CURRENT NEWS

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PASSIVE HOMES: SIMPLE RULES OF THE THUMB TO DO MORE WITH LESS ENERGY

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From early cave shelters to modern homes, buildings have evolved alongside human society. For centuries, dwellings worked in balance with nature, to remain comfortable with minimal energy use, while design was closely shaped by climate, weather, and daily living patterns. Over time, this approach shifted, and modern buildings increasingly began to dominate and reshape their surroundings rather than adapt to them.

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This shift accelerated with industrialisation and rapid urban growth. As electricity and fossil fuels became widely available, buildings came to rely heavily on mechanical systems for comfort, often replacing climate-responsive design with energy-intensive solutions. Today, buildings are among the largest consumers of electricity globally, accounting for nearly 30% of final energy use and around 26% of energy-related carbon emissions. While renewable energy solutions such as rooftop solar are gaining attention, overall electricity consumption in buildings continues to rise, revealing a critical gap in awareness and practice within the built environment. This indicates that clean energy generation alone is insufficient without parallel reductions in energy demand.

A key reason lies in the limited understanding and application of design approaches that reduce energy demand at the source. Awareness of natural energy principles rooted in climate, natural elements, and local knowledge remains low or largely absent in contemporary construction. This article addresses that gap to understand buildings as major energy consumers, and outlines simple, practical rules of the thumb for passive energy use in homes, focusing on climate and weather, basic natural elements, and time-tested local wisdom that can help homes do more with low energy.

Residential buildings (houses) consume a large share of energy because they rely on electricity for everyday needs such as lighting, cooling, cooking, water heating, and household appliances, resulting in a largely continuous energy demand compared to the transport and industrial sectors. In India, this trend is evident as total electricity use has reached about 1,694 billion units and peak demand has crossed 242 GW, with further growth expected. Although the country has over 509 GW of installed power capacity and rapidly expanding renewable energy, electricity generation remains largely coal-based, indicating that rising demand from buildings continues to outpace clean energy supply.

Table 1 shows that the residential sector accounts for the largest share of energy use among building types. Homes increasingly depend on electricity for cooling and appliances, especially as urbanisation, higher incomes, and rising temperatures drive greater use of fans and air-conditioners. Poor design choices, such as inadequate shading, improper orientation, limited ventilation, and inefficient materials, further increase energy demand by making homes rely heavily on mechanical cooling and lighting. As a result, much of the energy used in residential buildings is not due to necessity alone, but to design that fails to respond to climate and local conditions.

Table 1: Energy Use Across Building Types and Their Share in Global Final Energy Consumption

Sector	Typology	Energy Used for Daily Needs	Approx. Share of Global Final Energy Use
Buildings	Residential (homes, apartments)	Cooling, lighting, cooking, appliances, water heating	20–22%
	Commercial (offices, malls, hotels)	Cooling, lighting, lifts, equipment, data systems	8–10%
	Educational institutions (schools, colleges)	Lighting, ventilation, cooling, equipment	2–3%
	Health care (PHC, hospitals, clinics)	Cooling, lighting, medical equipment, hot water	2–3%

(Source: Tracking Buildings 2023, IEA; Global Status Report, UNEP, 2022)

Rule of the thumb # 1 - Climate is what you expect; Weather is what you get

Let us take Chennai as an example. Chennai has a hot and humid climate for most of the year, with strong sunlight and warm nights. This is what people can expect over time. The weather, however, changes from day to day, some days are extremely hot, some are cloudy, and others bring sea breezes or heavy rain during the monsoon. When homes in Chennai are built without considering the weather, we have homes that are built to keep out the heat, without allowing natural features like sea breeze to cool down a home. This forces people to rely heavily on fans and air-conditioners throughout the day even when they could have relied on a cool breeze to reduce temperatures within the home naturally. Trees that block direct heat, more windows to let air move and reduce humidity, and light-coloured roofs that reflect heat, are all features that can help residents stay comfortable even as the weather changes from day to day. Understanding both the climate and the weather helps homes stay cooler naturally, reducing the need for constant air-conditioning and lowering electricity use.

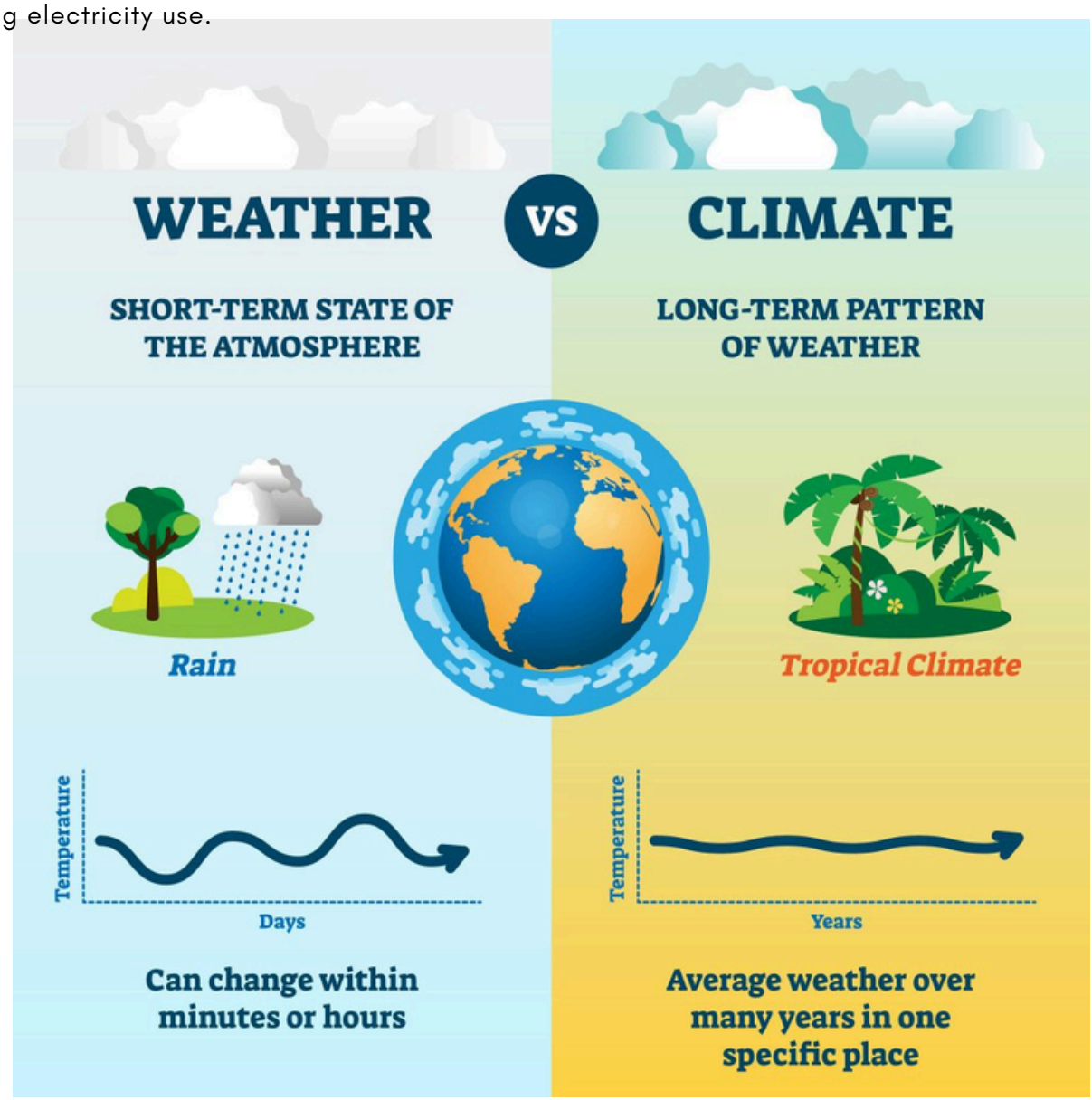


Figure 1: Understanding Weather and Climate | Source

Rule of the thumb # 2 - Five Key Elements That Help Homes Use Less Energy

A comfortable home does not need more machines; it needs better use of what nature already provides. The illustration below demonstrates how a passive home manages energy efficiently by working with five natural elements. The sun should be used wisely, homes can be planned to get enough daylight while avoiding too much heat by placing rooms properly and blocking harsh sunlight. Fresh air should be able to move easily through doors and windows, pushing hot air out and bringing in cooler air so there is less need for fans or air-conditioners. Water around the house, like ponds or small water bodies, can help cool the air naturally. Trees and plants give shade, stop hot winds, and cool the area around the house. The ground and soil also help keep indoor temperatures steady by absorbing and releasing heat slowly. When these natural elements work together, homes can need less electricity to keep occupants comfortable.

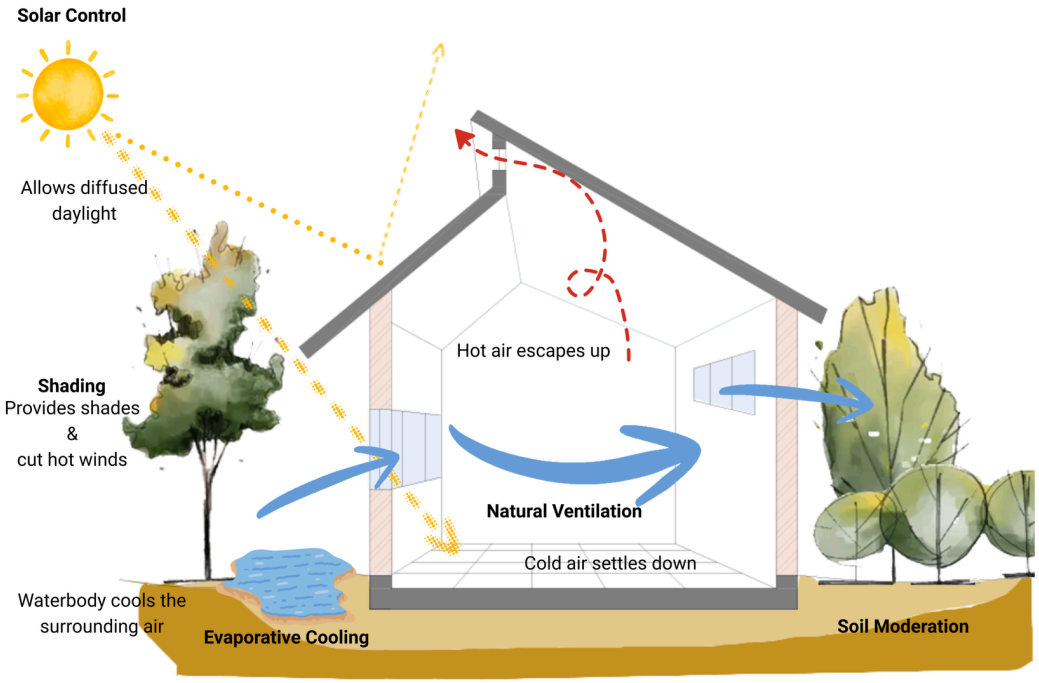


Figure 1: Key Passive Design Elements for Natural Cooling and Ventilation in Homes | CAG

Rule of the thumb # 3 - Learning from locals

Our ancestors knew how to create comfortable indoor spaces using very modest resources, guided by traditional knowledge and careful observation of nature. In regions like Tamil Nadu, homes were built with much thicker walls, which helped slow down heat entering the house. Many verandahs used jali screens that allowed light and fresh air to pass through while blocking direct heat. The mutram (central courtyard) was left open to the sky, with no roof above, allowing hot air to rise and escape naturally. Most importantly, buildings relied on locally available materials such as stone, mud, and wood, which responded well to the local climate. Together, these features kept homes cooler during the day and released stored heat slowly at night, reducing the need for fans or air-conditioners. Relearning these intuitive skills and applying them today is essential, not to return to the past, but to build a better, more energy-efficient future that works with local climate and resources.

"Build homes with nature, not against it"

CONSUMER FOCUS

The appellant is a domestic consumer. He observed that his electricity bill for the assessment period, January - March 2025, was excessive compared to his previous bills. For the February-March 2025 billing cycle, he was charged Rs. 4,203/-, while the average of his previous three readings was Rs. 3,427/-. Regarding this, he filed a complaint with the local section office. Based on the complaint, the respondent conducted a Meter Relay Test (MRT) in March 2025. They found that the meter had been defective since February 2025. This was therefore replaced. Additionally, the appellant claimed that the reading intimated to him on the bill on 05/3/2025 was neither recorded on the consumer ledger nor communicated to him.

The respondent mentioned that, during the assessment period from 05.03.2025 to 03.05.2025, the consumer was billed for 827.89 units (Rs. 4,688/-). The appellant argued that his actual consumption after the meter was replaced was only about 600 units, making the assessment for the period with the defective meter excessive and unjustified. He pointed out that, according to Section 56(2) of the Electricity Act, 2003, Clause 8 of the Tamil Nadu Electricity Distribution Code, and Regulation 55(5) of the TNERC Supply Code, 2004, billing during a faulty meter period should be based on the average of past consumption. He filed a grievance with the Assistant Engineer, who responded that since the meter was replaced on 19.03.2025, the assessment made on 03.05.2025 was correct and required no correction.

Dissatisfied with the respondent's reply, the appellant filed a complaint with the Consumer Grievance Redressal Forum (CGRF) on 17/3/2025. The appellant requested the calculations for the bill for the defective period. However, during the CGRF hearing itself, the respondent checked and found the average consumption calculation to be incorrect. Therefore, the respondent recalculated the average consumption using July 2024 (692 units) and September 2024 (707 units), arriving at an average of 700 units. As per this calculation, the respondent revised the current consumption charges for March 2025 as Rs 3,825/- . Since the appellant had already paid 4,203/-, the remaining amount of Rs.375/- was credited to the appellant's account as advance current consumption charges.

Despite this, the Forum did not address the appellant's prayer and instead issued an order dated 30/4/2025 favouring the respondent and making no mention of the billing error.

Aggrieved by this, the appellant filed an appeal petition before the Electricity Ombudsman, praying to be provided a detailed calculation sheet justifying the bill and to be issued a revised bill accordingly. A hearing was conducted on 08/8/2025. The following were observed by the Ombudsman during the course of the hearing:

The respondent submitted that during the 03/2025 assessment, the meter was recorded as defective in the consumer ledger on 04.03.2025. However, because of how the billing software was programmed, the consumption of March 2024 (740 units) was automatically carried forward for March 2025, resulting in a bill of Rs. 4,203/-, which the consumer paid on 23.03.2025.

The respondent further explained that the defective meter was replaced on 19.03.2025. For the May 2025 assessment, the assessment taken on 03.05.2025 showed 600.89 units consumed after meter replacement.

For the period when there was no meter reading (05.03.2025 to 19.03.2025), consumption was calculated using the May 2024 data of 909 units over 60 days, giving 15.15 units per day, which for 15 days amounts to 227 units. Adding this to the recorded 600.89 units after replacement gives a total of 827.89 units for May 2025. Based on this calculation, the appellant agreed that the May 2025 assessment is also correct and no rectification of the assessment is required.

On the basis of the submissions of the parties, the Ombudsman determined the following:

- Section 35 of the Evidence Act, 1872, makes it clear that an entry in any public official book, register, or record is admissible as evidence under the law of the country. Additionally, the MRT wing of the Licensee is authorised to determine the status of the meter after conducting a scientific test. From the consumer ledger, the meter was defective during the 03/2025 assessment. Therefore, it is concluded that the meter was indeed defective during the disputed period, and the appellant has not denied it anywhere.
- As per Regulation 11 of TNE Supply Code 2004 during the defective period clearly states that, if it is not possible to ascertain the defective period data from the downloaded details, the requirements for billing revision during defective meter periods shall be applied as Regulations 11(2), 11(4), 11(5), and 11(6), which prescribes the procedure for computing the average consumption during the period of meter defect.
- In this case, it is observed that the respondent has applied two different averaging methods over the defective period. For the period from 03.01.2025 to 04.03.2025, the average was calculated based on the consumption of 07/2024 and 09/2024, while for the period from 04.03.2025 to 19.03.2025 (up to meter replacement), the average was calculated based on the consumption of 05/2024. As the appellant is a domestic consumer, the respondent was required to adopt a seasonally similar consumption. Therefore, the respondent is directed to correct the average calculation uniformly for the entire defective period.
- Accordingly, the appellant's request to reassess the electricity consumption during the defective period as per the TNERC Supply Code Regulations is allowed, and a confirmation report on compliance with this order shall be sent to this office.

Based on the above findings, the Ombudsman set aside the CGRF's orders and accepted the Appellant's claims.

SOURCE: OMBUDSMAN CASE

NEWS FROM TAMIL NADU

Underground cabling to Parsons Valley Reservoir to start soon

After a wait of more than six years, TANGEDCO is set to start in the coming days the work on laying high-tension underground (UG) electric cable to the pumping station at the Parsons Valley Reservoir near Ooty. The necessary approval in this regard has been received from the central government. The Rs 6.02-crore project will help provide uninterrupted water supply to residents of Udhagamandalam (Ooty) town, 12 kilometres from the reservoir. Also, underground cable will not harm animals unlike the overhead one. As the work has to be carried out in forests with tiger and their prey, TANGEDCO clarified that there won't be any hindrance to wildlife movement as the cable is to be laid one metre deep in the ground. Underground cabling is necessary to obviate snapping of power lines by falling trees during winds and rains which in turn disrupts drinking water supply to Udhagamandalam residents for three to four days. TANGEDCO officials said in such situations they can't carry out power restoration works after 5pm due to wildlife movements and this prolongs resumption of pumping at Parson Valley by three to four days. "The years of delay were due to getting approval from the forest department as the cable is to be laid inside the forest area for 4.2 km. We applied to the Ministry of Environment, Forest and Climate Change through the portal parivesh.nic.in and got approval recently. We paid an additional Rs 38 lakh as fees to the forest department alone," said a senior official of the TANGEDCO. Sources in the forest department said the second stage of approval is expected on the central government portal in the coming days and then the work will commence. According to Udhagamandalam Municipal Commissioner M Ganesan "Currently, we are supplying 14 millions of liters (MLD) of water to the 1.10 lakh residents, including the floating population had to be halted for up to three days due as pumping of water from the Parson Valley Dam was not possible as power went off. Once this work is completed, the residents will get uninterrupted drinking water supply."

SOURCE: TNIE, 29 DECEMBER 2025

NEWS FROM ACROSS THE COUNTRY

Record 44.5 GW renewable energy capacity added till November this year: MNRE

The country added a record 44.5 gigawatt of renewable energy capacity, including 35 GW from solar, till November this year, an official statement said on Monday. The total renewable energy installed capacity reached 253.96 GW in November 2025, registering an increase of over 23 per cent as compared to 205.52 GW a year ago, the statement from Ministry of New and Renewable Energy (MNRE) said. The highest-ever renewable energy capacity addition has been made during 2025. The total renewable energy capacity added during the year (till November) is 44.51 GW, nearly double as compared to 24.72 GW during the same period last year. Solar is the major contributor in this progress. Solar capacity addition is 34.98 GW as compared to 20.85 GW during the same period last year. The overall solar energy installed capacity reached 132.85 GW in November 2025, registering an increase of over 41 per cent as compared to 94.17 GW in November 2024. Wind capacity also registered a substantial growth with capacity addition of 5.82 GW compared to 3.2 GW during the same period last year. Wind energy installed capacity crossed 50 GW mark in March 2025. The wind energy installed capacity reached 53.99 GW in November 2025, which is an increase of over 12.5 per cent as compared to 47.96 GW in November 2024. Meanwhile, in a post on X, Pralhad Joshi, Minister for New and Renewable Energy said the rooftop installations under PM Surya Ghar Muft Bijli Yojana has crossed the 25-lakh household mark. "Guided by the visionary leadership of Hon'ble PM Shri @narendramodi ji, 25 lakh households are now empowered with rooftop solar under the @PMSuryaGhar Muft Bijli Yojana, bringing cleaner power, lower bills and a sustainable future to millions of families," he said.

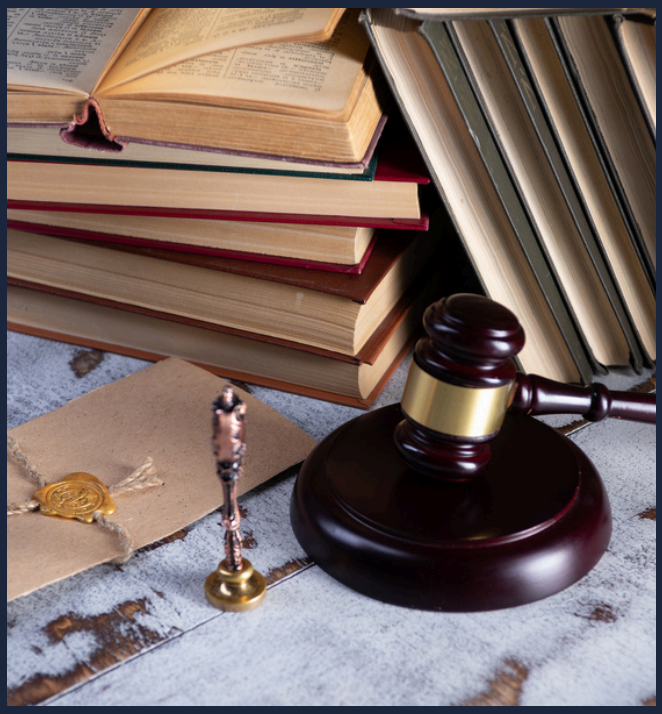
SOURCE: ECONOMICTIMES, 29 DECEMBER 2025

WORLD NEWS

Solar power brings new life to Chad

At night in the Bébalem market, located in the Logone Occidental province in southern Chad, most shopkeepers close for the day. Denis Tarlembaye uses lamps inside and in front of his shop, making it one of the few that remain illuminated and drawing several people. “Since I acquired this kit, I stay longer at the market. This allows me to increase sales. Instead of an average of CFAF 20,000 per day, I make between CFAF 30,000 and CFAF 35,000,” says the shopkeeper, enthusiastically. Located nearby, Ferdinand Djeguemde operates a small pharmacy. With improved lighting, he has been able to extend his business hours, enabling him to assist additional customers, including those seeking urgent care. "My revenue has consistently increased since installing the new lighting," he notes. As part of the Energy Access Improvement Project, 145,000 solar kits are being distributed at a subsidized price to households across 23 provinces in the country. Each kit, with a value of $100, is sold for $20. The kits provide home lighting and phone charging and will therefore be supplying electricity to an estimated 6 million people in Chad. Electricity plays a critical role in enhancing health and education services. Health centers with reliable electricity can maintain around-the-clock operations, utilize advanced medical equipment, and ensure the proper storage of vaccines. Similarly, electrified schools offer improved learning environments through adequate lighting and access to digital resources. In Bitkine, situated in the Guéra province of central Chad, the health center at the city's northern exit has experienced notable changes following the installation of a standalone solar system. Koye Anda notes that health center usage has increased following this installation. “We are able to operate 24 hours a day. Patients who previously sought care at the main hospital branch have begun frequenting this center instead. "The number of deliveries has increased as we are the only facility in the city providing nighttime childbirth services."

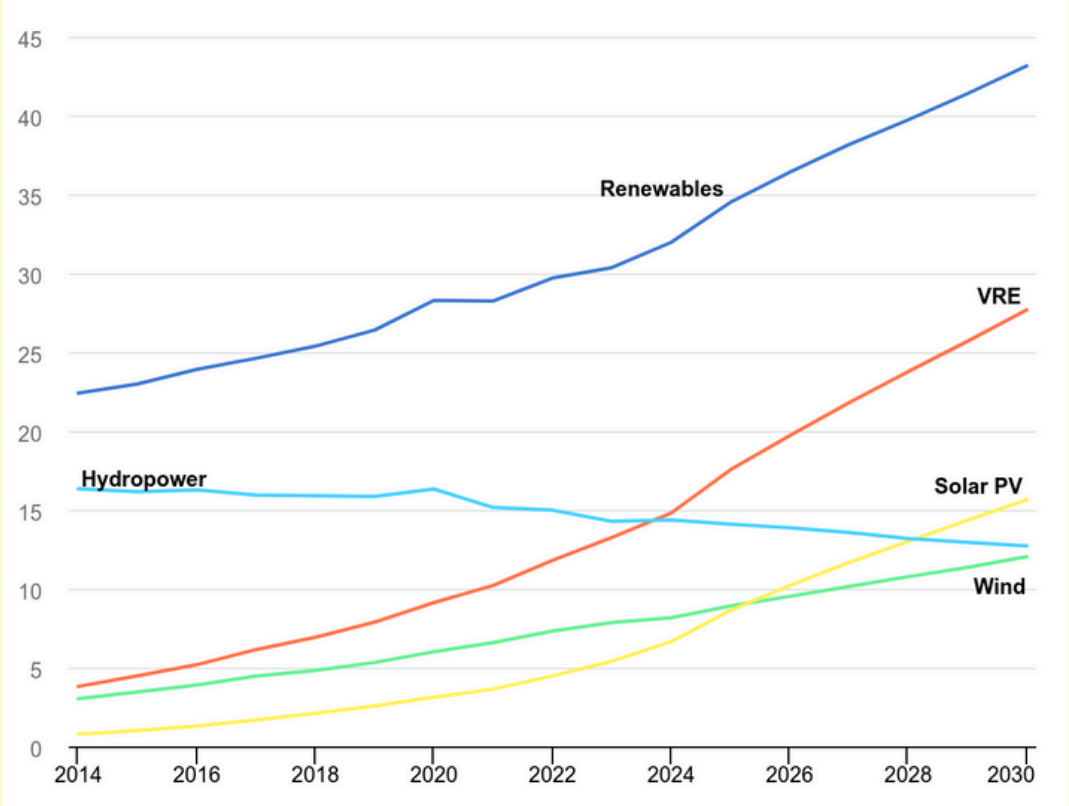
SOURCE: WORLDBANK, 2 DECEMBER 2025



PUBLICATIONS

- **Mapping India's Energy Policy 2025, IISD, December 2025**
- **Renewables for Industry, IEA, December 2025**
- **Monthly Report of Renewable Generation, CEA, December 2025**
- **Energy Efficiency Policy Toolkit 2025, IEA, December 2025**

GLOBAL RENEWABLE ELECTRICITY GENERATION SHARES(%) BY TECHNOLOGY, 2015-2030



SOURCE: IEA

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