

BRICS Academies Forum 2023

Energy Development Pathways and Policies
under Peak Carbon, Carbon Neutral Targets

Chunliang Fan, Jianfeng Guo

Institutes of Science and Development, Chinese Academy of Sciences

2023.12.2

Background

Climate change is a common global challenge. Addressing climate change has a bearing on the future of humankind and on the sustainable development of the Chinese nation.

China has always attached great importance to combating climate change, and has firmly pursued a high-quality development path that gives priority to ecology and is green and low-carbon. China is committed to promoting harmonious coexistence between human beings and nature and to promoting the building of a global community of life.



Annual Report on China's Policies and Actions to Address Climate Change 2023

Under this background, the Ministry of Ecology and Environment of the People's Republic of China released the "Annual Report on China's Policies and Actions to Address Climate Change 2023" on 27 October 2023, which clarifies that China's main tasks in addressing climate change are:

- Accelerating the green and low-carbon transformation of the development mode;
- Actively and steadily push forward carbon peaking and carbon neutrality;
- Actively participating in global governance to address climate change.

中国应对气候变化的政策与行动
2023 年度报告

中华人民共和国生态环境部
二〇二三年十月

Energy development occupies a very important position in the framework of China's goal of achieving "peak carbon and carbon neutrality" ("dual-carbon"), and the purpose of this report is to explore the pathways and policies for China's energy development in the context of the "dual-carbon" goal.

Content of the report

1. Lessons from major countries' dual-carbon targets
2. Challenges to achieving carbon neutrality in China
3. Achievements and problems in China's energy development under the dual-carbon target
4. Major policy recommendations for China's future energy development under the dual-carbon target

1. Lessons from the major countries' dual-carbon targets

International experience shows that in order to achieve the goals of carbon peaking and carbon neutrality, it is necessary to make overall planning, focus on key industries and steadily push forward the work of emission reduction, so as to achieve a coordinated and parallel relationship between the response to climate change and economic and social development.

Lessons learnt from major countries' dual-carbon targets

- ✓ In the energy production industry, accelerating the construction of a clean and low-carbon energy system, promoting the combination of renewable energy power generation and energy storage technologies, and realizing the deep decarbonization of the power system;
- ✓ In the transport sector, improving transport infrastructure facilities and promoting the digitalization of the transport system; achieving the replacement of fuel vehicles by electric and hydrogen-fuelled vehicles;

- ✓ In the area of construction, energy-saving renovation of old buildings and the creation of carbon-neutral buildings in accordance with green building standards ;
- ✓ In the industrial sector, improving energy efficiency and controlling coal consumption ;
- ✓ In agriculture, planting trees and supporting the development of carbon capture technologies to offset unavoidable carbon emissions and achieve net-zero carbon emissions.

2. Challenges to achieving carbon neutrality in China

Challenges to achieving carbon neutrality in China

- Firstly, the time from peak carbon to carbon neutrality in China is much shorter than that in developed countries. The time from peak carbon to carbon neutrality in China is 13 years less than that of the United States, 30 years less than that of the European Union and 13 years less than that of Canada. The difficulty of achieving carbon neutrality is much higher than that of any developed country.



- Secondly, the high carbon lock-in effect caused by the coal-based energy structure is a major obstacle to China's goal of achieving carbon peaks.
- Thirdly, China is in the middle to late stages of industrialisation and urbanisation, and economic growth is still dependent on the growth of energy consumption
- Fourth, the lack of core technology is also an important challenge that China must face.

3.Achievements and problems in China's energy development under the dual-carbon target

China has taken a number of a number of approaches to achieve its dual-carbon goals:

- Promoting technological advances in energy efficiency to achieve a reduction in carbon emissions;
- Reducing carbon emissions by adjusting the industrial structure;
- Developing renewable energy power generation and adjusting the energy structure to drive down carbon emissions;
- Guiding the transformation of the energy consumption structure towards electrification, cleanliness, low-carbonisation and high efficiency;
- Planting trees and increasing green areas

China has made great progress towards achieving its dual-carbon goals, but there are also many problems.

4. Major policy recommendations for China's future energy development under the dual-carbon target

(1) For Energy-consuming industries: on the energy supply side, making a scientific layout and connection of renewable energy power generation network to promote energy cleanliness; on the energy consumption side, fully implementing the terminal energy and electric energy replacement project. Promoting a number of major green and low-carbon technologies.

(2) For the technological system for new energy development: In the technical system of new energy development, firstly, strengthening the top-level design of new energy technology to guide research and development and innovation, and strengthening the scientific research of key core technologies. Secondly, building an innovation network through the innovation value chain to improve the efficiency of research and production transformation; thirdly, establishing a supporting security system for the development of large-scale energy storage technology, hydrogen energy, solar fuel/chemical technology and energy Internet

- (3) For the financial guarantee to achieve the dual-carbon goal:
improving the carbon trading mechanism and optimizing the carbon market environment; dual-carbon planning with Chinese characteristics should consider the regional dimension as the main framework and the industry dimension as the main content basis, to form a "region-urban cluster -city-industry-enterprise" of decomposable vertical management system of path planning