

India's sweltering nights expose power crunch

Demand for air conditioning is testing the limits of what renewable power can supply

RACHEL MILLARD — LONDON
ANDRES SCHIPANI — NOIDA
JYOTSNA SINGH — NAGPUR

Indian demand for night-time air conditioning to cope with sweltering temperatures is pushing up after-dark electricity use, testing the limits of the country's drive for renewable power.

Summer night-time temperatures in the world's most populous country have risen about twice as fast as those in the day, according to the International Energy Agency, with temperatures that can approach 30C across the country.

"The floor burns even at night," said Rajash Pakalwar, an air conditioning retailer in the central Indian city of Nagpur, whose sales have climbed 50 per cent this year. "We need to plan better for extreme heat." India's peak night-time electricity demand has climbed by about 40 per cent to 252 gigawatts since 2019, the IEA said, with air conditioning accounting for as much as one-third of night demand.

While the surge in night-time temperatures due to climate change and the urban "heat island" effect is a problem across many countries, the scale of the challenge in India — with its vast population of 1.4bn and extreme temperatures that linger long into the night — is particularly acute.

The heat island effect is exacerbated in cities, where there are fewer trees for cooling, tall buildings trap air and AC units pump warm air outside.

India is rapidly installing solar panels and, helped in part by investment from large groups such as Adani and Tata, now has the world's third-largest solar capacity. Solar supplied 9.4 per cent of total demand in 2025, according to green energy think-tank Ember.

This has helped to meet rising power demand during the day, driven in part by air conditioning as people try to cope with summer temperatures that reach



Heat of the night: Extreme temperatures are exacerbated in cities such as Delhi, which become 'heat islands'

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well above 40C. But the country's combined wind, nuclear, hydropower and battery storage resources are not enough to cover night-time demand, meaning that once the sun fades more coal-fired power stations have to kick back in.

"In the evening hours . . . demand increases, solar energy plummets and that's when we see a scarcity of storage," said Debmalaya Sen, president of industry group the India Energy Storage Alliance.

Thermal generation, mostly coal, supplied nearly 80 per cent of India's night-time power demand during May and June, followed by low-carbon sources hydropower, wind and nuclear, Ember data shows.

The country's solar output sometimes needs to be limited during the day to make sure that coal-fired plants remain

running at a minimum level so they can step in at night. Neshwin Rodrigues, a senior energy analyst at Ember, expects peak night-time electricity demand in India to climb by at least 10GW during 2027 as more and more of its residents buy air conditioning to beat the heat, adding to the pressure on the system.

Tata Group's Voltas, India's leading air conditioning brand, says it sold 1mn units in the first three months of the financial year starting in April, "achieving the landmark in record time".

"This is not something a middle-class person like me can easily afford," said Jaseem Siddiqui, a retired government employee who was about to hand over about INR50,000 (\$524) for his third air conditioner while shopping with his wife at a busy electronics shop near Delhi. "ACs are no longer a luxury for comfortable living, they're a necessity."

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Residential air conditioning is a major source of power demand globally, using about 1,500 terawatt-hours per year compared with the roughly 500TWh used by data centres, according to the IEA.

India's Prime Minister Narendra Modi has pledged to cut its emissions to net zero by 2070, with billions of dollars being poured into projects designed to more than double non-fossil-fuel power sources to 500GW by the end of the decade. The country is also racing to scale up battery systems to store wind and solar power so it can be used at different times.

But the IEA says India, the world's third-largest greenhouse gas emitter after China and the US, is also building about 40GW of new coal-fired power stations in order to help meet the growing demand at both day and night.

The lack of storage for renewable energy remains a key challenge, experts say. Between late May and December last year, India had to curtail 18 per cent of the average monthly solar power generated because it could not be accommodated on the grid, Ember data shows, highlighting the current system's limits.

The Central Electricity Authority estimates India will need to increase its battery storage capacity by more than 27 times to about 236 GWh by 2031-2032.

Falls in battery prices over the past few years due to Chinese manufacturing are helping India and others rapidly develop the technology. "Hopefully what we'll see is that batteries, plus the coal under construction, help to bridge us to a situation where we can increasingly meet the night-time load," said Thomas Spencer, senior energy analyst at the IEA. The power ministry said that electricity availability in the country remains "sufficient" and that robust systems are in place to manage rising summer demand.

But the demand for air conditioning is only heading one way. "In my childhood, at night we would sleep in the open air on the terrace, in front of the house. That was enough to bring respite," said Pakalwar in Nagpur. "Now the heat is becoming unbearable."