China Carbon Neutrality Tracker Special Issue

The China Carbon Neutrality Tracker (CCNT) special issue focuses on analyzing important events and policies related to China's key climate actions as it pushes forward its dual-carbon goals.

In Focus: Revisiting Dual-Carbon Topics at the Two Sessions

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In Focus: Revisiting Dual Carbon Topics at the Two Sessions

The conclusion of the 2025 Two Sessions in March brought several notable terms into the spotlight, including "dual control of carbon emissions," "zero-carbon parks," and "zero-carbon factories." A key focus was the role of technological innovation in driving industrial transition, with many deputies putting forward proposals on the matter. As the 14th Five-Year Plan (2021–2025) approaches its end, the energy consumption targets outlined in this year's government work report also drew significant attention. In this special issue of CCNT, we explore key dual-carbon topics that sparked dynamic discussions during the Two Sessions.

Some Progress, Some New Goals

In 2024, China:

- Produced over 13 million new energy vehicles (NEVs).
- Reduced energy intensity (energy consumption per unit of GDP) by more than 3%.
- Accelerated renewable energy deployment, adding 370,000 MW of installed capacity and raising the share of non-fossil energy in power generation to nearly 40%.
- Promoted energy-saving and carbon-reduction upgrades in energy-intensive industries.
- Launched China's National Voluntary Carbon Market, boosting carbon credit transactions across the country.

This year, China has set goals to:

- Reduce **energy intensity by about 3%**, while continuing to improve ecological environment.
- Expand national carbon peak pilot projects, establishing several **zero-carbon parks** and **zero-carbon factories**.

China also aims to:

- Synergize efforts for emissions reduction, pollution control, and green growth, to accelerate a comprehensive economic and societal transition.
- Accelerate the development of a green low-carbon economy, with green buildings, energy, and transportation as key growth drivers.
- Conduct **carbon emissions accounting and reporting**, establish a **product carbon footprint management system**, and implement a **carbon labeling certification system** to address green trade barriers.
- Launch pilot projects for the **decarbonization of coal-fired power generation**.
- Develop key initiatives to tackle climate change, while actively engaging in and steering global environmental and climate governance.

How to interpret the 3% Energy Intensity Reduction Goal?

According to *China News*, an official from the National Development and Reform Commission (NDRC) previously disclosed that the national energy intensity decreased by about 7.3% during the first three years of the 14th Five-Year Plan (2021-2025).

Based on the latest data from the National Bureau of Statistics, China's energy consumption per unit of GDP fell by 3.8% year-on-year in 2024—exceeding the annual target of 2.5%—after excluding raw material energy use and non-fossil energy consumption. Achieving this year's targeted reduction of around 3% will mark the successful completion of the target set in the 14th Five Year Plan (13.5%).

Lin Weibin, Director of the Energy Policy Research Office at the China Energy Research Society, points out that China is shifting from "dual control of energy consumption" to "dual control of carbon emissions." Using energy intensity restrictive indicators that exclude energy consumption for raw materials and non-fossil energy aligns with goals of clean energy policies. This shift boosts local governments' confidence in achieving their targets. He also believes the rapid development of new energy makes the 3% reduction target highly achievable, particularly with favorable hydropower conditions. However, he cautions local governments against simplistic measures, stressing the need for precise and orderly policy implementation.

However, some experts have expressed more cautious views. Guo Haifei, Deputy Secretary-General of the Energy Finance and Law Branch of the China Energy Research Society, believes that the 3% target aligns with the historical downward trend, making it relatively achievable. However, the challenge lies in balancing stable economic growth with a green, low-carbon transition. China is still in a phase of rapid industrialization and urbanization, where energy demand continues to grow steadily. The transition of energy-intensive industries such as steel and cement will require significant time and substantial investment. Moreover, many of the "low-hanging fruits" in energy-saving measures have already been implemented, making it more challenging and costly to uncover further potential.

So, what can contribute to the 3% energy intensity reduction target? Yang Li, Senior Analyst at the Institute for Global Decarbonization Progress (iGDP), highlights several areas: accelerating the **low-carbon transition of coal-fired power plants**; expanding the use of **heat pumps** for industrial waste heat recovery and the electrification of industrial processes; and speeding up the replacement of fossil fuel energy by renewable energy in sectors such as **buildings and transportation**. "By promoting energy-saving and low-carbon technologies, we can tap into further energy-saving potential, providing strong support for reaching the target."

As the 14th Five-Year Plan concludes and the 15th Five-Year Plan begins, the reduction in carbon intensity will replace the reduction in energy intensity as a key indicator for economic and social development. According to preliminary estimates, China's CO_2 emissions per 10,000 RMB of GDP in 2024 are expected to decrease by 3.4% compared to the previous year. Over the past four years, carbon intensity has decreased by around 8.6% in total, but meeting the carbon intensity target remains a challenge.

Industries like steel, cement, and electrolytic aluminum have seen a gradual decline in production and consumption, approaching carbon peak targets. While these industries have made progress in reducing emissions, they still lag behind international levels. Peking University's Climate Change and Energy Transition Program (CCETP) argues that further application and promotion of low-carbon technologies, energy structure optimization, and improved management are needed to reduce China's carbon intensity and enhance international competitiveness of its products.

Technological Innovation as A Key Driver in Achieving the Dual Carbon Goals

Low-Carbon Transformation of Coal Fire

According to the government work report, **by 2025, pilot projects for low-carbon coal-fired power plants will be launched.** The *Action Plan for Low-Carbon Transformation and Construction of Coal Power (2024-2027)* released last year states that by 2025, the first batch of coal-fired low-carbon transition projects will begin, and several coal-fired low-carbon power generation technologies will be deployed. Transition methods include biomass cofiring, green hydrogen cofiring, and carbon capture, utilization, and storage (CCUS).

An article in *China Power Enterprise Management* magazine analyzed the challenges of coal-fired power plant low-carbon transformation. It noted that applying these technologies involves technological, industrial, and business innovations. Most of these technologies are still in the early stages of demonstration and commercial exploration, facing significant challenges, especially high costs. Reducing and managing costs will be a major challenge for companies undergoing low-carbon transformation.

Emerging industries like **hydrogen energy** and **energy storage**, though still nascent, have received considerable attention in recent years during the Two Sessions, often reflecting urgent new issues and development directions.

Hydrogen Energy

According to the China Hydrogen Alliance, **23 provincial-level regions mentioned hydrogen energy in their government work reports during local Two Sessions this year.** Provinces like Inner Mongolia, Gansu, and Qinghai have proposed promoting green electricity for hydrogen production. Shanxi, Sichuan, and Shanghai are focusing on the utilization of hydrogen and its derivatives in transportation and full supply-chain development.

This year, deputies have increasingly focused on ensuring continued policy support and improving collaboration within the industry. An analysis from the Global Energy Interconnection Development and Cooperation Organization (GEIDCO) noted that, as of the second half of last year, global green hydrogen projects had significantly underperformed expectations. In China, key challenges include high hydrogen production costs, limited economic viability, and insufficient demand for green hydrogen in key sectors such as energy and transportation.

Zhong Baoshen, Chairman of LONGi Green Energy, emphasized, "China's new energy installed capacity has grown rapidly in recent years, but the inherent volatility and intermittency of renewable energy have led to growing challenges in consumption, transmission, and storage. Green hydrogen, as an important form of energy conversion, can address large-scale renewable energy local consumption and provide peak-shaving and energy storage solutions across regions and seasons."

New Energy Storage

New energy storage has also been frequently mentioned. For instance, Ningxia has set a target of 600 MW of new energy storage capacity. Inner Mongolia aims to start 35 new energy storage projects, targeting 10,000 MW of newly installed capacity and 6,000 MW of new commissioned capacity. Anhui aims to accelerate the development of world-class photovoltaic and energy storage industry clusters.

Despite improved utilization rates over the past two years, new energy storage in China still faces challenges such as limited deployment, low utilization, and long payback periods.

Zeng Yuqun, Chairman of CATL, proposed several measures to improve the market mechanism for energy storage, including:

- Widening the peak-valley price differentials to better reflect supply and demand and diversifying ancillary services for new energy storage.
- Refining the capacity compensation mechanism and accelerating the development of pricing standards and implementation guidelines.
- Establishing a fairer capacity pricing system for new energy storage based on pumped storage and coal-fired power models in the short term, while transitioning to a capacity market with market-driven pricing to reflect the scarcity of resource adequacy in the long term.

Currently, provinces including Shandong and Sichuan have already introduced local policies supporting the growth of new energy storage through capacity price compensation. Guangdong also issued a draft policy for comment regarding capacity price compensation for energy storage in October 2024.

The **production, recycling, and application of lithium batteries** have also been a major focus this year. The rising adoption of new energy vehicles has increased demand for recycling and repurposing of decommissioned batteries.

Wang Peng, associate researcher at the Beijing Academy of Social Sciences, explained that used batteries can support renewable energy storage and grid peak regulation through cascading applications. Moreover, advancements in energy storage technology are benefiting the new energy vehicle industry by optimizing charging infrastructure, improving charging efficiency, and more.

Opportunities and Challenges in Building Zero-Carbon Industrial Parks as Carbon Peak Pilots Advance

At the end of 2023, the NDRC announced the first batch of carbon peak pilot projects, comprising 35 cities and industrial parks. An article in *Outlook Weekly* highlighted that these pilots have made strides in optimizing industrial structures, advancing energy-saving measures, and promoting carbon-reduction efforts. However, as carbon reduction efforts intensify, the work has entered a more challenging phase. The marginal costs of emission reduction are rising as the potential for energy savings diminishes; green industry's overall capacity remains weak due to gaps in technological innovation, infrastructure, and talent; and the carbon emissions monitoring system is still underdeveloped.

Shortly after the Two Sessions, a second batch of 27 pilot projects was announced. An article by *Global Net-Zero* comparing the two lists highlighted that Jiangsu, Zhejiang, Inner Mongolia, and Xinjiang appear in both rounds. This is due to Inner Mongolia and Xinjiang's leading positions in coal production and new energy generation, while Jiangsu and Zhejiang are examples of ecological green development, with Jiangsu also being a hub for new energy industries. The first batch included 25 cities and 10 parks, while the second batch featured 15 cities and 12 parks, reflecting a **significant increase in the proportion of parks**.

Chen Lüjun, professor at Tsinghua University's School of Environment, noted that China has 2,543 national and provincial-level development zones, which house over 80% of industrial enterprises. These zones account for about 50% of the country's total industrial output value and 31% of CO_2 emissions. In his view, these parks are keys to economic development and green and low-carbon transition across China.

The government work report **for the first time** called for **building zero-carbon industrial parks and factories**. An article from *Economic Daily* emphasized that products such as "green steel" and "zero-carbon aluminum" from these parks could enhance manufacturing competitiveness and help bypass green trade barriers. Furthermore, zero-carbon parks can integrate energy production and consumption, promote local use of green electricity, and help achieve China's "dual-carbon" goals.

Looking at the dual-carbon focus of this year's Two Sessions, the policy shift from "dual control of energy consumption" to "dual control of carbon emissions" signals the increasing importance of reducing carbon intensity. Reducing emissions in energy-intensive industries such as steel and cement has entered a crucial phase. The transition of coal power, development of green hydrogen industry chains, and improvement of new energy storage mechanisms all call for stronger efforts in both technology and policy to drive industrial change. As the "inaugural year" for zero-carbon industrial parks, whether these efforts can inject new momentum and growth opportunities for China's green economic growth remains a focal point for anticipation.

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