



Centre for Research on Energy and Clean Air

# China energy and emissions trends

*January 2026 snapshot*

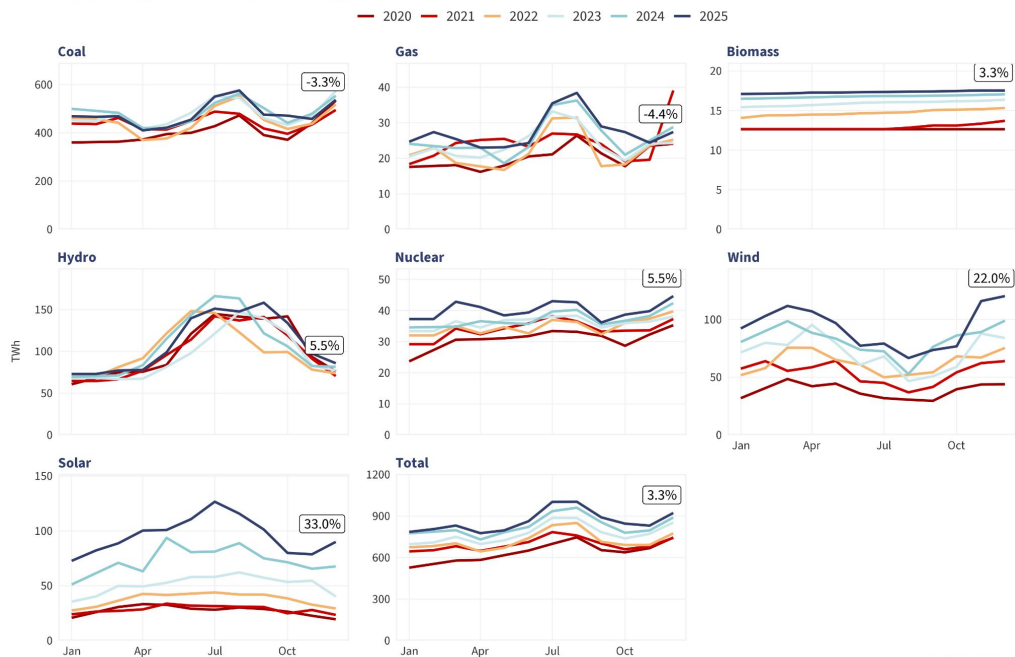
# Thermal power generation decreased in 2025

- Total power generation\* is estimated to have increased by 3.3% in December, while large-scale power generation grew by just 0.1%. For 2025 as a whole, total power demand rose by 5%, compared with only 2.2% growth in large-scale power generation, indicating that most of the increase in power generation came from solar and wind installations outside the industrial production statistics.
- Coal and gas power generation declined by 3.3% and 4.4% year on year, respectively, in December. For 2025 as a whole, thermal power generation fell by 1%.
- In December, solar and wind power generation\* increased by 33% and 22%, respectively.
- Hydro and nuclear both grew 5.5% in December.

\*This is a prediction based on the assumption that there wasn't a major increase in wind and solar curtailment compared with the same period last year.

National Bureau of Statistics (NBS) underreports wind and solar generation, particularly from rooftop and smaller solar plants. Find CREA's methodology for power generation [here](#).

Monthly power generation by technology



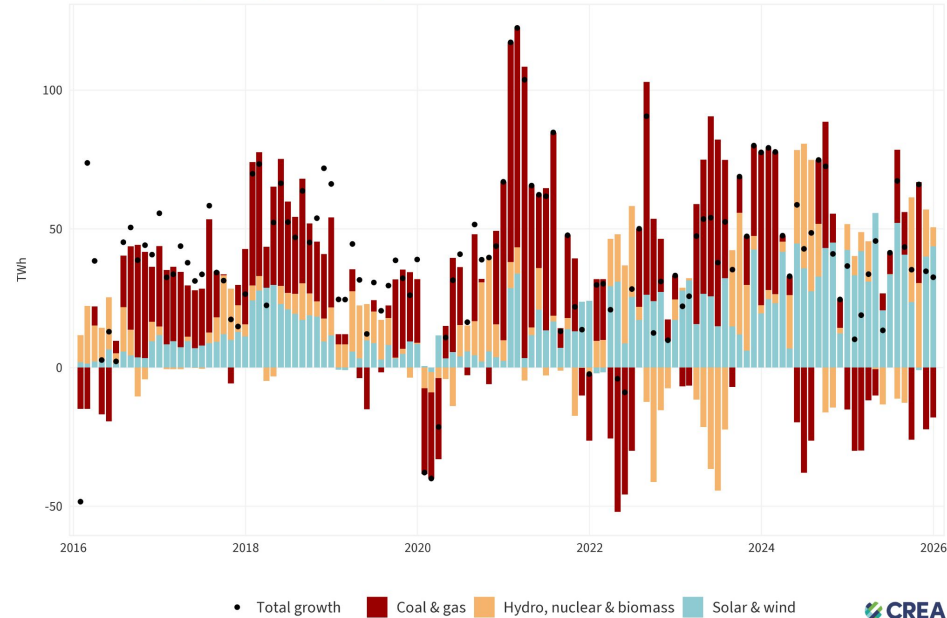
# Renewables meet total power demand growth in 2025

- Wind and solar\* power generation met all power demand growth in December. For 2025 as a whole, wind and solar accounted for 94% of total power demand growth.
- In 2025, solar and wind power\* accounted for 22% of total electricity generation, up from 19% a year earlier. Rapid growth in clean energy generation squeezed coal-fired power, whose share of total electricity output fell to 55%, down four percentage points from the previous year.

Read more: [Coal power drops in China and India for first time in 52 years after clean-energy records](#)

*\*This is a prediction based on the assumption that there wasn't a major increase in wind and solar curtailment compared with the same period last year.*

Growth in monthly power generation by source

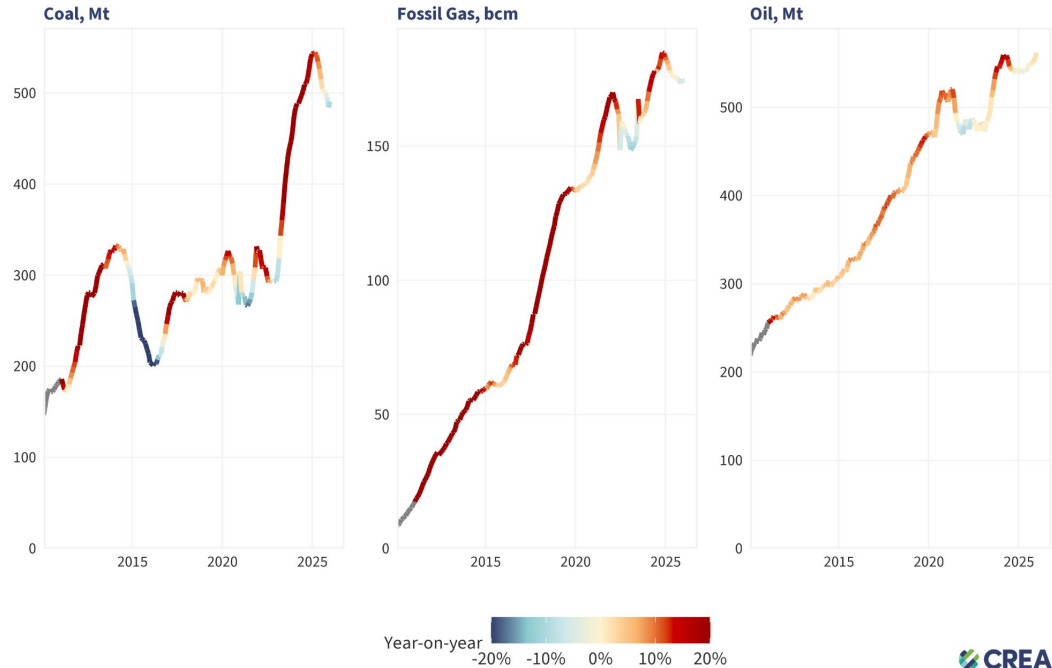


# Oil imports grow, while coal and gas decline in 2025

- China's coal imports increased by 11.9% year on year in December 2025, despite a 9.6% year-on-year decline in total coal imports for 2025 as a whole.
- China's crude oil imports increased by 16.8% year-on-year in December, while for 2025 as a whole, crude oil imports rose by 4.4%.
- China's natural gas imports fell by 15.5% year-on-year in December, and declined by 2.8% for 2025 as a whole.

## Fossil fuel imports

12-month moving sum

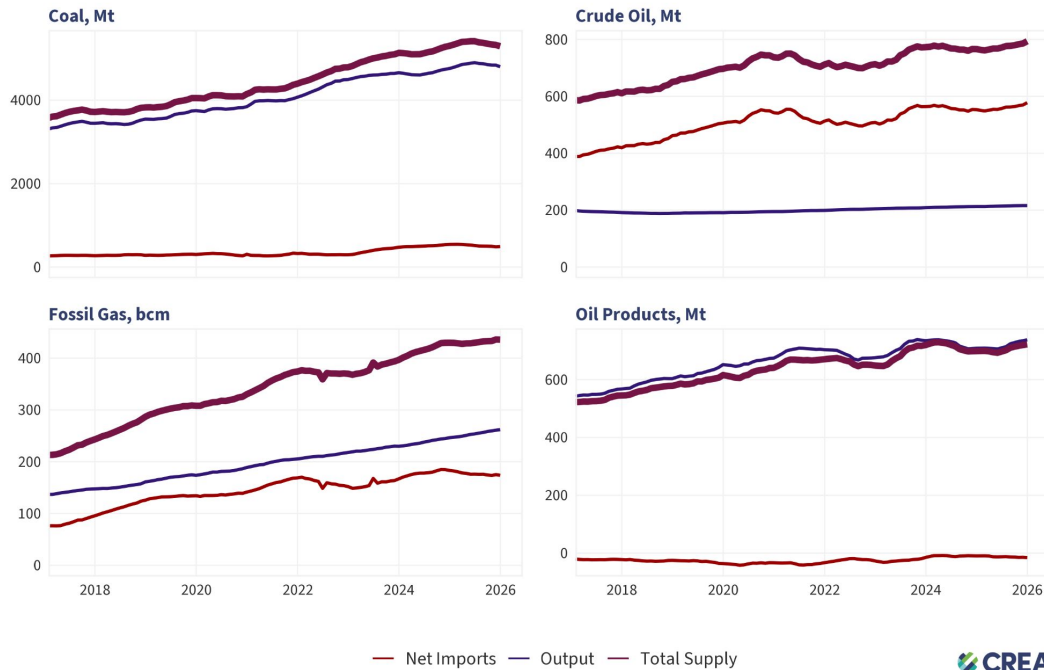


# Coal and oil output growth slowed slightly, while gas kept steady

- In December, coal output fell by 1% year-on-year; while for 2025 as a whole, coal output increased by 1.2%.
- Domestic natural gas production rose by 5.1% in December, bringing output for the whole year up 6.2% year-on-year. Domestic supply increasingly replaces imports.
- Crude oil production declined by 0.2%. Output for the whole year was up 1.5%.
- Refinery throughput rose by 5.0% year-on-year in December, and was up 4.1% in 2025.

## Fossil fuel supply

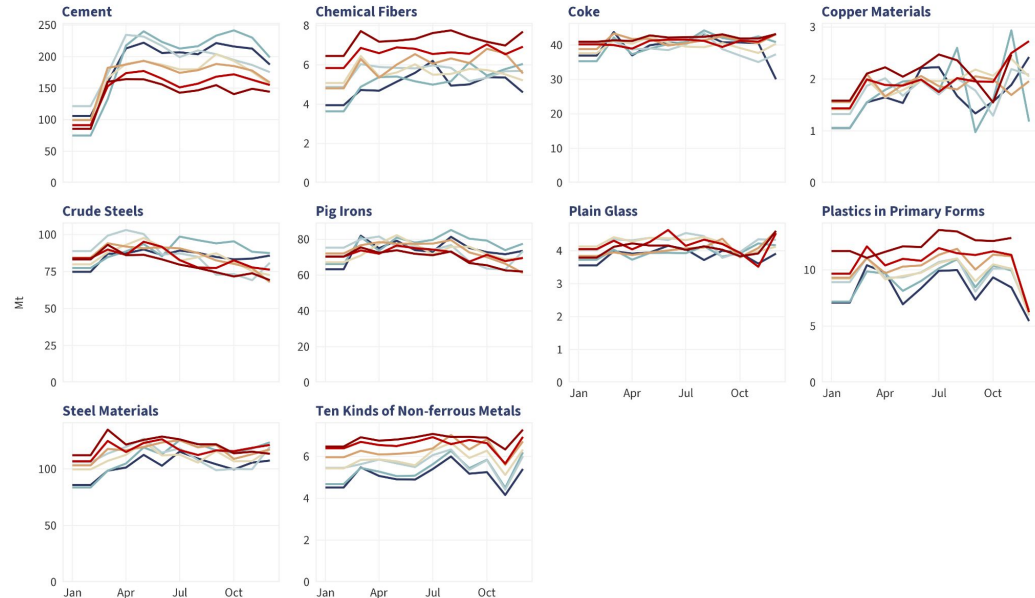
12-month moving sum



# Steel and cement output fell in 2025

- Steel and cement, the two largest-emitting industrial sectors saw a full-year drop.
- In December 2025, pig iron, crude steel, and steel product output declined 9.9%, 10.3%, and 3.8%, respectively.
- Cement production fell by 6.6% in December, reaching its lowest level for the month since 2019.
- For 2025 as a whole, output of pig iron, crude steel and cement fell by 3.0%, 4.4% and 6.9%, respectively.
- Chemical fibre and non-ferrous metal output grew by 6.4% and 4.9% in December, and by 4.9% and 3.9%, respectively, in 2025.
- Plain glass production grew by 3.4% year-on-year. Ethylene production, used as a key feedstock for plastics, grew by 3% in December.

Heavy industry output



Year — 2019 — 2020 — 2021 — 2022 — 2023 — 2024 — 2025

*The steel and cement industries are the largest CO2 emitters in China, when emissions from their electricity use are included. They are also bellwethers of real estate, infrastructure, and other fixed asset investments that play an outsized role in China's emissions and economy.*

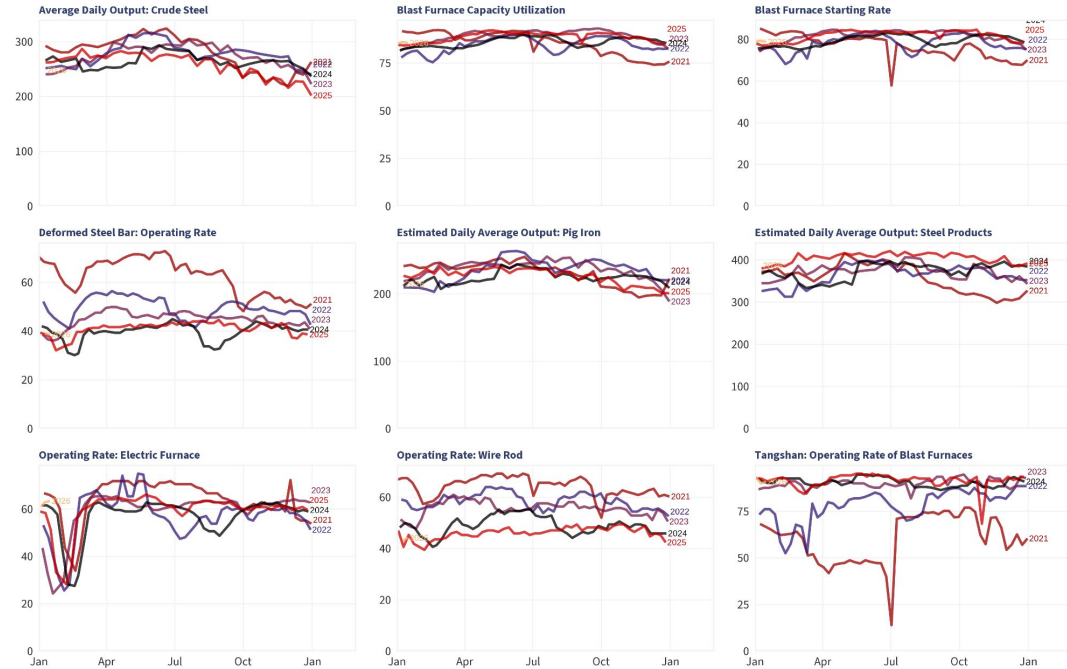
# Steel export reached record high in 2025

- At the beginning of 2026, blast furnace starting rates and utilisation were slightly higher than a year earlier. Electric furnace operating rate was also higher than in the same period last year.
- In 2025, China's total steel exports increased by 7.5% year on year, reaching a new historical high. Export licensing requirements will be introduced in 2026.
- The operating rate of blast furnaces in Tangshan, China's 'steel capital' and an important source of air pollution in Beijing, remained on a high level.

*Hebei Province industrial output is a bellwether of national priorities: when air quality and emissions are the priority, it is the most tightly regulated area due to its impact on Beijing's pollution levels.*

Read more: [Closing the loop: from stalled green steel targets to a strategic reset in China](#)

Steel industry weekly operating indicators



Source: Wind Information

# Newly added thermal power capacity highest in a decade

In the first eleven months of 2025, China added:

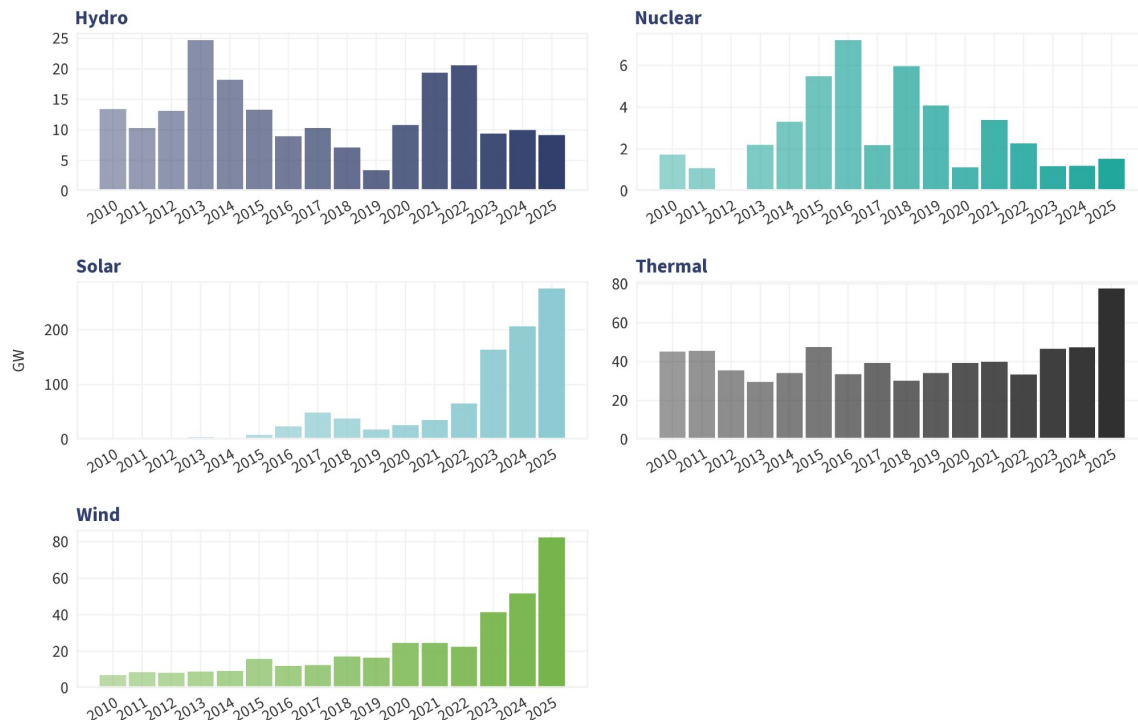
- 274.9 gigawatts (GW) of solar power capacity, up 33% from last year.
- 82.5 GW of wind power capacity, a 59% increase from last year.
- 77.5 GW of thermal power capacity, a 63% increase from last year.
- 9.1 GW of hydro power capacity, a 9% decrease from last year.
- 1.5GW of nuclear power capacity, a 29% increase from last year.

Read more: [Clean energy contributed a record 10% of China's GDP in 2024](#)

[Why China is still building new coal—and when it might stop](#)

[When coal won't step aside: The challenge of scaling clean energy in China](#)

Newly added power capacity, January to November

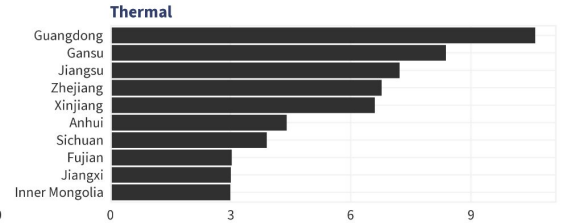
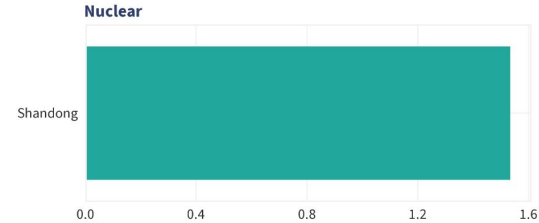
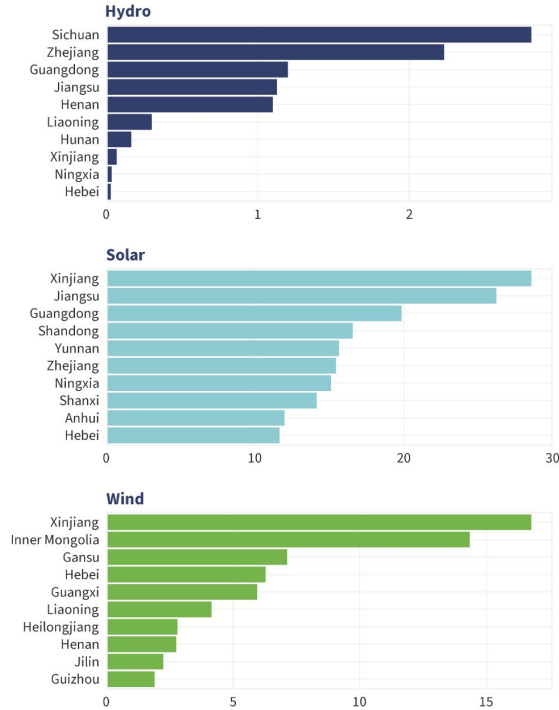


# Distributed solar and large-scale energy bases take the lead

- Solar power installations are led by Xinjiang, Jiangsu, and Guangdong. Jiangsu and Guangdong focus mostly on distributed solar, while in Xinjiang large-scale energy bases took the lead.
- Xinjiang, Inner Mongolia, and Gansu lead in wind development. These provinces are parts of the large-scale clean energy bases initiative.
- Thermal (coal) power additions accelerated in Guangdong, Jiangsu, and Gansu. In recent years, Guangdong has led the country in new thermal power capacity additions, undermining its clean energy performance and leading to signs of coal power overcapacity in 2024.

Newly installed power capacity by province

January - November 2025



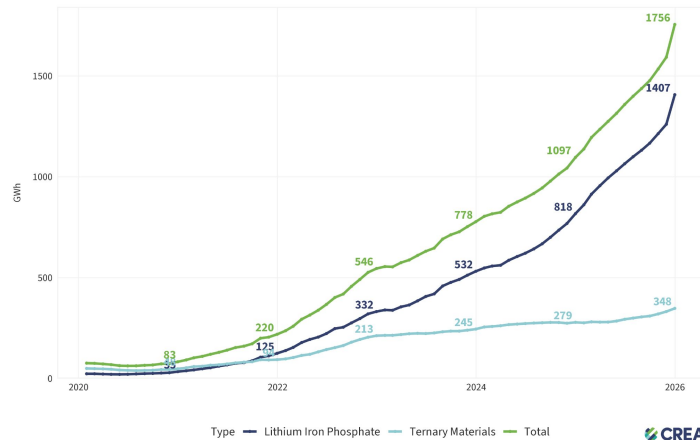
GW

Read more: [China's north cleans up its power mix as the south lags](#)

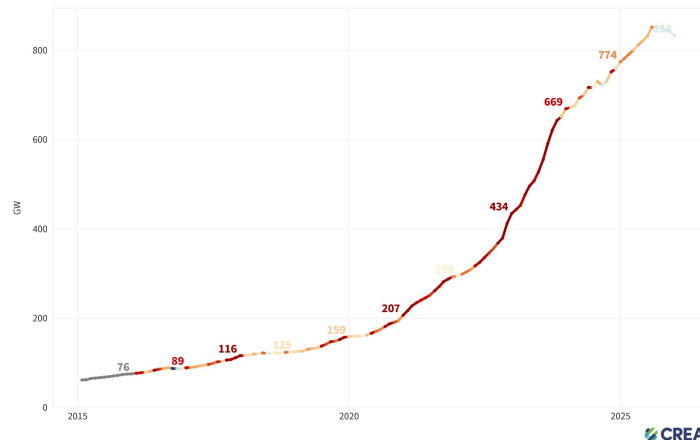
# Solar cell manufacturing remains resilient

- Solar output decreased by 9.7% in December. Cumulative solar output in 2025 grew by 7.6% year-on-year. Despite the recent monthly dip, production levels are still elevated, suggesting that manufacturing activity remains strong and providing a supportive signal for continued solar deployment.
- In December, total battery output reached 201.7 GWh, up 62.1% year on year. Cumulative battery output in the year of 2025 rose by 60.1%.

Battery output  
12-month moving sum



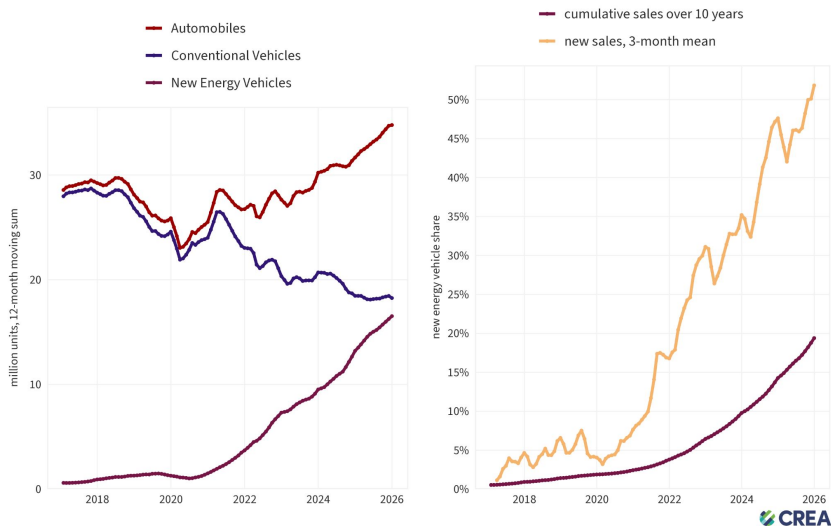
Solar cell output  
12-month moving sum



# NEVs reach majority share of output

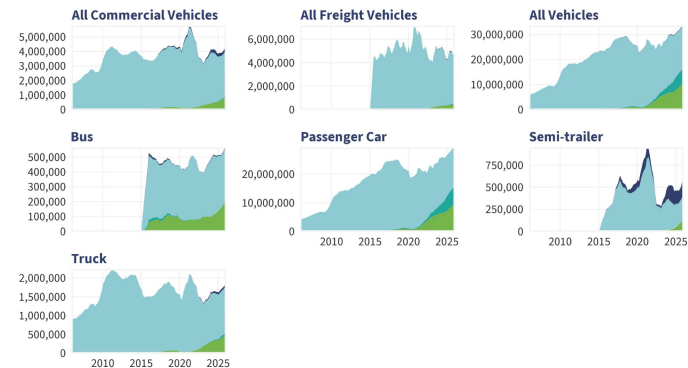
EV and plug-in hybrid output rose by 8.7% in December, accounting for 52.5% of total vehicle production. The three-month average market share of NEVs in new sales reached 52%.

## Vehicle production



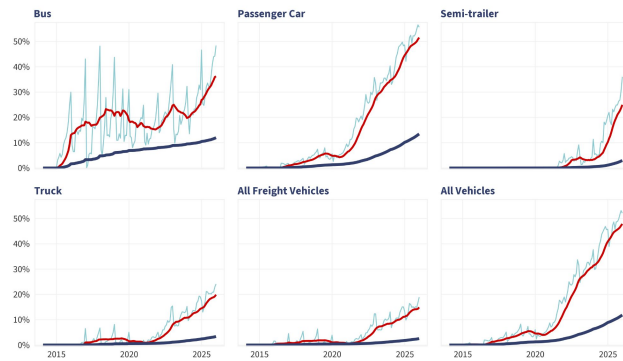
## Vehicle sales

12-month rolling sum



Gas Gasoline&Diesel Others Plug-in Hybrid Pure Electric CREA

## EV market shares by vehicle category



monthly sales share of sales, 12-month mean share of vehicles on the road CREA

# As of the end of December, 10 provincial capitals recorded 12-month average PM<sub>2.5</sub> levels above the national annual standard

- As of the end of December, 10 out of 31 provincial capitals recorded 12-month moving average PM<sub>2.5</sub> concentrations exceeding the national annual standard of 35 µg/m<sup>3</sup>.
- Cities with the highest PM<sub>2.5</sub> levels were mainly located in China's northern regions. Xi'an (Shaanxi) recorded the highest level at 41 µg/m<sup>3</sup>, followed by Zhengzhou (Henan) at 40 µg/m<sup>3</sup>, and Harbin (Heilongjiang) at 39 µg/m<sup>3</sup>.
- Compared with the previous month, 10 provincial capitals saw increases in their 12-month PM<sub>2.5</sub> averages.

PM<sub>2.5</sub> concentrations in provincial capitals

12-month moving average

--- National air quality standard



Data until 2025-12-31

# As of the end of December, six provincial capitals exceeded the national annual ozone limit

- As of the end of December 2025, six out of 31 provincial capitals recorded 12-month 90th percentile ozone concentrations above the national standard of  $160 \mu\text{g}/\text{m}^3$ .
- Cities with the highest ozone levels were mainly located in northern and central-western China. Shijiazhuang (Hebei) recorded the highest level at  $169 \mu\text{g}/\text{m}^3$ , followed by Jinan (Shandong) and Taiyuan (Shanxi) at  $165 \mu\text{g}/\text{m}^3$ , and Tianjin, Chengdu (Sichuan), and Zhengzhou (Henan) at  $163 \mu\text{g}/\text{m}^3$ .
- Compared with the previous month, only Fuzhou (Fujian) had an increase in its annual ozone assessment value.

## Ozone concentrations in provincial capitals

90th percentile over 12 months

... National air quality standard



Data until 2025-12-31

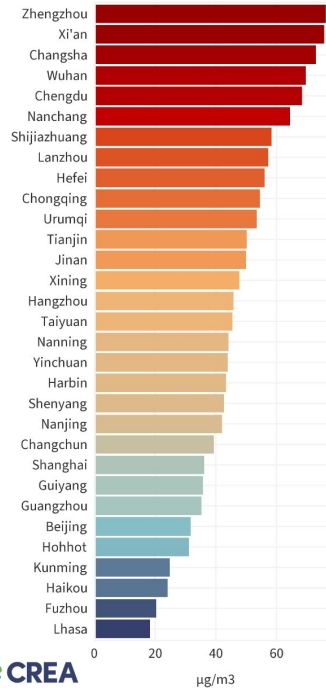
# In December, PM<sub>2.5</sub> peaked in central and western cities, ozone highest in South China, and NO<sub>2</sub> concentrated in northern inland cities

- In December, Zhengzhou (Henan) and Xi'an (Shaanxi) recorded the highest monthly average PM<sub>2.5</sub> concentration among China's provincial capitals, at 76 µg/m<sup>3</sup>, followed by Changsha (Hunan) at 73µg/m<sup>3</sup>, and Wuhan (Hubei) at 70 µg/m<sup>3</sup>.
- Ozone levels were the highest in South China, with Haikou (Hainan) topping the list at 121 µg/m<sup>3</sup>, followed by Guangzhou (Guangdong) and Fuzhou (Fujian), at 101 µg/m<sup>3</sup> and 94 µg/m<sup>3</sup>, respectively.
- Xi'an recorded the highest nitrogen dioxide (NO<sub>2</sub>) concentration at 51 µg/m<sup>3</sup>, followed by Lanzhou (Gansu), Tianjin and Yinchuan (Gansu), at 47, 45 and 44 µg/m<sup>3</sup>. Nitrogen dioxide not only poses direct health risks, but also contributes to the formation of PM<sub>2.5</sub> and ozone.

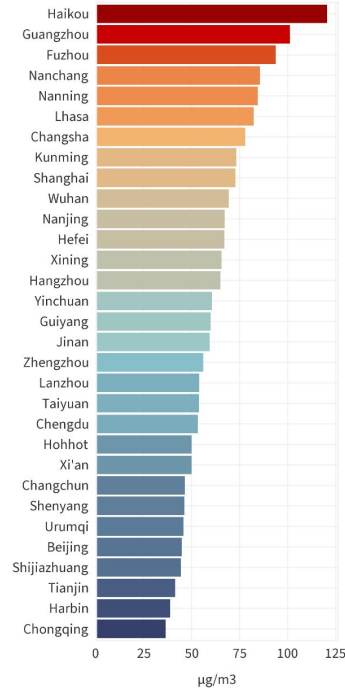
Monthly average pollutant concentrations in provincial capitals

Dec 2025

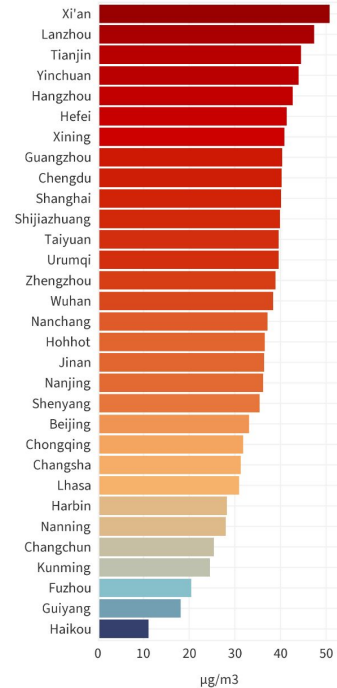
PM<sub>2.5</sub>



O<sub>3</sub>



NO<sub>2</sub>



# In December, PM<sub>2.5</sub> pollution rebounded sharply in the Beijing–Tianjin–Hebei region driven largely by unfavourable meteorological conditions

- In December, Beijing-Tianjin-Hebei region saw the most significant year-on-year increases in PM<sub>2.5</sub> concentrations. Monthly average PM<sub>2.5</sub> levels in Beijing, Shijiazhuang and Tianjin rose by 86%, 83% and 53% year-on-year, respectively.
- The rise in PM<sub>2.5</sub> pollution was mainly driven by unfavourable meteorological conditions, while increases in Changchun, Kunming and Jinan were primarily attributed to higher human emissions.
- Year-on-year increases in ozone concentrations were mainly observed in the central–eastern China. Nanchang, Xining and Changsha recorded the largest year-on-year increases of 23%, 16% and 14%, respectively.
- Nitrogen dioxide (NO<sub>2</sub>) concentrations rose most noticeably in Beijing, Kunming and Shijiazhuang, mainly due to unfavourable weather conditions.

Year-on-year changes in pollutant concentrations in provincial capitals

Dec 2025



Our analysis projects the influence of weather conditions on air pollution levels using a machine-learning model trained on actual data for each city. The variations that cannot be explained by weather conditions are attributed to changes in emissions.

# Worst 7-day air pollution episodes by pollutant

*PM<sub>2.5</sub> (excluding sandstorms)*

city	province	dates	average concentration	highest daily concentration
Luohe	Henan	Dec 15 – Dec 21	128	193
Xuchang	Henan	Dec 15 – Dec 21	126	196
Jilin	Jilin	Nov 25 – Dec 01	120	556
Kaifeng	Henan	Dec 15 – Dec 21	120	181
Zhumadian	Henan	Dec 16 – Dec 22	118	173

*Ozone*

city	province	dates	average concentration	highest daily concentration
Yangjiang	Guangdong	Dec 03 – Dec 09	155	181
Jiangmen	Guangdong	Dec 05 – Dec 11	150	188
Zhongshan	Guangdong	Dec 05 – Dec 11	149	175
Zhanjiang	Guangdong	Dec 04 – Dec 10	148	163
Zhuhai	Guangdong	Dec 05 – Dec 11	146	177

*Sandstorms (PM<sub>2.5</sub>)*

city	province	dates	average concentration	highest daily concentration
Wuhai	Inner Mongolia	Nov 25 – Dec 01	23	96
Jiaozuo	Henan	Nov 25 – Dec 01	22	66
Zhongwei	Ningxia	Nov 25 – Dec 01	21	107
Bayan Nur	Inner Mongolia	Nov 25 – Dec 01	20	74
Alxa	Inner Mongolia	Nov 25 – Dec 01	19	70

*NO<sub>2</sub>*

city	province	dates	average concentration	highest daily concentration
Weinan	Shaanxi	Dec 04 – Dec 10	65	86
Xi'an	Shaanxi	Dec 04 – Dec 10	63	77
Jinhua	Zhejiang	Dec 15 – Dec 21	62	99
Lanzhou	Gansu	Dec 04 – Dec 10	59	65
Xianyang	Shaanxi	Dec 04 – Dec 10	58	64

Unit:  $\mu\text{g}/\text{m}^3$

# Data sources

- Industrial output, power generation and power capacity additions, as well as fuel imports and exports, are based on Chinese government data, through Wind Financial Terminal. Some of the data is not included in public releases.
- Measured air quality data is compiled from Chinese government air quality monitoring stations. Weather-controlled air quality is derived from CREA's [deweathering algorithm](#).