Highlights from China's Medium and Long-Term Plan for the Development of the Hydrogen Energy Industry

BRIQ EDITORIAL TEAM

TODAY'S WORLD IS EXPERIENCING GREAT changes that have not been seen in a century. A new stage of technological and industrial reform is on the horizon. One of the most important branches of this reform is sustainable energy. Hydrogen energy is gradually becoming one of the most important carriers of global energy transformation and sustainable development. This summary reflects China's medium and long term plan for developing the energy industry.

Guiding Ideology and Principles

"Four Revolutions, One Cooperation"

"Four Revolutions, One Cooperation" is a term of strategy for energy security. It is based on instructions from General Secretary Xi Jinping at the 18th National Congress of the Communist Party of China in 2012.

The four revolutions are as follows:

To improve energy consumption structure by containing unnecessary consumption; to build a more diversified energy supply structure; to improve energy technologies to upgrade the industry; to optimize energy systems for the benefit of the energy sector.

"One cooperation" refers to comprehensive cooperation with other countries to realize energy security in an open environment. (The State Council Information Office of the People's Republic of China, 2020)

"Carbon peak, Carbon neutrality"

"Carbon peak, Carbon neutrality" refers to the transformation goals from carbon-based, unsustainable development models to an ecological civilization. By 2025, China aims to gradually increase the clean energy consumption rate to 20 percent. This rate is planned to be increased to 25 percent by 2030. By 2060, the country's non-fossil energy consumption is expected to reach 80 percent.

China's carbon dioxide emission is expected to stabilize and decline by 2030. By 2060, China plans to establish a green, low-carbon, circular economy and eventually become carbon

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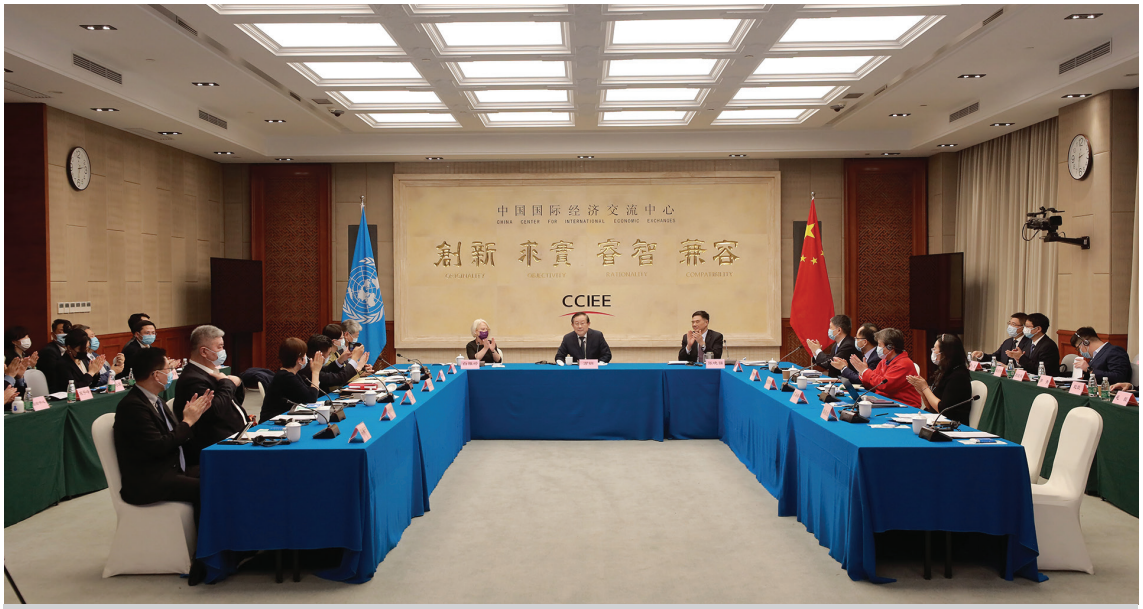

April 8, 2022, China Center for International Economic Exchanges – UNDP (United Nations Development Programme) Hydrogen Energy Industry Summit Forum. (China Daily, 2022)

neutral. (The Communist Party of China Central Committee and the State Council, 2021)

"1+N" Policy"

China's "1+N" climate policy concisely describes its "carbon peak and carbon neutrality" goals and necessary measures. The description's "1" refers to "2030, the declivity of carbon emission" and "2060, carbon neutrality" goals, where "N" stands for the measures that will be taken before 2030.

With the policy (1+N), the aim is to lead reforms in the following ten areas:

- To optimize the energy production system and establish a clean, safe, and efficient energy system based on new energy sources;
- To optimize production, curbing reckless development of high energy-consuming and high-emission industries;
- To promote the construction of energy-saving and low-carbon buildings and infrastructure;
- To establish a low-carbon transportation system;
- To develop a circular economy to increase the efficiency of resource use;
- To promote green and low-carbon technological innovation;
- To develop green finance and expand the capital support;
- To publicize relevant economic policies and reforms;
- To establish a formal carbon trading market;
- To implement nature-based solutions. (Zhenhua, 2020)

Strategic View of the Hydrogen Energy

"The hydrogen energy industry is emerging with strategic importance. It is one of the key development directions of the industry." (National Development and Reform Commission, 2022)

China sees hydrogen energy as an important part of the future national energy system and

a necessity to achieve "carbon peak, carbon neutrality" goals, aiming to utilize clean energy in major fields of energy consumption and reduce the overall carbon emission to close to zero. By 2025, hydrogen production from renewable energy is estimated to reach 100,000-200,000 tons per year, which will reduce carbon dioxide emissions by 1-2 million tons per year. It is also predicted that the number of fuel cell vehicles will reach 50,000 by 2025. (National Development and Reform Commission, 2022)

Some of the Exemplary Application Plans

In mining areas, ports, industrial parks, and other areas with high operation intensity, the aim is to carry out demonstration operations of hydrogen fuel cell trucks. Fuel cells will be used in public service fields, including urban buses, logistics distribution vehicles, and sanitation vehicles.

Areas with rich renewable energy resources and areas with high demand for hydrogen energy will be centralized as renewable energy and hydrogen production stations. These centers will be supported and take an exemplary role for other similar enterprises.

The application of fuel cell systems for communication base stations will be encouraged. There will be new communication base stations constructed with standby fuel cell systems. Some of the existing base stations will use fuel cell power generators. Gradually the application of hydrogen fuel cells will be expanded. The application scope of hydrogen fuel cells is expected to cover hospitals, schools, commercial centers, industrial zones, mining enterprises and more (National Development and Reform Commission, 2022).

About the Current Situation

China is the largest hydrogen producer globally, with an annual hydrogen production of about 33 million tons, of which about 12 million tons meet the industrial hydrogen quality standard. There are more than 300 Industrial enterprises within the whole industrial chain, concentrated in the Yangtze River Delta, Guangdong, Hong Kong and Macao Bay Area, Beijing, Tianjin, and Hebei. However, China's hydrogen energy industry is generally still in the early stages of development. (National Development and Reform Commission, 2022)

To further analyze the development structure, we have chosen Shanghai as an example of the practice and development of the hydrogen energy industry. We present the report titled **"Practice and development of hydrogen energy industry in Shanghai"**, published by the Expert Committee of the Shanghai Energy Conservation Commission.

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