



Analysis of China's Environmental Protection on Development of Economy and Society Planning Under the Dual Carbon Goals

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Abstract. With the intensification of global climate change, carbon emissions have become the core of environmental problems. Being the biggest developing country in the world and a significant emitter of carbon, China bears an important responsibility in global climate governance. Based on relevant literature, this paper analyzes how China can promote its strategic planning for economic and social development by protecting the natural environment under the goals of carbon peak and carbon neutrality. Specifically, this paper provides a comprehensive review of the background and importance of carbon peaking and carbon neutrality, the urgent need for natural environmental protection, and green development measures in related fields. This paper argues that in order to achieve the goals of carbon peak and carbon neutrality, China should promote the establishment of a national carbon sink mechanism and the implementation of various carbon sink projects in terms of policy, market, education, and technology research and development. In addition, this paper proposes recommendations for policy formulation to inform China's low-carbon transition and green development.

Keywords: Carbon Peak, Carbon Neutrality, Green Transformation.

1 Introduction

In recent years, anthropogenic greenhouse gas concentrations in the atmosphere have continued to increase, exacerbating global climate change, making carbon emissions the core of environmental problems. In response to this global challenge, many countries have set carbon peak and carbon neutrality GHG reduction targets and mitigation of environmental and social risks from climate change. Most countries or regions The European Union, the United States, the United Kingdom and Japan have committed themselves to carbon neutrality by 2050. As Responsible Major State, China officially put forward its ambitious goals in 2020: Strive to peak carbon emissions by 2030 and achieve carbon neutrality by 2060. As more and more countries make carbon neutrality commitments, the global response to climate change has ushered in an important period of opportunity. Climate change is a global problem that no single country can

tackle alone. Under the framework of global climate governance, for example, The Paris Agreement was adopted by 197 countries at COP21 (COP21) in Paris on 12 December 2015, with the objective of substantially cutting global GHG emissions and looking for action to further limit the temperature increase to 1.5 ° C. Countries have built mechanisms of trust and cooperation by setting and sharing their own emission reduction targets and measures. Such international cooperation not only facilitates the transfer of technology and the sharing of resources, but also provides mutual assistance and support for countries in addressing climate change, forming a joint force to address climate challenges.

Greenhouse gases, especially carbon dioxide, are mainly derived from the combustion of fossil fuels. By peaking carbon emissions, countries can begin to reduce emissions once they have peaked, effectively controlling CO₂ concentration in the atmosphere. This will help reduce the rise in global average temperature, slow down the melting of glaciers, sea level rise, and the frequency of extreme weather events, thereby protecting the stability of ecosystems, maintaining the living environment of human beings, and reducing the risks and losses caused by climate change [1]. To reduce dependence on fossil fuels, countries must increase investment and R&D in renewable energy technologies. Such a transformation will drive technological innovation, lead to new energy solutions, and reduce energy costs. With the popularization and application of renewable energy, related industries will also develop rapidly, creating a large number of employment opportunities and promoting economic growth and sustainable development [2]. On April 30, 2021, Xi Jinping, the General Secretary of the Nineteenth CPC Central Committee, stressed the importance of ecological environment protection and economic development. Under the Overall Target of Chinese Ecological Civilization, none of its indicators have reached the excellent level, reflecting that China still faces significant challenges in ecological environmental protection and improvement [3]. This situation highlights the need to further promote the construction of ecological civilization and the improvement of the environment. Based on this, this paper will analyze and summarize the research on carbon peak and carbon neutrality and provide some thoughts on the future direction of China's economic and social development. The primary importance of carbon peaking and carbon neutrality lies in their mitigation effect on global warming.

2 Targets for Carbon Peak and Carbon Neutrality and Protection of Nature

The negative effects of carbon emissions on the environment are widespread and profound. As one of the main drivers of global climate change, the sources of carbon emissions mainly include various activities such as fossil fuel combustion, industrial production and transportation. The United Nations Framework Convention on Climate Change reports that about 76 per cent of the world's total GHG emissions represent the dominant role of CO₂. With the acceleration of global industrialization, carbon emissions continue to increase, which in turn leads to the intensification of climate change. Climate change has not only changed the structure and function of eco-

systems, but also caused a series of ecological and environmental problems. For example, The frequent occurrence of extreme weather events due to global climate change has posed a severe challenge to the stability of ecosystems. Climate change will lead to an increase in extreme temperatures, heavy rainfall and droughts, which directly threaten the habitats of plants and animals and lead to a decline in biodiversity.

In addition, climate change is also one of the important factors contributing to biodiversity loss. The Global Union for Nature Conservation (IUCN) stresses that climate change, combined with the loss of habitat and pollution, raises the risk of extinction. This reduction in biodiversity not only affects the stability of ecosystems, but can also lead to a reduction in ecosystem services. Healthy ecosystems can provide a variety of key ecosystem services, such as water purification, soil conservation, and climate regulation. However, the deterioration of the ecological environment caused by carbon emissions will weaken the function of these services, and then affect the survival and development of human beings. The threat posed by water and public health, which in turn has an impact on social and economic development. Compared with the negative effects of carbon emissions on the environment, eco-environmental measures can be effective in dealing with them, particularly in terms of reducing carbon emissions [4]. Protecting and restoring natural ecosystems is considered an important means of reducing atmospheric carbon dioxide concentrations, a process that enhances the capacity of carbon sinks. Natural ecosystems such as forests, wetlands and soils are considered critical carbon sinks, absorbing and storing large amounts of carbon dioxide.

According to the United Nations Food and Agriculture Organization in 2020, about 30 per cent of global CO₂ emissions are absorbed annually. Ecological restoration measures such as afforestation and wetland restoration can effectively improve the carbon sink capacity of ecosystems and further reduce carbon emissions [5]. On the other hand, environmental and environmental policies tend to promote the development of renewable energy. For instance, in China's 14th Five-Year Plan, it is clear that the share of non-fossil fuels in the overall energy consumption will rise to 20 per cent by 2025. Not only will this policy help to cut carbon emissions, but it will also improve the overall environmental quality and promote a green economy. A 2020 report from the Organisation for Economic Co-operation and Development noted that a 10 to 30 per cent reduction in CO₂ emissions could be achieved by increasing the efficiency of resources, which is considered one of the key approaches to achieving carbon neutrality. Not only will these measures help to cut carbon emissions, but they will also make the economy more sustainable and more efficient. To sum up, the negative effects of carbon emissions on the environment are comprehensive and profound, and by taking effective measures to protect the environment, China will not only reduce carbon emissions, but also improve the resilience and service ability of ecosystems, thus achieving economic and environmental harmony [6].

3 Economic and Social Development Plan of China Based on Double Carbon Target

3.1 Energy Structure

China has a coal-based energy mix, so optimizing its energy mix is critical to cutting carbon emissions. The main factor in reducing carbon emissions in China is reducing energy intensity. According to the data of the 2024 China Energy Media Research Institute, Since the Communist Party of China's 18th National Congress, China has supported an average annual growth rate of 6.1%, an average annual increase in energy consumption of 3.3%, and a reduction in energy intensity of 26.1%. Although China's CO₂ emissions are still increasing, it is possible to achieve a peak carbon emission by 2030.

According to the data, the main sources of CO₂ emissions include the power sector (48%), industry (36%), transport (8%) and construction (5%). At the domestic policy level, The Fourteenth Five-Year Plan of National Economic and Social Development of the PRC has made it clear that by 2025, GDP will be reduced by 13.5 per cent compared to 2021. Moreover, a non-binding target of raising the share of non-fossil fuels from overall energy use to 20% by 2025 (from about 16% in 2020) was established. Assuming that these short-term policy objectives are met (IEA, 2021), China's CO₂ emissions are projected to peak in the middle of 2020s and then decrease slightly until 2030. Controlling carbon emissions is an indispensable condition for the sustainable development of China. In the past, the broad pattern of growth has resulted in over-consumption of resources and energy, and the ecological environment has been severely damaged. Therefore, it is imperative to move to a phase where knowledge, technology and governance are used to increase efficiency and promote growth. It is not only in accordance with its own development interests, but also in the formation of an active interaction between local low - carbon activities and global climate governance, promoting a green economy, and increasing the resilience and adaptability of the economy.

3.2 Industrial Emissions Reduction

The Chinese industry is a major source of carbon emissions. In 2019, China's industry accounted for about 50 per cent of CO₂ emissions, according to the National Bureau of Statistics. This proportion is higher in some heavy industry areas and is more pronounced in areas with heavy industry concentrations such as steel, cement, and chemicals [7]. In 2020, China has set a target of peaking carbon emissions by 2030 and achieving carbon neutrality by 2060. This policy framework sets a clear course for industrial emissions reduction. Promote the transformation and upgrading of the high-emission and energy-consuming traditional industries. Support new sectors by channelling capital and technology towards green and low carbon sectors [8]. The government, for instance, encourages clean energy and green manufacturing, and provides more support for low carbon technology R&D and application. Research has shown that the use of modern energy management and energy saving techniques can

dramatically cut down on industrial energy consumption and carbon emissions. Such as using energy saving equipment, industry waste heat recovery and so on, can raise the efficiency of energy. On the market side, businesses will have an incentive to cut emissions by creating a carbon market. In 2017, China launched a national carbon market, initially covering the power sector, and will gradually expand to more sectors in the future [9]. While China has made some progress in reducing industrial emissions, it still faces multiple challenges. First, China is still in a stage of rapid economic growth, and the increase in industrial output is often accompanied by an increase in energy consumption and carbon emissions. Achieving emissions reductions while sustaining economic growth is a major challenge. At the same time, although technological innovation is the key to reducing emissions, R&D and promotion of high efficiency and low carbon technologies still need significant investment. For certain SMEs, a lack of finance can hamper technological modernisation [10].

3.3 Innovation in Green Technology

Green Innovation is the use of environmentally friendly techniques and management techniques in product production, services and production to reduce resource consumption, reduce pollution emissions, and improve economic benefits. Green innovation could reduce global CO₂ emissions by up to 30% by 2030 [6]. For China, green innovation not only contributes to the double carbon target, but also enhances economic competitiveness and sustainability. The government of China has adopted a series of policies to encourage green innovation in recent years. The National Bureau of Statistics estimates that in 2020, China has invested 1.2 trillion yuan in research and development, or 1.5 percent of GDP. The policy framework, including the National Medium- and Long-Term Science & Technology Development Plan (2006 - 2020) and the Fourteenth Five-Year Plan, sets out the orientation of green innovation. According to the Chinese Ministry of Information Technology, over 50 percent of the enterprises in China have adopted green manufacturing technology in 2021, showing their passion for green innovation. For example, many enterprises have achieved remarkable results in resource recycling, cleaner production, energy conservation and emission reduction. China's scientific research achievements in the field of green technology are gradually being transformed into practical applications. According to a 2022 report by Science and Technology Daily, China's solar photovoltaic power generation technology and wind energy technology are already at the world's leading level, with 54GW of new photovoltaic capacity added in 2021, accounting for 30% of the global total. However, from another perspective, green innovation often requires high upfront investment, and the lack of capital and technology for small and medium-sized enterprises makes it difficult for them to face difficulties in the process of green transformation. According to 2021 World Bank data, the problem of financing difficulties for small and medium-sized enterprises in China remains prominent, with more than 60% of SMEs saying that they have difficulty obtaining financing. Although green products are gradually being accepted by the market, the overall market environment still needs to be further improved. Consumers' awareness and acceptance of green products are uneven, which affects the market share of green products.

4 Conclusion

Along with the growing severity of global climate change and the target of "double carbon", carbon peak and carbon neutral have been paid more and more attention. Carbon neutrality is an effective response to global climate change, and it can help to transform and develop the economy continuously, improve the security of energy and public health, strengthen the position and cooperation of the international community, and protect the ecological and biological diversity through the reduction of GHG emissions and carbon sinks. This paper analyses the influence of environmental protection on the economy and society, and points out that China can achieve the objectives of CO₂ peak and CO₂ neutral by optimizing its energy structure, reducing industrial emissions, promoting green technology innovation, and promoting low carbon lifestyle. To realize the target of CO₂ peak and CO₂ neutral, China should enhance its policy support, perfect its carbon trading market, and invest more in green technology. Third, people should strengthen green consumer education, raise the awareness and acceptance of green products, and build a good environment for green consumption. Through the promotion and promotion of green ideas, the consumer's environmental consciousness is stimulated. Promote the establishment of the national carbon sink system and all kinds of carbon sink projects, promote low carbon economy by means of innovation development mode, and achieve the harmonious coexistence of human and nature.

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