

# China remains massively ahead in global cleantech investment during slow economic growth

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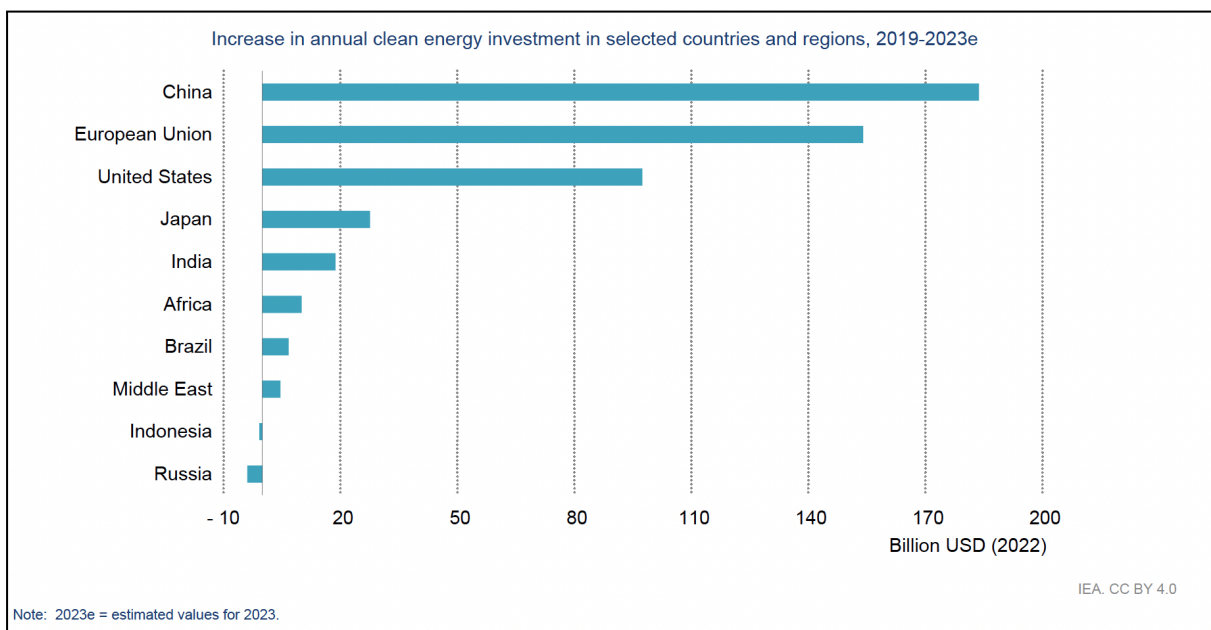
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The momentum of the energy transition race continues to accelerate in April, with renewable energy and EVs leading energy investment globally, according to the International Energy Agency (IEA) report [World Energy Investment 2023](#). US\$1.7 trillion will be spent on [clean-energy](#) in 2023 across the globe, which is more than 60% of the total worldwide investment of \$2.8 trillion in energy supply.

Amid the boom in renewable energy investment, solar power has gained popularity, attracting more investment than the oil industry for the first time. The IEA has [estimated](#) that more than USD \$1 billion per day will be spent on solar investment in 2023, with an expected total investment of USD \$380 billion in solar for the year of 2023.

However, the significant growth in clean energy investment did not occur evenly across the world, with the IEA [pointing out](#) that “the increase in clean energy spending in recent years is impressive but heavily concentrated in a handful of countries”. Advanced economies and China contributed more than 90% of the increase in clean energy investment since 2021.

There is a critical need for western public capital to crowd-in renewable energy investments across emerging markets, where demand growth is strong, and energy infrastructure not yet built. As the world’s leader in renewable energy, China should play a far more constructive role in enabling this investment, to leverage its domestic focus on decarbonisation at speed.



## China to continue renewable expansion momentum as solar power takes the lead

### New capacity

Domestically, China's renewable expansion remained powerful during the 4th month of 2023, building on the strong growth during the first quarter of 2023 that we reported on for [Climate & Capital Media](#), where 84% of newly added capacity came from renewable energy sources.

As shown in Figure 1, 82% renewable energy was added to the electricity grid during April while only 18% thermal power was added. 58% of growth came from solar power, with 14.7GW added to the grid. 3.8GW wind power, 1.5GW biomass and waste to energy (W2E) power, and 0.8GW hydropower were added to the grid, with no newly added nuclear power. In the meantime, 4.6GW thermal power was added.

**Figure 1. New Capacity Installed in China in Jan-Apr 2023**

		Jan-Apr 2023	Share of new adds (%)	Change (yoy %)	Apr-23	Share of new adds (%)
Thermal Power	GW	12.7	15%	35%	4.6	18%
Hydropower	GW	3.6	4%	-29%	0.8	3%
Nuclear Power	GW	1.2	1%	3%	0.0	0%
Wind Power	GW	14.2	17%	48%	3.8	15%
Solar Power	GW	48.3	57%	186%	14.7	58%
Other (Biomass, W2E)	GW	4.5	5%		1.5	6%
<b>Total capacity added</b>	<b>GW</b>	<b>84.4</b>	<b>100%</b>	<b>99%</b>	<b>25.4</b>	<b>100%</b>
Renewable Energy adds	GW	70.6	84%	122%	20.8	82%
Zero Emissions Capacity Adds	GW	71.8	85%	118%	20.8	82%

Source: NBS, CEF Estimates

With the strong renewable expansion during April, as shown in Figure 2, China's zero emissions capacity by the end of April reached 1,304GW, which represents 49% of China's national installed capacity, a 17.3% year-on-year increase (although we note generation has a materially lower share, given lower capacity factors for renewables).

The most prominent renewable growth happened in solar capacity, a 36.6% increase compared to a year ago, with installed solar capacity reaching 441GW.

This is followed by a 12.2% year-on-year increase in installed wind power capacity, which was 380GW by the end of this April. Hydropower has shown a slowdown in newly installed capacity, but still exhibited a 5.3% increase to 416GW in installed capacity.

Notably, however, installed thermal capacity still takes up more than half of the total installed capacity at the end of April, reaching 1,345GW, 51% of the share of installed capacity.

**Figure 2. National Installed Capacity as of April 2023**

		Apr-23	Share of Capacity	Change (yoy %)	Apr-22
Thermal Power	GW	1,345	51%	3.4%	1,300
Hydro Power	GW	416	16%	5.3%	396
Nuclear Power	GW	57	2%	4.3%	54
Wind Power	GW	380	14%	12.2%	338
Solar Power	GW	441	17%	36.6%	323
<b>Total of Installed Capacity</b>	<b>GW</b>	<b>2,649</b>	<b>100%</b>	<b>9.8%</b>	<b>2,412</b>
Renewable Energy Capacity	GW	1,236	47%	17.0%	1,056
Zero Emissions Capacity	GW	1,304	49%	17.3%	1,112

Source: NBS, CEF Estimates

### Electricity demand

Total power generation continues to increase in April, as Figure 3 exhibits, as a result of China's still strongly increasing electricity [demand](#), making decarbonisation more challenging.

Electricity demand for the 4th month of CY2023 witnessed a 8.2% year-on-year growth reaching 658TWh, which brings total electricity demand for the first 4 months in China to 2,731TWh – a 4.9% year-on-year increase.

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

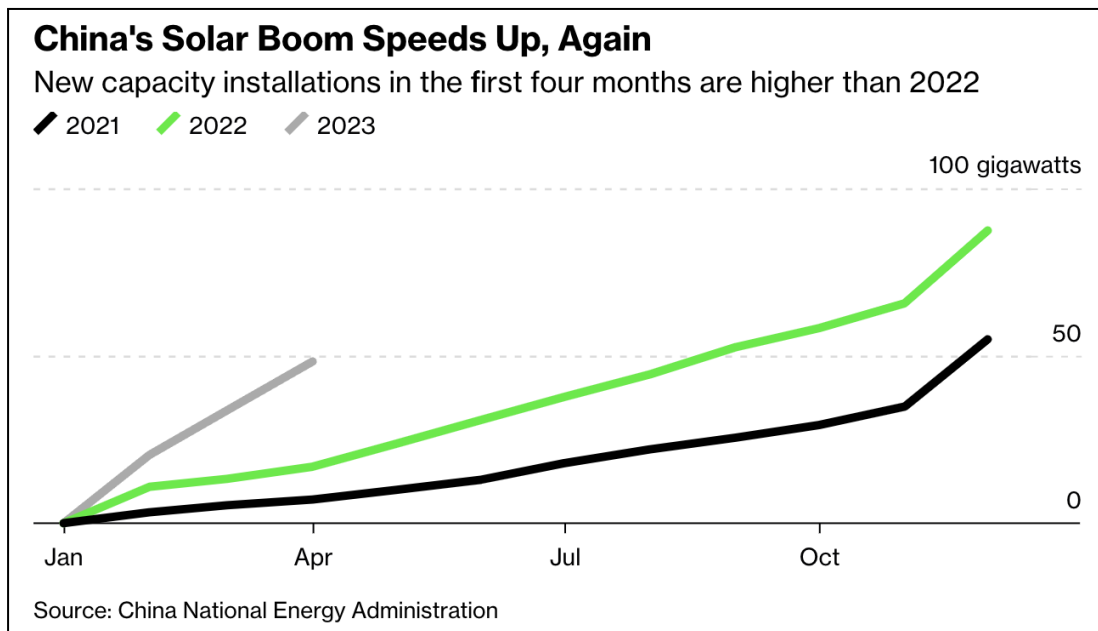
		Jan-Apr 2023	Share of Generation	Change (y-o-y %)	Apr-23	Change (y-o-y %)
Hydropower	TWh	271	10%	-13.5%	68	-25.5%
Thermal Power	TWh	1,947	71%	4.5%	449	12.1%
Nuclear Power	TWh	138	5%	4.7%	35	5.7%
Wind Power	TWh	291	11%	28.5%	83	32.1%
Solar Power	TWh	85	3%	23.8%	23	12.4%
<b>Total Power Generation</b>	<b>TWh</b>	<b>2,731</b>	<b>100%</b>	<b>4.9%</b>	<b>658</b>	<b>8.2%</b>
Renewable Power Generation	TWh	646	24%	6.3%	555	-0.4%
Zero Emissions Power Generation	TWh	784	29%	6.1%	590	0.5%

Source: NBS, CEF Estimates

### China's solar surge

China's solar power expansion is expected to continue. The world's [largest](#) operational solar plant of 2.2GW was connected to the grid in October 2020. In 2022, China started construction on a [3GW](#) and a [3.3GW](#) solar power plant. The [first phase](#) of the 3GW solar power plant was completed in April 2023, which required an investment of approximately CNY 5.11 billion (\$738 million). The 3.3GW solar power plant will be the world's largest PV plant.

According to [Bloomberg](#), China installed around 3 times the volume of solar capacity during the first 4 months of 2023 than in the same time period in 2022, as demonstrated in Figure 4. Bloomberg's [forecast](#) has risen too, from the previous estimate of 129GW to 154GW of solar capacity this year.



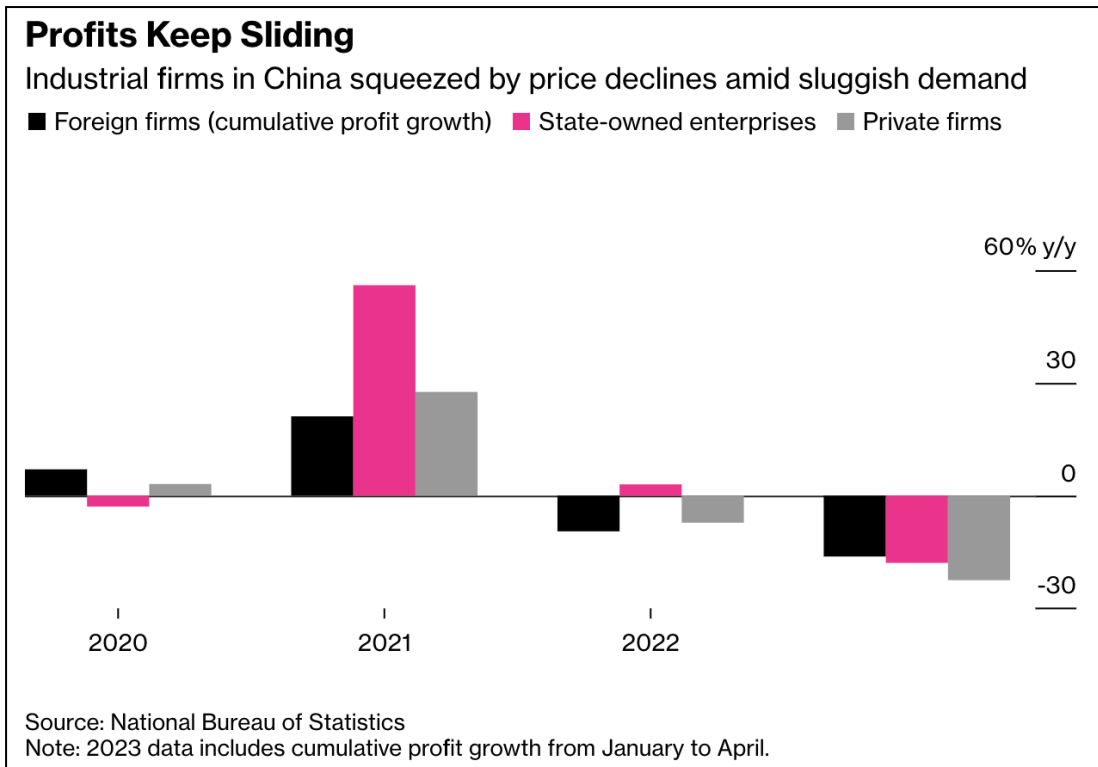
(Figure 4)

Overall, the first four months manifested staggering numbers in the expansion of solar power in China, with a total 48.3GW new solar capacity added. According to Lucas Zhang Liutong, of WaterRock Energy Economics, China is [expecting](#) to add total solar power of 120-140GW of capacity in 2023, a more than 40% increase than 2022.

### **Economic slowdown and recovery mean window for China to peak coal early**

China is determined to achieve economic recovery after an approximately 3 year stagnation of GDP growth due to the global pandemic. As a consequence, electricity demand climbed at the start of CY2023 as noted above.

Nevertheless, recent data from China's National Bureau of Statistics (NBS) showed that industrial profits had [fallen](#) 20.6%, as shown in Figure 5, during the first 4 months of 2023. Chinese companies are [struggling](#) with weak demand both domestically and internationally, and increased financial leverage is a rising headwind, as it is in the US and EU. Ironically, the lower GDP growth should bring lower electricity demand growth, which makes peak coal easier to reach – good news for global decarbonisation.



(Figure 5)

China had been [permitting](#) two new coal power plants per week in 2022, according to the Centre for Research on Energy and Clean Air (CREA). Lauri Myllyvirta at CREA [argues](#) that “the expectation of ... capacity payments is one motivation for coal power groups to pursue new projects despite the fact that power generation from coal is unprofitable at the moment”.

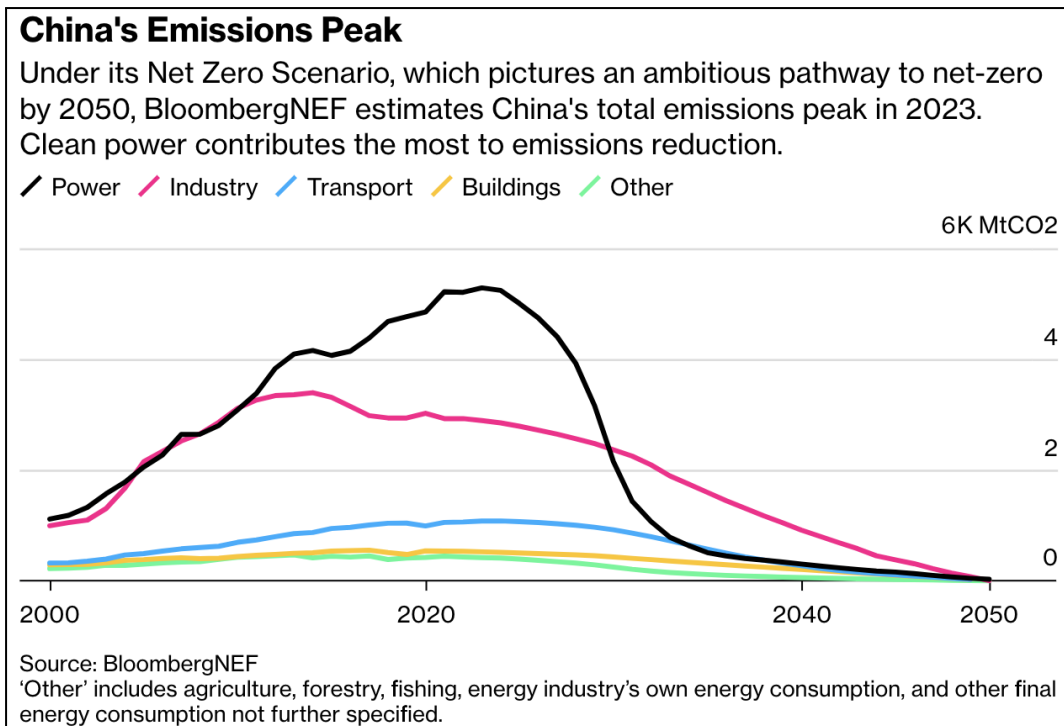
Further, Zhang Shuwei from Draworld Energy Research Centre [says](#) that it doesn’t make sense for China to encourage further investment in more coal-fired power plants, as the country has more coal power capacity than it needs.

In CEF’s view, it would be inadvisable for China to distribute more capital to new coal projects during the headwinds of lower profits and energy demand.

Sun Xiao, statistician from China’s NBS [claimed](#) that China’s next economic move is to focus on “restoring and expanding demand, further improve the level of production and marketing, and boost business confidence”.

As part of demand restoration, China should take this opportunity to drive even more investment in clean energy infrastructure to bring forward the [projected peak](#) in the country’s coal use in 2025 and accelerate the decarbonisation of China’s economy, enhancing energy security and reducing reliance on hyper-inflationary fossil fuel imports.

Moreover, as BloombergNEF estimated, if China lifts investment in decarbonisation to about \$38 trillion, China’s emission [peak](#) could happen this year, as shown in Figure 6, outperforming current climate targets and achieving net-zero by 2050.



(Figure 6)

This is a rare window and opportunity for China. This tipping point requires China to mobilise more capital into renewable energy rather than starting the construction of newly approved coal power plants. China has the opportunity to act as a responsible role model in global energy transition, and, as one of the biggest emitters in the world, to do its fair share in cutting down emissions.

## China and unevenly split global decarbonisation investment

While facing a potential economic downturn, China's April 2023 data still showed global leadership in its renewable energy expansion as we explored above. And China not only focused on increasing investment in domestic energy transition, it has also assisted central Asian countries in energy cooperation via its Belt and Road Initiative (BRI) and aid, leveraging its global technology leadership and the engineering capacities.

As noted above, the IEA [finds](#) that 90% of clean energy investment growth happening in developed countries and China. This is an outcome of the high price for emerging technologies and the shortage of affordable financing, which poses a challenge for the developing world to catch up with the global energy transition.

Even as the G7 was held this month to respond to China's technology leadership and domination in the global supply chain, China [held](#) a two-day summit to build stronger ties with its Central Asian allies, where Xi announced a total of 26 billion yuan (US\$3.7 billion) financial aid and support for development in central Asian countries.

We applaud China's commitment to renewable energy expansion and its support for Central Asian countries. The race for renewable financing highlights the importance of its response

on energy cooperation amidst global economic challenges and the uneven distribution of clean energy investment growth between developed and developing nations.

We would encourage China to expand its commitment tenfold, in alignment with the Paris Agreement, demonstrating by doing what the OECD should likewise be doing.

## **Australia's opportunity not only in US Compact, but in China**

The global momentum in energy transition is accelerating, and Australia is in a unique position with substantial opportunities to boost Australia's energy transition and energy cooperation with other countries.

In the recent CEF [response](#) to the [US-Australia Climate, Critical Minerals and Clean Energy Transformation Compact](#), we highlight Australia's unique opportunity as the nation holding some of the world's largest reserves of critical minerals, battery and hydrogen derivative technologies. To drive our economy away from its dependence on hyperinflated fossil fuel energy supply to zero emissions, deflationary renewable energy, we advocate strategic prioritisation of expanding and [value-adding](#) our world leading critical minerals resources.

As proposed by many Australian business leaders, this opportunity to green Australia's economy should be unlocked via greater collaboration with our key trade partners, including China. For example, Australia should be cooperating with China in the development of green iron, and creating a green price differential in iron ore markets, leveraging our world leading renewable energy potential to power processing and value-adding pre-export, thereby exporting 'embodied decarbonisation'.

Anthony Shaw, CEO of HSBC, [said](#) that "Australia remains China's sixth-largest trading partner but only 2% of Chinese outbound foreign direct investment (FDI) comes into Australia. We've just had a budget focused on productivity and services, and by the same token we have needs for investment into this country for us to achieve 82% by 2030 in terms of renewables".

This echoes David Olsson, national president of the Australia China Business Council, who [advocates](#) that we work collaboratively with China. Implementing Australia's ambition to pivot to the opportunities of a green economy at speed and scale requires that Australia explore all opportunities to access capital, capabilities and cooperation.

Working with China as well as the US and other trade partners and decarbonisation leaders to diversify our economy will help accelerate our transition to net-zero. But as Olsson argues, Australia needs to move fast. As the global race to the top escalates, the window is closing for Australia to realise its ambition of being a renewable energy superpower.