

MONTHLY CHINA ENERGY UPDATE |

Renewable expansion beyond China via Belt and Road Initiatives

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- China's renewables expansion remained strong in September, with 22.6GW of zero emissions capacity added. This brings the total newly installed capacity this calendar year to 187GW, 83% of the total new capacity, a 105% y-o-y- increase.
- Hydropower continued to recover in September, reaching 139TWh, up 40.8% y-o-y.
- In contrast there was only a 2.8% y-o-y increase in thermal power capacity.
- China's economic recovery regained momentum by the end of third quarter, with a 9.2% increase in electricity demand in the month.
- China celebrates the 10th anniversary of the Belt and Road Initiatives (BRI) with a pledge of \$107bn over the next five years. CEF looks to a greening of the BRI as China works with emerging and developing economies (EMDEs) to deploy zero emissions domestic energy capacity. It continues to invest in diversifying its renewable raw materials supply chain.
- On a related note, China's massive scaling-up of solar manufacturing has changed global solar dynamics triggering a rapid price deflation of solar components and taking prices to record lows.

Newly Installed Capacity

Figure 1. New Capacity Installed in China in Jan-Sep 2023

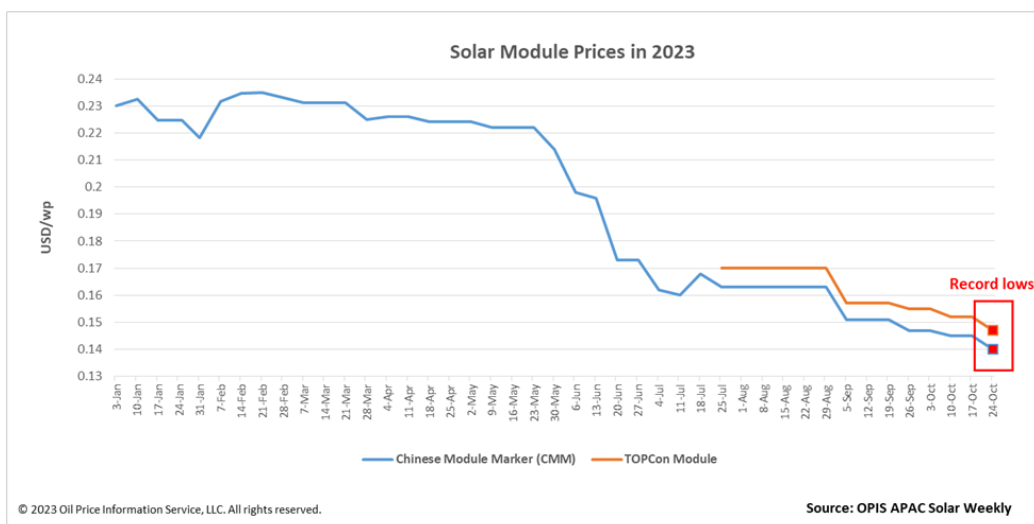
		Jan-Sep 2023	Share of new adds (%)	Change (yoy %)	Sep-23	Share of new adds (%)
Thermal Power	GW	39	17%	67%	5.2	19%
Hydropower	GW	8	3%	-50%	0.7	2%
Nuclear Power	GW	1	1%	-48%	0.0	0%
Wind Power	GW	33	15%	74%	4.6	16%
Solar Power	GW	129	57%	145%	15.8	57%
Other (Biomass, W2E)	GW	15	7%		1.6	6%
Total capacity added	GW	226	100%	97%	27.8	100%
Variable Renewable adds	GW	178	79%	109%	22.0	79%
Zero Emissions Capacity Adds	GW	187	83%	105%	22.6	81%

Source: NBS, CEF Estimates

China added 27.8GW capacity in September, of which 22.6GW was zero emissions, accounting for 81% of the newly installed capacity. Cumulatively, China has added 226GW capacity from January to September in 2023, a 97% y-o-y increase. Newly installed zero emissions capacity saw an even more significant y-o-y growth, reaching 187GW at the end of September, a 105% increase compared to last year.

From January to September in 2023, China has added 129GW of solar capacity, a 145% y-o-y increase, accounting for 57% of the newly added total capacity. In September itself, China added 15.8GW of solar capacity, more than two times as what the US has [installed](#) during the 2QCY2023, a total of 5.6GW of solar capacity.

Relatedly, China's scale-up of solar manufacturing capacity is changing global solar dynamics, [driving down prices](#) for materials such as polysilicons and solar modules. OPIS reports the solar module export price is [down](#) 40% in 2023 to a record low due to falling upstream prices and China's domestic weak demand, and is likely to keep falling this year. The '1yuan/W' era is here, as [bids](#) for P-type module procurement tender reached lows of 0.933yuan/W.



33GW of wind power was newly added, representing a 74% y-o-y increase, accounting for 15% of the newly added capacity. 8GW of hydropower was newly installed during the first 9 months, a 50% y-o-y decrease, while just 1GW of nuclear power was newly added.

While newly added zero emissions capacity continues to show a strong increasing trend, China also added 5.2GW of new thermal power in September alone, a 19% y-o-y increase, bringing the total newly installed thermal power from January to September to 39GW, a 67% y-o-y increase, a disaster for the global need to drive towards decarbonisation.

Installed capacity

Figure 2. National Installed Capacity as of Sep 2023

		Sep-23	Share of Capacity	Change (yoy %)	Sep-22
Thermal Power	GW	1,373	49.2%	4.5%	1,314
Hydro Power	GW	419	15.0%	3.4%	406
Nuclear Power	GW	57	2.0%	2.2%	56
Wind Power	GW	400	14.3%	15.1%	348
Solar Power	GW	521	18.7%	45.3%	359
Total of Installed Capacity	GW	2,791		12.4%	2,483
Variable Renewables Capacity	GW	921	33.0%	30.4%	706
Zero Emissions Capacity	GW	1,419	50.8%	21.3%	1,170

Source: NBS, CEF Estimates

China's national installed zero emission capacity reached 1,419GW by the end of September, taking up 50.8% of the total installed capacity, a 21.3% y-o-y increase.

Solar power continues to lead zero emissions power, with 521GW of installed capacity, accounting for 18.7% of the total installed capacity, a 45.3% y-o-y increase.

Hydropower ranked second in the zero emissions capacity, reaching 419GW, 15% of the total installed capacity, a 3.4% y-o-y increase.

Wind power capacity is not far behind, with 400GW of installed capacity, 14.3% of the total installed capacity, 15.1% y-o-y increase.

As of the end of September, 57GW of nuclear power was installed nationwide, 2% of the total installed capacity, a 2.2% y-o-y increase.

1,373GW of thermal power was installed by the end of September, representing almost half of the total installed capacity, a 4.5% y-o-y increase.

Electricity generation mix

Figure 3. China's Electricity Generation Mix in Jan-Sep 2023

		Jan-Sep 2023	Share of Generation	Change (y-o-y %)	Sep-23	Change (y-o-y %)
Hydropower	TWh	858	13%	-9.7%	139	40.8%
Thermal Power	TWh	4,640	70%	6.2%	497	2.8%
Nuclear Power	TWh	323	5%	6.0%	35	6.7%
Wind Power	TWh	584	9%	19.8%	50	4.5%
Solar Power	TWh	217	3%	24.2%	25	22.0%
Total Power Generation	TWh	6,622	100%	5.3%	746	9.2%
Variable Renewable Generation	TWh	801	12%	21.0%	662	9.8%
Zero Emissions Power Generation	TWh	1,982	30%	3.4%	606	24.7%

Source: NBS, CEF Estimates

September alone saw China's national electricity demand increase by +9.2% y-o-y, a sign of strong economic recovery in 3QFY2023 with [economic growth](#) of 1.3% compared to the previous quarter.

September also saw a recovery in hydropower generation, which reached 139TWh, a 40.8% y-o-y increase. This brings the total hydropower generation from January to September to 858TWh, 13% of total power generation, a 9.7% y-o-y decrease.

Solar power generation also increased significantly in September, with a total of 25TWh, representing a 22% y-o-y increase. Solar power has generated 217TWh in total during the first 9 months of CY2023, 3% of total generation, a 24.2% y-o-y- increase, representing the most growth among all energy sources.

In September, nuclear power generation reached 35TWh, a 6.7% y-o-y increase. From January to September, nuclear power has generated 323TWh in total, 5% of the total power generation, a 6% y-o-y increase.

Wind generated 50TWh of power during the month of September, up 4.5% y-o-y. From January to September, wind generated 584TWh, 9% of the total generation, 19.8% y-o-y increase.

September saw a slower increase in thermal power generation, only 2.8% y-o-y, with a total of 497TWh power generation units. From January to September, thermal power generation represented 70% of total power generation in the country, reaching 4,640TWh, a still way too strong +6.2% y-o-y.

Diversifying China's renewable supply chain via BRI

This year marks the 10th anniversary of China's BRI, a diplomatic initiative to drive development of and investment in infrastructure projects from Asia to Europe. China celebrates the anniversary with a [pledge](#) of US\$107bn investment over the next 5 years, with an emphasis on investing in "small but beautiful" projects and green development.

As the current global renewables superpower, whether or not China will make substantial efforts in greening the BRI is under the spotlight.

China [cancelled](#) one third of its proposed overseas coal power projects, with a total capacity of 36.3GW, between September 2021 and July 2023, representing 163 million tonnes of carbon emissions per year, and 6.2 billion tonnes over the lifetime of these coal projects.

China is also diversifying its global renewable energy supply chain to further secure its dominant position in the global renewable race. Currently, it [imports](#) two thirds of its mineral supplies, while remaining the world's largest mineral processor.

For example, it imports 86.5% of its raw lithium, with 90% of these [imports](#) from Australia in 2021.

China is now building a [lithium triangle](#) in South America with Argentina, Chile and Bolivia, who make up more than half of the global lithium resources.

On 16 October, Xiang Guangda, the chairman of China's Tsingshan Holding Group [met](#) with Chilean president Gabriel Boric. The company signed a US\$233m [agreement](#) with the Chilean government to build a lithium green ecological industrial park in Chile's Antofagasta region. The project will create 668 jobs, with the annual capacity to produce 120,000 tons of battery grade lithium.

On the same day, the head of Tibet Summit Resources Co. (Tibet Summit) met with Argentine President Alberto Gernandez to discuss a US\$2.2bn [lithium investment](#) in the Salta province. Tibet Summit has [acquired](#) two lithium companies in Argentina since 2018,

the Argentina Lithium Potassium Co, Ltd and the Argentina Tosa Co., Ltd. It owns the mining rights in nearly 500 square kilometres of salt lake in Salta province with more than 1,500 million tonnes of lithium carbonate equivalent and a plan to achieve an annual production capacity of 150,000 tonnes of lithium carbonate by 2025.

Earlier this year, the world's largest battery company – Contemporary Amperex Technology (CATL) – announced a US\$1.4bn [investment](#) in Bolivia to construct lithium extraction plants, building on CATL's [existing](#) lithium investment portfolio in Bolivia.

China has also [secured](#) mineral cooperation deals with more than 10 countries across South America and Africa this month, and signed agreements to [invest](#) in the world's largest untapped high-quality iron ore reserved in Guinea, and nickel projects in Indonesia and Kazakhstan.

China's embargo this month on exports of graphite – a key input into batteries for EVs, with China leading the world in mining and refining – builds on its embargo last month of two rare earths in retaliation to the embargo of US chip exports to China, and flags what could be to come.

As the world seeks to diversify its supply chain dependence away from China, Australia has a once in a century opportunity to become a value-added critical minerals and metals superpower.

Australia is the world's largest producer of the key critical mineral lithium (50% of the world's supply in 2022) and is abundant in the other resources, such as cobalt, vanadium, graphite, rare earths, copper and nickel, that underpin the energy transformation. We are the world's biggest producer of iron ore.

We have untapped potential to process and manufacture onshore. Given the scale of Australia's opportunity, the federal government's most recent announcement of a \$2bn critical minerals boost is an entirely [insufficient](#) response to both China's dominance and the US\$1 trillion Inflation Reduction Act (IRA), which has turbocharged the energy transition in the US, accelerating the global decarbonisation 'race to the top'.

CEF, along with the Climate Capital Forum, Smart Energy Council, the ACTU, Saul Griffith's Rewiring Australia, the ACF, and the Clean Energy Council and others call for a [\\$100bn federal government investment](#) into an Australian renewable industry package, including value-added critical minerals, to respond to the IRA and diversify from China. With every passing month the urgency of such a comprehensive response is increasing.