



MONTHLY CHINA ENERGY UPDATE | China to Meet its Climate Target 6 Years Early and Robust Market Outlook

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During the first quarter of 2024 (1QCY2024), China added 69.4GW of new electricity capacity to the grid, with 91% of it being renewable energy. China is projected to exceed its 2030 target for installed solar and wind capacity six years early.

The electricity generation mix shows a rising contribution from zero-emissions sources, with wind power surpassing hydropower for the first time.

In the EV market, China remains the world's largest, with nearly 1.9 million electric cars sold in 1QCY2024.

Additionally, China's solar manufacturing industry faces challenges due to overcapacity, although major players like Jinko Solar remain financially strong even as gross margins contract as solar module prices are now down 50% y-o-y.

NEWLY INSTALLED CAPACITY

Figure 1. New Capacity Installed in China in Jan-Mar 2024

		Jan-March 2024	Share of new adds (%)	Change (yoy %)	Mar-24	Share of new adds (%)
Thermal Power	GW	6.4	9%	-21%	1.3	8%
Hydropower	GW	1.8	3%	-33%	0.8	5%
Nuclear Power	GW	0	0%	-100%	0.0	0%
Wind Power	GW	15.5	22%	49%	5.6	34%
Solar Power	GW	45.7	66%	36%	9.0	54%
Total capacity added	GW	69.4	100%	24%	16.7	100%
Renewable Energy adds	GW	63.0	91%	35%	15.4	92%
Zero Emissions Capacity Adds	GW	63.0	91%	31%	15.4	92%

Source: NBS, CEF Estimates

During 1QCY2024, China added 69.4GW of new electricity capacity to the grid. March alone saw China added 16.7GW of capacity to the grid, a slowdown compared to the 52.7GW addition during the first 2 months of CY2024.

Among the new additions during 1QCY2024, 91% of the newly added capacity was renewable energy, reaching 63GW, a 35% y-o-y increase.

This renewable energy surge continues to be led by solar power addition, with a total of 45.7GW of solar capacity newly installed during the first 3 months this year. This is a 35% y-o-y increase, and takes up 66% of the total capacity additions. Noting that this is a drastic slowdown in solar power expansion, but continues to build on China's staggering annual solar expansion rate over [CY2023](#) of +148% y-o-y.

This is followed by wind power additions, 15.5GW of wind capacity was added in 1QCY2024, 22% of the total new additions, a 49% y-o-y increase. This also shows a further building up on the annual wind addition increase rate of [CY2023](#), a 102% y-o-y increase.

1QCY2024 saw China add 1.8GW of hydropower capacity, accounting for 3% of the total new adds, a 33% y-o-y decrease. According to China's National Energy Administration (NEA), this [includes](#) 210MW of conventional hydropower and 1.6 GW of pumped hydropower storage (PHS, which is new capacity for time-shifting VRE generation, but doesn't itself add to generation).

During 1QCY2024, China did not add any new nuclear power capacity.

China added 6.4GW of net new flexible thermal power capacity to the national grid during 1QCY2024, representing 9% of the total new adds, a 21% y-o-y decrease. If this rate sustains, China will add another 25.6GW of thermal power over CY2024, putting achieving its target of peaking carbon emissions by 2030 at risk.

CEF calls China to continue the massive expansion in wind, solar, battery energy storage systems and PHS capacity additions, and phase out building new coal power.

Benchmark against CEF forecast

According to CEF forecast model [released](#) last month, to achieve ahead of time its 'dual carbon' targets – to peak carbon emissions by 2030 and reach carbon neutrality by 2060, China needs to: install at least 323GW per annum of solar capacity, 80GW of wind, 1GW of hydropower and 3GW of nuclear. And sustaining this rate of installation of >400GW pa of zero-emissions additions next decade and beyond.

Based on figure 1, March 2024 saw only hydropower kept up with the rate it needed to achieve China's 'dual carbon' targets.

INSTALLED CAPACITY

Figure 2. National Installed Capacity as of Mar 2024

		Mar-24	Share of Capacity	Change (yoy %)	Mar-23
Thermal Power	GW	1,397	47%	4.2%	1,340
Hydro Power	GW	423	14%	1.9%	415
Nuclear Power	GW	57	2%	0.3%	57
Wind Power	GW	457	15%	21.5%	376
Solar Power	GW	660	22%	55.0%	426
Total of Installed Capacity	GW	2,994	100%	14.1%	2,623
Renewable Energy Capacity	GW	1,540	51%	26.5%	1,217
Zero Emissions Capacity	GW	1,597	53%	24.5%	1,283

Source: NBS, CEF Estimates

By the end of March 2024, China had a total installed capacity of 2,994GW, a 14.1% y-o-y increase. Among which, zero-emissions capacity takes up 53% of the total installed capacity, reaching 1,597GW, a 24.5% y-o-y increase.

Total installed solar power capacity reached 660GW, leading the zero-emissions capacity, accounting for 22% of the total installed capacity, showing a 55% y-o-y increase.

Total installed wind capacity reached 457GW by the end of March, taking up 15% of the total installed capacity, a 21.5% y-o-y increase. Among which, installed [onshore wind](#) capacity reached 419GW, and offshore wind capacity reached 38GW, both world-leading positions for China in terms of new installs and cumulative total, as is seen in solar, BESS and EV.

Total installed hydropower capacity reached 423GW, accounting for 14% of the total installed capacity, a 1.9% y-o-y increase. Among which, installed [traditional hydropower](#) capacity reached 371GW, and pumped-hydro capacity reached 53GW.

57GW of nuclear power capacity was installed by the end of March, taking up 2% of the total installed capacity, a 0.3% y-o-y increase.

Total installed thermal power capacity still takes up 47% of the total installed capacity, reaching 1,397GW, a 4.2% y-o-y increase.

Despite the slowdown in solar and wind power expansion during the first 3 months of 2024, according to CEF's new report [POWER SHIFT](#), China could achieve its 14th Five Year Plan (FYP) 2030 target of 1,200 GW of installed solar and wind capacity six years early, as early as this year. If China sustains the wind and solar expansion rate as the 1QCY2024, we would see China have a total wind and solar capacity of 1,294GW by the end of 2024 - significantly exceeding the 2030 target.

ELECTRICITY GENERATION MIX

Figure 3. China's Electricity Generation Mix in Jan-Mar 2024

		Jan-March 2024	Share of Generation	Change (y-o-y %)	Mar-24	Change (y-o-y %)
Hydropower	TWh	210	9%	3.3%	71	4.2%
Thermal Power	TWh	1,603	72%	7.2%	520	1.1%
Nuclear Power	TWh	104	5%	0.6%	35	-4.8%
Wind Power	TWh	242	11%	16.3%	91	23.2%
Solar Power	TWh	78	4%	27.9%	31	28.1%
Total Power Generation	TWh	2,237	100%	8.0%	748	4.2%
Variable Renewable Generation	TWh	320	14%	18.9%	122	24.4%
Zero Emissions Power Generation	TWh	634	28%	10.1%	228	12.3%

Source: NBS, CEF Estimates

At the end of March, China's electricity demand rose by 8% y-o-y, reaching 2,237TWh. Among which, zero-emissions power generated 634TWh of electricity, accounting for 28% of the total generation, a 10.1% y-o-y increase.

Wind power generation surpassed hydropower for the first time, reaching 242TWh, taking up 11% of the total power generation, a 16.3% y-o-y increase. We note the [NBS data](#) only reports generations based on a threshold for revenue. According to a [press conference](#) by the NBS, China's total wind power generation reached 264TWh, representing a 16% y-o-y increase.

Hydropower generated 210TWh of electricity during 1QCY2024, accounting for 9% of the total power generation, representing a 3.3% y-o-y increase.

That is followed by nuclear power that has generated 104TWh of electricity, accounting for 5% of the total power generation, a 0.6% y-o-y increase.

According to China's National Bureau of Statistics (NBS), solar power stations that have reached the threshold for revenue generated 78TWh of the total electricity during 1QCY2024, accounting for 4% of the total power generation, a 27.9% y-o-y increase. According to the [press conference](#) by the NBS, China's total solar power generation reached 162TWh, representing a 42% y-o-y increase.

Thermal power generation still dominates China's overall power generation sector, accounting for 72%, reaching 1,603TWh, a 7.2% y-o-y increase.

Energy Storage

The progression of new energy storage capacity installation remains fast, [with](#) over 35GW of installed capacity now operational. By the end of 1QCY2024, the cumulative installed capacity of completed and operational new energy storage projects nationwide has reached 35.3GW/77.7GWh. This shows a growth of over 12% from the end of 2023 and an impressive surge of 210% from the end of 1QCY2023.

In terms of geographical distribution, the northwest region stands out for its abundance of wind and solar resources, emerging as China's most rapidly expanding area for new energy storage. With 10.3GW of newly operational energy storage capacity, the northwest region

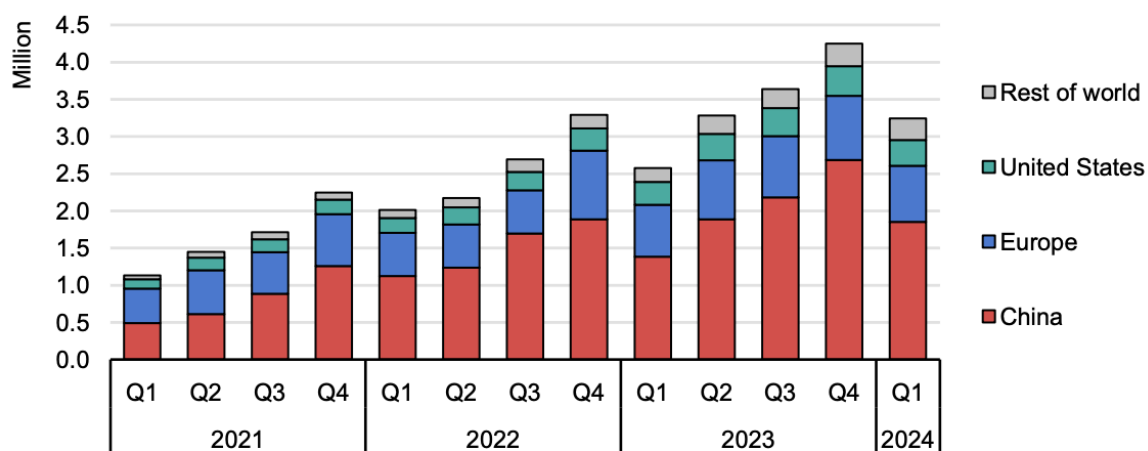
contributes 29.2% to the national total. North China follows closely with 25.3%, while central China accounts for 17.5%. The South holds 15.2%, East China has 12.3%, and the Northeast region contributes 0.5%.

EV

As the world's biggest EV market, according to the International Energy Agency (IEA) 1QY2024 saw China [sell](#) nearly 1.9mn electricity cars, more than the rest of the world combined, representing a 35% y-o-y increase. This happened after subsidies for NEV purchase in China has [expired](#), such as receiving RMB60,000 (US\$8,317) when purchasing an EV, expired in January 2023.

Figure 4. Quarterly Electric Car Sales, 2021-2024

Quarterly electric car sales, 2021-2024



IEA. CC BY 4.0.

Source: IEA analysis based on data from on EV Volumes, China Passenger Car Association and the European Automobile Manufacturers' Association.

In the meantime, Chinese EV brands continue to grow their influence inside and outside the Chinese market. Tesla [reports](#) its sales of China-made EVs fell by 18% in April y-o-y, amid strong growth of domestic EV sales. Tesla's market share in China dropped by 3.8% this Tuesday.

In comparison, Tesla's biggest competitor, Chinese EV maker BYD's car sales grew 49% y-o-y in April. It's not a secret that BYD's ambition lies in more than just China's domestic EV market. Its \$1bn investment [announcement](#) to build a factory in West Java is a move to challenge Japanese EV brands' dominance in the Indonesian market. BYD is also exploring new factories in Brazil, Mexico and Hungary to further build on its increased export drive.

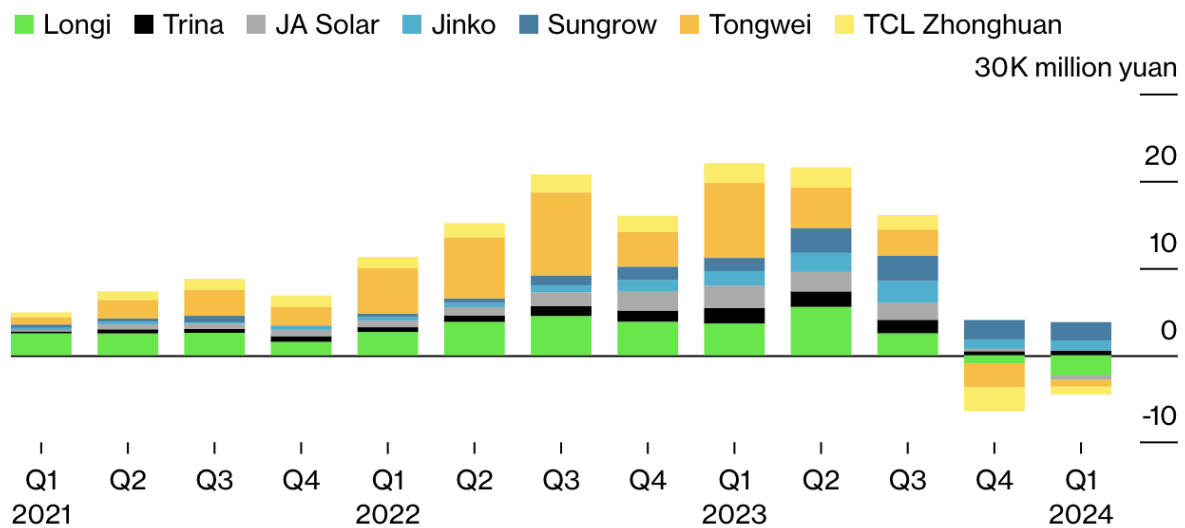
Concerns over lower cost, better technology Chinese EVs flooding overseas market remains, the European Commission President Ursula von der Leyen [addressed](#) once again on Wednesday, that Europe needs to prevent China from flooding the bloc's market with its heavily subsidised EVs.

Solar Manufacturers

China's solar manufacturing overcapacity continues to pose threats to the industry as the price slump for solar panels makes the business non-profitable for many, however some major players remain financially healthy.

Figure 5. Solar Profits in China

A solar price war is slashing margins for Chinese manufacturers



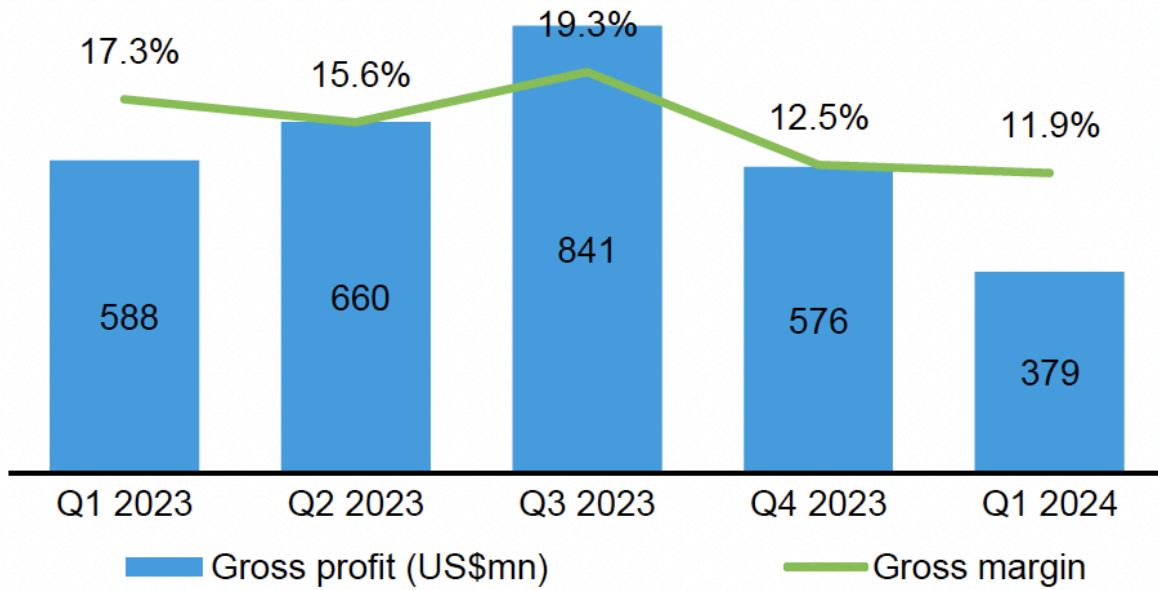
Source: Company filings

Via Bloomberg

Profits for many solar manufacturers have gone negative since 4QCY2023, only a few big players such as Jinko, Sungrow, and Trina are profiting.

When facing complaints and concerns overseas, Jinko Solar [expects](#) solar panel demand globally to grow 20% this year and had an expansion of its Florida facility during 1QCY2024, and is preparing for another extension. [BNEF](#) is more bullish forecasting over 30% y-o-y global growth solar installs. In Jinko Solar's 1QCY2024 earnings call presentation, Jinko is expecting to have 12GW integrated overseas capacity by the end of this year. Even when the solar panel price has halved y-o-y, the company's quarterly revenue remained at US\$3bn, only down 1.2% y-o-y, and its gross margin remains at 12%. This shows the strength of the Chinese solar manufacturers like Jinko, and the company is in well financial health.

Figure 6. Jinko Solar Gross Profit and Gross Margin, Q1 2023 - Q1 2024



Source: Company filings

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[Previous Monthly China Energy Updates here.](#)

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