

# Running behind the solar dragon

The contrast is striking — in the first half of 2024, China added over 100 Gw of capacity while India could manage only 14.9 Gw

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What a difference six years make? Pre-Covid, India was catching up with China in the race for solar supremacy. Post-pandemic, India has slowed while China has surged. In 2018, the difference between India and China's solar energy capacity additions were just 17 gigawatts (Gw) — India added 7Gw to China's 24Gw. Last year, the gap widened 30-fold in China's favour, with our northern neighbour adding over 200Gw compared to India's 7.5Gw, a 44 per cent drop year-on-year (Y-o-Y).

In the first half of 2024, China added over 100Gw of solar capacity, according to data from Centre for Research on Energy and Clean Air (CREA), a Finnish think tank. India added 14.9Gw, a record for the country and nearly four-fold higher from a year-ago period, according to Mercom Research. JMK Research reported additions of 12.2Gw during the period.

India's first half performance was skewed by a massive January-March quarter, an outlier where around 10Gw was added. Installations tumbled in the subsequent quarter. The bullish first quarter numbers resulted from Indian developers scrambling to take advantage of cheap Chinese imports after New Delhi denied another extension to India's mandatory domestic solar module procurement programme beyond March 31. Re-imposition of the Approved Lists of Models and Manufacturers (ALMM) programme has impacted several open access projects while tendering for utility scale dropped in April-June by 65 per cent quarter-on-quarter (Q-o-Q), Mercom said.

"Indian renewable growth faces

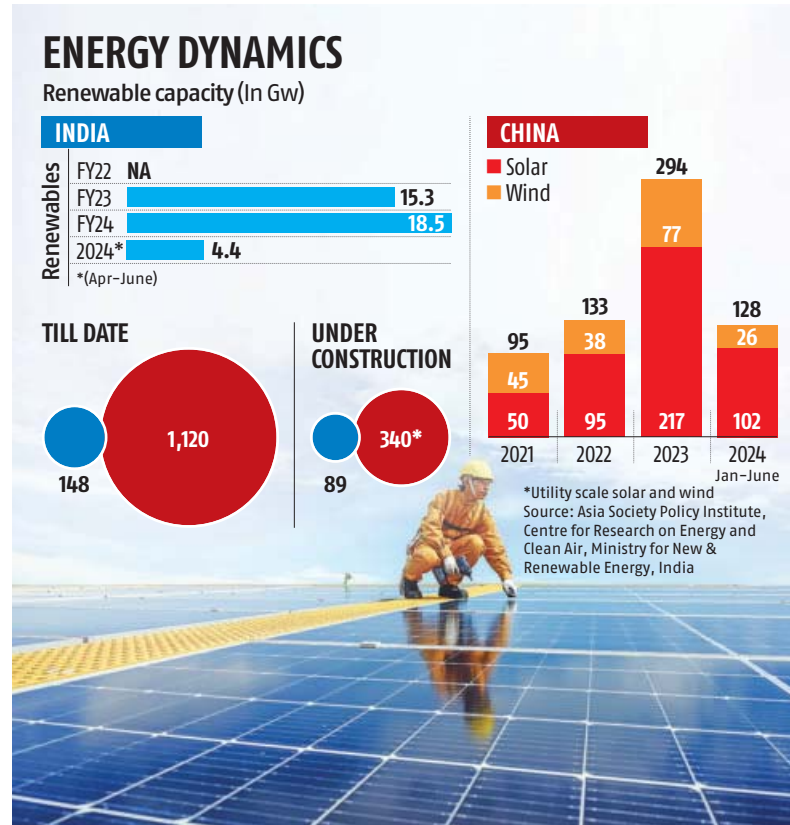
several changes, including land acquisition, grid connectivity, and supply chain and regulatory delays," said Shriprakash Rai, chief revenue officer, Ampin Energy Transition, a renewable energy company. "ALMM has had a mixed impact. While it aims to strengthen local manufacturing, it has led to supply chain constraints, particularly for developers deploying cutting-edge technologies," Rai added.

China faces no such constraints because it virtually supplies most solar projects in the world. There is an overcapacity of top technology modules, which increases the efficiencies of their panels. The ALMM list is a mix of old and newer technologies. As many as 72 per cent of modules are high-efficiency, according to JKM Research, but emerging module technologies such as n-type TopCon, and bifacial n-type TopCon only constitute around 23 per cent.

Ampin, which is now setting up a manufacturing facility of 1.3Gw of cells and modules under the PLI (Production Linked Incentive) Scheme, expects installations of 16-20Gw of solar power and 4Gw of wind power in 2024. China may build out more than 200Gw of solar capacity this year, industry officials said.

"China's success in rolling out renewables is a combination of strong government support, significant investment in R&D and integrated supply chains," said Belinda Schaepe, China policy analyst for CREA. "The Chinese government made renewable energy a national priority in its Five-Year Plan already in the early 2000s," Schaepe said.

Chinese renewable installations are humongous, leading to slower growth in emissions. Solar additions were up 31 per cent to 102Gw and wind additions up 12 per cent to 26Gw in the



first half of 2024 from a year earlier, on track to beat last year's record installations, said Lauri Myllyvirta, senior fellow, Asia Society Policy Institute.

In 2023, China added 217Gw solar, with the average utilization of solar capacity at 14.7 per cent equal to average added generation of 32Gw. Also, 77Gw wind was added, and average utilization was 25.4 per cent equal to average output of 20Gw, totalling 52Gw of average power generation, Myllyvirta said. That's one nuclear power plant or two large coal plants worth of power generation from wind and solar every week of 2023. And this year is expected to top that, he told Business Standard.

Myllyvirta attributed China's success to two key policy measures, which he said India can emulate. First, the

"whole county solar" programme, which enables distributed rooftop solar at a massive scale. In this model, county/district-level governments set a target for the amount of rooftop solar to be installed in one coordinated push, and developers then arrange financing, equipment, grid connections; the second are the "clean energy bases" — large areas designated for solar and wind on marginal land, avoiding conflicts and reducing the ecological impact. The key to the success of both programmes is that they are attractive to local governments and developers, and not Beijing pushing the local level to do more.

These policy measures have enabled Beijing to balance solar and wind power growth against demand

for electricity, Myllyvirta said, something India proposed but failed to execute. Instead, New Delhi is adding 80Gw of polluting coal-fired capacity to meet a 7 per cent growth in power use.

Also, economies of scale and technological advancements in China have enabled companies to build vertically integrated supply chains, drive renewable prices lower—with clean energy becoming the largest contributor to China's economic growth in 2023 at around 40 per cent of the annual GDP increase across all sectors, Schaepe said.

China invested a lot in infrastructure, much before us, particularly on grid connection and number two, it has huge land parcels, said Hitesh Doshi, chairman and managing director of Waaree Energies, the world's largest solar panel maker outside China. "We almost have the same population but the size of China, and the land it has, is much larger," Doshi said.

Regulatory constraints, policy seesaws and an emphasis on local manufacturing are hurting renewables development. Utility scale still accounted for around 80 per cent of installations last year, a weak link because large-scale solar installations need large spaces and grid connectivity. India installed only 7.5Gw of solar capacity in 2023, with extensions to projects and land and transmission issues impacting capacity additions.

Slow regulatory approval processes hinder a faster rollout of renewables in Europe and the US, while India faces challenges related to infrastructure and finance, Schaepe said.

"In China, there is 800Gw of manufacturing, and you can buy land at dirt cheap prices," said Vineet Mittal, chairman of Avaada Group, a renewable energy developer. "Over there you get land for 100Gw in a week, which you don't get it in any state here; over there storage of HVDC (High-Voltage Direct Current) has 50 vendors, in India our vendor asks for four years and if it's in the great Indian bustard area, then they say get me Supreme

Court approval," Mittal said.

The overall installed power capacity in China is more than 3,000Gw as against 450Gw of India, indicating that the size of their market is seven times the Indian market, said Vikram V, vice president and co-group head, corporate ratings, at Moody's affiliate ICRA.

India's solar slowdown began in 2018 when out of nearly 35Gw of solar projects that were tendered, only 13Gw of projects were auctioned, which led to a 65% decline in tender activity in Q3. In Q2 2018, Indian solar installation rate stood at 1.6Gw and in Q3 it even fell further to 1.5Gw, industry data shows. Uncertainty created by safeguard duty imposed on imports of solar panels and cells, GST ambiguities, quality standards, power evacuation, grid issues and a failure to meet Renewable Purchase Obligation targets hindered growth in 2018, industry officials said.

Grid issues also plague China, Vikram said—but that has not stopped Beijing from adding more solar power last year than the rest of the world combined. Having said that, the installation numbers for China are significantly higher and the same is on account of strong policy focus of their government along with focus on backward integration, Vikram said.

"China has created a very strong ecosystem and ensured self-dependency, thereby alienating itself from geopolitical risks. Additionally, in India, acquisition of land causes a lot of hindrances to infrastructure projects, whereas in China, it's much easier to secure approvals, which ensures timely delivery," he added.

Installations may increase as India invited bids for a record 70Gw of utility-scale solar projects last financial year. But mere tendering will not help catch up with China. So, for deployment, what we need are policies and support to add more solar panels, Doshi said. "Apart from that, we need land and grid availability. If that is in place, putting a solar power plant is not a challenge," Doshi added.