An Evaluation on China's Energy Transition and Carbon Neutrality

BY CHAN KUNG AND HE JUN

Abstract

China has set its ambitious target of attaining "carbon peak" and "carbon neutral" in three decades, yet as far as China is concerned, this goal is far difficult than most developed countries.

More countries are pledging to the cause of carbon neutrality, with some EU countries carbon neutrality by 2050. China has pledged to the goal of "double carbon" in September 2020, i.e. carbon peak by 2030 and carbon neutrality by 2060. The United States, who recently rejoined the Paris Agreement on February 19, 2021, also shared its aims to achieve carbon-free power generation by 2035 and carbon neutrality by 2050 respectively; although some analysts are doubtful of the country's ability to do so. As it stands, most countries have already set their carbon neutral targets.

All pledged countries can be broken down into four categories depending on their rate of carbon emission: (1) Countries that are experiencing a post-carbon emission peak decline such as the United States, the United Kingdom, France, etc.; (2) Countries that are still seeing a growth in carbon emissions, such as India; (3) Countries in which carbon emissions have entered the "platform period", such as China; (4) And lastly, those that have yet to put their carbon emission reduction plans into practice, such as some agricultural-based developing countries.

Based on a series of latest research, Chinese Academy of Sciences academician Dong Zhili believes China will have no problems accomplishing its "double carbon" goal, as there is no "ceiling" in carbon peaks. Dong's team further added there is no need to concentrate the research on carbon peaks, as the focus lies in achieving carbon neutralization instead. Internationally there are no set rules and regulations for carbon peaks either, and countries are free to achieve carbon neutrality two ways. The first which is high peak, and the second which is low peak. If China hopes to achieve carbon peak by 2030, the country would enjoy more relaxed day before the year, yet it will face tremendous pressure on carbon neutrality post-2030. On the other hand, if it chooses to reach a low peak in 2030, then China will have to strictly limit carbon emissions.

China's pledge of reaching the "dual carbon" target is acknowledged by most countries in the world. That said, it would not be easy for China to attain the goal. Data from 2019 shows the country's total energy consumption was about 4.86 billion tons of standard coal. In the same year, China's total energy emitted 9.826 billion tons of carbon dioxide. Among them, carbon emissions under power generation end accounted for about 47%, and carbon emissions under consumer end accounted for about 53%. These findings show that China will face an uphill battle in achieving carbon neutrality in the days to come. The conditions set by the research team of the Chinese Academy of Sciences for China's carbon neutrality are as follows: the GDP doubles in 2035 and again 2060; the living standards is representative of the corresponding development stage; and industrial structure gradually develops towards mid-to-high end. Additionally, population changes must be taken into account (i.e. lower fertility and aging society).

Regarding the direction of China's future energy transition, early judgments made by the research team of the Chinese Academy of Sciences mainly include: (1) For China, the increase in the proportion of non-carbon energy will not be linear, and it will be driven by technological progress; (2) Coal being the main source of energy, will continue to exist for a long period of time. Therefore, the advancement of clean coal utilization technology still requires greater attention; (3) If advanced fission energy can solve the problems of fuel, safety, inland plant construction and the issue of how it is perceived by the public, it can play a crucial role in carbon neutralization, and China should not follow the footsteps of certain countries that have abandoned the use of nuclear energy; (4) China's abundant wind, light, and geothermal resources, especially wind and light resources in the west, will be vital in achieving carbon neutrality.

The research suggests the key to achieving carbon neutrality lies in the utilization of non-carbon energy to replace fossil energy for power generation and hydrogen production, then using electricity and hydrogen to replace fossil energy in residential life, transportation, industrial processes, construction, agriculture and other fields. This in turn, helps to reduce carbon dioxide emissions substantially. The research also found that China has large-scale hydrogen-related industrial system-petrochemical and chemical industries, which will be the most crucial areas in hydrogen utilization, both now and in the future. If China can properly apply green hydrogen to the petrochemical and chemical industries, this will better reflect the value of green hydrogen and truly solve the major problem of industrial de-carbonization.

Founder of Anbound Think Tank in 1993, **Chan Kung** is one of China's renowned experts in information analysis. Most of Chan Kung's outstanding academic research activities are in economic information analysis, particularly in the area of public policy. **He Jun** takes the roles as Partner, Director of China Macro-Economic Research Team and Senior Researcher. His research field covers China's macro-economy, energy industry and public policy