

PATH TO CARBON PEAKING AND NEUTRALITY: CHINA'S PROGRESS AND UPCOMING NDCS

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Summary

- China has enhanced policies on mitigation and adaptation.
- New targets for upcoming Nationally Determined Contribution are discussed.
- Policy gaps in achieving climate goals have been identified.

This policy brief summarizes recent highlights in China's climate policy, anticipates key elements of China's upcoming Nationally Determined Contribution (NDC), and addresses existing policy gaps in reaching its carbon neutrality goals.

China's Progress

Mitigation In 2023, non-fossil energy sources accounted for 17.9% of primary energy consumption. As of July 2024, the total installed capacity of wind and solar power reached 1,206

GW, surpassing its NDC target for wind and solar capacity six years ahead of schedule. For the first time, non-fossil power generation capacity has exceeded that of fossil fuels. However, the construction of new coal power plants remains high. In the first half of 2024, construction began on over 41 GW of coal power plants.

Adaptation China has strengthened climate change monitoring, early warning systems, and risk management, enhanced the resilience of natural ecosystems, and reinforced the adaptive capacity of its economic and social systems. By 2022, over half of the country's arable land had been transformed into climate-resilient farmland. Climate adaptation projects have also been implemented to enhance the resilience of urban areas, healthcare, and infrastructure.

Figure 1: China's Climate Progress

Target type	First NDC	Second NDC	Progress
Carbon peaking and carbon neutrality	Peak around 2030 and making efforts to peak earlier	Peak before 2030 and achieve carbon neutrality before 2060	
Carbon intensity	↓ by 60–65% in 2030 from the 2005 level	↓ by over 65% in 2030 from the 2005 level	↓ 51% in 2022 from the 2005 level
Non-fossil share of primary energy consumption	↑ to around 20% by 2030	↑ to around 25% by 2030	↑ to 17.5% in 2022
Forest stock volume	↑ by 4.5 billion cubic meters in 2030 from the 2005 level	↑ by around 6 billion cubic meters in 2030 from the 2005 level	
Installed capacity of wind and solar power (new)		↑ to over 1,200 GW by 2030	↑ to 1,206 GW in July 2024

Policy Highlights

MITIGATION POLICY

The Chinese government has strengthened its 1+N climate policy framework by targeting seven critical areas for mitigation: industrial structure, energy consumption, transport modes, energy efficiency, non-CO₂ emissions, carbon sinks, and pollution reduction. Key progress includes:

- **Industrial structure:** The government has promoted strategic emerging industries with low carbon footprints while imposing restrictions on high-emission, low-tech sectors. In 2022, high-tech and equipment manufacturing contributed 15.5% and 31.8%, respectively, to the total added value of large-scale industries.
- **Energy consumption:** In addition to advancements in solar and wind capacity, China's total installed capacity in 2022 reached 41 GW for biomass power generation, 368 GW for conventional hydropower, 55 GW for nuclear, and 8.7 GW for energy storage. Over 350 hydrogen stations have been constructed nationwide. In June 2024, the

Chinese government launched the Action Plan for the Low-Carbon Transformation of Coal-fired Power Plants, aiming to transition China's coal power fleet to achieve emission levels comparable to natural gas power plants by 2027.

- **Transportation modes:** A low-carbon shipping model has been promoted, with strengthened shifts from road to rail and from road to water for medium- and long-distance transport. In 2022, the national rail freight share of total freight volume increased from 7.8% in 2017 to 9.8%, while waterway freight rose from 14.1% to 16.9%.
- **Energy efficiency:** Policies and incentives have been introduced to support the renewal of industrial equipment, aiming for enhanced energy efficiency and reduced carbon emissions.
- **Non-CO₂ emissions:** China has implemented an action plan to control national methane emissions. Additionally, it has strengthened the management of hydrofluorocarbons (HFCs) across production, usage, and import and export stages.

Figure 2: 1+N Scenario Emissions Reductions by Policy Group

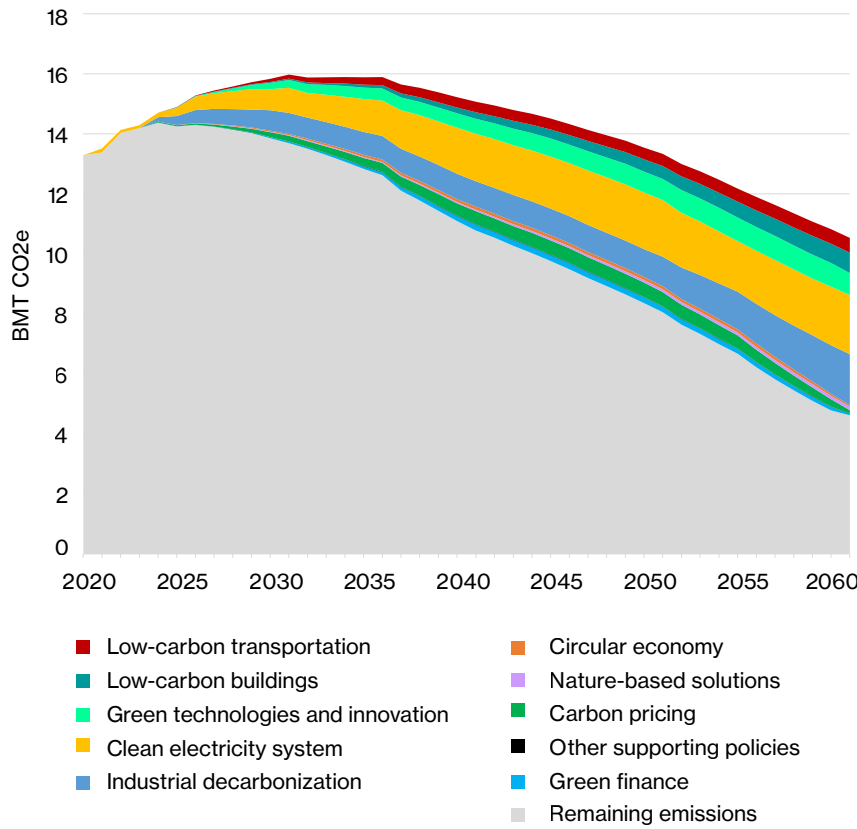
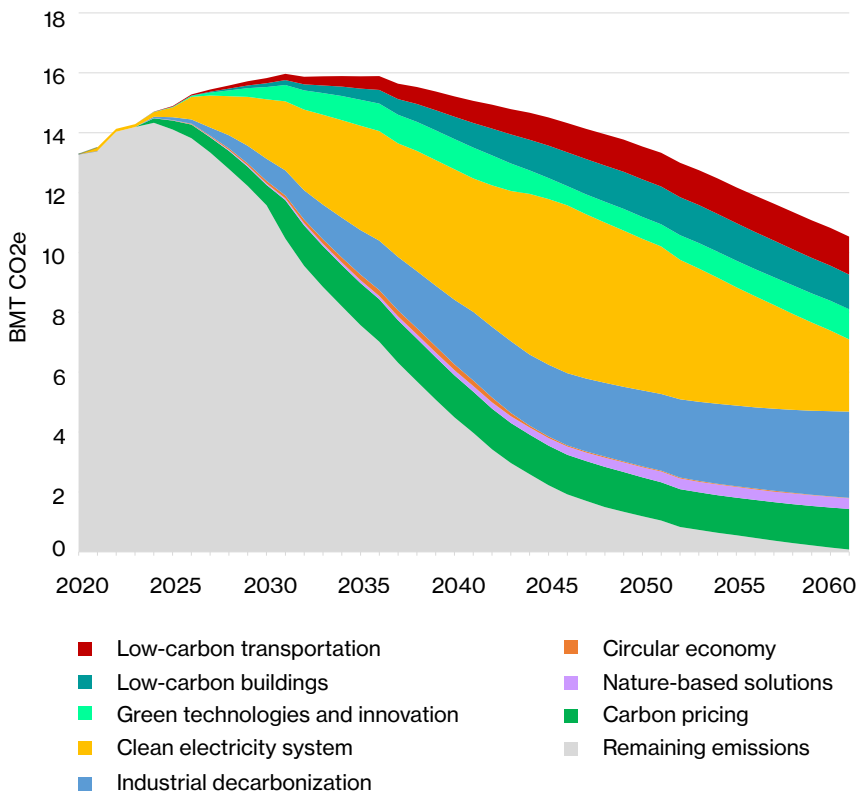


Figure 3: Expanded 1+N Scenario Emissions Reductions by Policy Group



ADAPTATION POLICY

In addition to the National Climate Change Adaptation Strategy 2035, China developed the 2023 Climate Risk Assessment Report and conducted research for the Technical Guidelines for Climate Change Adaptation: Vulnerability, Impact, and Risk Assessment. More adaptation policies have been implemented at subnational levels, focusing on enhancing the resilience of cities, farmlands, and ecosystems.

INTERNATIONAL COOPERATION

In November 2023, the U.S. and China jointly issued the *Sunnylands Statement on Enhancing Cooperation to Address the Climate Crisis*, agreeing to collaborate on energy transition, the circular economy, subnational exchanges, and methane emissions control. Additionally, China has signed 53 South-South climate change cooperation agreements with 42 developing countries, and efforts to green Belt and Road Initiative investment projects continue.

New Nationally Determined Contribution

According to the Sunnylands Statement, China's upcoming NDC, scheduled for an update in 2025, will set actions and targets for all greenhouse gases, including methane and other non-CO₂ emissions such as hydrofluorocarbons (HFCs) and nitrous oxide (N₂O), to be achieved by 2035. China is also expected to triple its renewable energy capacity target through 2030 from 2020 levels.

Policy Gap Analysis

Climate Policy Lab's latest research (currently under peer review), *Assessing the Adequacy of Domestic Policies for Achieving China's Carbon Neutrality Target*, finds that China's current 1+N climate policy package is sufficient for meeting its carbon peaking goal but falls short of achieving economy-wide carbon neutrality by 2060, which will require expanded and strengthened measures. China's existing climate policies under the 1+N framework are projected to achieve carbon neutrality only in the power and building sectors but not across the whole

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economy due to remaining GHG emissions in the industry, transportation, and agriculture sectors after 2050. These remaining emissions highlight the existence of significant policy gaps.

Our research identified three types of policy gaps critical for meeting China's carbon neutrality target. Using a mixed methods approach that combines expert surveys and system dynamics modeling, we first highlighted specific policy gaps related to unmitigated coal consumption in non-power sectors, non-road transportation emissions, agricultural emissions, and non-CO₂ process emissions from industry. Second, the identified stringency gaps reveal insufficiencies in existing policies on clean energy deployment (with the exception of solar

and wind), the phase-out of coal-fired power plants, and the carbon pricing scheme. Third, the implementation gaps emphasize the need for market reforms in energy and electricity pricing, as well as reforms to state-owned enterprises.

Conclusion

China has continued to strengthen its 1+N climate policy framework and has made progress on mitigation and adaptation measures. China's new NDCs are likely to include non-CO₂ emissions targets and more ambitious new renewable energy targets. However, there are policy gaps that need to be addressed for China to achieve its carbon neutrality goal by 2060. ●

Climate Policy Lab is based in the Center for International Environment and Resource Policy (CIERP) at The Fletcher School, Tufts University

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