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China's Role in the Global Energy Transition

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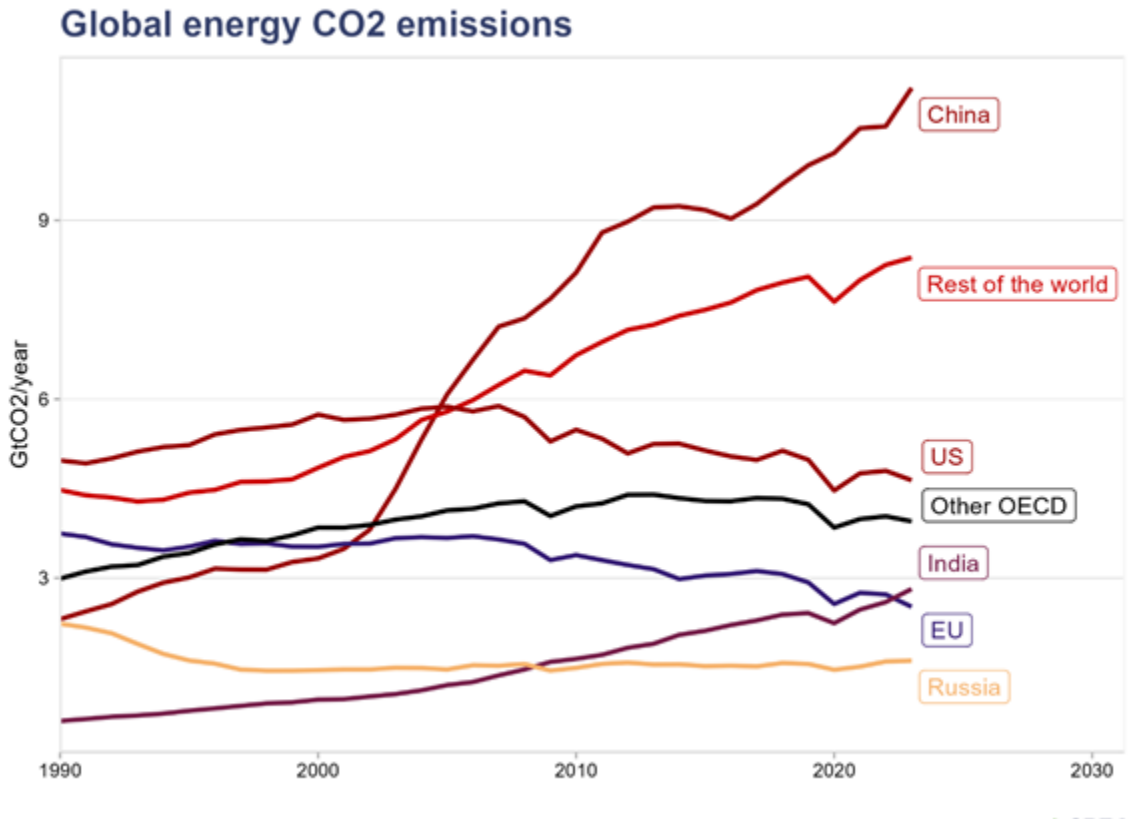
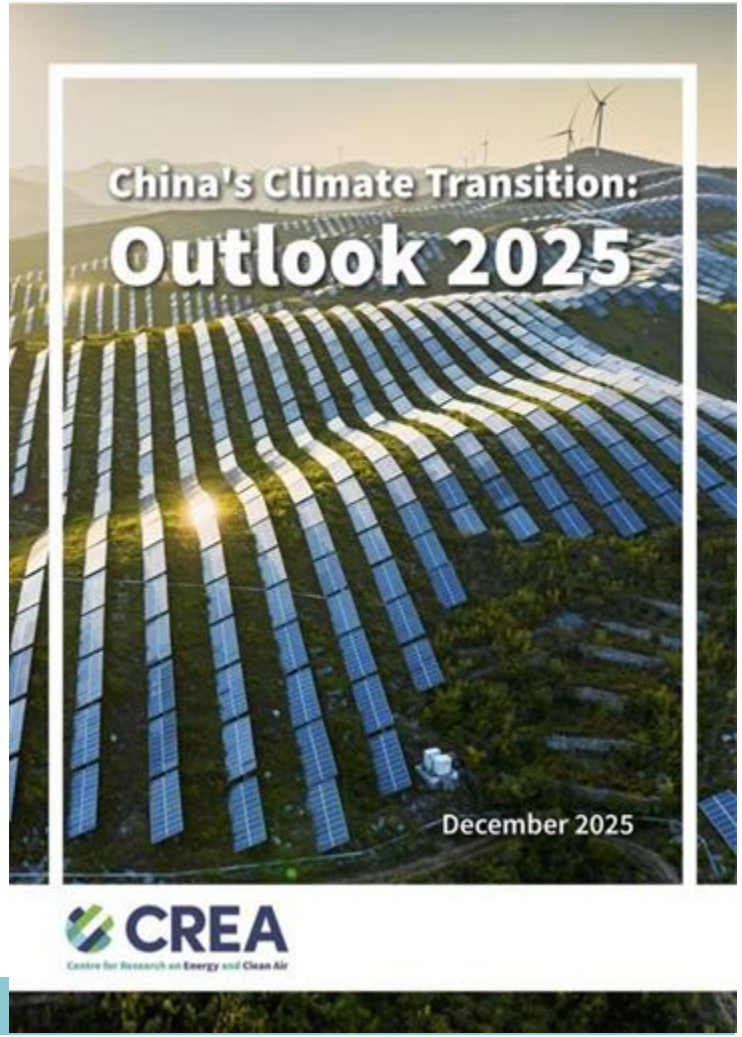
China dominates global emission trends



- China accounts for 30% of global emissions and is now the second largest historic emitter after the US
- China has been responsible for 75% of global emissions growth since the Paris climate conference in 2015

China’s Climate Transition: Outlook 2025

- Emissions plateau in 2025 despite rising energy demand and power sector emissions fall for the first full year since 2016, driven by a major clean energy boom.
- Yet China will miss several 2025 climate targets, including:
  - Cutting CO_2 intensity (per unit GDP)
  - Strictly controlling new coal projects & coal consumption



Sectoral progress

- **Power:** New pricing system pits renewables against coal, modest renewable capacity targets risk slowing the clean power boom, largest addition of coal power since 2015; very slow progress on retiring old plants
- **Industry**: Energy use & emissions up, chemicals & coal-based chemicals drive growth; EAF steelmaking lagging
- **Buildings**: Energy use & emissions above Paris-aligned pathways; coal-to-gas switching limits CO_2 reductions
- **Transport**: Breakthrough year—EVs >50% of new car sales; 12% of total vehicles electric; oil demand in transport falling

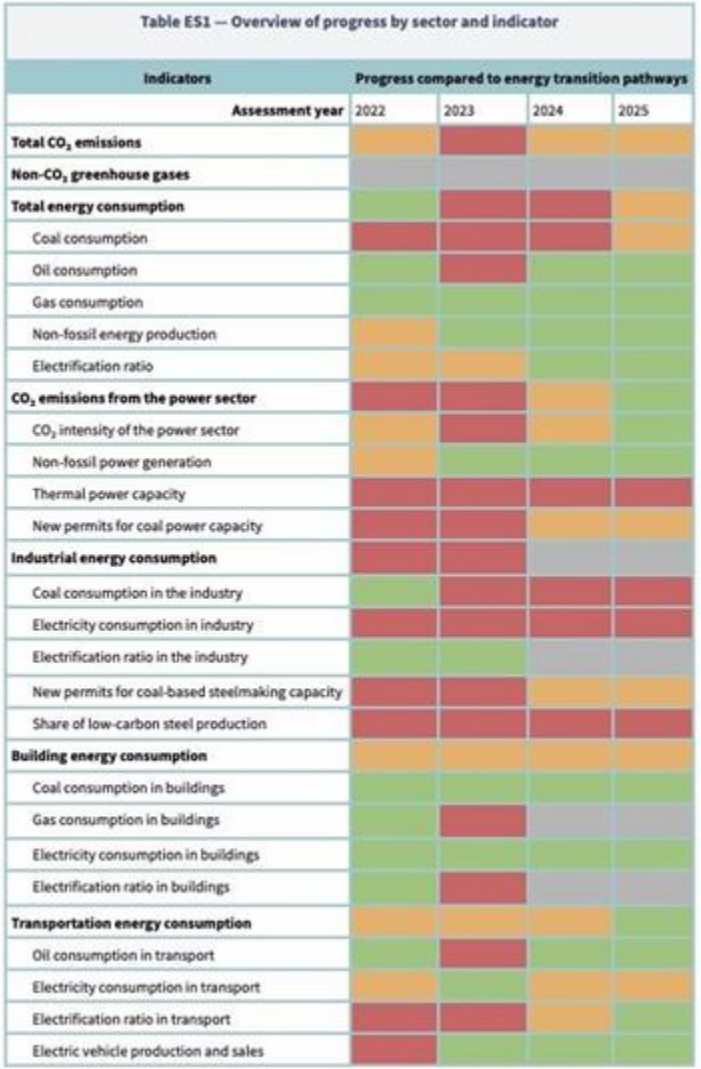
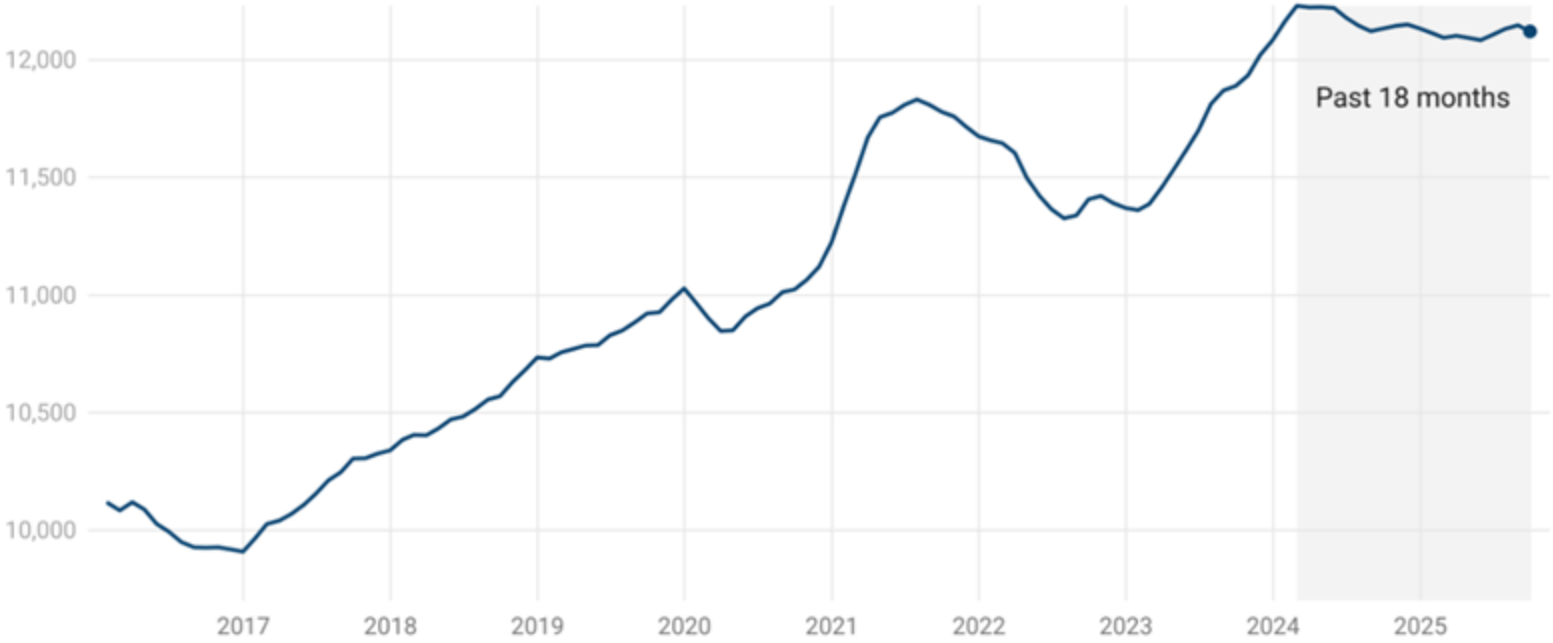


Table ES1 — Overview of progress by sector and indicator

Indicators	Progress compared to energy transition pathways			
Assessment year	2022	2023	2024	2025
Total CO_2 emissions				
Non-CO_2 greenhouse gases				
Total energy consumption				
Coal consumption				
Oil consumption				
Gas consumption				
Non-fossil energy production				
Electrification ratio				
CO_2 emissions from the power sector				
CO_2 intensity of the power sector				
Non-fossil power generation				
Thermal power capacity				
New permits for coal power capacity				
Industrial energy consumption				
Coal consumption in the industry				
Electricity consumption in industry				
Electrification ratio in the industry				
New permits for coal-based steelmaking capacity				
Share of low-carbon steel production				
Building energy consumption				
Coal consumption in buildings				
Gas consumption in buildings				
Electricity consumption in buildings				
Electrification ratio in buildings				
Transportation energy consumption				
Oil consumption in transport				
Electricity consumption in transport				
Electrification ratio in transport				
Electric vehicle production and sales				

China's CO2 emissions have now been flat or falling for 18 months

Emissions from fossil fuels and cement, MtCO2, rolling 12-month totals



Source: Analysis for Carbon Brief by Lauri Myllyvirta

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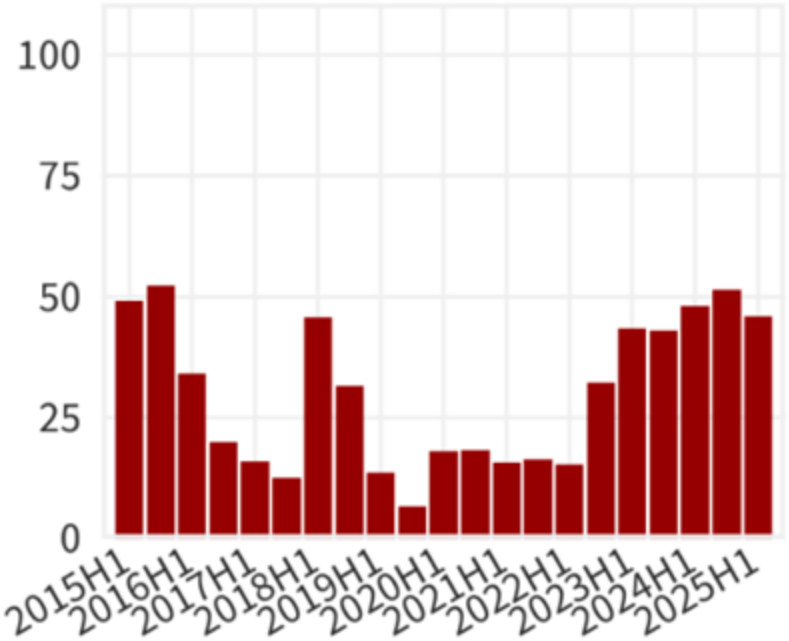
When coal won’t step aside

Coal power construction starts



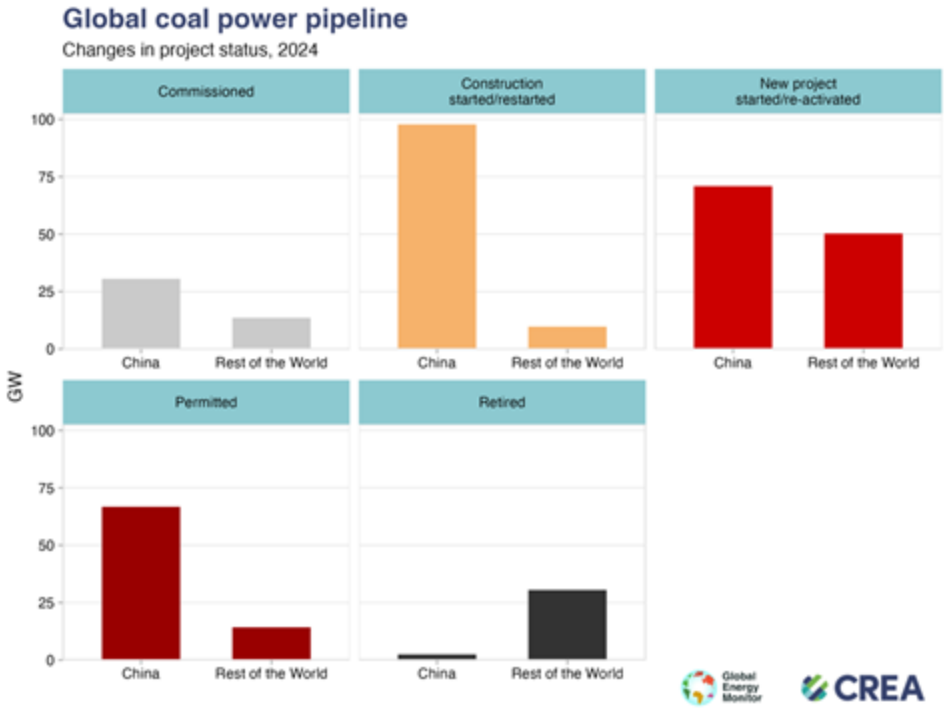
Energy security concerns following power shortages and global volatility are driving continued coal power expansion.

Coal power **permits remain high**. In 2022 and 2023, **China approved two new coal power plants per week** on average (over 100 GW).

Coal power **construction starts and commissioning reached their highest level since 2015**.

Directly **contradicting President Xi Jinping’s pledge** from 2021 to ‘strictly control coal power projects’ and ‘strictly limit coal consumption’

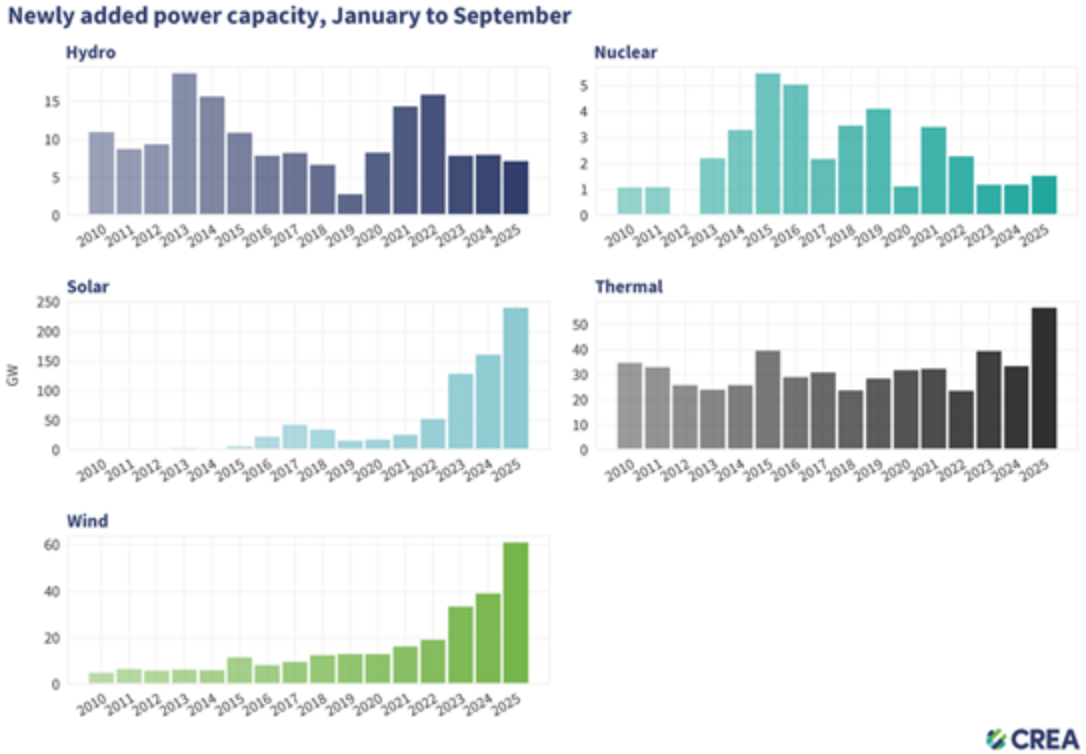
Defying global trends



While China continues to add new capacity, the global coal **fleet outside China shrank by 9.2 GW** in 2024, reinforcing China's dominant role in shaping the future of coal power.

China now accounts for **93% of global construction starts** for coal power in 2024.

Positive real-world trends: surging solar & wind installations



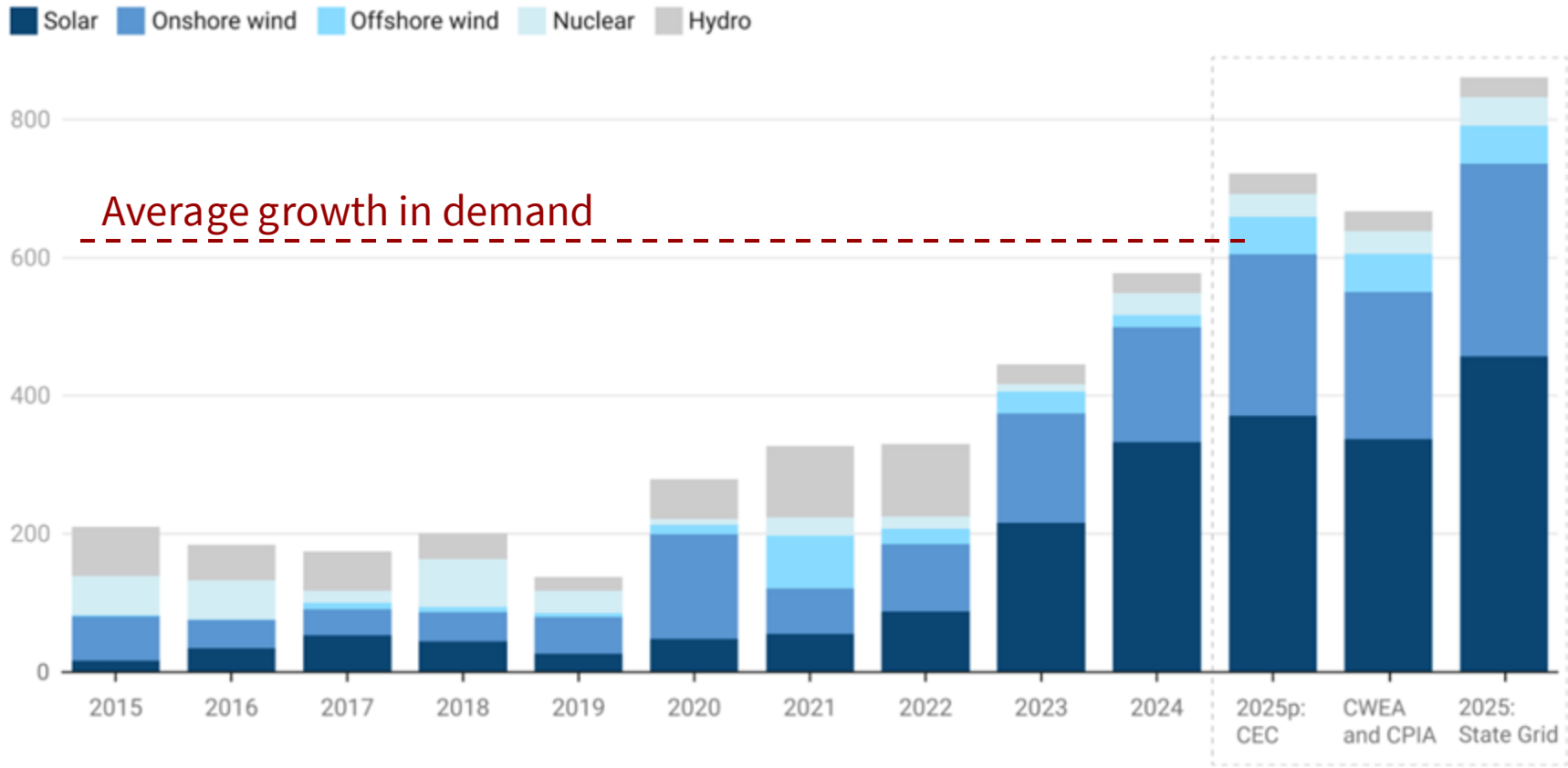
China added a **record 356 GW of solar and wind capacity** in 2024- more than the rest of the world combined.

Renewables capacity is higher than fossil fuels for the first time, with renewables generation exceeding increase in electricity demand.

Coal power share of total generation dropped to record low this year

China could add enough clean power in 2025 to supply Germany and the UK

Annual electricity output from newly added clean-power capacity, TWh



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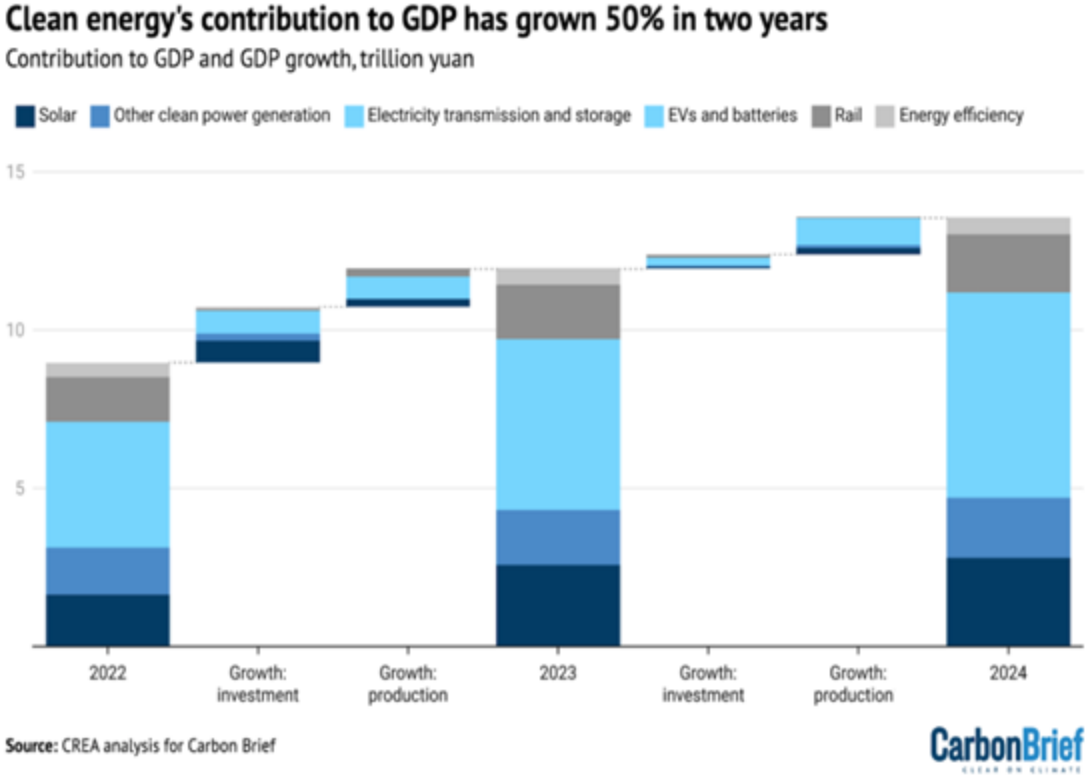
China’s Clean Energy Surge: A New Economic Driver

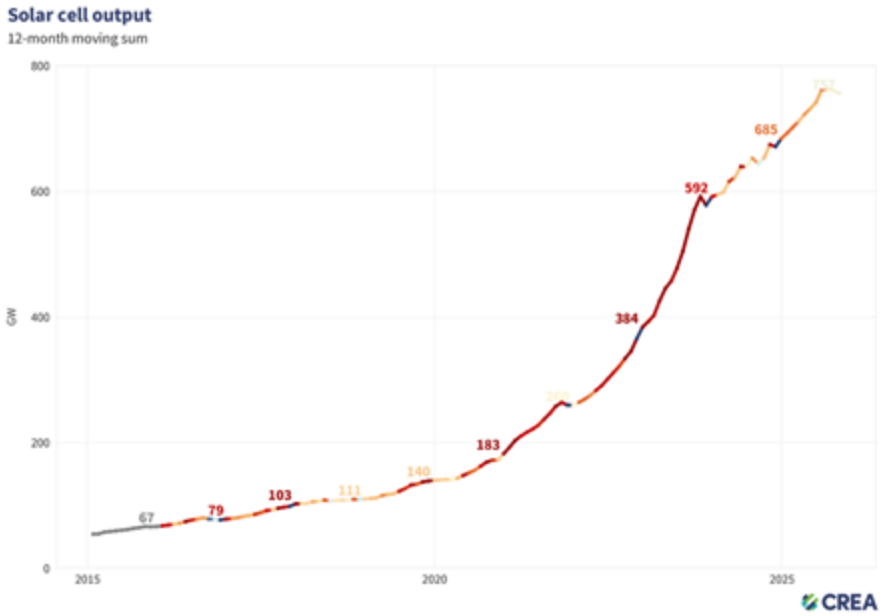


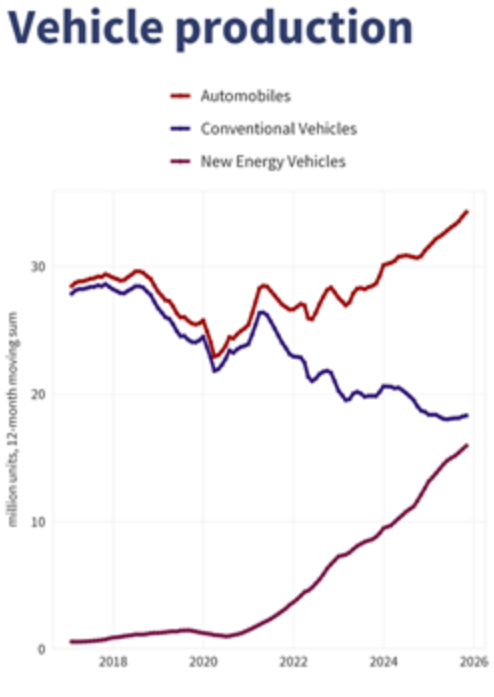
Clean energy technologies contributed **more than 10% of China’s GDP** in 2024 for the first time ever, with sales and investments worth **$1.9tn**.

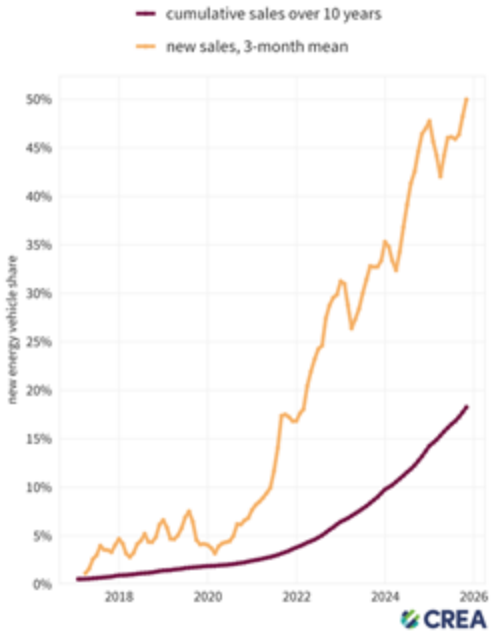
Clean energy sectors grew **three times as fast as the Chinese economy overall**, accounting for **26% of all GDP growth** in 2024, and have **overtaken real estate** sales in value.

China would have missed its 5% target for GDP growth without the growth from clean technologies, expanding by 3.6% instead of the 5.0% reported.

Positive real-world trends: surging clean energy manufacturing



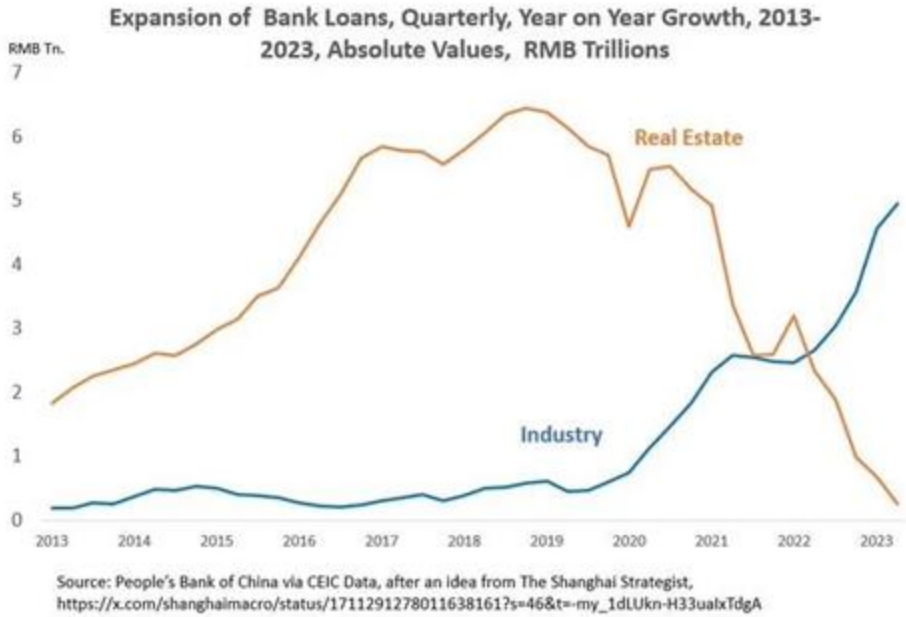




China’s Clean Energy Surge: Causes and Implications

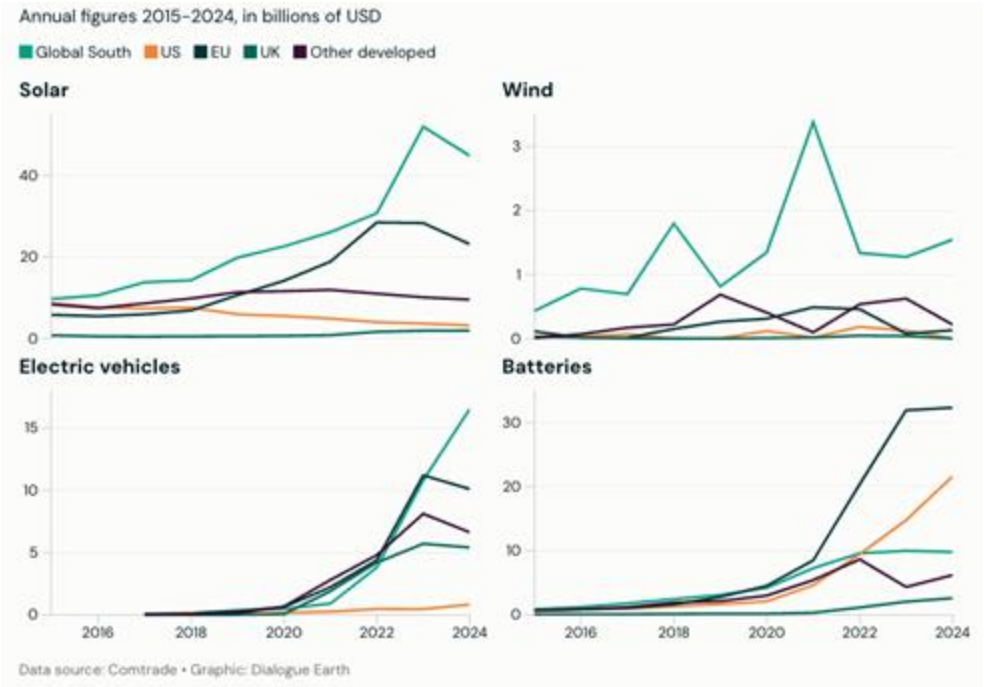
Strategic pivot from real estate to manufacturing, particularly clean-tech, fueled by government incentives, easing of financial access, and a shift towards a low-carbon economy

China’s great rotation



Source: People’s Bank of China via CEIC Data, after an idea from The Shanghai Strategist, https://x.com/shanghaimacro/status/1711291278011638161?s=46&t=-my_1dLUkn-H33uaIxTdgA

Global South emerges as major destination for Chinese cleantech



Half of all China's exports of solar and wind power equipment and electric vehicles (EVs) now go to the Global South.

Emerging and developing countries have driven **most of the recent growth in export volumes**.

Emerging and developing countries are **expected to have a market share of 70% in solar PV and 60% in wind and in battery storage** during this decade out to 2030

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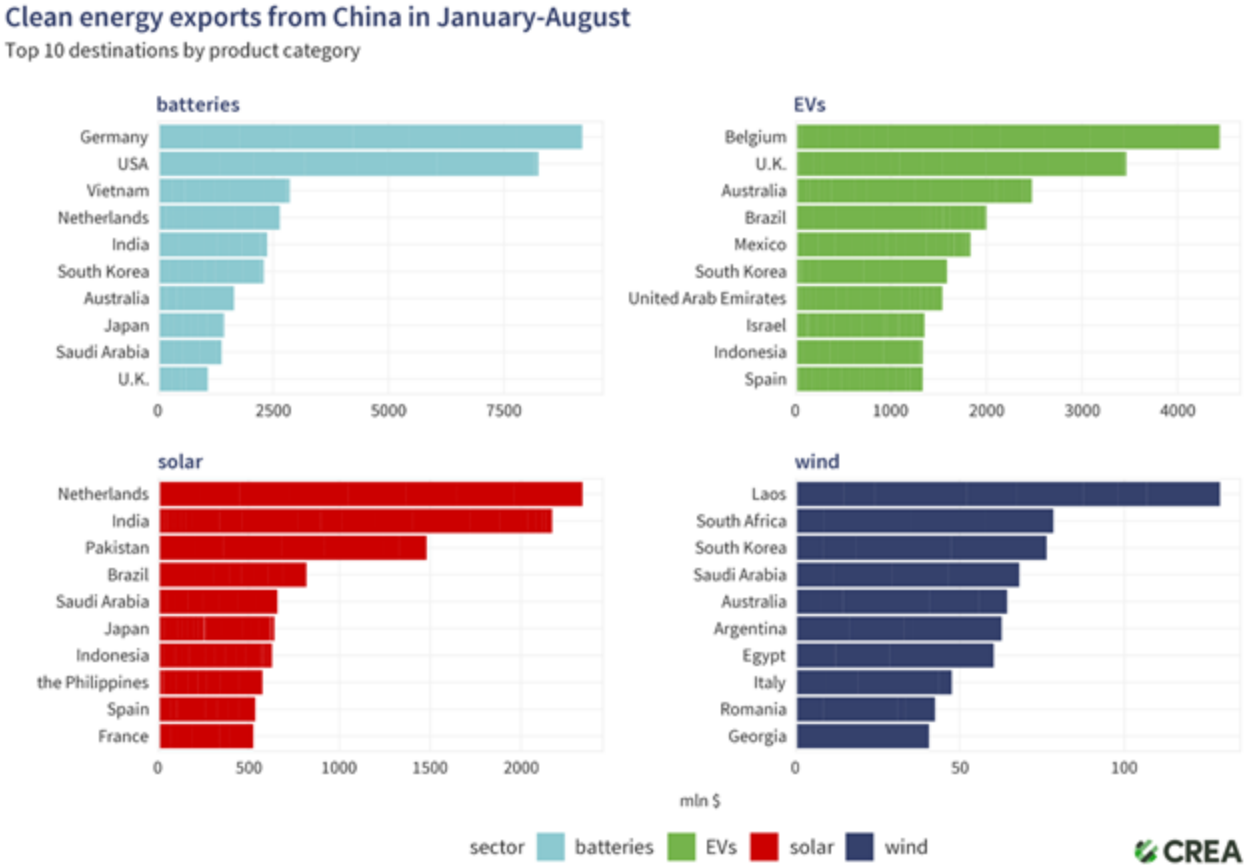
Broad-based growth from Global South, but Europe still essential



China at COP30

- China won the communications at COP30, positioning itself as responsible major power and clean tech provider without any new commitments
- Strong presence of Chinese SOEs and private clean-tech firms (solar, wind, batteries), indicating Beijing's alignment of climate diplomacy with industrial strategy

China’s new 2035 climate targets

HEADLINE TARGET

Reduce emissions by 7 to 10% from peak levels

At least 30% needed to align with 1.5°C goal

BASE YEAR

Reduce from undefined “peak levels”

No space for China’s emissions to keep increasing further

GHG COVERAGE

Covers all greenhouse gases and sectors

NON-FOSSIL SHARE OF TOTAL ENERGY CONSUMPTION

Target of 30%

>40% needed to align with 1.5 and 2°C goals

SOLAR AND WIND CAPACITY

Target of 3,600GW

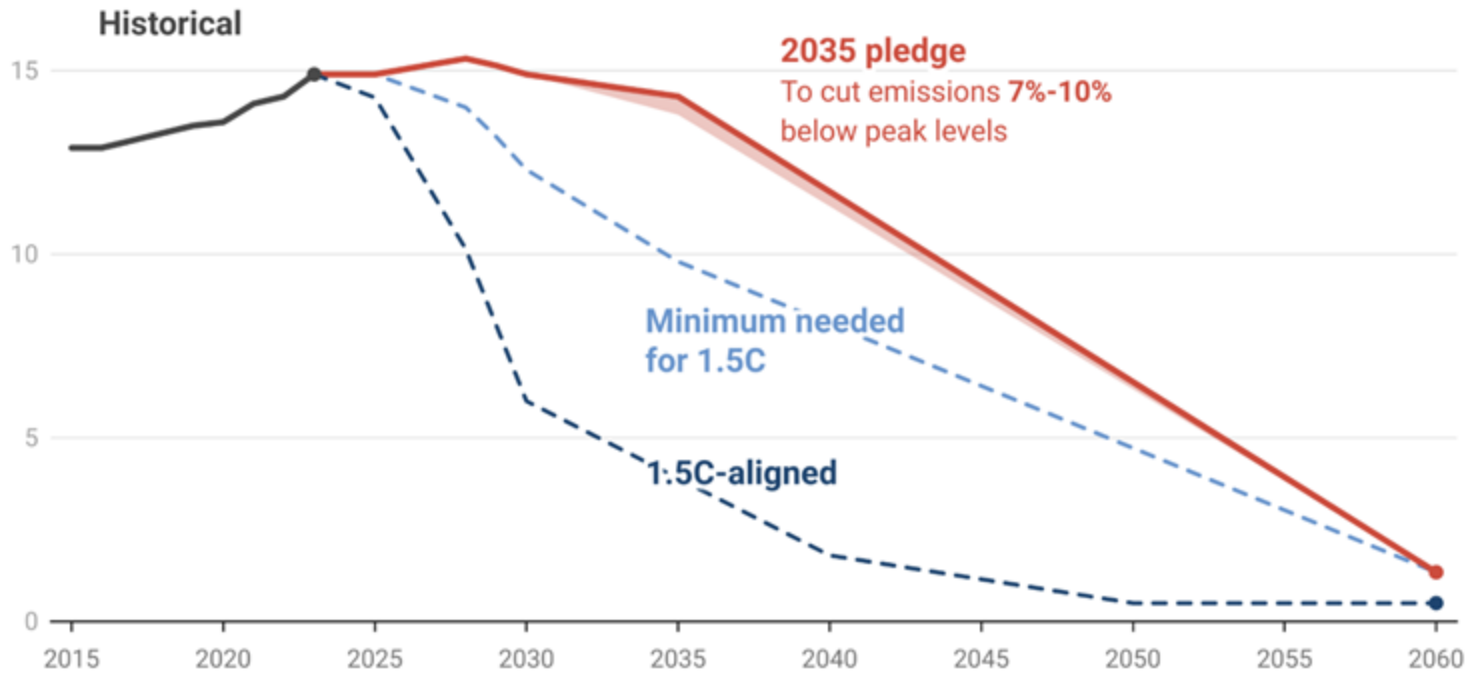
4,500GW needed to align with 1.5 and 2°C goals

FRAMING

“Striving to do better”

China's 7-10% emissions reduction target for 2035 falls short of 1.5C

Greenhouse gas emissions, billion tonnes of CO2 equivalent



Source: Centre for Research on Energy and Clean Air

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Current trends are far ahead of China's new 2035 targets

Indicator	2030 NDC	2035 NDC	Benchmark	Current trends
Emission reductions	65% CO2 intensity reduction	7-10% net-GHG reductions, striving to do better	>30%	Clean energy trends could cut emissions by more than 30%, 2025 carbon intensity target will be missed, requiring total reductions already by 2030
Emissions peak	before 2030	before 2030	2024	Emissions have fallen since March 2024, indicating a structural decline and early peak
Non-fossil share of total energy consumption	25%	30%	40%	19.8% in 2024
Solar and wind capacity	1,200 GW	3,600 GW	4,500 GW	Installed capacity of >1,600 GW with annual additions of 360 GW in 2024 and 500 GW expected in 2025
New energy vehicles	-	Mainstream in new sales	>60% of new sales	NEVs reached 45% of new sales on average over the past three months
Coal consumption reduction	phase down over 15th FYP	not included in NDC submission	40%	Annual growth increased sixfold from 0.5% in 2016-20 to 2.9% in 2024

Experts confident for 2035 targets to be overachieved, but uncertain about short-term emissions cuts

- More than two-thirds (69%) of experts believe China will significantly or partly overachieve its new climate targets for 2035
- Although emissions have fallen since March 2024, experts are less certain that China will peak in 2025, expecting a peak later in 2028.
- Still, the majority of experts (99%) are confident that China will achieve its 2030 targets, implying no emissions growth over the coming five years.
- More than half of the experts (54%) believe that the future macroeconomic environment will strengthen the importance of the dual-carbon goal. This indicates that carbon neutrality is widely seen as a key direction for promoting China's 'high-quality development'.

Expectations for the 15th Five-Year Plan

Key priorities from recommendations

1. Building a modern industrial system and becoming a “manufacturing powerhouse”
2. Accelerating high-level “science and technology self-reliance and self-strengthening”

Key questions for China’s 2030 climate and energy targets

- CO2 intensity target
- CO2 cap
- Dual carbon control
- Reduction in coal and oil consumption
- Limiting new coal capacity and accelerate retirement
- Clean energy targets
- Control fossil fuel-based chemical industry

Conclusion

China's Dominance

China navigates a complex green transition but the overall direction is clear: green is the "underlying colour of high-quality development" for China, which led the country to become the dominant player across most clean technologies.

US Stagnation

The US has turned its back on the decarbonisation agenda (for now), locking in an economy built on fossil fuels that are coming to the end of their era.

Europe at a Crossroads

Europe stands at a crossroads to either render itself irrelevant through continued reliance on fossil fuels and then long-term dependence on China's clean tech or double down on its own efforts to build economies of the future.

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Thank you!

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