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## Chinese investment turns from red to green

China’s green investment surge is supporting economic growth and more than offsetting the drag from the beleaguered property sector. This pivot is essential to meet global climate targets. But it is also adding to geopolitical tensions, and there are looming headwinds from EV consolidation and excess battery capacity.

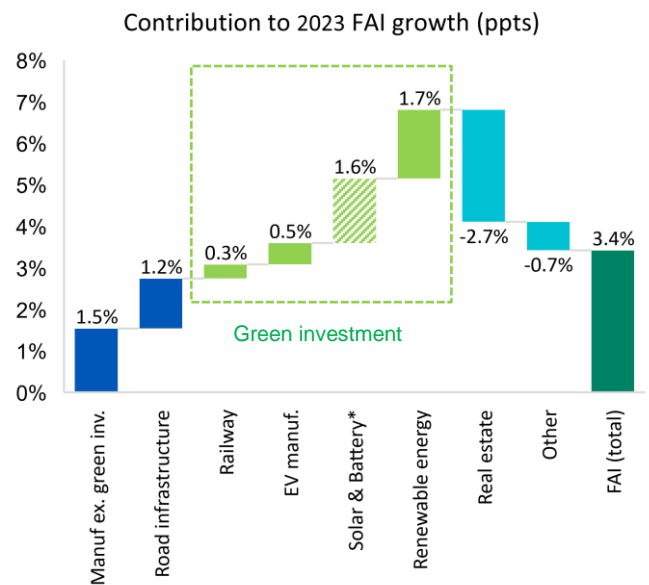
### Key Takeaways

- The global automotive industry is being shocked by the sudden arrival of Chinese electric vehicle (EV) manufacturing, which is amplifying geopolitical tensions with the West.
- But China has also been leaning hard on other forms of green investment, boosting the share of renewables in domestic power generation, and furthering its lead in aspects of green technology.
- China’s pivot to renewable energy is essential for global climate targets. Like with EVs, strong investment in solar and battery manufacturing capacity is reducing the cost of the green transition.
- But it also has the potential to add to geopolitical tensions. And the recent breakneck rollout risks adding to headwinds from consolidation within the EV sector and looming excess capacity within battery manufacturing.
- Much will depend on the renewable power aims from here. The authorities have already hit their 2030 goals, and we think they will continue to add to renewable power generation, grid capacity and ancillary infrastructure, helping to counter the drag from the real estate adjustment.
- And while other forms of green investment – particularly EVs and batteries – are likely to see investment retreat in the near term, they remain plausible drivers of Chinese growth over the long run.

### Green investment surged in China in 2023

China’s carbon reduction goals, increased focus on energy security, a desire to be at the forefront of green technology and the need to counter a substantial drag from real estate, motivated an unprecedented surge in green investment last year. Whether this continues will have huge ramifications for the Chinese economy, climate change and geopolitics.

Figure 1: Green investment became a policy lever in 2023, helping to counter the drag from property



\*Note: Solar and Battery manufacturing FAI data estimated.

Source: Haver, CarbonBrief abrdrn, June 2024



We estimate that green investment more than offset the drag from real estate on GDP growth in 2023 (see Figure 1).

A huge investment in renewable energy – which saw a record 215 gigawatts (GW) of new solar and 75 GW of wind capacity added – was the largest major driver.

We do not have official fixed asset investment (FAI) splits for solar and battery manufacturing, but plausible estimates suggest it may have been almost as large. Continued expansion of electric vehicle (EV) manufacturing and a pick-up in railway infrastructure investment also helped shore up investment.

### Peering through the smog

China’s abrupt green pivot partly reflects a need to counter the real estate drag, but it is also consistent with its climate targets.

In September 2020, President Xi made a surprise announcement that China would “aim to have CO2 emissions peak before 2030 and achieve carbon neutrality before 2060” – known as the ‘dual-carbon’ or ‘30-60’ goals.

The pivot to green investment also represents an increased focus on energy security and is deeply intertwined with China’s industrial policy.

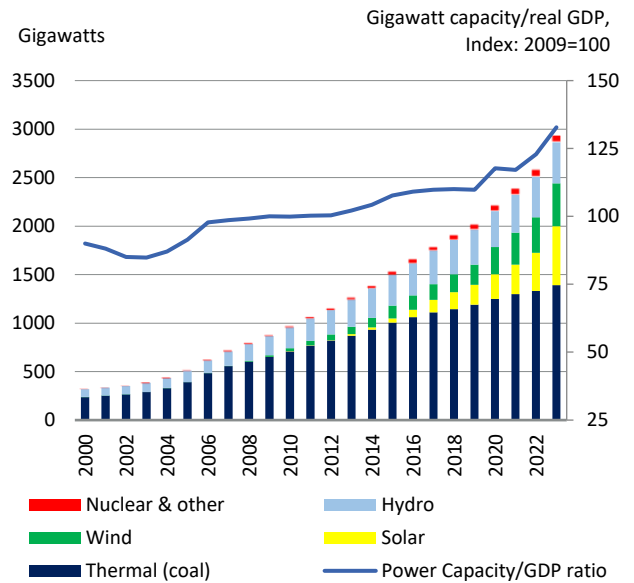
The importance of a resilient power sector was highlighted by localised black outs in December 2020 and September 2021, partly caused by earlier attempts to reduce reliance on coal and introduce more market discipline.

Since coal can be sourced from domestic mines, it provides an energy source that is not reliant on imports and therefore improves China’s energy security.

Set in this context, it is perhaps less surprising that China continues to press ahead with adding coal-fired power stations, which can be used to deal with the vagaries of renewable production (see Figure 2). Indeed, at the end of 2023, the National Development & Reform Commission (NDRC) announced that coal plants will receive payments under a “capacity mechanism”, which reduces the need for power plants to be profitable, improving grid stability as the share of renewables rises.

The risk of adding “stranded assets” and the subsidisation of coal power appears to be an insurance cost the authorities are willing to pay.

**Figure 2: Renewable capacity may have surged, but China continues to build new coal-fired power plants**

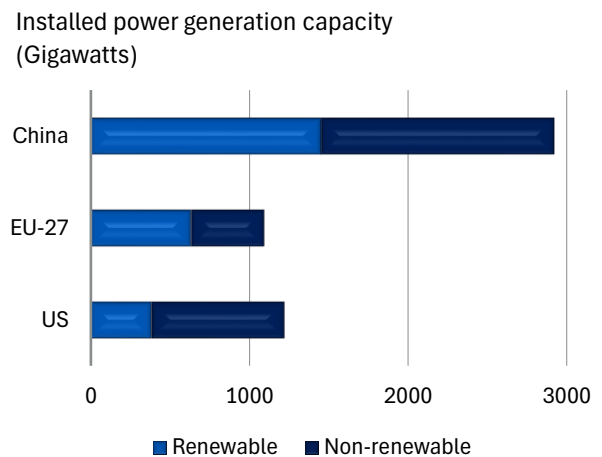


Source: Haver, abrdrn, June 2024

### China’s industry craves power

China’s electricity consumption and generation capacity is already above that of the US and Eurozone combined (see Figure 3). This reflects the large role industry plays in the economy and the energy-intensive manufacturing in which it now specialises.

**Figure 3: China is not world’s largest economy, but it already has the largest energy demands**



Source: International Renewable Energy Agency, abrdrn, June 2024

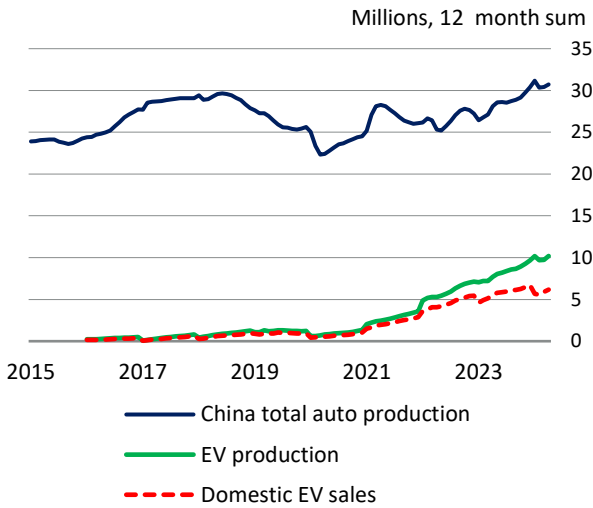
Semiconductors, aluminium, nickel refining and data centres all require large amounts of electricity.

Pushing power capacity into renewables also requires inputs that themselves need a lot of electricity to produce. Polysilicon – the key raw material for solar panels – needs four times as much energy per ton as aluminium and 150 times more than a ton of steel, for example.



And, while China's EV adoption has slowed down recently (see Figure 4), the electrification of transport over the long run will require greater grid capacity. The Chinese Academy of Sciences predicts that EVs could account for 7% of national power consumption by 2035.

**Figure 4: China has bet heavily on EVs**



Source: Haver, abrdrn, June 2024

China already has a competitive advantage from providing low electricity prices. Commercial prices of \$0.09 per kWh are lower than in most developed countries (Germany \$0.27, US \$0.15) and other major emerging markets, especially those often touted as potential beneficiaries of reshoring such as Mexico and India (where manufacturers pay an average of \$0.23 and \$0.13 respectively). Having excess capacity and slim profit margins is likely part of the plan to keep costs low.

And in the long run, the greening of China's electricity supply could provide some protection against carbon border adjustment taxes for energy intensive industries.

**Green light, red light**

A key question is whether China's green drive can continue to support growth or will turn into a headwind.

The push into EVs has raised geopolitical tensions, with both the Biden administration and EU having recently taken steps to buttress their domestic markets against Chinese EVs (see Figure 5).

A tougher export market combined with an already overcrowded domestic EV market may drive significant consolidation. This could weigh on investment in the automotive sector over the next couple of years, even if the long-run drive to electrify China's transport ultimately generates more green investment in autos.

Excess capacity within battery manufacturing is also likely to be made worse by developed market industrial policy attempting to reduce reliance on China.

Bloomberg NEF is tracking 7.9 TWh of annual battery manufacturing capacity for the end of 2025, with China alone making up nearly 6 TWh. This is much higher than demand, which projections put at only 1.6 TWh, assuming steady EV demand growth and a very rapid increase in batteries for storage unrelated to autos.

Similarly, China's already extensive rail network suggests little scope for transport infrastructure to do much heavy lifting. We judge that rail and road investment will likely ease off, adding to the fixed asset investment drags from autos and battery manufacturing over 2024 and beyond.

**Figure 5: Politics is blurring with security in the US, while the EU has also moved to protect its auto sector**

US actions by product	New tariff
Steel and aluminium	25%
Electric vehicles	100%
Lithium-ion batteries (EVs)	25%
Solar cells	50%
Natural graphite	25%
Semiconductors	50%
EU actions by manufacturer	New tariff
BYD	27%
Geely	30%
SAIC	48%
Other cooperative manufacturers	31%
Other non-cooperative manufacturers	48%
Tesla	TBC

Source: [Whitehouse](#), [European Commission](#), abrdrn, June 2024

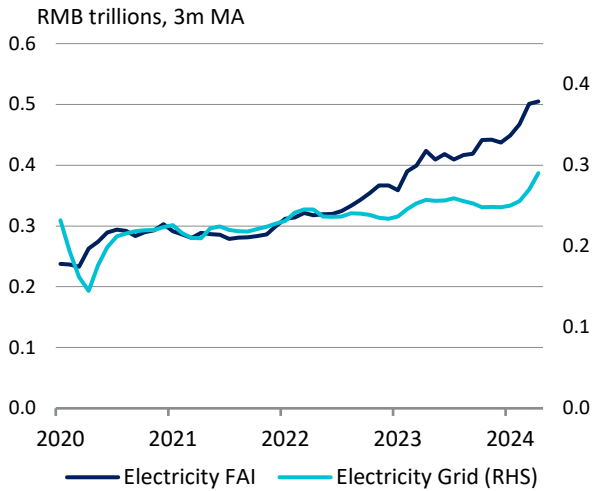
It is also difficult to know whether the renewable energy roll out can continue to gather pace and therefore support GDP growth in 2024. To do so, it is not enough to add new power capacity at the exceptionally high pace seen over 2023 – it must rise further.

Data to April show that new capacity is in fact being added at a faster pace across solar. But additions to wind and coal have fallen compared to Q4 2023. So total new power capacity being added across the whole energy sector has stabilised, which could imply a risk that it adds little to GDP growth in 2024.

That said, investment in the electricity sector goes beyond just power capacity and overall it shows little sign of slowing down, seemingly aided by stronger investment in the power grid (see Figure 6). Investment in the grid and ancillary infrastructure could support total investment growth – albeit probably to a lower extent than in 2023 – even if the installation of new renewable energy capacity stabilises or eases.



**Figure 6: Can a rotation towards grid capacity and storage drive further growth?**



Source: Haver, abrdrn, June 2024

Indeed, China likely needs to install more ultra-high voltage (+800 kV) power lines to move renewable power from where it is generated in the West, to where industrial and household demand resides in the East.

Additional investments will also need to be made to keep the electricity system operating smoothly with a larger share of renewable electricity production.

Storage mechanisms, such as pumped hydro, is one example of an ancillary investment that could keep green infrastructure spending high. [CarbonBrief](#) notes that 250 GW is in ‘pre-construction’.

**An unsustainable surge in sustainable investment?**

China’s push into green investment in 2023 was remarkable; the number of EVs manufactured rose by a third, to almost 10 million, while surging investment in renewables means around half of China’s electricity generation capacity now comes from these sources.

That said, the pivot away from real estate and into green investment raises the question of whether China is swapping one unsustainable form of investment for another.

Assessing the time horizons over which different aspects of green investment support or weigh on growth is complicated.

The impulse from renewable power, grid capacity and ancillary infrastructure is likely to support growth in 2024, even if the impulse to GDP is smaller than in 2023.

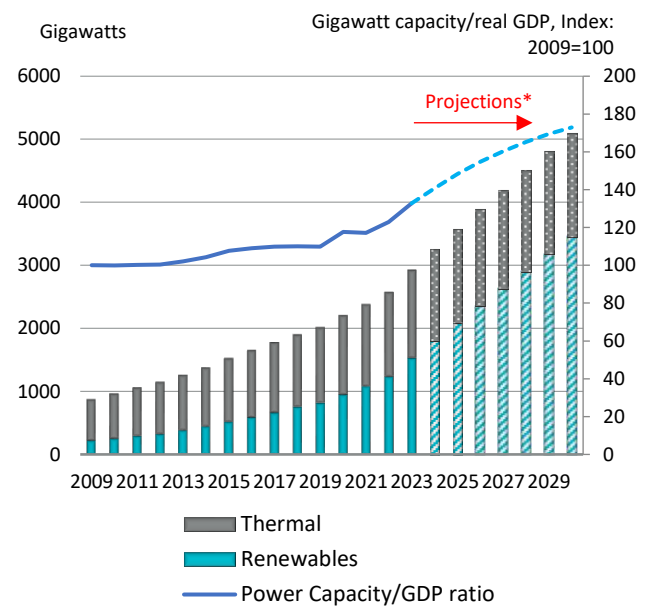
On the other hand, excess capacity across EVs, battery and solar production may start dragging on the economy soon – especially if geopolitical tensions curtail China’s ability to export. This could imply that green investment contributes only modestly on net this year.

But considering a longer time horizon, the potential for EVs to rise from their current 20% share to a much larger proportion of China’s auto fleet suggests green investment in transportation could still be a significant driver of growth.

We have little visibility on the Chinese Communist Party’s (CCP’s) plans for investment in renewable power over the long run. China will almost certainly reach its 2030 target of 1,200 GW of solar and wind capacity this year. The International Energy Agency (IEA) estimates that renewable capacity could more than double to 3,200 GW by 2030. But even that would imply a slowdown from the almost 300 GW of renewable power installed in 2023.

Assuming thermal capacity remains unchanged, the IEA renewable projection would imply a continuation of the recent sharp rise in the power capacity to GDP ratio (see Figure 7). This may only be plausible if thermal capacity is only used intermittently to smooth through the ups and downs of renewable energy production, or if a large number of coal-fired power stations are shut down.

**Figure 7: How much power does China need?**



Source: Haver, abrdrn, June 2024 \* Note: projections assume thermal power capacity held at 2023 levels, renewables expand to 3200 GW (in line with IEA), while real GDP follows abrdrn Global Macro Research forecasts.

Similarly, while we expect grid capacity and ancillary infrastructure to support the recent surge in renewable power installation, it is unclear whether this will provide a more long-lasting support to growth. [The IEA](#) World Energy Investment report expects investment into grid and storage to almost triple. If correct, green energy investment could still continue to support growth over the coming years.

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