



Taking The Pulse

Insights on Climate Developments in China

Spring 2024

Welcome to Taking the Pulse!

Taking the Pulse (TTP) provides the global climate community with access to the latest thinking inside China on the low-carbon transition.

In this newsletter, we gather recently published Chinese-language opinions, quotes, news articles, and reports to give readers a glimpse into the multi-faceted discussion on climate taking place in China.

In Focus: Unleashing New Quality Productive Forces for Economic Growth and Green Transformation

The recent Boao Forum for Asia, which came to a close on March 29th, reignited discussions around the concept of "[new quality productive forces](#)." Put forward in 2023, the concept has evolved significantly. Marked by innovation, new quality productive forces deviate from traditional economic growth models and productivity development paths. With an emphasis on advanced technology, efficiency, and quality, new quality productive forces embody a progressive form of productive capacity in line with modern developmental principles. This notion, prominently featured in the 2024 government work report, is emerging as a significant driver of China's economic growth. As for the energy sector, terms closely linked to "new quality productive forces," including the national carbon market, hydrogen power, modern energy storage, and distributed new energy, received considerable attention during this year's Two Sessions.



From the Baidu Index, we can see that “new quality productive forces” became a highly searched key word after the release of government work report on 5th March, with a small peak during Boao Forum (26th to 29th March).

The introduction of a series of green development policies has further propelled discussions surrounding this new concept in both social and economic spheres. For instance, the recent issuance of the “[Guidance Catalogue for Green and Low-Carbon Transition Industry \(2024 Edition\)](#)” by the National Development and Reform Commission (NDRC) has provided a roadmap for evaluating and promoting this economic concept. Under the guidance of the central authorities, local governments are actively identifying and nurturing their unique “new quality productive forces” to devise local strategies aimed at unlocking new economic potential and exploring innovative development pathways, as highlighted by LIU Xueye, Senior Analyst at the Institute for Global Decarbonization Progress (iGDP), in her newly published [Green Hydrogen Policy Factsheet](#).

But the pursuit of these new growth paths has also intensified the pressure to meet the energy and climate targets outlined in China’s 14th Five-Year Plan, underscoring the urgency of achieving the “[Energy Consumption Dual Control](#)” goals by 2025 and raising concerns about their feasibility. Balancing economic growth with green development has thus become a paramount concern. Last year, [eight provinces and municipalities](#) were warned for falling behind on these goals, revealing underlying tensions.

Conversely, under low-carbon scenarios characterized by increasing electrification and the increasing popularity of new energy vehicles, industries related to the current “new quality productive forces” have unexpectedly emerged as the primary drivers of electricity consumption growth. This trend was highlighted in [an analytical article on the electricity structure](#) published in the *Energy Observer Magazine*.

Despite the challenges and complexities inherent in the reform process, the government remains steadfast in its commitment to driving the development of new quality productive forces. The government work report once again emphasized the importance of deepening electricity reform, introducing policies such as the "[Regulatory Measures on the Fully Guaranteed Purchase of Renewable Electricity](#)" and the "[Guidance on the High-quality Development of Distribution Networks under the New Context](#)." To showcase cutting-edge green and low-carbon technologies, China has been championing a number of [demonstration projects](#).

Experts and scholars in various fields have given their interpretation around the concept of "new quality productive forces", pointed out the deficiencies and problems faced in China's ongoing transition and development, and offered suggestions and possible solutions. In this spring issue, TTP has curated several perspectives and discussions to provide readers with a clearer understanding of the role of new quality productive forces, particularly within the energy sector.

Quotes and opinions

I. "New Quality Productive Forces": An Emerging Development Engine for China

★ "From my perspective, it's important to seize three key dimensions to analyze China's future economic development. First, the pace of economic growth is shifting from rapid to moderately high and stable growth. Second, there is a profound change in the economic structure, characterized by the rise of the service sector and a decline in the share of agriculture and industry. Third, the emergence of a new troika - domestic consumption, digitalization of manufacturing, and green transition - is seen as a key driver for China's stable economic development in the future."

"In essence, China's industrial structure is transitioning from the 'traditional trio' (clothing, household appliances, furniture) to the 'new trio' (electric vehicles, lithium-ion batteries, photovoltaic), which represents a significant shift."

- [Zhu Min](#), Vice President, China Center for International Economic Exchanges

★ "New quality productive forces, as I see it, involves leveraging new technologies to comprehensively enhance total factor productivity. High-quality development is more than just a slogan or abstract idea; it entails specific actions. From an economic perspective, it requires meeting specific indicators, with a key focus on improving total factor productivity, which includes labor efficiency."

“How to improve total factor productivity? Digital and green technologies are paving new ways for it. The latest advancements in digital technologies, particularly artificial intelligence, have exceeded expectations in many areas. Regarding green transformation, a significant shift occurred with the rapid growth of numerous low-carbon green industries since China set its ‘dual-carbon’ goal. In the past, concerns arose when discussing environmental protection and green transformation. Some believed it would clash with economic growth and feared that prioritizing these aspects might slow down economic progress. If we still stick to the old technical system, these doubts may be true.”

“However, if we address green transformation challenges with new technologies based on innovation, the outcomes will be different. For instance, compared to conventional power generation methods, photovoltaic power substantially reduces carbon emissions. After over a decade of effort, the cost of photovoltaic power generation now competes favorably with or even undercuts traditional coal-fired power generation costs, making it economically competitive.”

“Thus, the fact that new technologies can boost the development of relevant industries shows that the relationship between new quality productive forces and economic growth is not a paradox but rather mutually reinforcing.”

- [Liu Shijin](#), Chief Advisor, China Council for International Cooperation on Environment and Development

★ “Recently, the National Development and Reform Commission, along with relevant departments, published the ‘Guidance Catalogue for Green and Low-Carbon Transition Industry (2024 Edition)’. The Catalogue, based on China's basic national conditions, actively promotes the clean and low-carbon transformation of traditional energy sources. By incorporating ‘low-carbon transformation’ into its title and adding key industries related to low-carbon transition in its content, it aims to better align with the latest trends in international financial development.”

“The Catalogue introduces a number of new industries and highlights key points that urgently need support, to name a few: industries related to greenhouse gas control in line with carbon peak and carbon neutrality strategies; new sectors related to new pollutant management and biodiversity conservation; industries reflecting the progress of green technology, such as advanced and efficient aviation equipment, novel energy storage products, and equipment manufacturing for the entire hydrogen energy chain (production, storage, transportation, and use); green technology trading and other green modes following the new green service development trend.”

“Currently, China's socioeconomic development has entered a stage of accelerating progress towards green and low-carbon high-quality development. The Catalogue unveiled the latest status and demands of global and domestic green development, serving as a reference for regions and departments to strategize economic development and formulate supportive policies that are in line with practical considerations.”

- [Lü Wenbin & Gu Lijing](#), Experts from the Energy Research Institute, Academy of Macroeconomic Research

★ “From the perspective of state-owned asset management, a key focus is to encourage bold innovation in enterprises and remove institutional barriers that hinder high-quality development. For example, in the realm of new energy vehicles, state-owned automotive companies are not progressing swiftly enough. Therefore, we're adjusting policies to separately evaluate the new energy vehicle business for three major central state-owned automotive enterprises (FAW Group, Dongfeng Motor Corporation, and Changan Automobile). We've noticed that despite the ongoing advantages of traditional fuel vehicles, there's a global trend among automotive companies to implement new energy vehicles businesses, which requires heavy investment in the initial stage. If we only consider the immediate profits, this might slow down companies' progress. Therefore, our policy aims to address this challenge by evaluating their technology, market share, and prospects in the future.”

- [Zhang Yuzhuo](#), Chairman of the State-owned Assets Supervision and Administration Commission of the State Council

[II. New Growth Places Challenges on Achieving the Energy and Climate Targets of the 2025 Plan](#)

★ “The goal of reducing energy consumption per unit of GDP by 13.5% during the period of China's 14th Five-Year Plan (2021-2025) now seems challenging to achieve, and it may not stay a rigid goal. It is anticipated that there won't be a resurgence of 'rushing to carbon peak', but stricter measures will be implemented, especially targeting sectors with high energy consumption and pollution.”

“In the short term, reducing the proportion of the mining and construction industries, increasing the utilization of clean energy, and enhancing energy efficiency in traditional and high-energy-consuming industries are the three main focal points for reducing energy consumption this year.”

“Regarding long-term mechanisms, the expansion of the carbon market and the construction of a new energy system are expected to accelerate within the year. It is projected that the steel, electrolytic aluminum, and cement industries will be brought into carbon trading this year, and reforms in the electricity market are also expected to progress rapidly.”

- [Yang Fan](#), Chief Policy Analyst, CITIC Securities

★ “In the current transitional phase, China is experiencing a slowdown in GDP growth. Foreign experiences suggest that when GDP growth decreases, energy consumption growth also declines. However, our energy consumption growth is outpacing GDP growth. Several factors contribute to this, with insufficient attention to enhancing energy efficiency being a significant one.”

“Tightly controlled energy prices and a guaranteed supply reduce the economic benefits of energy conservation. As a result, there is less motivation for businesses and individuals to prioritize energy conservation.”

- [Yang Fuqiang](#), Senior Advisor, Climate Change and Energy Transition Program, Peking University

★ “To achieve the target of a 13.5% reduction in energy consumption per unit of GDP and an 18% reduction in carbon emission intensity during China’s 14th Five-Year Plan period, a mere 2.5% reduction in energy consumption in 2024 is insufficient. The accounting method, as announced by the National Bureau of Statistics, excludes ‘raw material energy use’ from the energy consumption in 2024 and deducts ‘non-fossil energy consumption’. While adjusting energy consumption indicators may alleviate pressure to meet the target task of energy consumption reduction for this year and the next, it’s still not time to relax.”

“Since 2020, particularly due to the impact of the pandemic, the growth rate of the tertiary industry has slowed down. As the secondary industry re-emerged as a pillar of economic growth, the rate of decline in energy consumption per unit of GDP has continued to slow down. This indicates a diminishing ‘structural energy-saving’ effect of the economy. By 2023, the rapid growth in wind power and photovoltaic power generation has surpassed the critical value of the existing power system, posing challenges to achieving a high proportion of renewable energy consumption.”

“In the face of the challenges towards carbon peak, reaching the targets set in the 14th Five-Year Plan relies on the new quality productive forces.”

- [Cao Yuan & Zuo Jingying](#), Zero Carbon Initiative, SynTao Co.

★ “The growth rates of total electricity consumption and GDP moved in tandem from 2020 to 2023, with electricity consumption outpacing GDP growth. Experts suggest that this trend is partly influenced by the high temperatures during those years.”

“Recent years have seen accelerated development in green and low-carbon areas such as smart homes and electric vehicle charging, fostering the growth of the service industry and enhancing its contribution to the national economy. The declining share of electricity usage in the secondary industry, coupled with a rise in the tertiary industry, reflects ongoing economic structural adjustments. Concurrently, the increased electricity usage in the primary sector, particularly in agriculture, correlates with advancements in agricultural electrification and promotions of electric vehicles in the countryside. Experts

argue that energy substitution plays a significant role in driving up total electricity consumption.”

“To achieve the "dual carbon" goal, the rapid expansion of green industries will elevate the share of electricity in total energy consumption, leading to a surge in per capita electricity usage. In the long-term, the proportion of electricity consumed by the tertiary industry and urban and rural residents is expected to rise.”

“The rapid growth of distributed energy has increased the number of energy producers and consumers, disrupting the traditional dynamics of power supply and demand. This shift poses new challenges for electricity demand forecasting, particularly in predicting peak loads.”

- [Pan Qiuxing & Hong Jialin](#), *Journalists at Energy Observer Magazine*

III. Smart Design of the Regulation to Promote Clean Technology Market Penetration is Critical

(Hydrogen Energy)

★ “After analyzing hydrogen energy policies and major projects listed by 28 provinces from 2020 to 2023, iGDP had the following findings:

“First, during the past four years, investment in hydrogen energy listed in major projects of each provincial region has accelerated, with an overall increase of three times.”

“Second, hydrogen production projects make up a small percentage of the total, in which green hydrogen manufacturing projects are predominant. However, there is a lack of sufficient policies and guidance for related segments.”

“By categorizing these policies and projects, it was noted that China lacks unified national standards for defining green hydrogen, its technical pathways, and thresholds. The "Standards and Evaluation of Low-Carbon Hydrogen, Clean Hydrogen, and Renewable Hydrogen" group standard released by China Hydrogen Alliance in 2020 sets thresholds at 14.51 kg CO₂e/kg H₂ for low-carbon hydrogen, and 4.9 kg CO₂e/kg H₂ for clean hydrogen while renewable hydrogen requires renewable energy as the hydrogen source. These thresholds exceed the 3.4 CO₂e/kg H₂ set by the EU and Japan for green hydrogen.”

“In provincial major project lists, we can find emerging hydrogen projects that utilize waste resources for production. These projects not only effectively utilize existing waste materials but also reduce land usage and the demand for renewable energy in hydrogen production processes. Therefore, incentivizing relevant technological innovations and effectively reducing greenhouse gas emissions, particularly carbon dioxide emissions, generated during hydrogen production processes, may be a key focus area for future hydrogen energy policies in China.”

- [Liu Xueye & Yang Li](#), *Senior Analysts from Institute of Global Decarbonization Progress (iGDP)*

(Nuclear Power)

★ “As a stable and reliable low-carbon energy source, nuclear is the only non-fossil fuel energy source excluded from China's green energy framework. Such exclusion not only hinders the achievement of the nation's ‘dual carbon’ goals but also goes against the long-term prospects of the nuclear power sector.”

“Nuclear power (in China) can contribute over 160 billion kilowatt-hours of electricity to the market per year, making it a significant green energy option. However, currently nuclear power firms are unable to furnish official certifications like green certificates, which hampers their ability to meet the growing social demand for green energy consumption.”

“Moreover, the exclusion of nuclear power from China's green energy system poses challenges to its market competitiveness. When purchasing nuclear power, entities responsible for renewable energy integration, such as grid operators, electricity retailers, and consumers, are still required to assume the same duties and quotas as when buying fossil fuel energy. This fails to acknowledge nuclear power's contributions to emission reduction, thereby discouraging consumer enthusiasm for it.”

“Incorporating nuclear power into the green energy framework is both necessary and feasible. The policy precedent of including hydropower in green certificates offers valuable insights for the integration of nuclear power.”

- [Yang Changli](#), *Chairman of China General Nuclear Power Group*

(Biomass)

★ “Biomass energy plays an indispensable role in recycling waste resources, promoting circular development, protecting the environment and so on. By using mature technologies that already exist, biomass energy can be harnessed in various forms—solid, gas, and liquid—with applications spanning across diverse scenarios.”

“The recently issued Opinions on Accelerating the Construction of a Waste Recycling System underscore the importance of establishing a robust system for collecting and transporting waste resources, which is key to the effective utilization of biomass energy. To ensure the good function of such a system, several problems need to be taken into consideration. For instance, it is crucial to link the straw collection and transportation system with downstream industries. Merely collecting and storing without effective utilization may lead to new issues and waste. Additionally, given the continuous and seasonal nature of waste resources, the collection and transportation system require periodic maintenance and equipment updates.”

- [Li Jingming](#), *General Secretary of China Biogas Society*

(Photovoltaic Industry)

★ “The unprecedented surge in China's photovoltaic (PV) installations in 2023 is an unusual (thus unsustainable) case stemming from various factors: a surprising drop in upstream prices in the PV industry, accelerated construction of power stations during the post-pandemic period, and the concentrated launch of large-scale wind and solar projects. This year, however, the foremost goal for the industry is to ensure stable and healthy growth, avoiding drastic fluctuations. As the second-largest contributor to China's installed capacity, the PV industry shoulders greater responsibilities and faces mounting pressures. It needs to proactively adapt to the power system, prepare for greater participation in the electricity market on a larger scale, and explore effective mechanisms for integrating distributed renewable energy generation into the market.”

- [Xing Yiteng](#), *Director of New Energy Division, Department of New and Renewable Energy, National Energy Administration*

(Electricity Market)

★ “As renewable energy continues to expand, the challenges of fully guaranteeing the purchase of renewable electricity have become more complex. Some provinces are struggling to meet the minimum annual purchase hours required by national mandates. In addition, the purchase price of renewable electricity often falls below the national electricity price level. Due to these phenomena, the controversy regarding ‘price guarantee or quantity guarantee first’ often arises, undermining the legitimate rights of power generation enterprises. In this context, the ‘Regulatory Measures on the Fully Guaranteed Purchase of Renewable Electricity’ issued on February 5th helps facilitate the sustainable and high-quality development of renewable energy.”

“The transformation primarily involves shifting the pricing mechanism for renewable energy electricity. Instead of solely relying on government-determined prices, there will now be a combination of government-set and market-driven prices. Specifically, the pricing of renewable energy electricity traded in the market will be determined through market transactions.”

“In addition, grid companies will no longer be solely responsible for ensuring the purchase of renewable electricity, but various entities such as power dispatching agencies, power trading institutions, and others will be involved. As for the part of electricity trading in the market, other members such as electricity distribution companies and electricity users will also be involved.”

- [Tao Ye](#), *Deputy Director of the Renewable Energy Development Center, Academy of Macroeconomic Research of China*

(New Energy Vehicles)

★ “The development of new energy vehicles stands as a crucial national strategy in China, based on considerations of oil security, air pollution, and industrial advancement. China is also a front-runner in automotive intelligence. Electric vehicles, with their inherent advantage in intelligence, outmatch traditional fuel-powered vehicles in terms of autonomous driving capabilities.”

“New energy vehicles represent a technological ecosystem rather than a mere shift to electrification. This comprehensive system encompasses the essence of the Fourth Industrial Revolution and propels three fundamental transformations: electrification, intelligence evolution, and decarbonization.”

“The realization of the three transformations aims to make China an automotive powerhouse, which requires not only domestic strategies but also global market integration to promote high-end development.”

- [Ouyang Minggao](#), *Academician of the Chinese Academy of Sciences*

(Energy Storage)

★ “In the emerging energy storage sector, lithium batteries dominate the market. However, lithium batteries are only suitable for relatively short energy storage durations of 1 to 4 hours, so they struggle to meet the requirements of medium to long-term applications and can’t address some energy storage needs. Boosting research and technological advancement in energy storage products with varying durations and types is essential for the continuous development of the energy storage industry. We need to actively promote the large-scale application of energy storage across multiple time scales and the coordinated operation of diverse energy storage systems. For example, hydrogen energy (storage) is the most promising solution for long-term, seasonal energy storage.”

- [Huang Zhiguo](#), *Deputy Director of the Integrated Energy and Dual Carbon Center, CRRC Zhuzhou Institute*

Thank you for reading!

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If you have any questions, please contact ttp@igdp.cn