China’s energy transition and climate status report 2026

From scaling renewables to governing carbon

Agora Energy China

Agora Energy 博众智合

Agora Energiewende

Foreword

Dear readers,

China's energy transition has entered a new phase. After more than a decade of rapid renewable energy growth and accelerating electrification, the country is approaching a critical turning point. While emissions have yet to enter a sustained decline, their growth has slowed significantly, suggesting that China is nearing a high-level structural emission plateau.

As China enters the 15th Five-Year Plan (FYP) period (2026–2030), the focus is shifting from expanding clean energy capacity to transforming the energy system and strengthening carbon-based governance. Greater emphasis on carbon management, system flexibility and industrial decarbonisation signals a transition increasingly defined by implementation and structural change. Meanwhile, AI-driven computing demand is emerging as a new driver of renewable energy consumption and regional system integration, while the energy transition is reshaping the geography of employment.

As the world's largest energy consumer, carbon emitter and clean energy investor, China's choices will continue to shape global energy markets and climate outcomes. This report provides an evidence-based assessment of these developments and aims to support informed dialogue among policymakers, researchers, businesses and other stakeholders. We hope it serves as a useful resource and welcome feedback to strengthen future editions.

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Key findings

1 **China's emissions are approaching a structural plateau as power sector decarbonisation consolidates and industry becomes the next critical – and interdependent – frontier.** Despite accounting-related uncertainty, the direction is clear: reported data shows a 0.5 percent rise in 2025, with carbon emissions shifting to chemicals, non-ferrous metals and other heavy industry. Electrification, renewable hydrogen, material circularity and low-carbon feedstocks are key pathways, but each requires a decarbonised, integrated grid as its foundation, alongside deep production system restructuring to link climate with industrial competitiveness and economic transformation goals.

2 **Energy security for China increasingly depends on system integration rather than fuel supply alone.** Despite rapid renewable energy deployment, oil import dependence remains over 70 percent, and coal-to-chemicals investment continues to reflect security concerns. Meanwhile, electric vehicles, data centres and electrification are driving new demand, making storage, demand response, flexible charging, transmission and market reform critical to converting clean power growth into economy-wide fossil fuel displacement.

3 **The governance shift from scaling renewables to prioritising emission reductions opens a key window to close the gap between installed capacity and verified emission outcomes.** The 15th Five-Year Plan (FYP, 2026–2030) is expected to accelerate the move towards carbon-based policy frameworks with stronger provincial accountability, emission-focused assessments and improved carbon accounting. Realising this opportunity requires matching renewables deployment with the regulatory architecture to lock in durable emission cuts and faster decoupling of economic growth from carbon-intensive drivers.

4 **Having set the global pace of electrification, China is increasingly shaping the next phase of industrial transformation.** The 15th FYP is expected to accelerate electrification across industrial supply chains while supporting emerging sectors such as green steel, renewable hydrogen and other low-carbon industrial products. The success of these efforts could define global cost curves, technology standards and infrastructure requirements, highlighting the importance of innovation, deployment and international cooperation in advancing industrial decarbonisation.

What China’s energy transition means for the world

- **Climate action is increasingly an industrial growth strategy:** China’s clean-tech supply chains in EVs, batteries, solar and wind show how climate objectives can drive competitiveness, jobs and new growth, a model increasingly relevant as countries seek to balance decarbonisation, energy security and economic development.
- **China’s scale offers lessons for system integration:** Experience in grid expansion, UHV transmission and storage deployment offers insights for economies integrating high shares of renewables. AI-driven data centre demand is emerging as a new consumption driver, with the co-location of computing infrastructure and renewable hubs pointing to new models of demand-side integration.
- **Energy security anxieties are shaping the transition as much as climate ambition:** High oil import dependence and expanding coal-to-chemicals investment remain structural drivers of Chinese energy policy. Recent disruptions – including tensions around the Strait of Hormuz – show how supply chain vulnerability can accelerate clean energy investment and fossil fuel entrenchment simultaneously.
- **Hard-to-electrify sectors create opportunities for international cooperation:** Decarbonising sectors such as steel, chemicals and cement requires advances in green steel, renewable hydrogen, carbon accounting, and industrial standards, areas where practical and mutually beneficial collaboration between China and international partners could accelerate progress and shape global cost curves.
- **China’s international role is evolving from climate governance participant to technology, supply chains and standards provider:** Strengthening transparency, intellectual property protection and international cooperation can support this transition.
- **Trade tensions should not undermine climate progress:** Clean energy competition is reshaping trade patterns, but stable policy frameworks, open markets and resilient supply chains remain preconditions for broadly sharing the benefits of the transition.
- **Peace and stability remain important enablers of a global energy transition:** Geopolitical conflict has accelerated clean energy diversification in some economies while entrenching fossil fuels in others. As transition pathways fragment, a stable international environment remains a precondition for effective climate cooperation.

About the data and emissions accounting (1/2)

Data for this analysis was compiled from publicly available sources, including the National Bureau of Statistics of China, National Energy Administration, National Development and Reform Commission, Ministry of Ecology and Environment, China Electricity Council, China National Petroleum Corporation Economic & Technology Research Institute, Sinopec, China National Coal Association, China Non-Ferrous Metals Industry Association, World Steel Association, World Cement Association, China Customs, International Energy Agency, International Renewable Energy Agency, Energy Institute, Global Energy Monitor, World Bank, International Monetary Fund, various industrial sources and media outlets. Figures are subject to periodic revisions by the above sources.

The data sourced from the National Bureau of Statistics for this slide deck is current as of 31 May 2026.

Carbon dioxide emissions estimates are based on the *2021 Guidelines for Formulating Provincial Action Plans for Carbon Dioxide Emissions Peaking* issued by the Ministry of Ecology and Environment, using default emission factors published by the National Development and Reform Commission. Industrial process emissions are derived from a comprehensive update of a peer-reviewed 1990–2020 China industrial process emissions inventory. Cement-related process emissions are further refined using China's provincial process CO_2 emissions from cement production during 1993–2019.

About the data and emissions accounting (2/2)

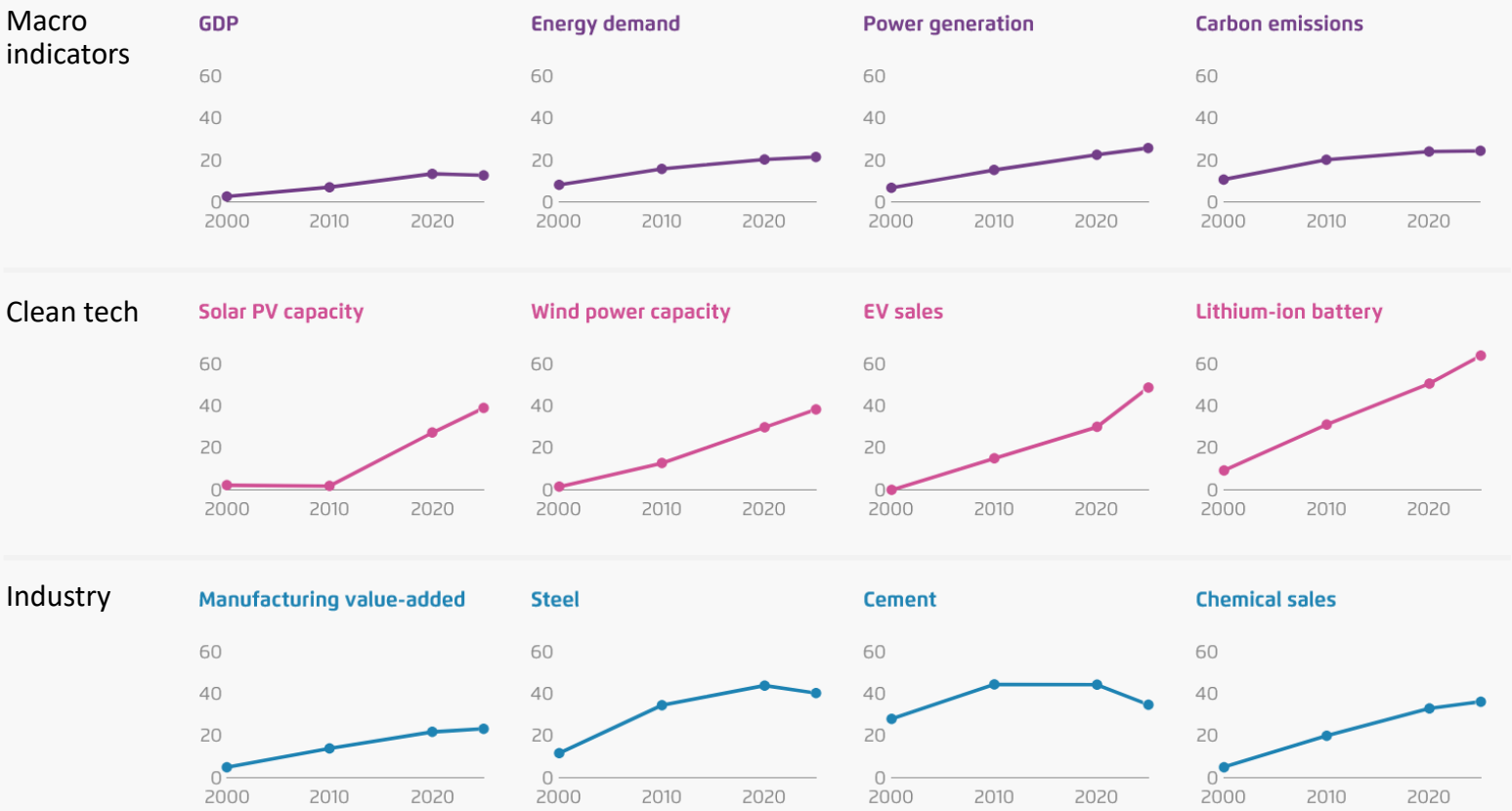
Since 2024, China's official carbon intensity indicator has excluded both non-fuel fossil use and non-fossil energy consumption. While this revision better aligns the indicator with the country's carbon peaking and carbon neutrality objectives, it also complicates comparisons with previous accounting approaches and international assessments. The change may partly explain the accelerated decline in reported carbon intensity in 2024 (-3.4%) and 2025 (-5.0%), following no reported reduction in 2023.

Based on official year-on-year reductions, the cumulative decline in carbon intensity during the 14th Five-Year Plan period can be estimated at 12.4%. This differs from the 17.7% cumulative reduction reported by the National Development and Reform Commission in March 2026. Using publicly available data, the Agora Energy China research team independently estimates a cumulative reduction of 14.3%.

As the Chinese government has not yet published a detailed reconciliation between the old and new accounting approaches, it is difficult to fully explain the differences among these estimates. Agora Energy China will continue to monitor developments and conduct a dedicated assessment once additional data and methodological information become available.

China in the global energy and industrial economy: rapid ascent since 2001, recent moderation and a critical crossroads ahead

0.1 China as a percentage of the global total [%]



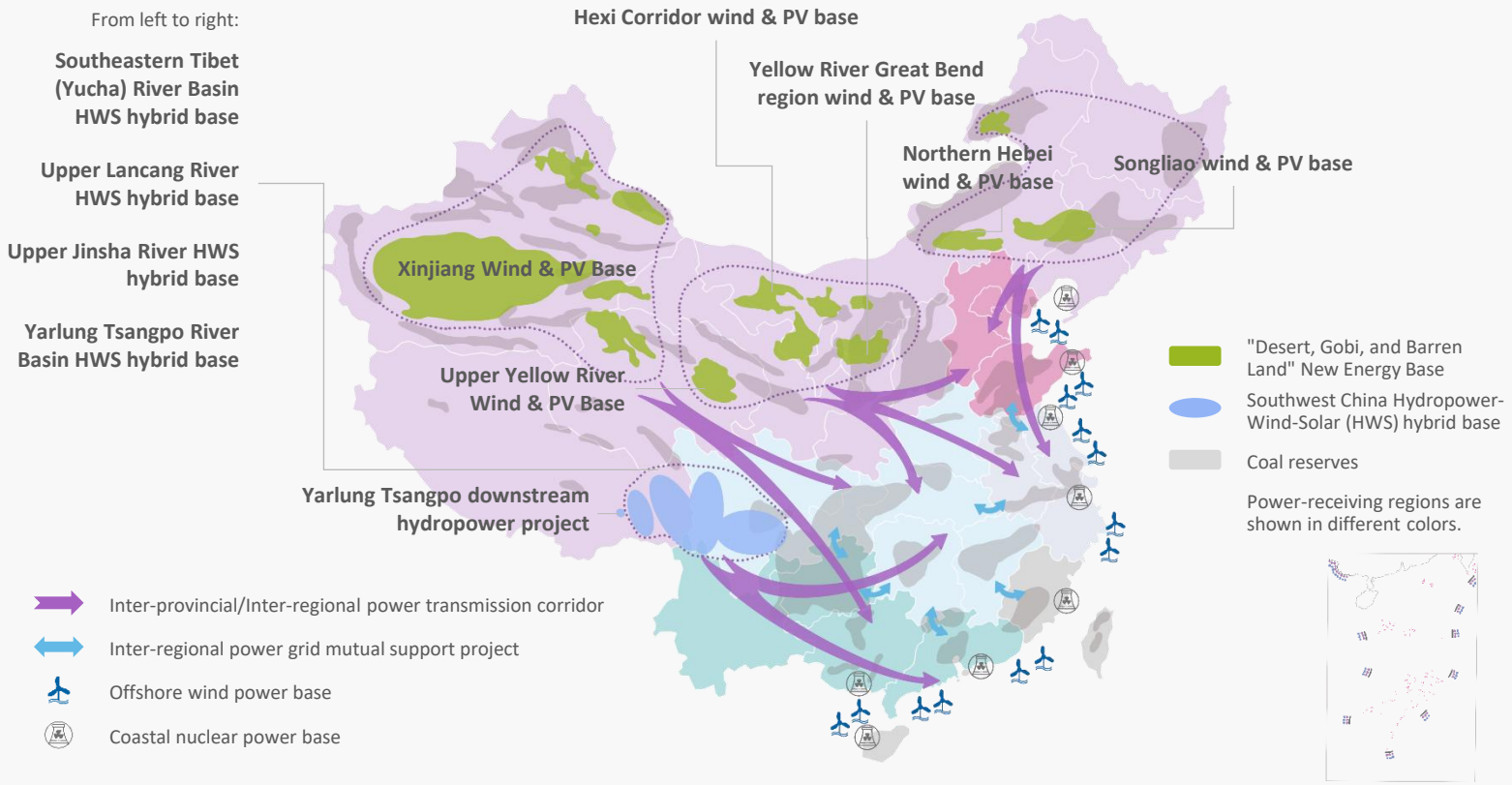
China's role in the world:

- **Rapid global ascent:** Since joining the WTO in 2001, China's global economic and industrial weight has expanded drastically.
- **Moderating growth dynamics:** In recent years, China's global GDP share has broadly stabilized at around 16–18%, while growth in heavy industries (e.g., steel, cement) has moderated as the economy transitions towards lower-carbon and higher-value growth.
- **A transition crossroads:** China remains the world's largest coal consumer and emitter, while simultaneously leading the global clean energy transition.

Agora Energy China & Agora Energiewende (2026): National Bureau of Statistics China (NBS), World Bank Open Data, IMF (International Monetary Fund, Energy Institute (EI), International Energy Agency (IEA), World Steel Association, World Cement Association, European Chemical Industry Council (CEFIC), Our Word in Data, Ministry of Industry and Information Technology China (MIIT), BloombergNEF, SNE Research, EVTank and own estimation.

China’s energy future will be shaped by the transformation of its coal regions

0.2 Clean energy base layout planned in China’s 15th Five-Year Plan (2026–2030)



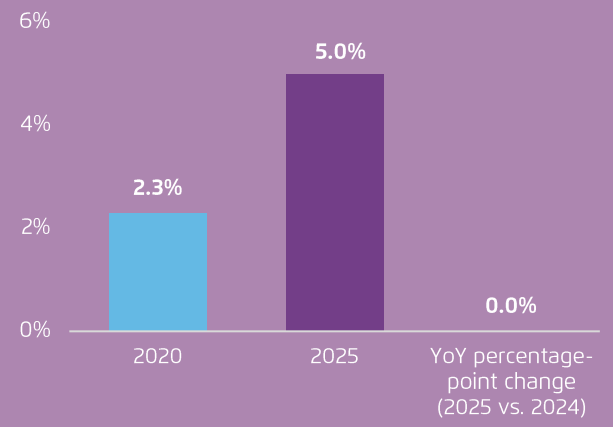
Redrawing China’s energy map:

- **Coal and clean energy increasingly share the same geography:** Many coal-producing regions are becoming China’s largest renewable energy bases, creating a strategic opportunity to transform traditional energy hubs.
- **The bottleneck is no longer resource availability but system integration:** Wind and solar utilisation rates fell in 2025 below 95%, the lowest of the 14th FYP period. The key challenge is expanding transmission, storage and market integration to move clean power from resource-rich regions to demand centres.
- **The 15th FYP will be defined by system transformation:** China’s energy future depends on converting coal regions into hubs for clean power, flexibility and low-carbon industry.

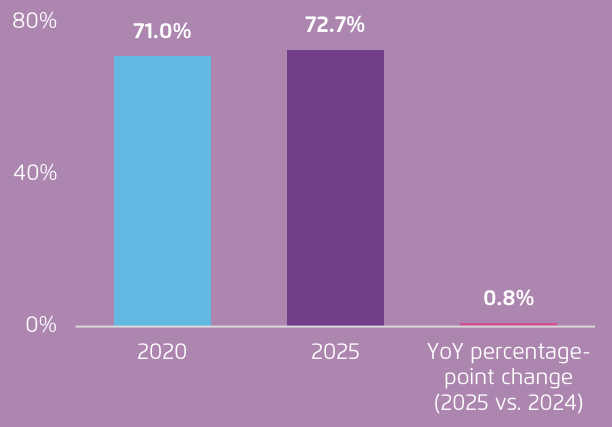
Agora Energy China & Agora Energiewende (2026): Authors’ translation and adaptation based on the 15th Five-Year Plan, Institute for Planet, and Center for Electric Power Industry Planning Research, Monitoring and Early Warning

2025 recap: economic stabilisation amid heightened energy security concerns and coal's declining share in the energy mix

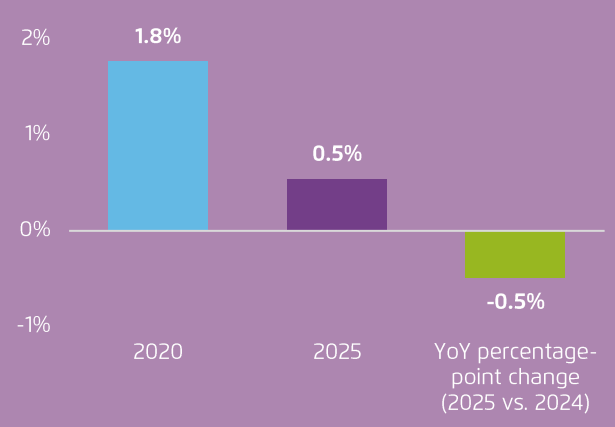
0.3 GDP growth rate



0.4 Dependency rate on oil imports*



0.5 Share of coal in energy mix



→ China's GDP growth remained stable at 5.0%, unchanged from 2024 and well above the 2.3% pandemic-era level in 2020, despite continued property sector challenges and weak domestic demand.

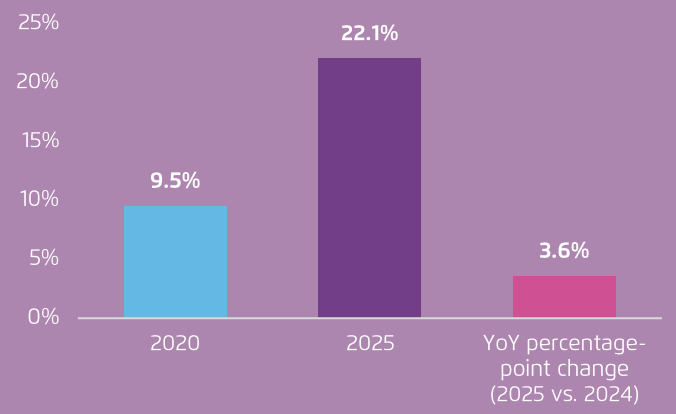
→ China's dependence on net oil imports rose to 72.7%, slightly above both 2024 and 2020 levels, underscoring persistent energy security concerns as well as stockpiling building efforts.

→ Coal's share in China's energy mix fell further to 51.4% in 2025, down from 56.7% in 2020 and 53.2% in 2024, indicating continued progress in energy transition despite heightened energy security concerns.

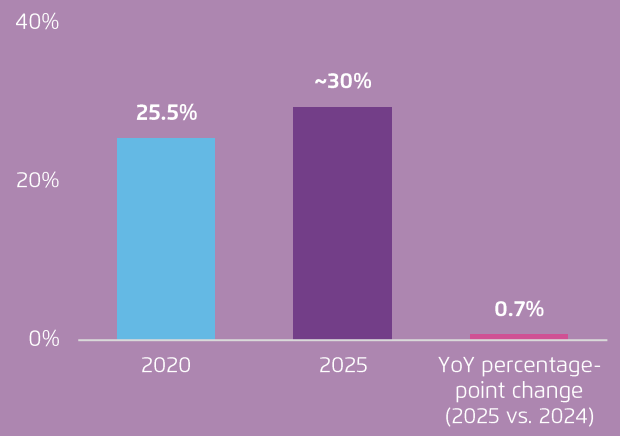
Agora Energy China & Agora Energiewende (2026): NBS and China National Petroleum Corporation (CNPC) Economics & Technology Research Institute (ETRI), NEA, and Xinhua
* Indicator reported by CNPC ETRI and calculated as the ratio of net oil imports to total domestic oil consumption.

2025 recap: renewable-oriented electrification reinforces emissions plateauing, while data and accounting uncertainties persist

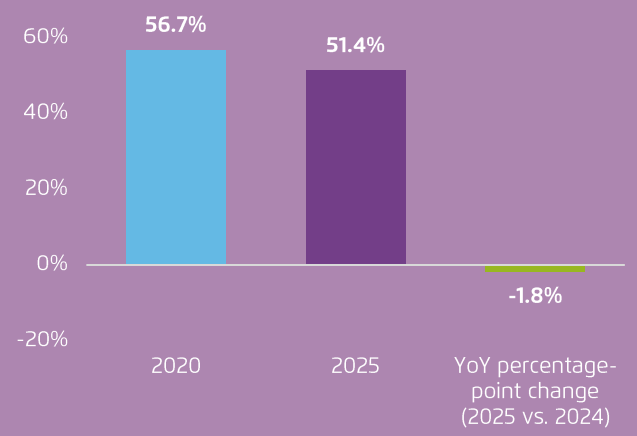
0.6 Share of solar PV and wind in power generation mix



0.7 Electrification rate



0.8 CO_2 emission growth rate



→ The share of solar PV and wind in China's power generation mix rose to 22.1% in 2025, more than doubling from 9.5% in 2020, highlighting the rapid expansion of renewable-based electrification.

→ Steady gains in electrification during the 14th FYP lay the foundation for deeper electrification in the 15th FYP, where renewable hydrogen may play an increasingly important role.

→ China's emissions appear to be entering a structural plateau phase, but evolving data and accounting methodologies complicate assessments of progress across countries.

 Agora Energy China & Agora Energiewende (2026): NEA, China Electricity Council (CEC), and Agora's own estimation. Note: CO_2 emissions include industrial process emissions.

Assessing the 14th FYP: a foundation for China's next phase of energy transition and climate action

- **The dual-carbon agenda became a central framework for development:** Carbon peaking and carbon neutrality objectives increasingly shaped energy, industrial and regional policies, while climate considerations became more deeply embedded in economic decision-making and long-term national development planning.
- **Energy security and decarbonisation became parallel priorities:** COVID-19 disruptions, the global energy crisis and power shortages reinforced energy security concerns, while renewables and electrification emerged as the main drivers of energy system transformation and increasingly important pillars of future economic growth.
- **China's emissions entered a structural high-level plateau as the power sector transformed:** Emissions growth slowed markedly, while coal power increasingly shifted from energy generation toward flexibility, reliability and system balancing functions as renewable energy became the dominant source of capacity growth.
- **Industrial decarbonisation emerged as the next major challenge:** Progress in the power sector exposed the growing importance of reducing emissions from steel, chemicals, cement and other hard-to-electrify industries.
- **Carbon governance entered a new phase of development:** New assessment mechanisms, carbon-focused policy frameworks and revised accounting methodologies signalled a gradual shift from energy-consumption controls toward emissions-oriented governance and stronger accountability for climate outcomes.
- **The geography of the energy transition began to change:** Traditional coal-producing regions increasingly became major renewable energy bases, creating both opportunities and challenges for regional transformation, industrial upgrading and workforce transition across China's traditional energy-producing heartlands.

15th FYP (2026–2030) outlook: likely to shape China's energy transition, with shift from managing energy consumption to governing carbon emissions

	14th FYP Target (%)	14th FYP Actual (%)	15th FYP Target (%)
Energy intensity	**–13.5**	**–4.4**	NA[4]
Carbon intensity	**–18.0**	**–14.3[1]** **–12.4[2]** **–17.7[3]**	**–17**
Share of non-fossil fuels in national energy mix	**≈20**	**21.7**	**25**
Climate governance	Dual control of energy intensity and consumption		Dual control of carbon intensity and emissions The evaluation and assessment method for provincial leadership to achieve carbon peak and carbon neutrality
Core strategy	Establish a modern energy system		Establish a new type of energy system
Focus of energy transition	Ramp up renewables		Focus on non-fossil fuel consumption

Data without superscript annotations are sourced from the 15th Five-Year Plan.
1. Author's own calculation based on publicly available data.
2. Based on annual carbon intensity reduction rate published by NBS: -3.8% in 2021, -0.8% in 2022, 0 in 2023, -3.4% in 2024, and -5.0% in 2025.
3. Based on NDRC (14 March 2026) with methodology unspecified.
4. Since 2024, China has revised its energy-intensity metric to exclude non-fuel fossil use and non-fossil energy consumption. While better aligned with decarbonisation objectives, the change complicates historical comparisons and coincides with the removal of energy intensity as a primary target in the 15th Five-Year Plan.

15th FYP outlook: first carbon-focused assessment of provincial governors requires economic growth and climate objectives to be pursued in parallel

Carbon peaking and carbon neutrality assessment framework for provincial governors: 9 mandatory indicators and 5 supporting indicators

Category	Indicator	Responsible authority
Mandatory indicators	Total carbon emissions	NDRC; MEE
	Carbon intensity reduction (CO_2 per unit of GDP)	NDRC; MEE
	Total coal consumption	NDRC; NEA; MEE
	Total oil consumption	NDRC; NEA
	Share of non-fossil energy in energy consumption	NEA; NDRC
	Energy intensity reduction (per unit of GDP)	NDRC
	Share of clean energy in incremental electricity demand	NDRC; NEA
	Energy and carbon intensity reduction in industrial value-added (above designated size)	MIIT
	Energy-saving and carbon-reduction review for “two high”* projects	NDRC; MIIT
Supporting indicators	Green and low-carbon urban–rural development	MOHURD
	Green transport transformation	MOT
	Carbon intensity reduction in public institutions	NGOA
	Sectoral targets under the national ETS	MEE
	Forest stock volume increase	NFGA; MNR

NDRC, National Development and Reform Commission; **MEE**, Ministry of Ecology and Environment; **NEA**, National Energy Administration; **MIIT**, Ministry of Industry and Information Technology; **MOHURD**, Ministry of Housing and Urban-Rural Development; **MOT**, Ministry of Transport; **NGOA**, National Government Offices Administration; **NFGA**, National Forestry and Grassland Administration; **MNR**, Ministry of Natural Resources

Carbon governance enters a new phase of accountability:

- **Carbon performance will become a core governance metric:** From 2026, provinces will face annual assessments based on 5 mandatory indicators linked to carbon peaking and 9 supporting indicators covering major sectors.
- **Assessment results will strengthen accountability:** Provinces will be rated as Excellent (all targets met), Qualified or Unqualified (≥ 1 mandatory indicator is not met, or ≥ 3 support indicators are not met), with outcomes linked to cadre evaluation and policy implementation.
- **A new carbon governance system is taking shape:** Top-down and bottom-up target setting will be supported by carbon accounting, emissions monitoring and multi-level evaluation mechanisms.

Agora Energy China & Agora Energiewende (2026): Translated from *Comprehensive Evaluation and Assessment Method for Carbon Peaking and Carbon Neutrality* by State Council of China in April 2026
* “Two high” projects refers to projects with high energy consumption and high emissions.

15th FYP outlook: from scaling renewables to governing carbon

- **The focus will shift from peaking emissions to achieving sustained reductions:** The pace of emissions decline during the 15th FYP will largely determine the feasibility, cost and credibility of China's longer-term climate objectives, and shape the country's pathway towards carbon neutrality beyond 2030 and 2060.
- **Coal and oil are approaching structural turning points:** Future energy demand growth is expected to be met primarily by non-fossil sources, while fossil fuels increasingly serve feedstock, flexibility and energy security functions.
- **Deep electrification and industrial transformation will accelerate:** Sustained emissions reductions will increasingly depend on electrifying industrial processes, scaling renewable hydrogen, expanding material circularity and integrating low-carbon electricity into manufacturing, particularly across energy-intensive industrial value chains.
- **System integration will become more important than capacity expansion:** Renewable development will be judged increasingly by utilisation, flexibility and reliability, making storage, demand response, transmission and market reform critical enablers of the transition, alongside digitalisation and smarter system operation.
- **Carbon governance will become a core economic management tool:** Stronger carbon accounting, emissions-focused assessments and provincial accountability mechanisms are expected to accelerate the shift from energy-based controls to carbon-based governance, across major sectors and levels of government.
- **Regional transformation and just transition will rise on the policy agenda:** The success of the transition will increasingly depend on whether coal-producing regions can develop new advantages in clean energy and low-carbon industries while supporting workers and communities through structural change and maintaining long-term social stability.

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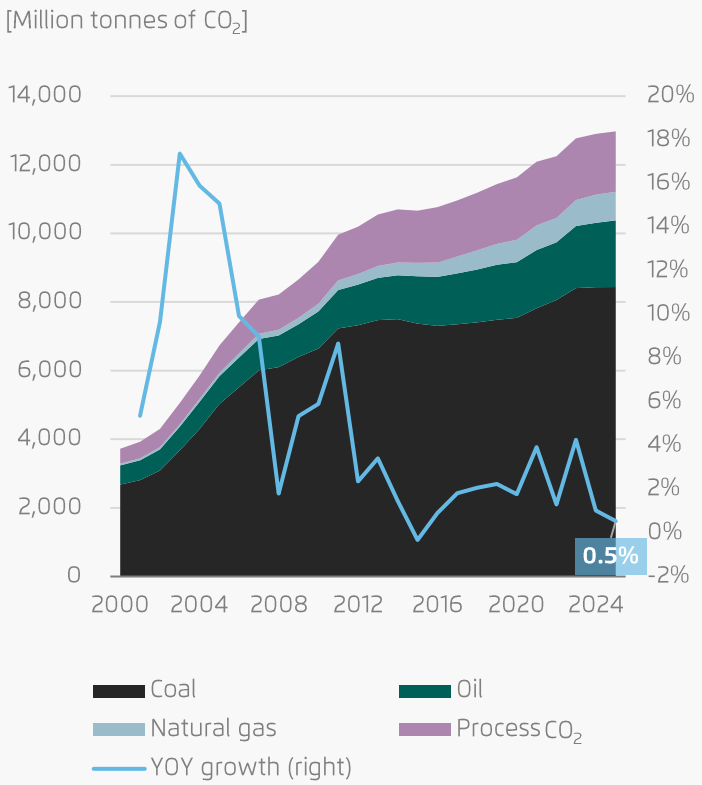
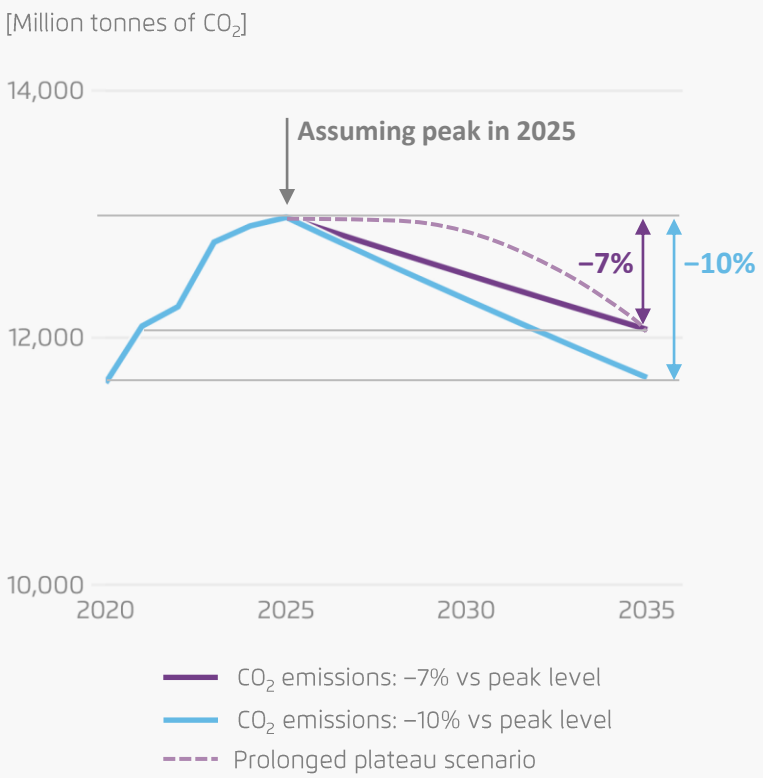
Trend 1 China's carbon emissions growth has slowed markedly, entering a structural high-level plateau

1.1 CO_2 emissions from fossil fuel combustion by source



1.2 CO_2 emissions and trajectory towards NDC targets 2035



China's emission trajectory:

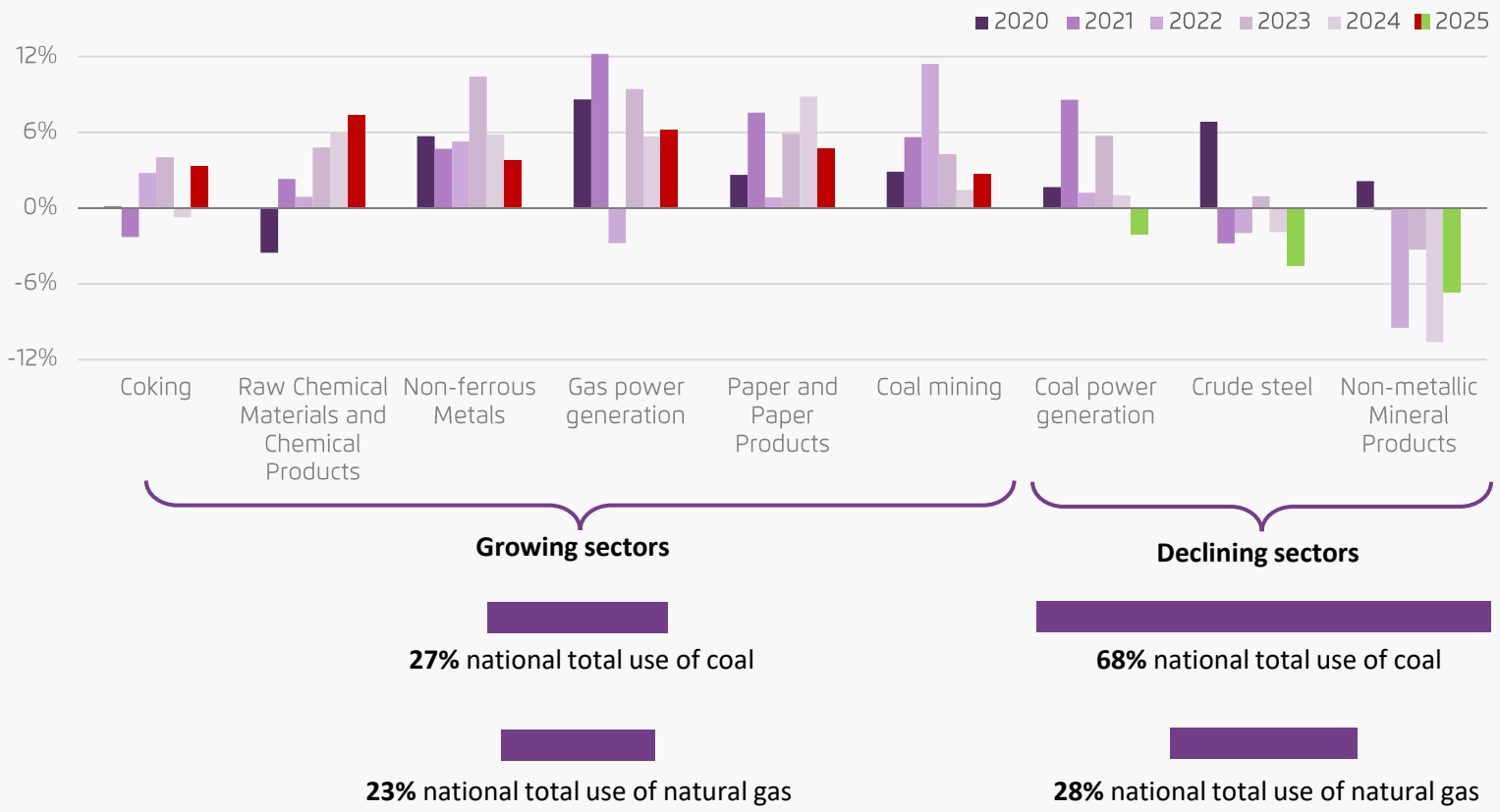
- **Emission growth is slowing:** In 2025, CO_2 emissions from fossil fuel combustion and industrial processes rose just 0.5%.
- **China's 2035 NDC target remains within reach:** If emissions peaked in 2025, reducing emissions 7–10% below peak levels by 2035 would require annual declines of 0.7–1.0%.
- **Delays will raise transition costs:** A prolonged emission plateau would require steeper future reductions, making the 2035 target harder and more costly to achieve.

Agora Energy China & Agora Energiewende (2026): Emissions from fuel combustion were calculated by the Author based on data from NBS. Process emissions were calculated based on the methodology in Hu & el al (2024) and Liao & et al (2022).

Trend 2

Behind the plateau: structural shifts in industrial emissions across sectors with limited abatement potential

2.1 Annual growth of outputs of key sectors



Drivers underlying the plateau:

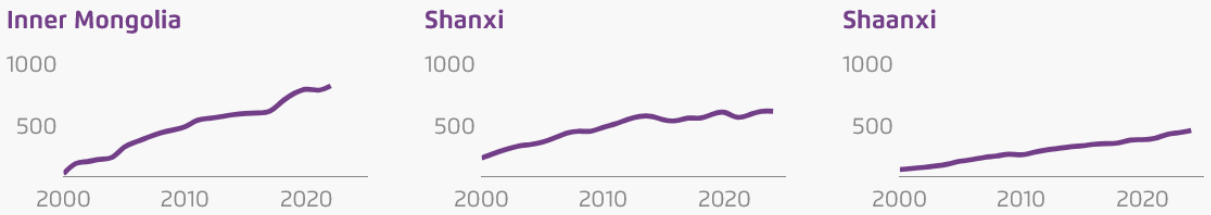
- **Both cyclical and structural factors slowed emission growth:** Weak real-estate demand reduced steel and cement output, while coal-fired power generation fell by 1.9% in 2025 – the first decline since 2016.
- **Traditional heavy industries drove emission reductions:** Emissions fell in coal power, steel and building materials, which together account for 68% of coal and 28% of natural gas use, contributing the most to emission moderation.
- **Growth sectors offset the gains:** Expanding output in coking, gas power, chemicals and non-ferrous metals pushed emissions higher, resulting in a 0.5% increase in total CO_2 emissions in 2025.

Trend 3

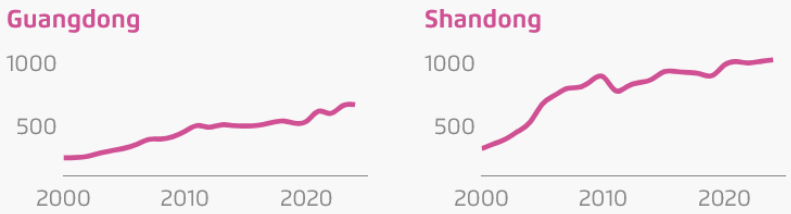
Timely peaking in energy-intensive provinces is critical to China's carbon peak goal

3.1 CO_2 emissions from fossil fuel combustion of selected energy-intensive provinces

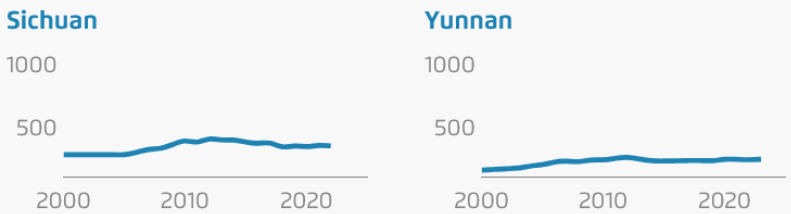
Coal- producing provinces



Energy-consuming provinces



Renewable (i.e., hydro) power exporters



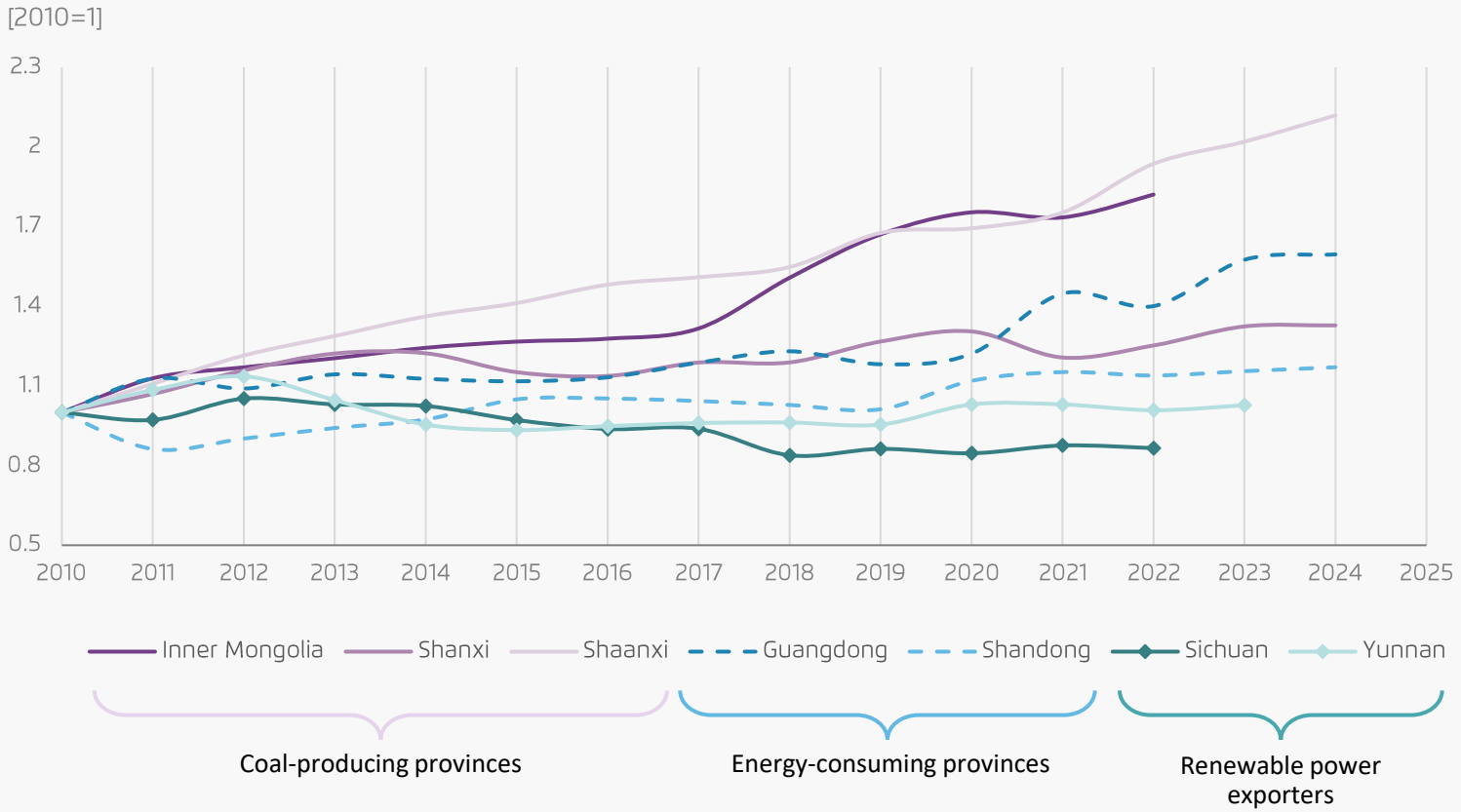
Provincial peaking matters:

- → **National progress masks provincial divergence:** While China's emissions have entered a plateau phase, emissions in many energy-intensive provinces continued to grow in 2025.
- → **Provincial peaking will determine the national peak:** Emission growth exceeded 1% in many coal-producing and coastal economic provinces, suggesting that national emissions moderation was largely driven by reductions elsewhere.
- → **Stronger provincial accountability is needed:** As provinces are required to achieve carbon peaking independently, energy-intensive regions need more robust carbon accounting, monitoring and mitigation measures to stay on track for their peaking targets.

Agora Energy China & Agora Energiewende (2026): Author's calculation based on provincial Bureau of Statistics
Note: Due to differences in provincial data availability, the latest year for which carbon emissions can be estimated varies across provinces.

Trend 3 Timely emissions peaking in energy-intensive provinces is critical to China's carbon peak goal

3.2 CO_2 emissions of selected energy-intensive provinces



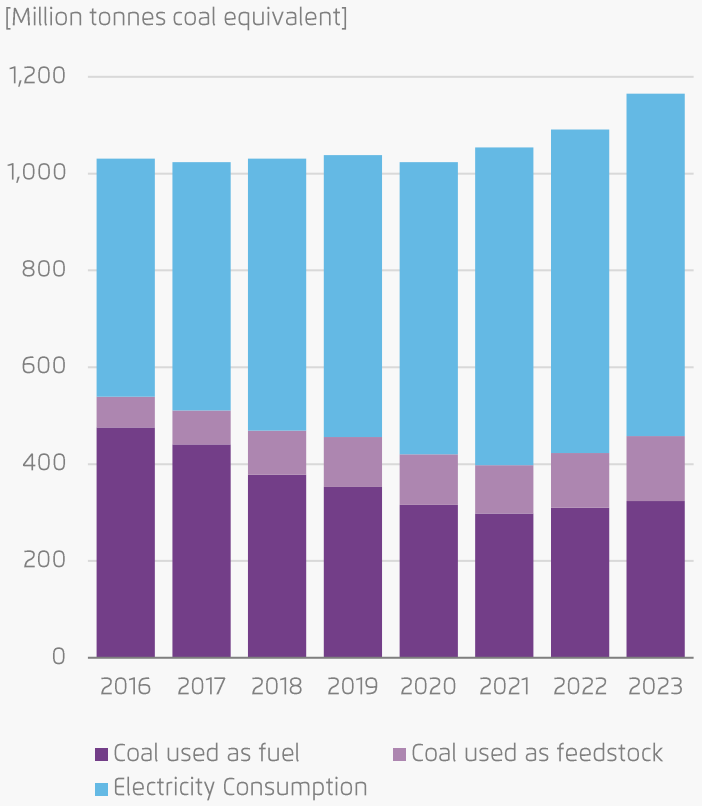
Diverging provincial pathways:

- → **Coal regions continue to drive emission growth:** Emissions remain on a rising trend in major coal provinces, while slower growth in Shanxi reflects economic headwinds rather than decarbonisation.
- → **Economic growth remains emissions-intensive:** In provinces such as Guangdong and Shandong, economic expansion continues to drive energy use and emissions despite higher electrification and growing clean power imports.
- → **Climate risks challenge clean energy provinces:** Drought-induced declines in hydropower have increased coal generation in Sichuan and Yunnan, contributing to renewed emissions growth.

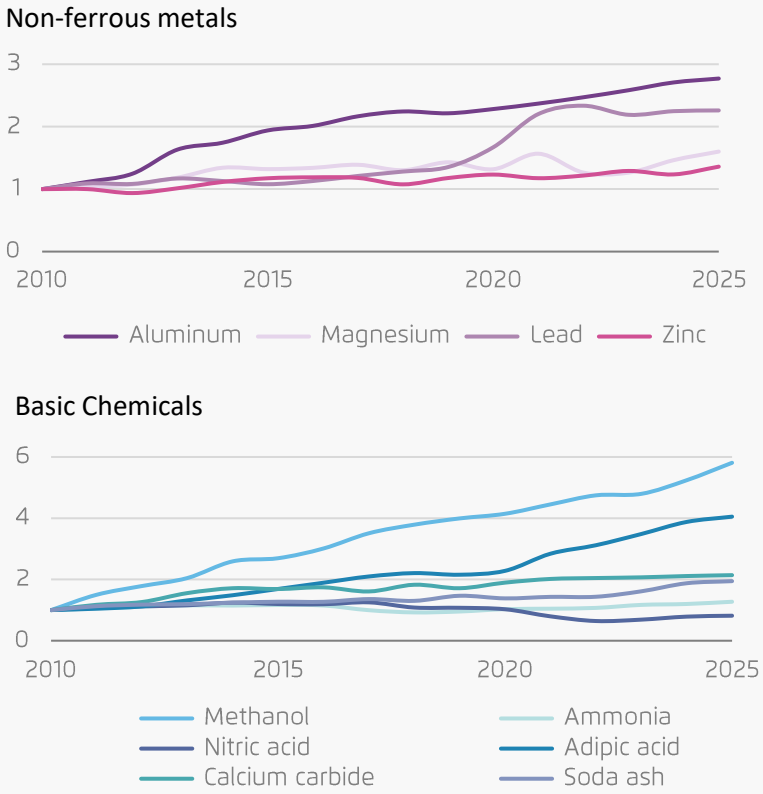
Trend 4

Industrial decarbonisation enters a harder phase: deep electrification and material circularity become critical

4.1 Coal and electricity end use in the industrial sector



4.2 Surge in process CO_2 emissions in key industrial sectors, 2010=1



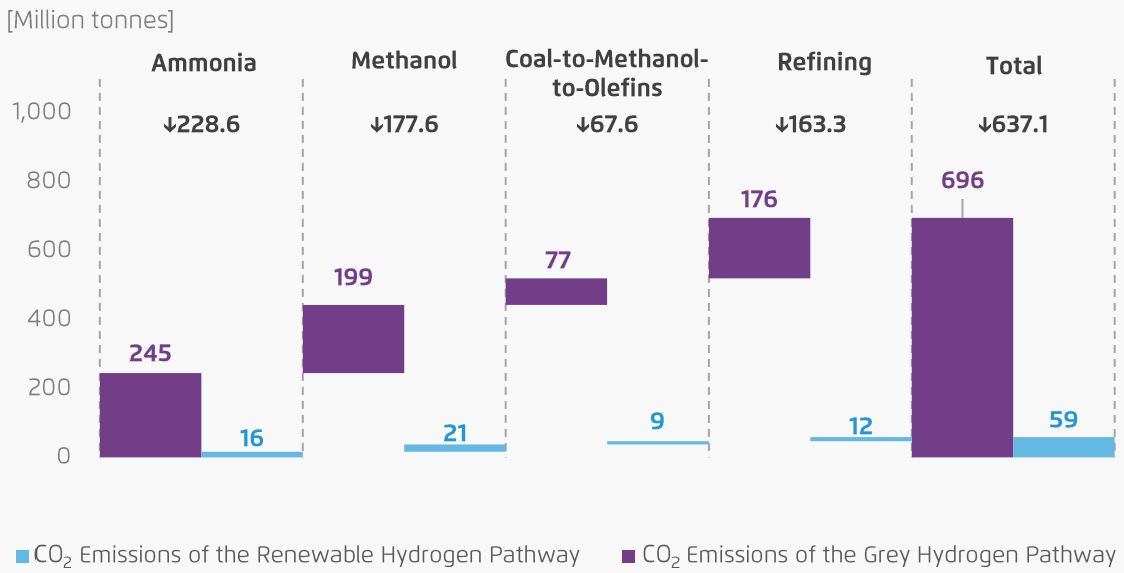
Tackling harder-to-electrify emissions:

- **Industrial decarbonisation is entering a harder phase:** While electrification has reduced direct coal use in industry, rising energy demand and growing use of coal as a feedstock continue to offset emissions reductions.
- **Non-energy emissions are becoming the key challenge:** Decarbonising fossil-based feedstocks and embedded carbon emissions will require greater renewable power integration, high-temperature electrification and long-duration energy storage.
- **Circularity and hydrogen will be essential:** Expanding material recycling, secondary production and hydrogen substitution can reduce reliance on emissions-intensive primary production in sectors such as steel, aluminium and chemicals.

Trend 4

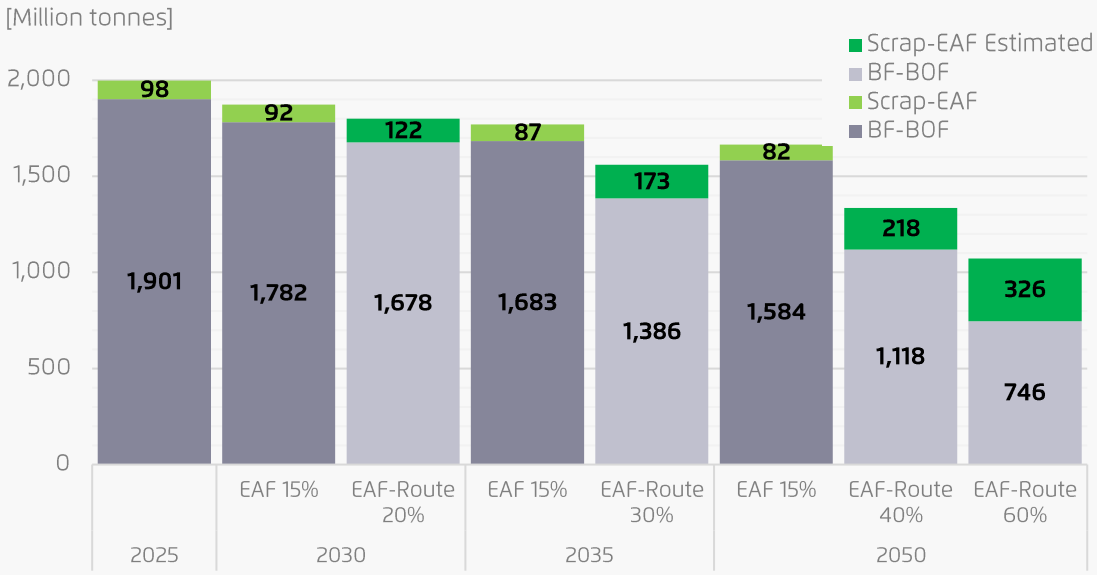
Industrial decarbonisation enters a harder phase: deep electrification and material circularity become critical

4.3 Decarbonisation potential of key chemical sectors via renewable hydrogen



→ Replacing fossil-based with renewable hydrogen could reduce emissions from the above chemical sub-sectors by more than 90%, the equivalent of avoiding over 630 Mt of CO_2.

4.4 Decarbonisation potential (carbon emission) of China's steel industry via Scrap-based EAF expansion

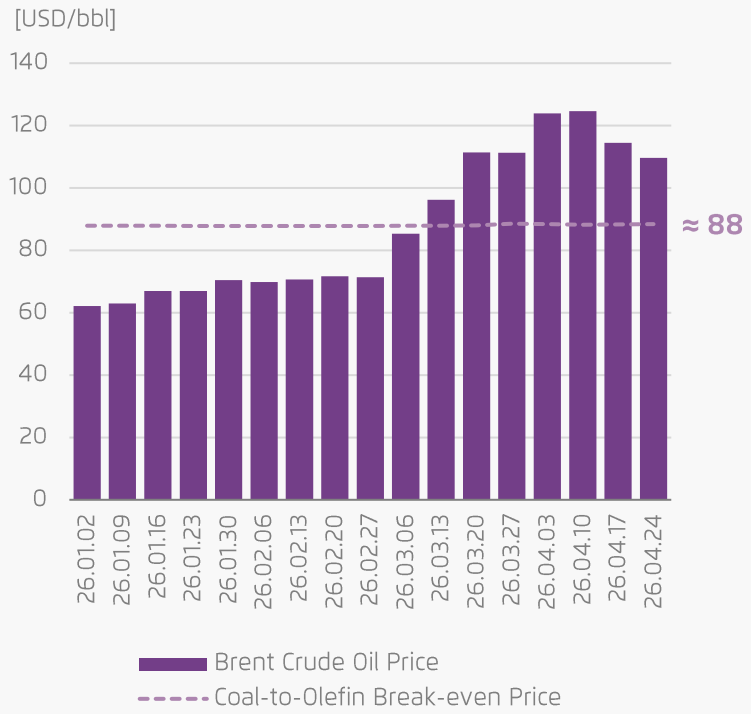


→ Expanding scrap-based EAF steelmaking could become a major decarbonisation pathway for China's steel sector, with emissions from crude steel production falling by nearly 50% by 2050 under an ambitious circularity and capacity-rationalisation scenario.

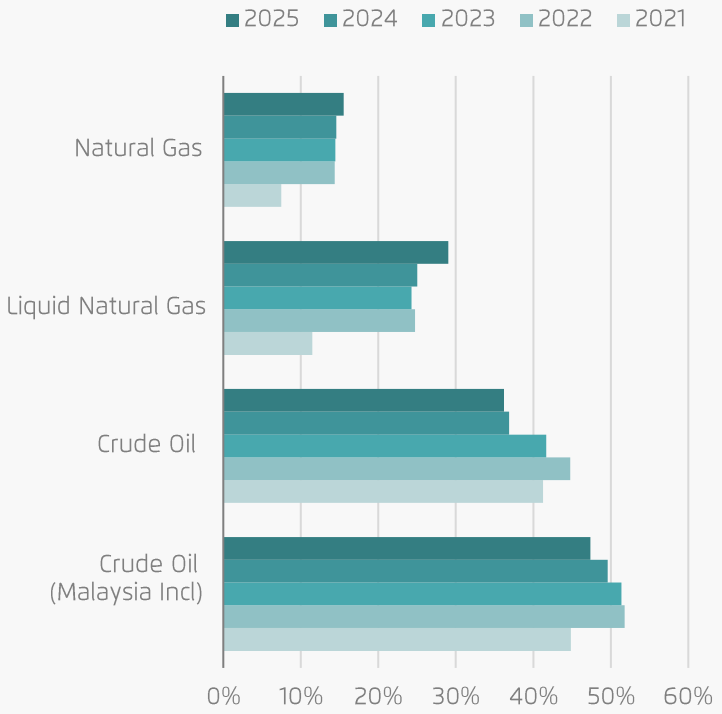
Agora Energy China & Agora Energiewende (2026): Left: China Petroleum and Chemical Industry Federation (CPCIF), IEA, China Iron and Steel Association (CISA). Right: Agora; Note: Calculations for methanol and olefins are based on the assumption that sustainable carbon is used as the carbon feedstock.
* CO_2 abatement potential estimated by replacing grey hydrogen with renewable hydrogen along the production pathway

Trend 5 Energy security concerns revive coal chemicals, raising long-term carbon lock-in and overcapacity risks

5.1 Brent crude prices and the competitiveness of China's coal-to-olefins industry



5.2 Shares of China's oil/gas imports transiting the Middle East over China's oil/gas imports total



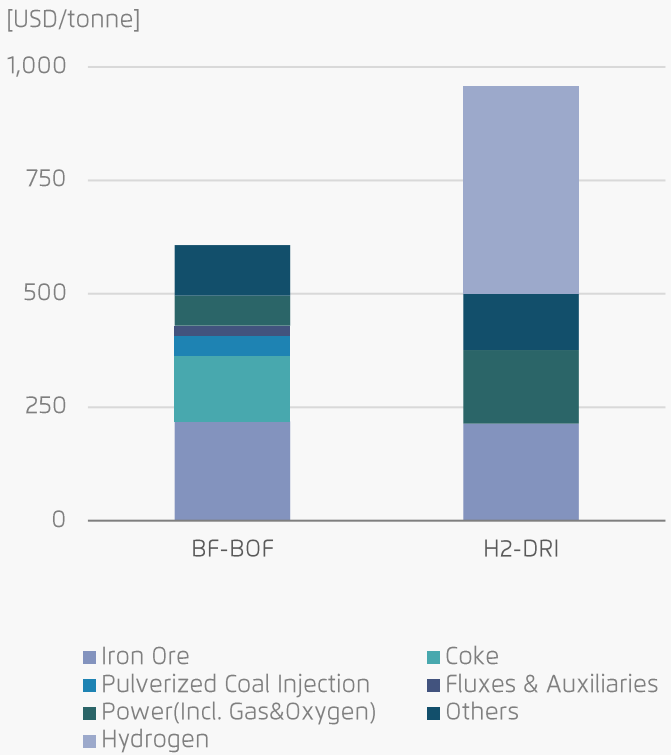
Coal chemicals at the nexus of energy security and decarbonisation:

- **Higher international oil prices have strengthened the cost competitiveness of coal chemicals (e.g., coal-to-olefins) production relative to oil-based alternatives.** This may support higher utilisation of existing assets and renewed interest in project development.
- **Energy import exposure remains significant:** Reliance on Hormuz oil and gas imports reinforces the need for diversified energy supplies.
- **Short-term incentives conflict with long-term decarbonisation goals:** Rapid coal chemical expansion risks carbon lock-in and overcapacity, underscoring the need for cleaner feedstocks and electrification.

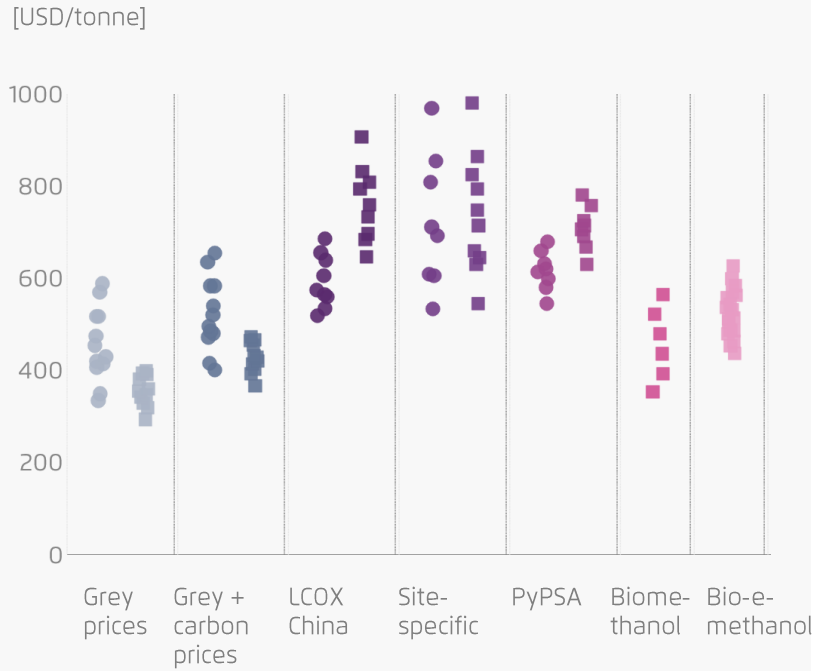
 Agora Energy China & Agora Energiewende (2026): Left: China Coal Market Network, China Customs. Right: Authors' calculation

Trend 6 Green hydrogen costs remain a key barrier in low-carbon production across harder-to-electrify sectors

6.1 Cost comparison of iron-making routes



6.2 Estimated levelised cost of ammonia and methanol compared to fossil -based alternatives



LCOA & LCOM results

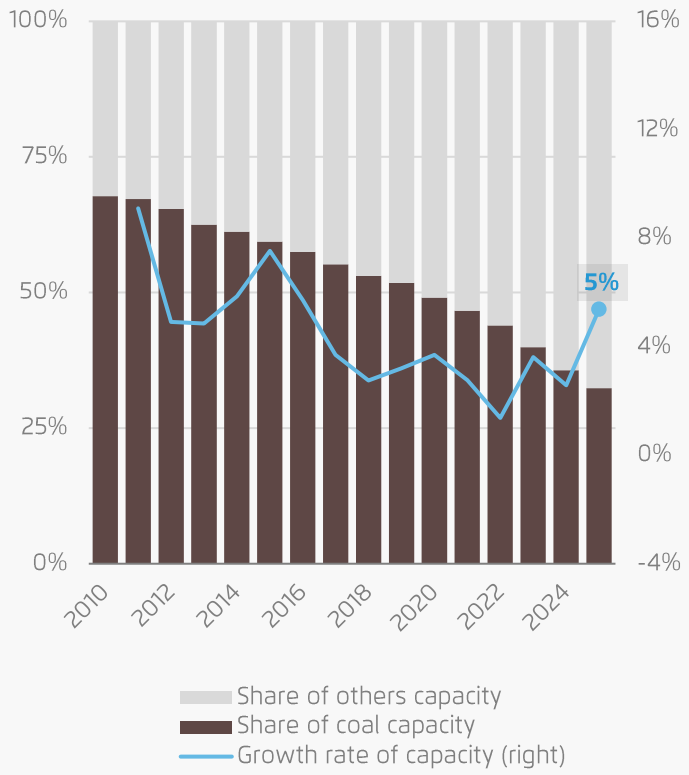
Green hydrogen's economic headwinds:

- **Green hydrogen costs remain a key barrier:** In steelmaking, hydrogen-based DRI remains significantly more expensive than conventional BF-BOF production, limiting large-scale commercial deployment.
- **Cost competitiveness will determine market uptake:** Achieving wider adoption of hydrogen-based steelmaking will require substantial reductions in green hydrogen production costs and continued technology learning.
- **Transitional pathways are needed in chemicals:** For green ammonia and methanol, high hydrogen costs continue to constrain competitiveness, highlighting the role of hybrid approaches to support early market development while scaling the green hydrogen value chain.

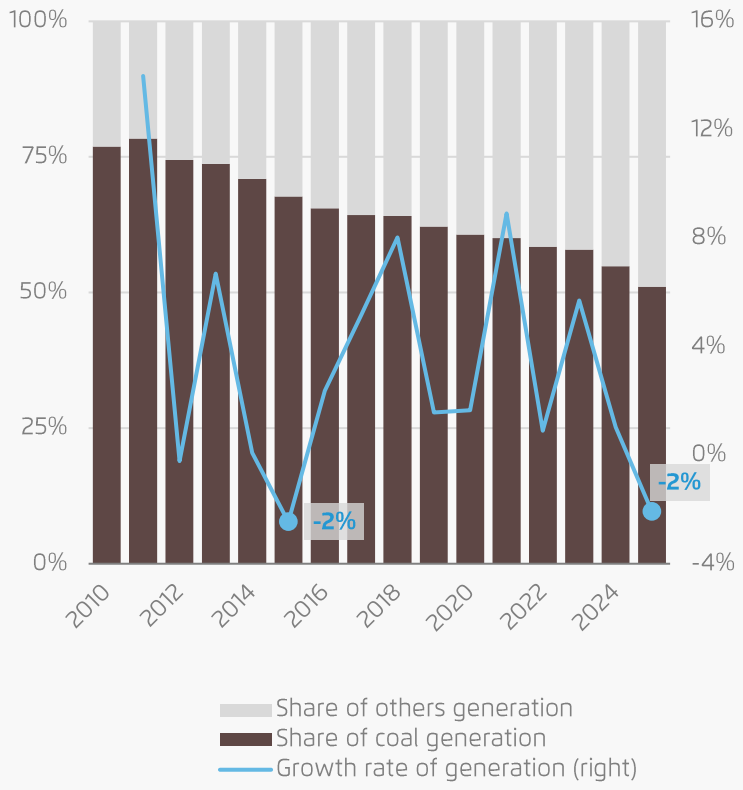
 Agora Energy China & Agora Energiewende (2026): Left: Hebei Iron & Steel Group. Right: Agora Energiewende (2026); Note: All calculations are based on 2022–2023 data

Trend 7 China’s power system transformation enters a new phase: from renewable expansion to system integration

7.1 Coal power capacity, 2010–2025



7.2 Coal power generation, 2010–2025

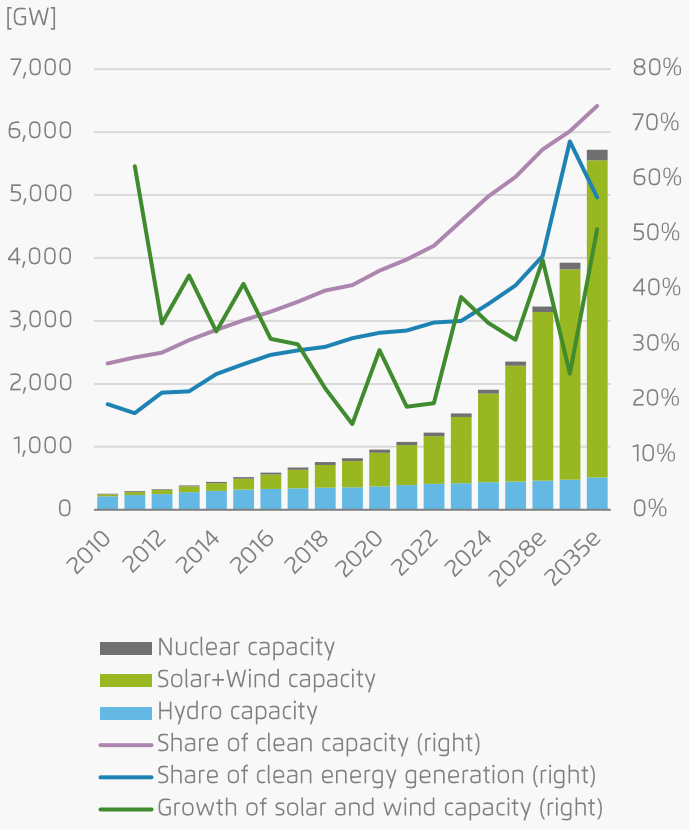


Coal power enters a new phase:

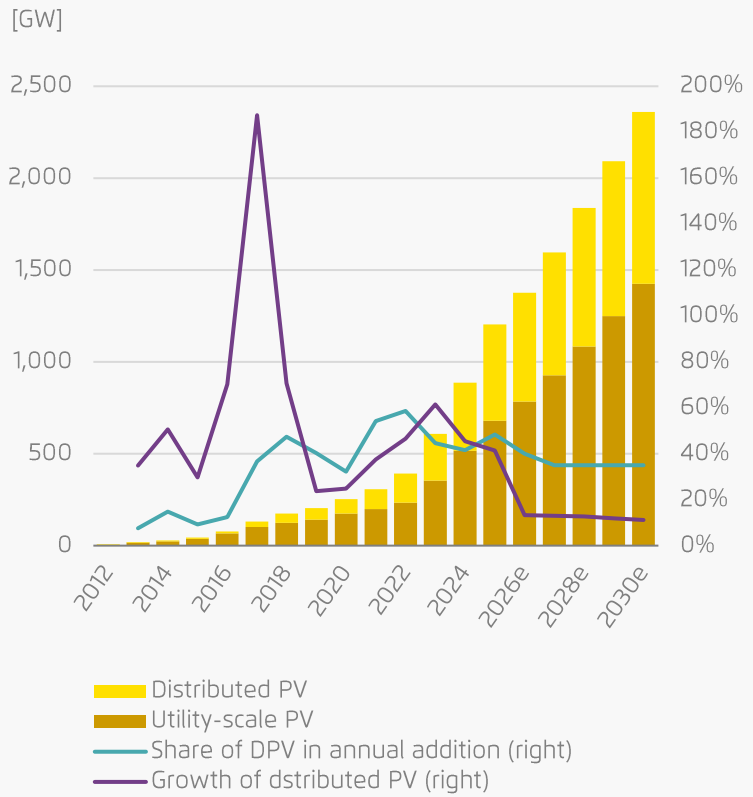
- **Coal power is entering a structural decline:** Coal’s share of both installed capacity and electricity generation continued to fall in 2025, with coal-fired generation declining again as clean energy increasingly meets demand growth.
- **Coal is shifting from baseload to flexibility:** Despite lower generation, coal capacity continues to expand, reflecting its evolving role in providing system balancing, reliability and peak-load support.
- **Flexibility investment is becoming a priority:** Expanding storage, grid infrastructure and demand-side flexibility can reduce reliance on new coal capacity and support higher shares of renewable energy.

Trend 7 China’s power system transformation enters a new phase: from renewable expansion to system integration

7.3 Development of clean energy



7.4 Development of China’s PV power installations



From capacity growth to system value:

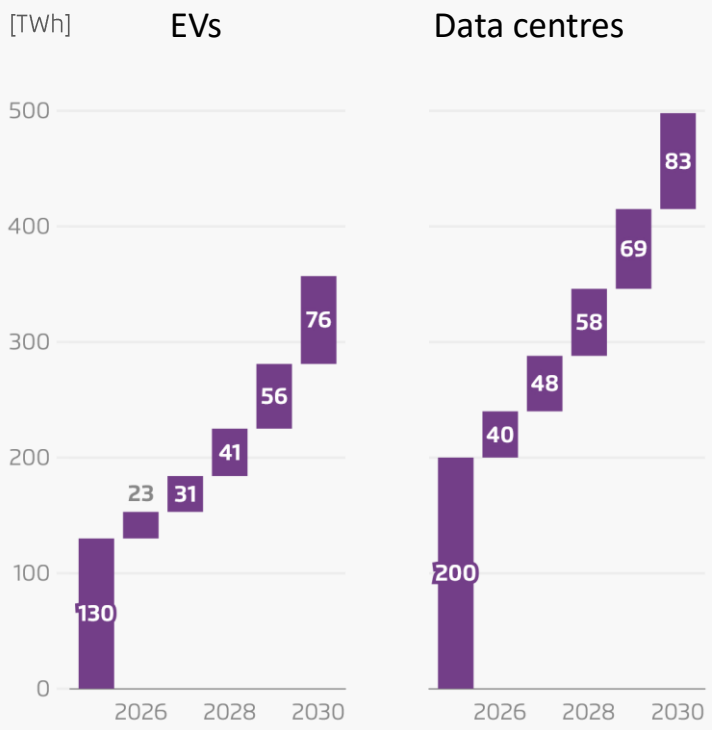
- → **Renewables remain the main growth engine:** Solar PV is expected to continue leading capacity additions, although growth is likely to moderate after the exceptional expansion of 2025, with solar capacity projected to surpass coal by 2026.
- → **Distributed renewables become more system-active:** As distributed PV expands in load centres, distribution networks are emerging as a key focus for investment, market reform and renewable integration.
- → **Policy focus is shifting toward system value:** Under the 15th FYP, renewable development is expected to be assessed increasingly by its contribution to grid reliability, flexibility and clean energy consumption, alongside capacity growth.

 Agora Energy China & Agora Energiewende (2026): Left: NEA, and CEC. Right: NEA, U.S. Energy Information Administration (EIA) and IEA.

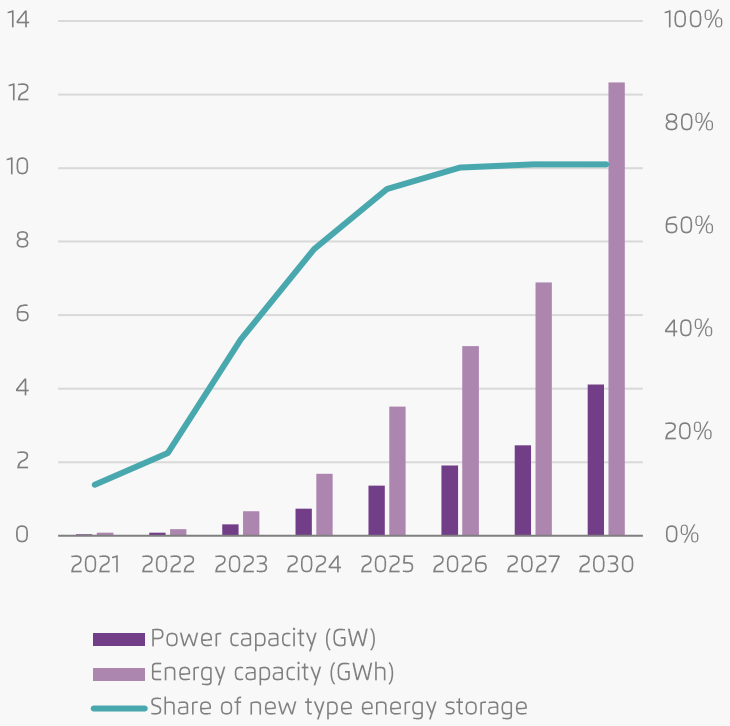
Trend 8

As new sources of electricity demand emerge, flexibility becomes increasingly important to move beyond the emission plateau

8.1 Electricity demand addition from EVs and data centres, 2025–2030



8.2 China's new energy storage* development, 2021–2030



Flexibility for a new demand era:

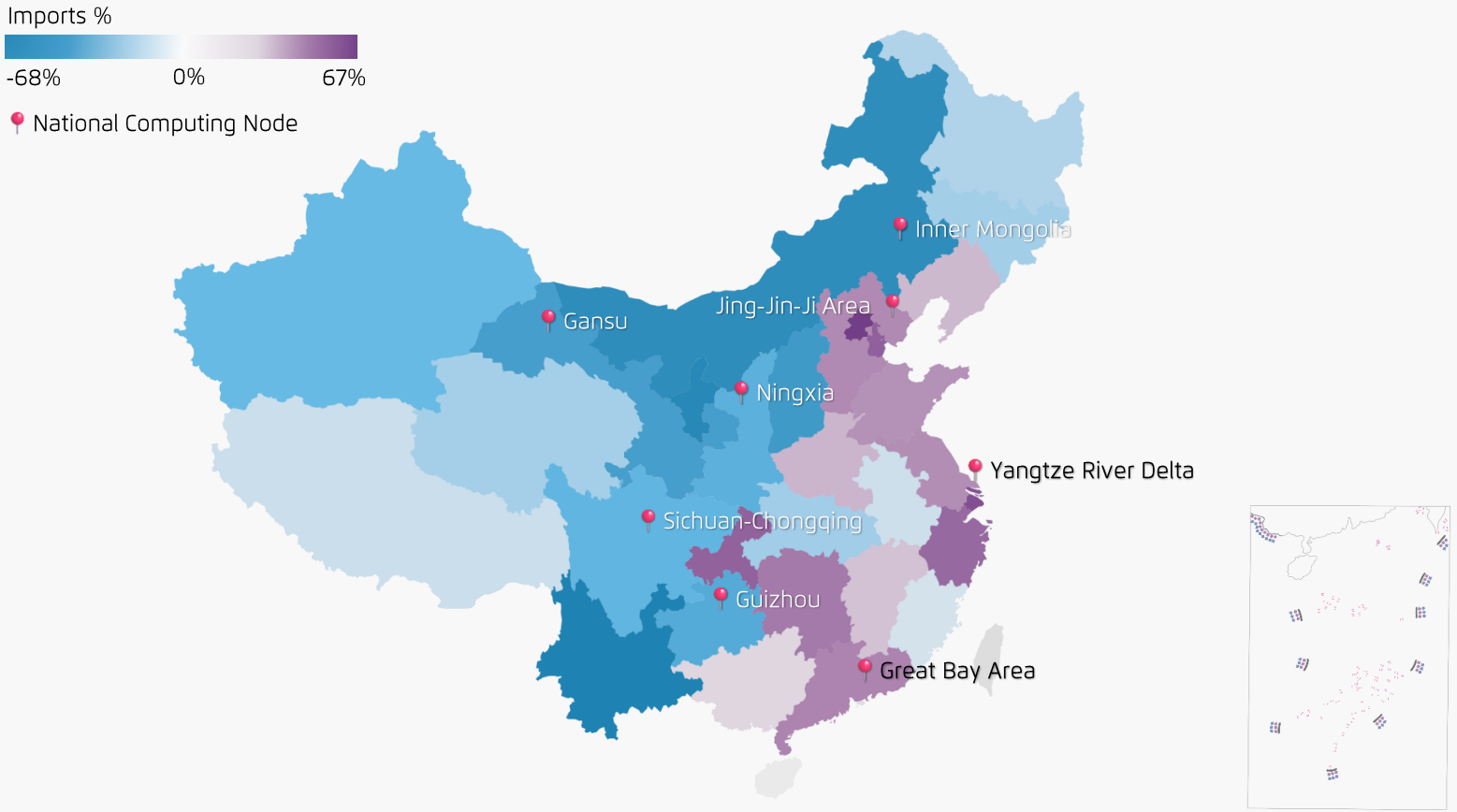
- **New growth drivers are reshaping power demand:** Rapid growth in EVs and data centres is increasing electricity consumption, meaning a larger share of new renewable generation is meeting incremental demand rather than directly displacing fossil generation.
- **Flexibility become increasingly valuable:** EVs and data centres can provide system flexibility through smart charging, V2G, demand response and load management, helping integrate more renewable energy and reduce peak demand.
- **Early deployment is already underway:** By 2025, more than 100,000 EVs and over a dozen data centres were participating in dispatchable flexibility programmes, demonstrating the growing role of flexible demand-side resources.

Agora Energy China & Agora Energiewende (2026): Left: China Association of Automobile Manufacturers (CAAM), China Academy of Information and Communications Technology, and Author's calculation. Right: NEA. *New energy storage: energy storage technologies other than pumped-storage hydropower that primarily output electricity, thus supporting this emerging power system model.

Trend 9

AI-driven computing demand is emerging as a new source of stable, large-scale demand for renewable electricity in China

9.1 China's provincial electricity trade balance and 8 National Computing Nodes



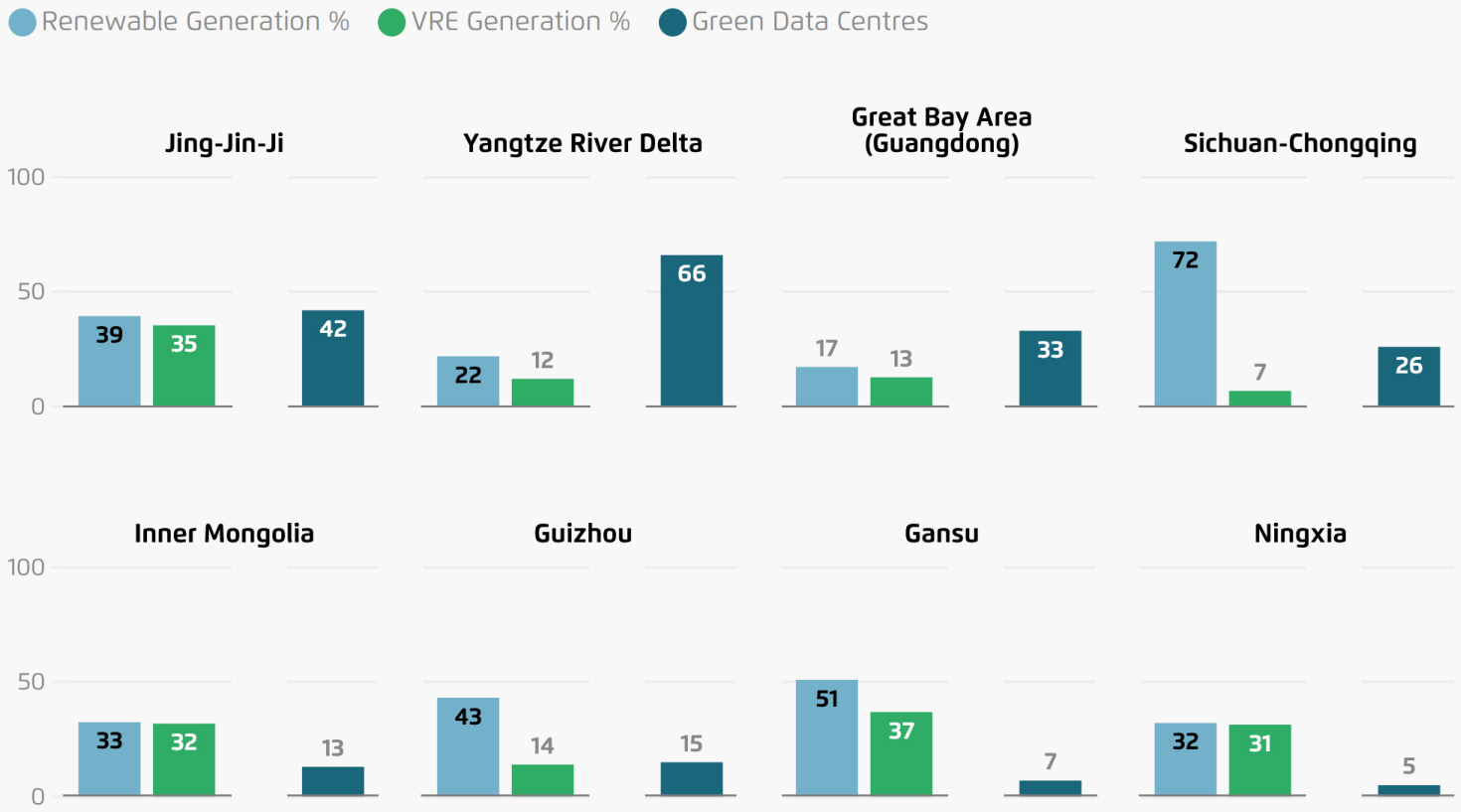
AI as a driver for clean energy demand:

- **Digital infrastructure is increasingly tied to clean energy:** New data centres in national computing nodes are required to source at least 80% renewables, strengthening the connection between AI-driven demand growth and renewable consumption.
- **Computing demand can help address regional imbalances:** As power demand is concentrated in eastern China and renewable resources in the west, the "East Data, West Computing" strategy can better align digital infrastructure with clean energy development.
- **Data centre siting is becoming a system planning tool:** Locating new computing capacity in renewable-rich regions can support clean power utilisation, ease grid constraints and improve regional system balancing.

 Agora Energy China & Agora Energiewende (2026): CEC; Compiled from publicly available MIIT national green data centre lists.

Trend 9 AI-driven computing demand is emerging as a new source of stable, large-scale demand for renewable electricity in China

9.2 Eight National Computing Nodes and their local characteristics



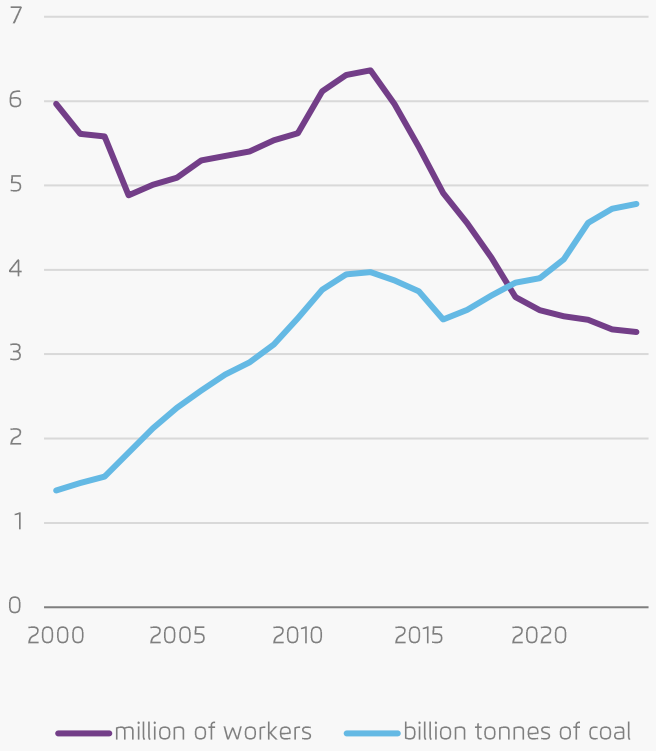
Balancing computing and energy:

- **National Computing Nodes are taking shape:** China's "Eastern Data, Western Computing" initiative has established eight National Computing Nodes to better coordinate AI growth, digital infrastructure and energy supply.
- **Balancing computing and energy needs remains a key challenge:** eastern nodes are closer to demand centres but face power constraints, while western ones offer stronger renewable resources but require greater system integration.
- **Regional difference requires tailored solutions:** Diverse resource endowments, power systems and demand profiles call for differentiated approaches to align computing growth with clean energy development.

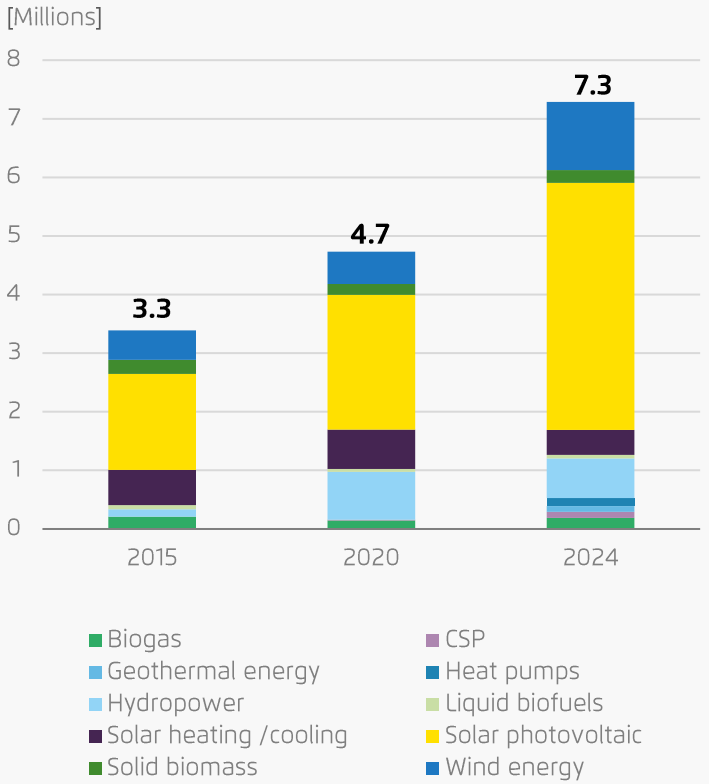
Agora Energy China & Agora Energiewende (2026): China defines Green Data Centres through GB/T 44989—2024, Green Data Centre Evaluation, a national standard implemented in June 2025. The evaluation framework focuses on energy efficiency, low-carbon development, rational siting, and efficient computing-resource utilisation

Trend 10 The energy transition is reshaping the geography of employment

10.1 China's coal mining jobs vs. national coal production



10.2 Renewable energy jobs by technology in China



The workforce transition matters:

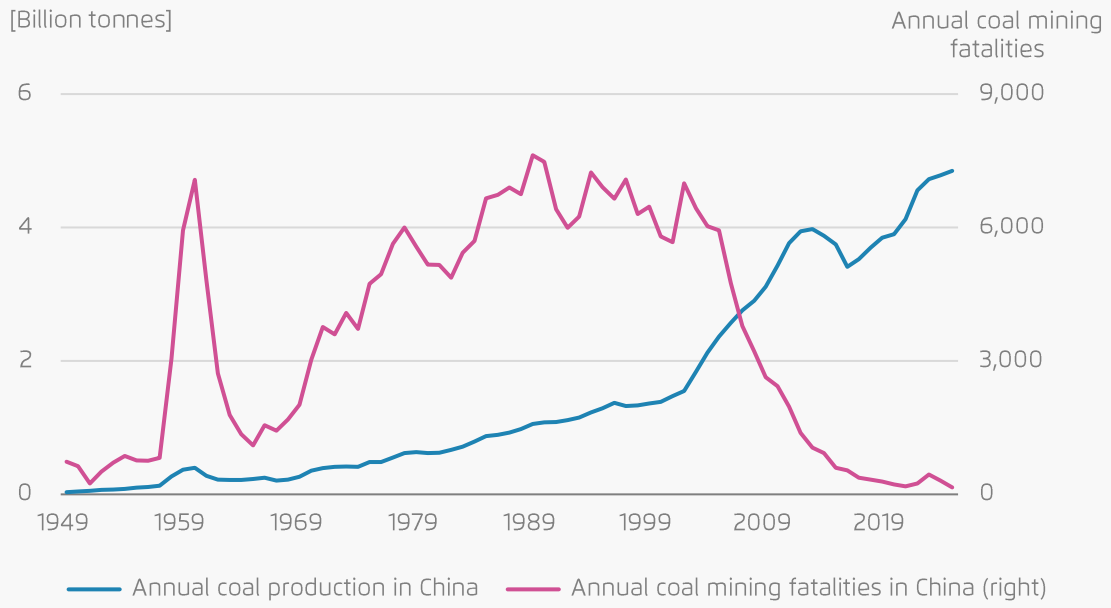
- **Coal employment continues to decline:** Despite record-high coal production, employment in China's coal mining sector has fallen by nearly 60% since 2013, reflecting ongoing productivity gains and industry consolidation.
- **Renewable energy is creating new jobs:** Renewable energy employment has grown steadily over the past decade, led by solar PV and increasingly supported by emerging sectors such as heat pumps and concentrated solar power.
- **Geographic mismatches remain a challenge:** Many new renewable energy jobs are being created far from traditional coal regions, highlighting the need to better align workforce transition, regional development and clean energy investment.*

Agora Energy China & Agora Energiewende (2026): Left: NBS, IRENA; and author's own estimation.
* Wu, Huihuang, et al. "Fewer than 15% of Coal Power Plant Workers in China Can Easily Shift to Green Jobs by 2060." One Earth, vol. 7, no. 11, Nov. 2024, pp. 1994–2007.

Special study 1

Coal mine safety highlights the importance of regulatory burden in energy transition decision-making

SS 1.1 China's coal output vs. mining fatalities, 1949–2025



→ Coal mining safety has improved dramatically over the last 20 years, with fatalities per million tonnes of coal output falling from 4.19 in 2000 to 0.0322 in 2025, driven by mechanisation, industry consolidation and stricter safety standards.

SS 1.2 Top 10* coal mining accidents in China since 1949

Ranking	Location	Date	Fatalities	Mine type	Reason
1	Laobaidong Mine, Shanxi	May 1960	684	SOE	Methane explosion
2	Sunjiawang Mine, Liaoning	Feb 2005	214	SOE	Methane explosion
3	Longshanmiao Mine, Henan	Nov 1960	187	SOE	Methane explosion
5	Yiluo Mine, Henan	Feb 1950	174	SOE	Methane explosion
4	Huayuan Mine, Shandong	Aug 2007	172	SOE	Flooding
6	Dongfong Mine, Heilongjiang	Nov 2005	171	Private	Methane explosion
7	Chenjiashan Mine, Shaanxi	Nov 2004	166	SOE	Methane explosion
8	Muchonggou Mine, Guizhou	Sep 2000	162	SOE	Methane explosion
9	Daping Mine, Henan	Oct 2004	148	SOE	Methane explosion
10	Sanjiaohe Mine, Shanxi	Apr 1991	147	Township	Methane explosion
*	Xinjing Mine, Inner Mongolia	Feb 2023	53	Private	Landslide
*	Liushenyu Mine, Shanxi	May 2026	82+	Private	Methane explosion

→ Despite substantial safety improvements, systemic accident risks remain due to the scale of China's coal industry, increasingly complex mining conditions and the concentration of production in deeper and more geologically challenging reserves.

Agora Energy China & Agora Energiewende (2026): Left: NBS, Compilation of Statistical Data on China's Coal Industry 1949–2009 (edited by China National Coal Association, published by China Coal Industry Publishing House) and National Mine Safety Administration (NMSA). Right: Ministry of Emergency Management and Bang.cn
* Major coal mining accidents in China.

Special study 1

Coal mine safety highlights the importance of regulatory burden in energy transition decision-making

China's coal sector illustrates an often-overlooked dimension of energy transition decision-making: regulatory burden. Safety has improved dramatically – fatalities per million tonnes fell from 4.19 in 2000 to 0.0322 in 2025 (**a reduction of over 99%**) – driven by mechanisation, mine consolidation and stronger enforcement. Yet **major accidents persist**. Remaining reserves are concentrated in deeper, more complex geology, and the scale of the coal value chain continues to create significant governance and oversight challenges that regulation alone cannot fully resolve.

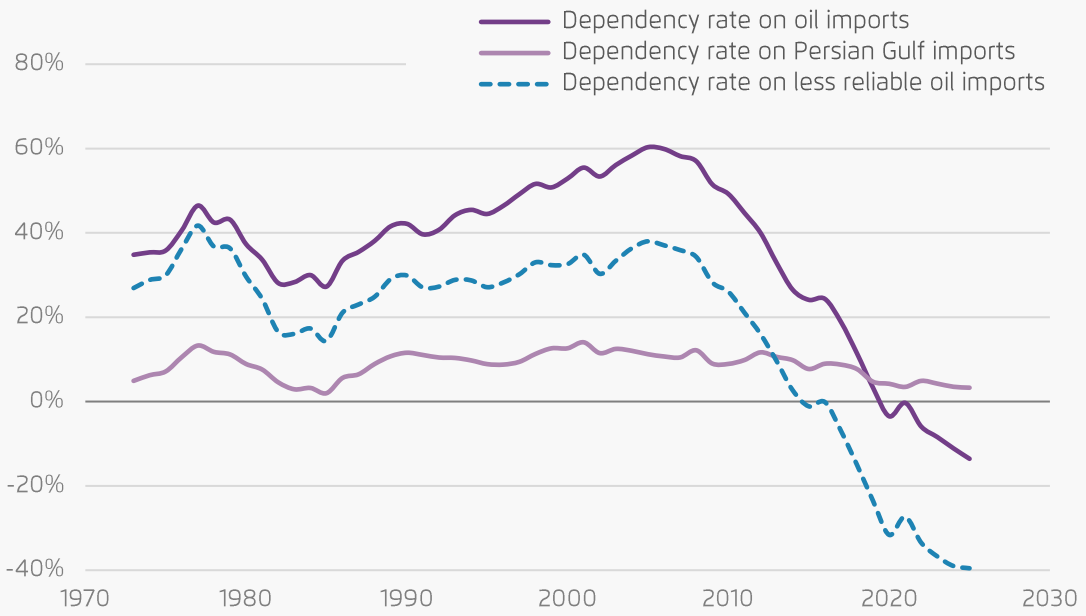
This points to a **broader policy question for the 15th FYP**. Energy transition decisions are typically assessed through energy security, economic development and environmental protection.

As suggested in our 2025 annual report, **regulatory burden deserves equal attention.** Coal requires extensive supervision across mining, transport, combustion, environmental compliance and workplace safety – and as production systems grow larger and more complex, **maintaining regulatory effectiveness becomes increasingly resource-intensive**.

From this perspective, **renewable energy expansion offers benefits beyond emission reductions**. Wind and solar involve lower operational safety risks and fewer regulatory layers across their value chains. Incorporating regulatory burden into energy transition assessment could provide a more comprehensive picture of long-term trade-offs, and support safer, more resilient and lower-carbon energy systems.

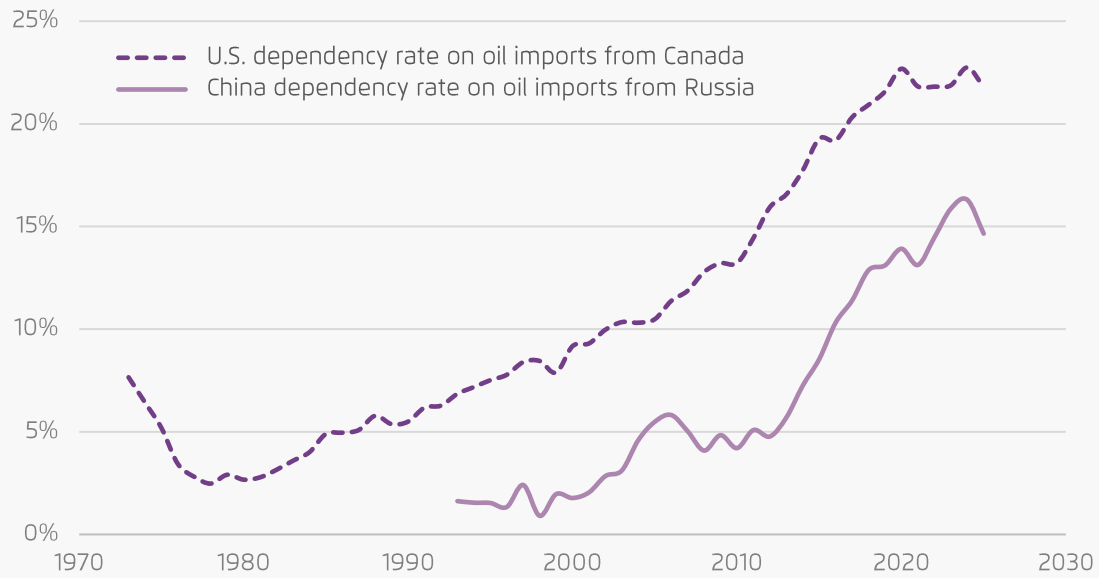
Special study 2 | What can China learn from the USA's experience on energy security?

SS 2.1 Alternative measure of USA oil import dependency



→ If oil imports from reliable countries such as Canada are excluded, USA oil import dependence since 1973 were not as high as it appears, similarly, China's over anxieties on energy security should be moderated with a more sophisticated energy security strategy.

SS 2.2 Oil import dependence on neighboring countries: USA vs. China



→ The USA did not depend heavily on Canadian oil before the shale revolution despite close bilateral ties. This suggests that supply diversification, rather than reliance on individual producers, remains central to long-term energy security.

Special study 2 | What can China learn from the USA's experience on energy security?

In October 2021, President Xi Jinping declared that "China's energy bowl must be held firmly in our own hands" – echoing, across half a century, President Nixon's 1973 "Project Independence". Both leaders identified the **same strategic vulnerability**. The USA's energy security journey since then offers key lessons for China's policy debate today.

The **first lesson: the composition of imports matters as much as their volume.** Headline dependency figures attract attention, but the risk character of the supply portfolio determines actual vulnerability. The USA reduced exposure to geopolitically sensitive producers while deepening ties with stable, pipeline-connected partners.

The **second lesson: avoid excessive dependence on any single supplier.** Even trusted relationships carry concentration risk from infrastructure failures, commercial disputes or shifting geopolitical circumstances, a diversified supplier base can buffer in ways strategic reserves alone cannot.

The **third lesson: avoid the anxiety trap.** Overestimating vulnerability produces responses more costly than the risks they address. Large-scale coal-to-liquids and coal-to-chemicals expansion – capital-, carbon- and water-intensive – risks becoming precisely such an overreaction, as EVs and renewables are already structurally reducing China's oil demand. The **fourth lesson: the most durable solution lies in reducing dependence itself.** The USA's energy position was ultimately transformed by technological disruption. China's equivalent is already underway via its ongoing clean energy transition.

Energy security is not achieved by pursuing self-sufficiency at any cost; for China, the **clean energy transition may prove to be its most effective path to achieving it**.

Imprint

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