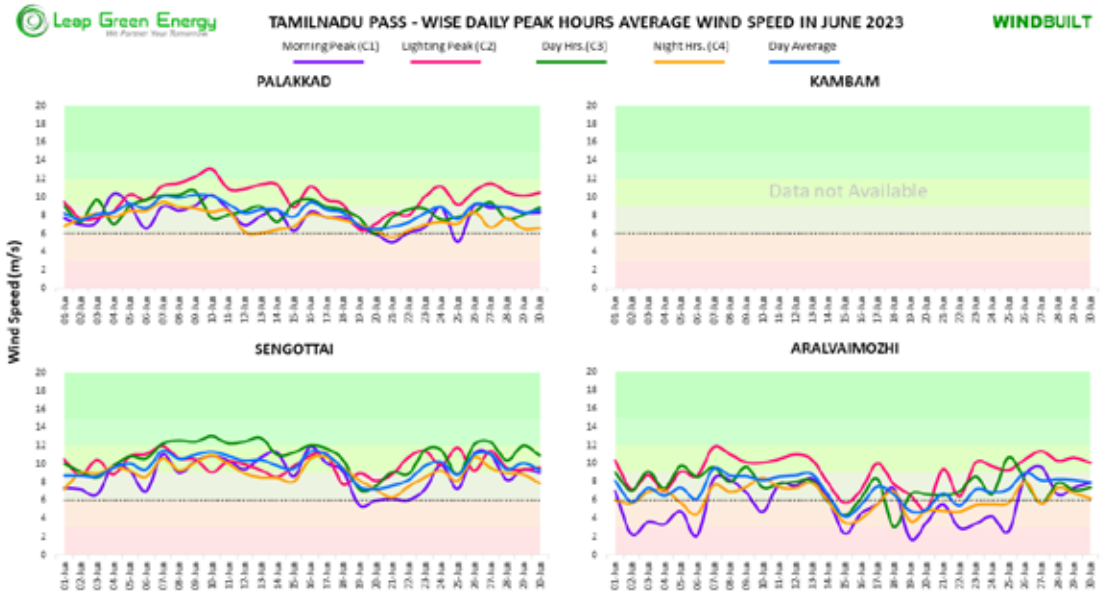


Image 1. Average peak wind speed

Wind power generation

Wind power evacuation during June 2023 contributed to 21.5% of Tamil Nadu's total energy demand met.

- Maximum generation: The maximum evacuation was 107.29 MU on 07 June, which accounted for 27.4% of the demand met.
- Minimum generation: The minimum evacuation was 41.23 MU on 20 June, which accounted for 11.9% of the demand met.

For four days the generation was above 100 MU, for 16 days it was between 75 and 100 MU, for seven days the generation was between 50 and 75 MU and for the remaining three days, it was between 20 and 30 MU.

Wind direction

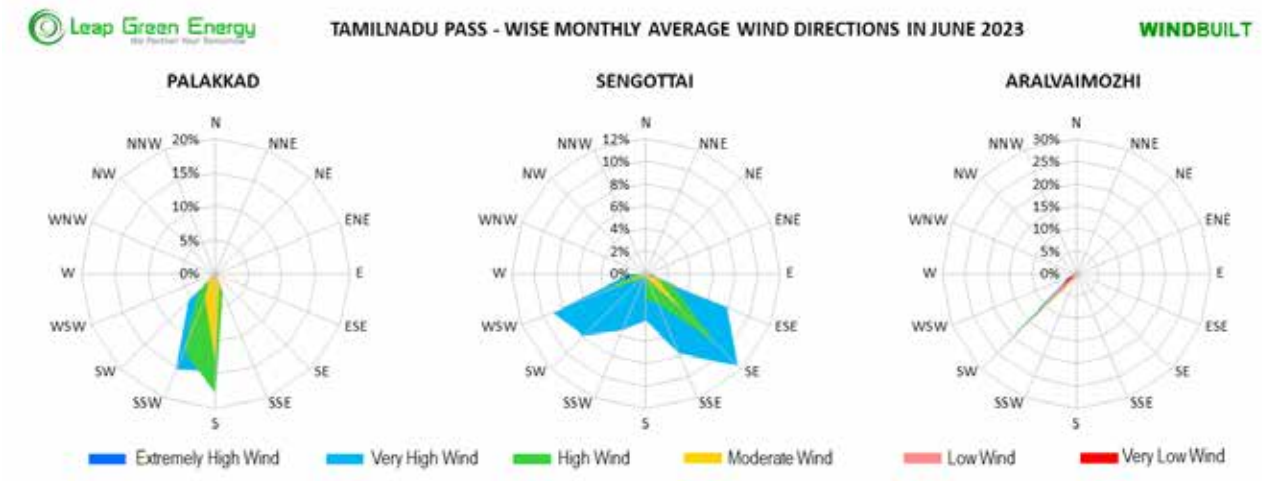
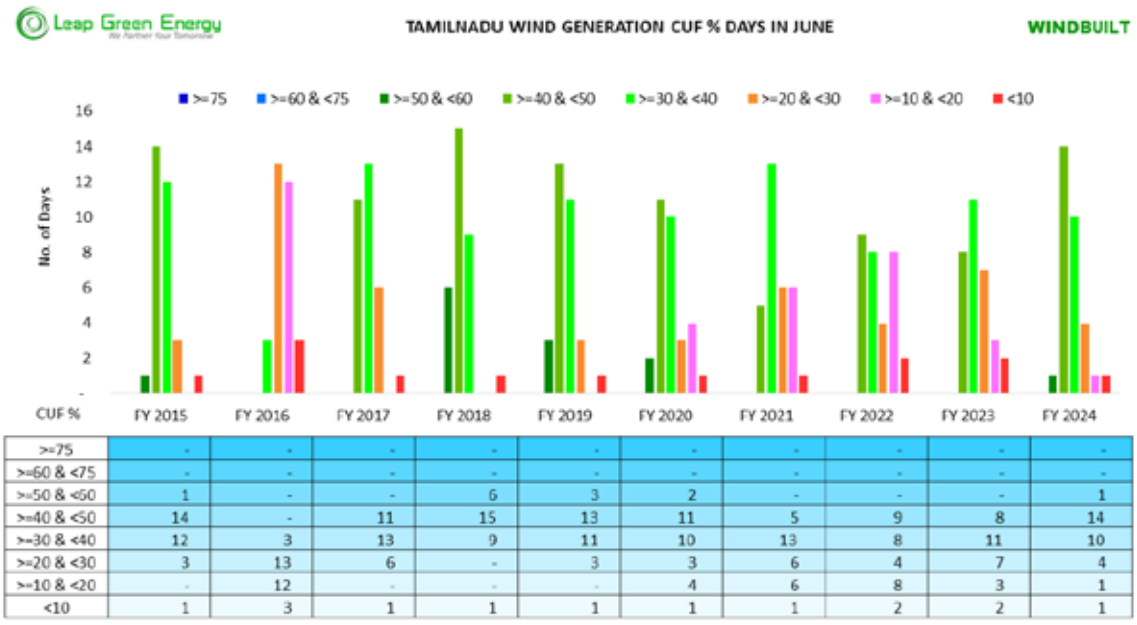


Image 2. Average wind direction


SUZLON

Palakkad Pass wind directions covered were 47.5% in the south, 35.1% in SSW and 10.9% in SW. In Sengottai Pass, they were 26.67% in SE, 15.5% in WSW and 13.2% in SSE. In Aralvaimozhi Pass the wind directions were 90.2% in SW, 5.9% in WSW and 3.3% in SSW.

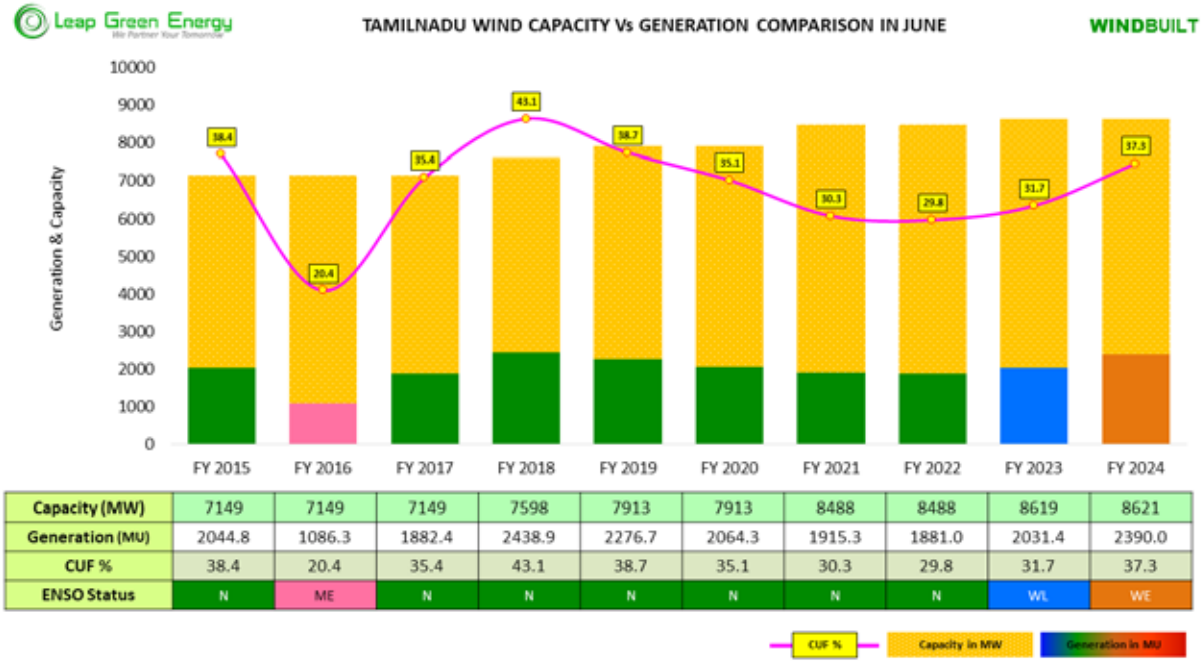
Capacity utilisation factor (CUF)



CUF %	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
>=75	-	-	-	-	-	-	-	-	-	-
>=60 & <75	-	-	-	-	-	-	-	-	-	-
>=50 & <60	1	-	-	6	3	2	-	-	-	1
>=40 & <50	14	-	11	15	13	11	5	9	8	14
>=30 & <40	12	3	13	9	11	10	13	8	11	10
>=20 & <30	3	13	6	-	3	3	6	4	7	4
>=10 & <20	-	12	-	-	-	4	6	8	3	1
<10	1	3	1	1	1	1	1	2	2	1

Image 3. CUF frequency

As regards capacity utilisation factor, on one day the evacuation was between 50 and 60%, for 14 days the evacuation was between 40 and 50%, for 10 days the evacuation was between 30 and 40%, four days it was between 20 and 30%, on one day it was between 10 and 20% and on the remaining one day the evacuation was less than 10%.



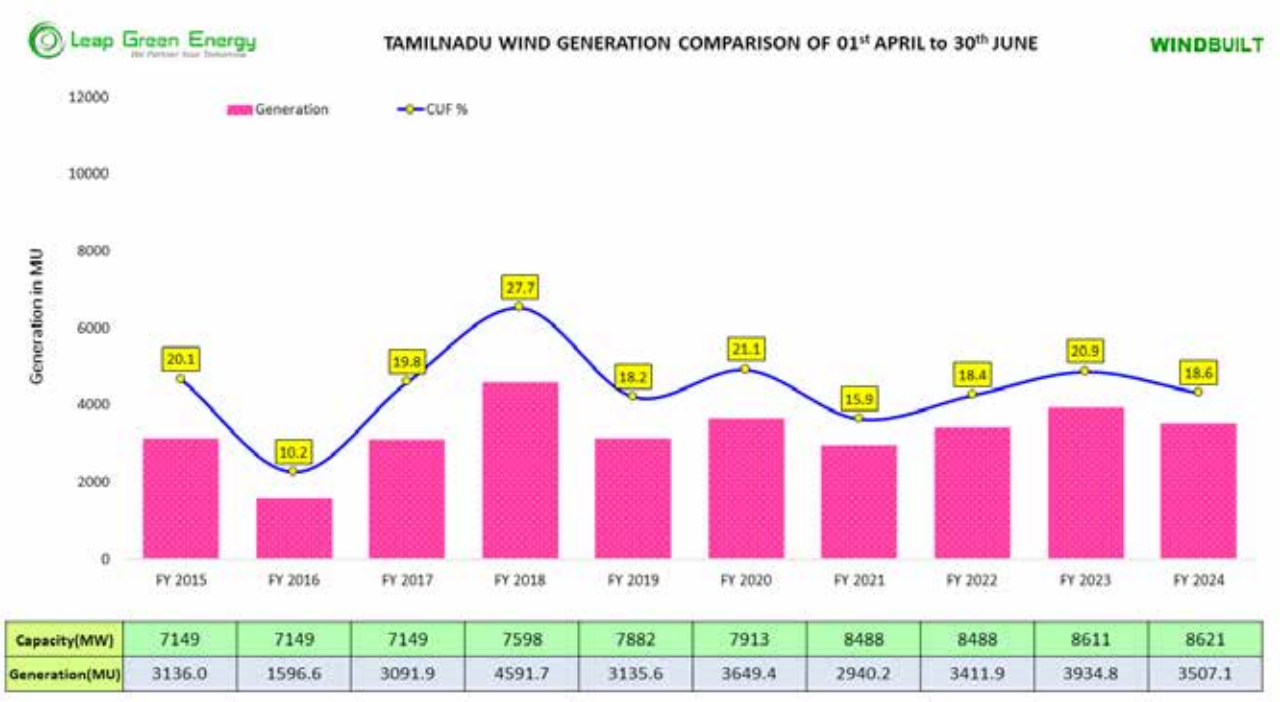
Capacity (MW)	7149	7149	7149	7598	7913	7913	8488	8488	8619	8621
Generation (MU)	2044.8	1086.3	1882.4	2438.9	2276.7	2064.3	1915.3	1881.0	2031.4	2390.0
CUF %	38.4	20.4	35.4	43.1	38.7	35.1	30.3	29.8	31.7	37.3
ENSO Status	N	ME	N	N	N	N	N	N	WL	WE

Image 4. Monthly generation comparison

During June 2023, 2,390 MU of wind energy was evacuated from Tamil Nadu, which is 37.3% of CUF, which is 17.6% higher than the CUF of June 2022.

Cumulative year-wise comparison

During FY 2024, 3,507.1 MU of wind energy has been evacuated, which amounts to about 18.6% CUF of the total installed capacity of 8,621 MW.



Capacity(MW)	7149	7149	7149	7598	7882	7913	8488	8488	8611	8621
Generation(MU)	3136.0	1596.6	3091.9	4591.7	3135.6	3649.4	2940.2	3411.9	3934.8	3507.1

Image 5. Year-wise generation comparison

Energy consumption comparison

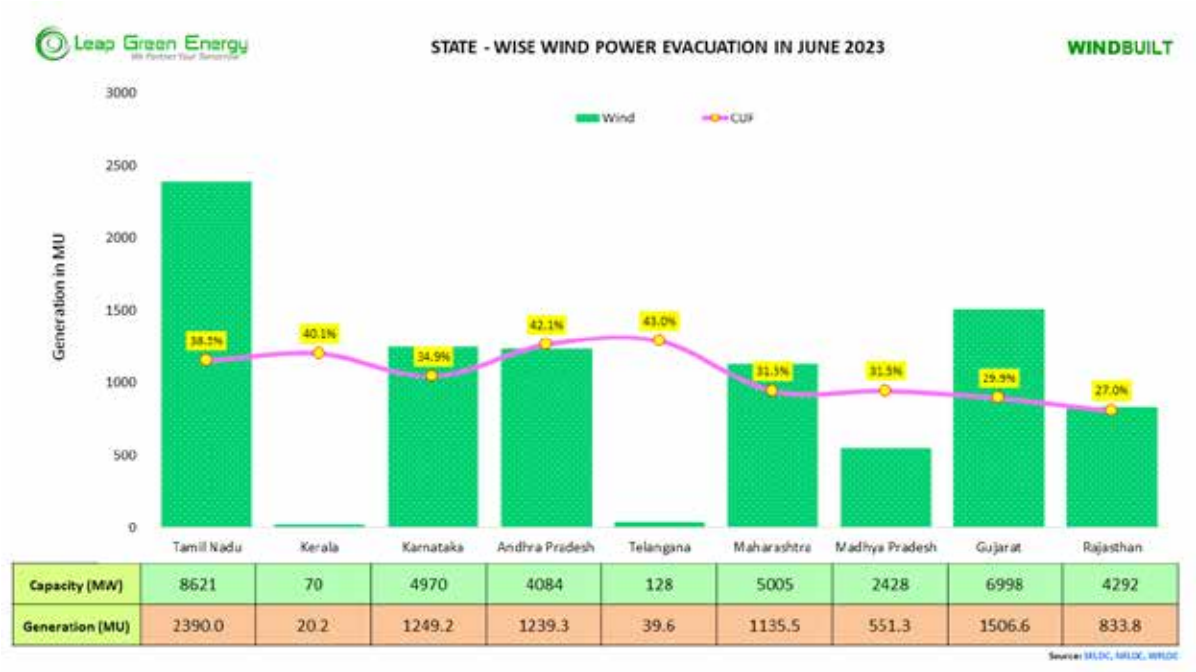
As regards the energy utilisation of Tamil Nadu, 42.9% of energy was taken from the central grid, followed by wind at 21.5%, thermal at 21.3%, solar at 7.6%, other resources like bio-mass and co-generation at 2.8%, hydro at 2.4% and gas at 1.4%.

In June, the energy consumption was 11,102 MU and 7% higher than that last year.

- Maximum consumption: The maximum consumption was 405.57 MU on 16 June 2023.
- Minimum consumption: The minimum consumption was 336.3 MU on 25 June 2023.

State-wise wind power evacuation

In June 2023, Telangana had the maximum wind power capacity utilisation of 43%, followed by Andhra Pradesh at 42.1%, Kerala at 40.1%, Tamil Nadu at 38.5%, Karnataka at 34.9%, Madhya Pradesh at 31.5%, Maharashtra at 31.5%, Gujarat at 29.9%, and Rajasthan at 27%. An aggregate quantum of 8,965.5 MU was evacuated, which was 34% CUF of the total state grid installed capacity of 36,596 MW of wind power in the country.



	Tamil Nadu	Kerala	Karnataka	Andhra Pradesh	Telangana	Maharashtra	Madhya Pradesh	Gujarat	Rajasthan
Capacity (MW)	8621	70	4970	4084	128	5005	2428	6998	4292
Generation (MU)	2390.0	20.2	1249.2	1239.3	39.6	1135.5	551.3	1506.6	833.8

Image 6. State-wise generation comparison

Reduction in carbon emission and water consumption

Wind power generation in Tamil Nadu during June 2023 has resulted in reduction of carbon emission and water consumption of about 22,29,248 tonnes and 1,737 million litres, respectively. Cumulative reduction of carbon emission and water consumption of 32,71,261 tonnes and 2,022 million litres respectively during FY 2024.

Feedback & queries: prabhu@leapgreenenergy.com

CEM14 / G20 Snippets

We (G20 ministers) agreed that the pace of energy transitions needs to be increased. 85% of all capacity additions in the past year has been in renewables. We emphasised the need for sharing of technology and for low-cost financing especially for developing countries so that no one is left behind

– Minister for New and Renewables Energy R K Singh

Wind pattern and power generation in Rajasthan – June 2023

Rainfall: In June, 152.3 mm and 162.7 mm rainfall were recorded at west Rajasthan and east Rajasthan respectively, against a normal of 39.4 mm and 74.7 mm, which is the historical heaviest rainfalls in June month. In west Rajasthan, 143.3 mm of rainfall recorded in 1996 and in east Rajasthan 171.3 mm recorded in 1971 were the highest.

Wind speed: The average wind speed was 6.3 m/s in Jaisalmer and 6.8 m/s in Jodhpur regions. While comparing the last year Jaisalmer wind speeds were very less and Jodhpur wind speed was normal. Last year the average wind speeds recorded were 7.8 m/s and 6.6 m/s in Jaisalmer and Jodhpur regions, respectively. However, maximum average wind speed sustained was 14.2 m/s at night peak on 17 June at Jodhpur region.

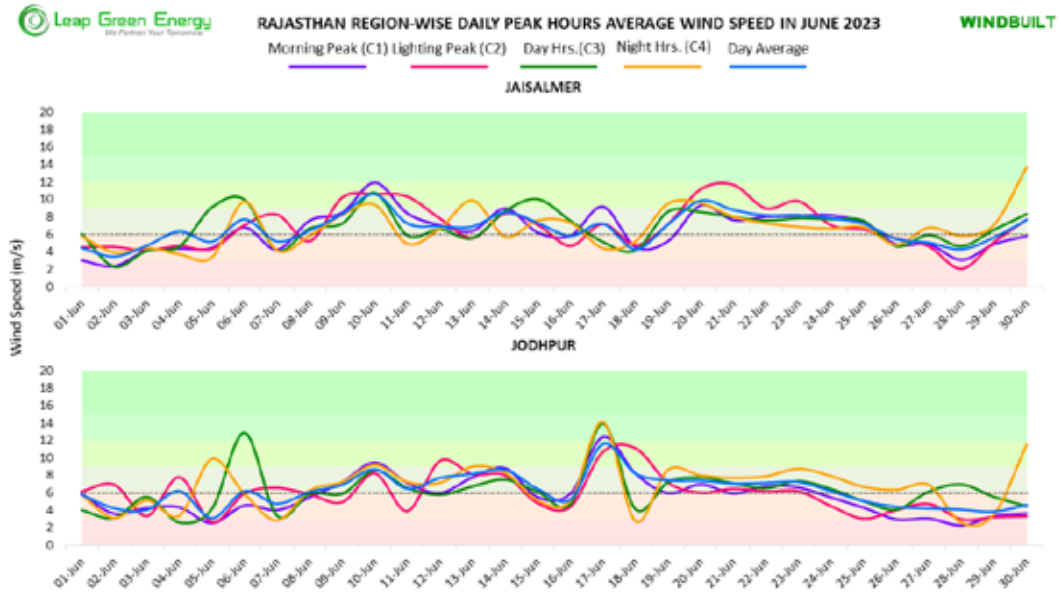


Image 1. Wind speed

Wind direction

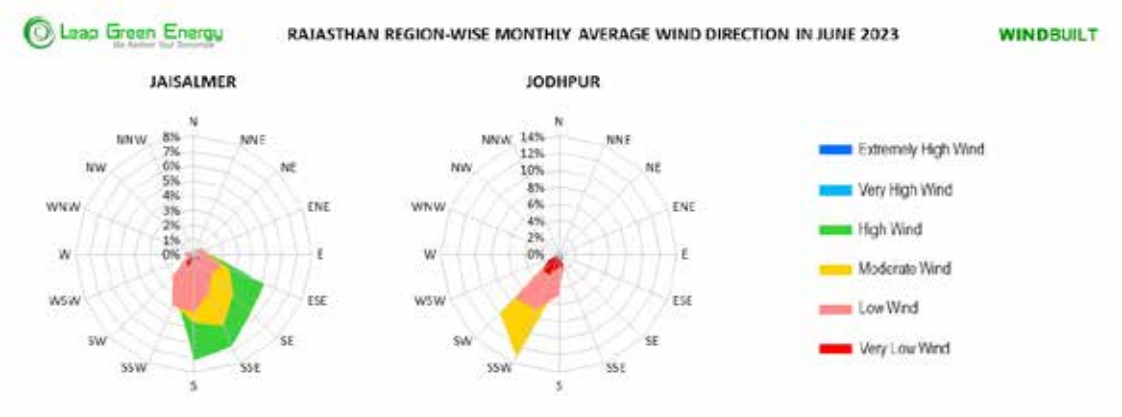


Image 2. Wind direction

In June, Jaisalmer region wind directions were 20.5% in the south, 20.3% in SSE and 15% in SE. Jodhpur region wind directions were 42.5% in SSW, 30.1% in SW and 12% in the south.

Wind generation

In June 2023, 833.8 MU of wind energy was evacuated in Rajasthan, which contributed to an average of 10.3% of the state's total electricity demand met.

- Maximum generation: The maximum evacuation was 52.56 MU on 17 June, which accounted for 20.6% of the demand met.
- Minimum generation: The minimum evacuation was 7.44 MU on 02 June, which accounted for 3.1% of the demand met.
- CUF: The wind capacity utilisation factor for June worked out to 27% and FY 2024 it was 21.6%.

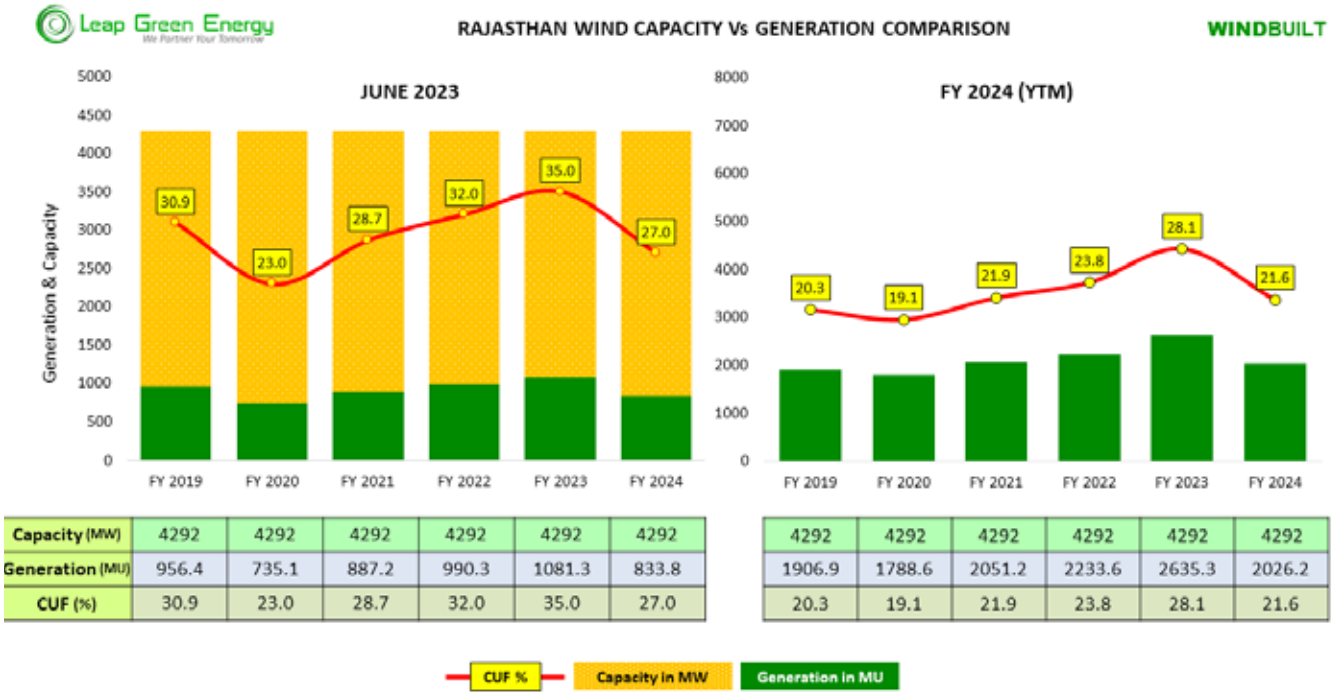


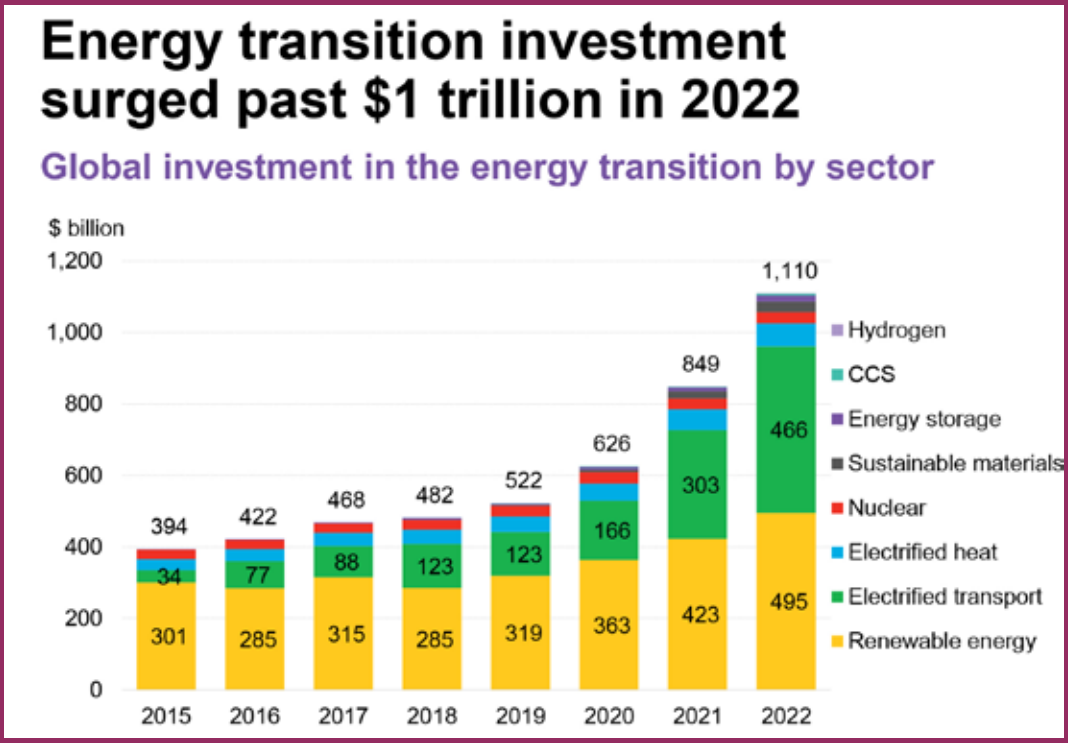
Image 3. Monthly generation comparison

Reduced carbon emission and water consumption

The wind generation for June 2023 has resulted in reduction of carbon emission and water consumption of about 7,77,746 tonnes and 290 million litres respectively. The cumulative reduction for FY 2024 is 18,89,957 tonnes of carbon emission and 607 million litres of water consumption.

Feedback & queries: prabhu@leapgreenenergy.com

CEM14 / G20 Snippets DataSpeak



Source: BloombergNEF

Ministries' announcements

Summary of announcements that pertain to the wind industry, made by various ministries

DATE	MINISTRY	DETAILS
20 July, 2023	NITI Aayog	**NITI Aayog unveils climate – energy dashboard** NITI Aayog has released version 3.0 of the India Climate Energy Dashboard (ICED). The ICED is the country's one-stop platform for near real-time data on the energy sector, climate and related economic datasets based on government published sources. Developed as a user-friendly platform, ICED 3.0 enables users to access and analyse datasets using an analytical engine. It will facilitate insights and enhance understanding about the energy and climate sectors while identifying the key challenges. This dashboard offers more than 500 parameters, over 2000 infographics, and a number of interactive visualizations, allowing users to gain a holistic understanding of India's energy sector. Source: https://pib.gov.in/PressReleasePage.aspx?PRID=1941095
20 July, 2023	NITI Aayog	**NITI Aayog releases tool to assess energy transition journey** NITI Aayog has released a revamped India Energy Security Scenarios (IESS) 2047 (IESS 2047 V3.0) to assess the integrated impact of various green energy policies of the government. An open-source tool, IESS incorporates several policies related to alternative energy resources like green hydrogen, energy storage, renewable purchase obligations, PM-KUSUM, offshore wind strategy, energy efficiency, etc. Assessing the demand and supply of energy in the country, the tool helps in analysing emissions, cost, land, and water requirements till 2047. Designed with the help of IIT Bombay, the revamped IESS 2047 will be updated on yearly basis. With an aim of making this technology available to the people, this version of IESS is easily downloadable and facilitates users to generate their own pathways. It will help researchers and think tanks to develop user-specific scenarios and the option of customised applications on the basis of share of industry, population, pace of urbanisation, end-use energy demand etc. Source: https://pib.gov.in/PressReleasePage.aspx?PRID=1941098
28 June, 2023	Ministry of Power	**Government issues resource planning framework** Government has issued Guidelines for Resource Adequacy Planning Framework for India, in consultation with Central Electricity Authority (CEA). The guidelines, issued by the Ministry of Power, have been framed under Rule 16 of Electricity (Amendment) Rules, 2022 which were notified on 29 December, 2022.

DATE	MINISTRY	DETAILS
		Government has issued Guidelines for Resource Adequacy Planning Framework for India, in consultation with Central Electricity Authority (CEA). The guidelines, issued by the Ministry of Power, have been framed under Rule 16 of Electricity (Amendment) Rules, 2022 which were notified on 29 December, 2022. The guidelines will ensure that sufficient electricity is made available to power the country's growth, by putting in place a framework for advance procurement of resources by discoms to meet the electricity demand in a cost-effective manner. New generation capacities, energy storage and other flexible resources, needed to reliably meet future demand growth at optimal cost, will be assessed well in advance. The guidelines also provide for the number of years before which the procurement process by discoms must be completed for each type of generation, so that the procured capacity becomes available when it is required to serve the projected load. The National Load Dispatch Centre (NLDC) shall prepare a detailed annual operational plan considering the planned maintenance schedules of existing generating stations. Similar to NLDC, all SLDCs will also prepare detailed annual operational plans These plans shall also factor in the renewable purchase obligations (RPOs) mandated for the obligated entities to promote RE capacity addition. The guidelines can be accessed at https://static.pib.gov.in/WriteReadData/specificdocs/documents/2023/jun/doc2023628218801.pdf Source: https://pib.gov.in/PressReleasePage.aspx?PRID=1936026

CEM14 / G20 Snippets

We must find ways to bridge technology gaps, promote energy security and work on diversifying supply chains. We must strengthen collaboration on the 'fuels for the future'. Trans-national grid interconnections can enhance energy security. We are promoting this mutually beneficial cooperation with our neighbours in this region, and we are seeing encouraging results. Realising the vision of inter-connected green grids can be transforming. It will enable all of us to meet our climate goals, stimulate green investment and create millions of green jobs

– PM Narendra Modi

IWPA's representations

- Indian Wind Power Association wrote to the chief minister of Tamil Nadu on 18 July, 2023, requesting extension of banking to windmills that have completed 20 to 30 years of life. Backed by data, pointing out how wind evacuation has increased, and detailing the importance of banking of energy, IWPA requested that annual banking be allowed for wind turbines that are older than 20 – 30 years.

- IWPA wrote to the Central Electricity Authority on the draft paper on reconductoring of transmission lines in ISTS on 17 July, 2023. While agreeing that reconductoring is a boon for repowering of wind and wind-solar projects, IWPA requested that the developers be permitted to do reconductoring of their existing dedicated transmission / interfacing transmission lines. IWPA sought that the reconductoring of line and upgradation of bay equipment in such cases be carried out by the licensee simultaneously.

- IWPA submitted its comments on the Draft Tamil Nadu Electricity Regulation Commission (Renewable Energy Purchase Obligation) Regulations, 2023, to TNERC on 14 July, 2023. IWPA sought a revision in the definition of renewable sources, to indicate non-conventional, inexhaustible sources that can be replenished. IWPA sought that the third proviso of Regulation 3(d) to clearly indicate that the obligated entities who have not complied with the RPO due to court cases or any other reason may be exempted till the final judgement. The fourth proviso of Regulation 3(d) regarding fulfilling the unfulfilled RPO of previous years was requested to be modified. With an extensive explanation, IWPA sought the revision of the fifth proviso of Regulation 4(1) about energy banked to a distribution licensee to be considered as sale and accounted for RPO. Suggestions and revisions were also shared regarding renewable energy for which generators / prosumers do not claim RECs to be counted RPO fulfilment by the distribution licensee; the minimum percentage for RPO for different sources; storage obligation.

- Citing the expected difficulties in evacuating wind power due to proximity of defence airbase, IWPA wrote to MNRE, requesting the relocation of 765 / 400 / 220 kV PGCIL P/S proposed north of Bidar, to a site closer to Kalaburagi.

- IWPA wrote to Tamil Nadu Transmission Corporation Ltd on 30 June, 2023, regarding loss in evacuation of wind energy due to problems at the substations. It was pointed out that despite TANGEDCO collecting sizable amounts for operation and maintenance, WEG owners were expected to repair transformers and substation equipment at their own expense. Listing the substations that needed to be restored, IWPA requested enhancing the capacities of substations that were unable to handle the loads during high wind season. IWPA also requested restoration of annual banking to WEGs that have completed 20 / 25 years of life, as directed by the High Court of Madras.

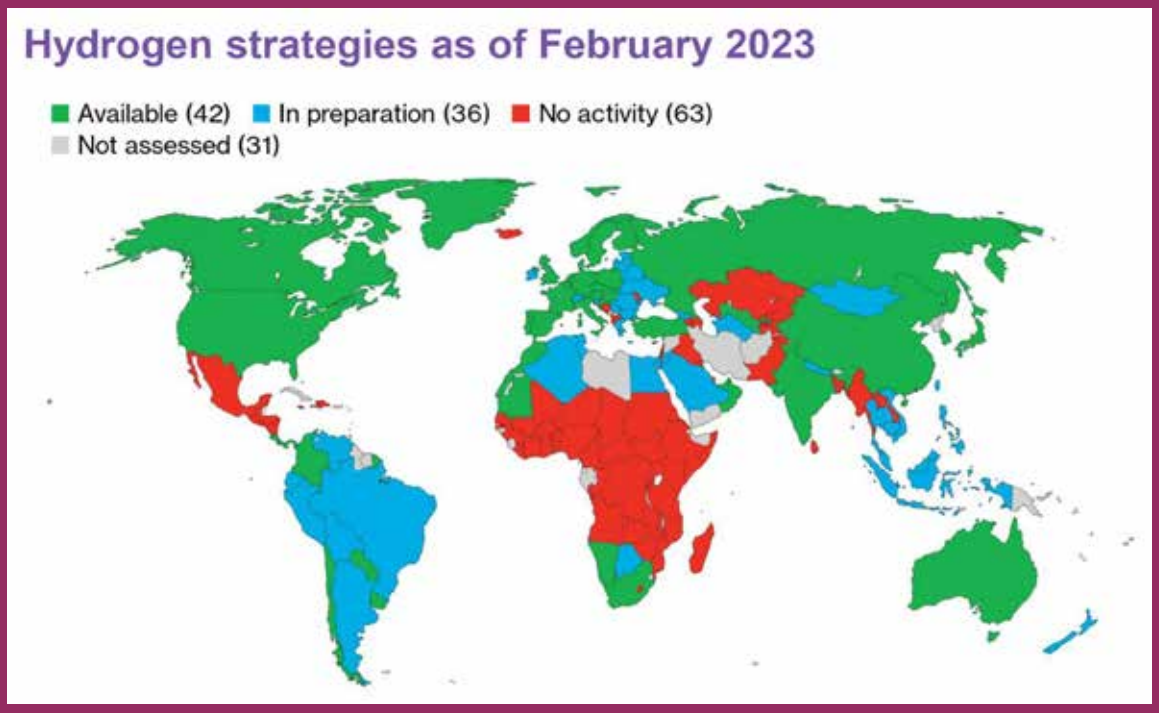
- Citing the exact revenue loss to the government because of problems in some of the substation and transmission infrastructure pending for many years, IWPA wrote to TANGEDCO and TANTRANSCO on 28 June, 2023, requesting that the issues be attended to, to ensure evacuation of wind energy.

CEM14 / G20 Snippets

G20 members have agreed upon the identified technological gaps for energy transition, namely, carbon capture, utilisation and storage (CCUS), biofuels, small & modular reactors, green and low carbon hydrogen

– Additional Secretary Ajay Tiwari, Ministry of Power

CEM14 / G20 Snippets DataSpeak



Source: BloombergNEF

INDIAN WIND POWER ASSOCIATION

IWPA

helping mankind with energy from nature

KNOW IWPA

IWPA is a pan India Association of manufacturers, investors, generators, service providers and consumers of wind energy with more than 1400 members who have around 26 GW of wind energy installations in India. It has offices in seven wind rich states viz., Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Rajasthan, Tamil Nadu and Telangana.

Mission and Objectives of IWPA

To create an enabling regulatory and policy environment for investment in the wind energy sector, thereby supporting the national goals of energy access at affordable prices, economic development of India's manufacturing capacity, energy security and independence and meeting the goals of greater sustainability.

Activities of IWPA

- Actively participate with government in formulation of policy, rules and regulations pertaining to the wind sector.
- To closely liaise with State, Central Government and other agencies on matters affecting the wind energy sector and the interest of its members.
- To promote and protect the common interests of members.
- To collect and disseminate statistical, technical and other information regarding wind energy sector through a monthly magazine and e-mails distributed to all members free of cost.
- To affiliate with organizations having similar objectives.

Where does IWPA function?

IWPA's National Office is based in Chennai with Regional / State Council offices at New Delhi, Mumbai, Bengaluru, Hyderabad, Ahmedabad and Jaipur.

Benefits of being a member of IWPA:

- IWPA offers suggestions / comments and steers policy formulation at the State and National level for the benefit of stakeholders.
- IWPA's views are taken cognizance of and factored in the policy decisions concerning the wind industry.
- Interests of the stakeholders are protected through representations and follow-up with appropriate Regulatory / Government bodies.
- Offers a protective platform to enable members to fight contentious issues legally in a collective forum at an affordable cost.
- The Association organizes International Conferences and Workshops which help members to keep in step with the latest trends and developments in the wind industry.
- Association's activities like the Annual General Meetings, National Council Meetings, Issue based Meetings in various state capitals not only facilitates the dissemination of information, but also helps in networking with professionals from the wind industry.

Who can become a member of IWPA?

- Generating Members / IPPs
- Manufacturing Members (machines / ancillaries)
- Service Providers (including consultants)
- Small Wind & Roof Top (Generators and Manufacturers)
- Educational & Research Institutions and other Promotional Bodies
- Financial Institution Members
- Honorary Members
- Associate Members
- Associations in India
- International Membership

How does IWPA function?

Registered under Societies Act, IWPA works on democratic lines with well conceived Bye-Laws and Rules. The National Council, comprising of elected members, give broad guidelines for the functioning of the Association. The State matters are pursued by the elected members of the State Councils. The National Council Meetings are held by rotation at all Regional / State Council centres.

Media bites

A summary of news that pertain to the wind industry

Media bites – National

ReNew and Gentari to collaborate for 5 GW RE capacity in India

26 July, 2023

ReNew Power (ReNew) and Gentari Renewables India – a clean energy company working towards net zero solutions – have finalised key terms to collaborate on a 50:50 joint venture in clean energy solutions.

As part of this proposed joint venture, Gentari and ReNew will collaborate to explore investments in developing renewable assets including solar, wind and energy storage, to achieve a target of 5 GW in renewable energy capacity in India. The collaboration between the parties follows Gentari's initial investment for a 49% equity stake in ReNew's 403 MW peak power project in May this year.

Source:https://www.windtech-international.com/projects-and-contracts/renew-and-gentari-announce-strategic-collaboration-for-5-gw-renewable-capacity-in-india

India to have 100 GW battery manufacturing capacity in a few years

19 July, 2023

The Ministry of Heavy Industries is planning to launch a new tender in August for setting up a 20 GW of battery energy storage capacity.

The government had earlier tried to award 50 GW capacity under the PLI scheme, but 20 GW of which remained unallotted. "For the 20 GW that went unallocated, fresh bids are being invited. We are holding a stakeholder consultation with the prospective bidders on 24 July and the tender should be in the public domain by 10 Aug," said Kamran Rizvi, Secretary, Ministry of Heavy Industries.

He was responding to a question asked by G20 Sherpa and former Niti Aayog CEO Amitabh Kant on the status of India's preparedness on battery capacity front, at a seminar on "Enabling Policies to Accelerate E-Mobility" as part of the 14th Clean Energy Ministerial (CEM) and Mission Innovation (MI) 8 meetings in Goa.

Rizvi said out of the 30 GW capacity that the government allotted in the beginning, 20 GW went to Ola Electric whose manufacturing plants are coming into production by the end of this year. “The other partner Reliance Industries has acquired the technology of Sodium Ion cells and their plant is also coming up," he said. "Additionally, private companies have also announced around 50 GW at their own initiative. So, around 100 GW of manufacturing capacity is lined up in the next 2-3 years.”

Rizvi also informed that the government is working on another proposal to manufacture 5 GW of niche technologies for battery manufacturing. The ministry is looking for 10 different technology partners who are working on these upcoming and niche technologies and the details will be in the public domain by September.

Source:https://energy.economictimes.indiatimes.com/news/power/india-to-launch-new-tender-for-20-gw-battery-manufacturing-capacity-by-10-aug/101946469

India's first trans-national power plant for Bangladesh commissioned

15 July, 2023

The Ultra Super-Critical Thermal Power Plant (USCTPP) at Godda, in Jharkhand, is India's first commissioned trans-national power project where 100% of the generated power is supplied to another nation.

Godda USCTPP with 1.6 GW capacity marks the Adani Group's entry into trans-national power projects. On 12 July, Adani Power Jharkhand Ltd (APJL), a wholly owned subsidiary of Adani Power Ltd, completed the Godda plant's dependable capacity test – a mandatory requirement under the power purchase agreement (PPA) with Bangladesh.

The first unit of 800 MW capacity of the Godda plant in Jharkhand began commercial operations on 6 April, and the second unit, also of 800 MW capacity, on 26 June. APJL will supply 1,496 MW from the Godda USCTPP under the PPA with the Bangladesh Power Development Board, executed in November 2017 for a period of 25 years, via a 400 kV transmission system connected to the Bangladesh grid.

"The USCTPP's commissioning in a record time of 42 months after achieving financial closure and obtaining the necessary clearances is noteworthy given the considerable logistical challenges the project encompassed, including the establishment of a 105 km-long 400 kV Double Circuit Transmission Line, the construction of a private railway line, and the implementation of an extensive water pipeline from the Ganges," the company said in a statement.

It added that the electricity supplied from the plant will have a positive impact on Bangladesh's power situation by replacing costly power generated by using liquid fuel.

Source: https://energy.economictimes.indiatimes.com/news/power/indias-first-trans-national-power-plant-of-1600-mw-capacity-commissioned-by-adani-group/101785678

Media bites – International

Octopus Energy to invest USD 20 billion in offshore wind

24 July, 2023

Octopus Energy's generation arm, which manages USD 7.7 billion worth of green energy projects globally, plans to invest USD 20 billion in offshore wind by 2030.

This will help generate 12 GW of renewable electricity per year, enough to power about 10 million homes.

Octopus is targeting projects across the globe, with a focus on Europe, and it already has several deals in the pipeline. It will back developers of new offshore wind farms as well as wind farms that are under construction or operational.

The global energy and technology group first entered the offshore wind farm market last year and has since made five offshore deals, amounting to a total of $1 billion (£800 million).

Source:https://www.offshore-mag.com/renewable-energy/article/14296765/octopus-energy-to-invest-20-billion-in-offshore-wind-by-2030

Goldwind installs turbine in Gantsu for low, medium speeds

24 July, 2023

Goldwind, the Beijing-based clean energy development and management company, has installed the Goldwind GWH204-6.X prototype in Gansu province. With a rotor diameter of 204 meters and a sweeping

area of up to 32,047 , it represents a new generation of smart wind turbines designed for low and medium wind speeds, with an extension capability of up to 7.5 MW.

The turbine is engineered to thrive in challenging environments, including deserts, mountains and large shear zones. It has a robust three-row pitch bearing and high-precision sensors to ensure safety. The turbine offers multiple tower options and features single-blade installation for enhanced operational flexibility.

Source: Goldwind

German TSO 50Hertz and ENERTRAG test reactive renewable power for grid stability

20 July, 2023

German transmission system operator (TSO) 50Hertz has launched a joint pilot project with ENERTRAG SE, an operator of renewable energy plants, near Bertikow in Brandenburg, to provide reactive power to the grid through renewable energy.

At Bertikow, wind turbines and other renewable generation systems with a total capacity of over 500 MW are connected to the nearby 50Hertz substation. Through the project, they will provide the reactive power necessary for voltage stability, thus ensuring overall grid stability, even when little wind feed-in is available.

Reactive power ensures the smooth transmission of electricity over long distances. It can be used to compensate for voltage losses during transmission so that as much active power as possible reaches the consumer and the grid functions safely and reliably.

Until now, reactive power has mainly been provided by conventional power plants while in operation. Under current regulations, renewable energy plants do not have to deliver reactive power in periods when they provide less than 10% of their active power. This presents a challenge for power grid operators as they have to compensate for the necessary reactive power with other technical systems in order to maintain voltage stability at these times.

However, modern wind turbines are also technically capable of providing reactive power, even when there is little or no wind. In the pilot project, ENERTRAG and 50Hertz want to test how reactive power activation works technically in practice and can be contractually designed, including with a view to a future reactive power market.

Source:https://www.smart-energy.com/industry-sectors/energy-grid-management/50hertz-and-enertrag-test-reactive-renewable-power-for-the-grid/

US announces prize to promote recycling of turbine materials

18 July, 2023

The U.S. Department of Energy's Wind Energy Technologies Office has launched the Wind Turbine Materials Recycling Prize, a USD 5.1 million competition administered by the National Renewable Energy Laboratory (NREL). This is part of Investing in America agenda. The prize is aimed at developing a cost-effective and sustainable recycling industry for two high-impact wind turbine materials, namely, fibre-reinforced composites and rare earth elements.

About 90% of the mass of a wind turbine is made of materials that can be commercially recycled. The bulk of the unrecycled materials is composed of fibre-reinforced composites, mainly carbon fibre and fibreglass, primarily used in the blades and the cover for the hub that connects the blades to the wind turbine.

The wind industry also depends on rare earth elements including neodymium and dysprosium, which do not currently have domestic commercial-scale recycling options.

The Department of Energy hopes to advance the nation's ongoing efforts at wind turbine materials recycling.

The prize seeks to promote collaboration among stakeholders to accelerate the development and commercialisation of wind turbine materials recycling technologies.

Source:https://www.renewableenergymagazine.com/wind/new-prize-to-propel-wind-turbine-materials-20230718

Denmark to invest $1.3 billion for offshore wind in Bangladesh

12 July, 2023

Danish companies Copenhagen Infrastructure Partners (CIP) and Copenhagen Offshore Partners (COP) have submitted a $1.3 billion investment proposal to the government of Bangladesh to produce 500 MW of offshore wind energy. The proposal has been placed in accordance with the Mujib Climate Prosperity Plan that works towards accelerating climate policies and actions.

The companies plan a utility-scale offshore wind project off the coast of the Bay of Bengal. CIP and COP have also proposed Summit Group, an infrastructure operator and developer in South Asia and independent power producer in Bangladesh, to join its consortium. The proposal comes at a time when Bangladesh remains heavily reliant on fossil fuel imports to meet its growing energy demand.

Once implemented, the offshore wind project will be the first of its kind in Bangladesh – and possibly South Asia, enabling a technology transfer that would accelerate the learning curve for a nascent industry and reduce barriers to entry for future projects, the company said.

Source:https://www.thedailystar.net/business/economy/industries/investments/news/denmark-proposes-13-billion-investment-produce-wind-energy-bangladesh-3367041

Capacity added in June 2023	574.10 MW
Capacity added in FY 2023-24 (April – June 2023)	1,139.955 MW
Operational installations as of June 2023	43,773.080 MW

S.No.	State	Installations March 2022	Installations March 2023	Apr-23	May-23	June-23	Total during FY 23-24	Total Operational in FY 23-24
1	Andhra Pradesh	4096.65	4096.65	0	0	0	0	4096.65
2	Gujarat	9209.22	9978.92	165.1	271.8	484.1	921	10899.92
3	Karnataka	5130.9	5294.95	0	8.1	10.5	18.6	5313.55
4	Kerala	62.5	62.5	0	0	0	0	62.5
5	Madhya Pradesh	2519.89	2844.29	0	0	0	0	2844.29
6	Maharashtra	5012.83	5012.83	13.5	0	54	67.5	5080.33
7	Rajasthan	4326.82	5193.42	0	0	0	0	5193.42
8	Tamil Nadu	9866.36	10017.165	56.35	51.005	25.5	132.855	10150.020
9	Telangana	128.1	128.1	0	0	0	0	128.1
10	Other	4.3	4.3	0	0	0	0	4.3
	Total	**40357.57**	**42633.125**	**234.95**	**330.9**	**574.1**	**1139.955**	**43773.080**

Source: Indian Wind Turbine Manufacturers Association

State-wise wind energy evacuation – June 2023

State	State-grid connected installed capacity in MW	June 23			FY 2023-24 Cumulative		
		Demand Met (MU)	Wind Energy (MU)	%	Demand Met (MU)	Wind Energy (MU)	%
Andhra Pradesh	4,084.00	7,112.78	1,239.06	17.42	20,928.85	2,114.28	10.10
Gujarat	6,494.00	11,759.00	1,564.40	13.30	37,964.00	4,055.95	10.68
Karnataka	4,970.00	7,383.38	1,249.00	16.92	23,573.58	2,211.96	9.38
Madhya Pradesh	2,424.00	7,233.80	561.60	7.76	21,828.10	1,328.70	6.09
Maharashtra	5,010.00	17,511.90	1,166.80	6.66	52,005.60	2,337.33	4.49
Rajasthan	4,292.00	8,133.03	833.82	10.25	23,700.84	2,026.22	8.55
Tamil Nadu	8,621.00	11,064.67	2,389.97	21.60	33,246.24	3,507.11	10.55
TOTAL	**35,895.00**	**70,198.56**	**9,004.65**	**12.83**	**2,13,247.21**	**17,581.55**	**8.24**

An IWPA compilation

Renewable energy update

RE capacity added in May 2023

Gujarat – wind : 272 MW
Gujarat – solar : 368 MW
Karnataka – solar : 236 MW
Tamil Nadu – solar : 65 MW
Rajasthan – solar : 32 MW
Kerala – solar : 10 MW

Monthly RE generation

RE generation in June 2023: 20,525 MU (up by 16.4% from May 2023). Solar generation decreased by 10% and wind generation increased by 57% in June 2023, on a month-on-month basis.

GTAM traded volume

Total traded volume in IEX: 66.69 MU in GTAM in June 2023 (28.72% less than in May 2023). Average GTAM trade price for June 2023: IEX – Rs 5.79/kWh.

Source: JMK Research & Analytics

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