Carbon Emissions Reduction in China

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Climate change is one of the largest challenges facing mankind, and the question of how to reduce carbon emissions has raised extensive concern all over the world. China's carbon emissions trading policy and the horizontal mobility experience of the provincial governors exert a significant positive effect on carbon emission reduction.

carbon emissions trading political mobility policy evaluation

1. Introduction

Human survival and sustainable development face severe challenges. Climate change threatens the lives and environmental conditions of humans worldwide and has become a global concern [1]. Increasing carbon emissions have gradually become the main reason for global climate change. According to the annual report by the United Nations Environment Program, global carbon dioxide emissions showed an upward trend [2]. Correspondingly, to achieve green growth, nations all over the world have enacted a number of environmental laws and emission reduction plans. Therefore, reducing carbon emissions is essential for maintaining a healthy ecological ecosystem.

As the largest source of carbon emissions in the world, China has responded with a series of policies such as instituting emission reduction measures and promoting the establishment of an international carbon market to mitigate global warming [3]. To achieve low-carbon development, China issued the carbon emission reduction plan as guidance for different industrial sectors in terms of achieving the reduction targets in 2012. In 2015, the Chinese central government set the policy target that China's carbon emissions will achieve the peak of domestic carbon emissions by 2030. The Chinese government widened its objectives in 2020 by pledging to achieve carbon neutrality by 2060. To meet these climate targets while trying to pursue economic development, China has implemented a carbon emissions trading system [4]. Since the 11th Five-Year Plan, Chinese central government has added environmental performance, especially carbon emissions, into the local government performance appraisal, and during the 13th Five-Year Plan it was proposed to establish a national carbon emission trading market by 2020.

Previous studies on carbon emission trading policies have explored the factors that influence carbon emission performance, such as technology development [5], total energy consumption [6] and energy consumption structure [7]. Studies on the impact of carbon emission trading policies mainly focused on two categories, which contains sectors and environmental governance. For the sectoral impact, existing studies have mainly focused on the power sector and transport sector [8][9]. However, it can be found that the existing empirical research was limited to certain

sectors related to carbon trading policies while ignoring interactions with other perspectives, or was concentrated on macro-economic simulation instead of specific environmental activities and behaviors based on different perspectives.

2. Carbon Emissions Trading System

Traditional regulation tools and policies such as environmental tax and industrial energy prices were inefficient due to information asymmetry [10]. Existing studies have discussed that using a market-oriented mechanism is more efficient and economical on the realization of carbon emissions reduction compared to policies directly led by government, such as environmental protection administrative penalties and pollution charges [11]. Therefore, it is imperative to design effective market-oriented regulation policies for reducing carbon emissions.

During the past decades, carbon emissions trading systems have become important tools in market-oriented environmental regulation to address the issues of inefficient carbon emission allocation. Building on Coase's option theory, John Dales proposed a system of carbon emissions trading in 1968 [12]. Introducing property rights into environmental pollution control was meant to internalize the cost of carbon dioxide emissions [13]. The literature on carbon trading mechanisms has mainly focused on the effects of regional carbon emissions reduction programs in developed countries. The markets were often the research objects, especially carbon trading in Europe's EU-ETS program, which operates through auctions. To better quantify and empirically study the utility of carbon trading mechanisms, scholars began to use different models such as the dynamic decision-making model, the general equilibrium model, and the network analysis model [14]. For example, Dong et al.'s study of China's carbon emissions trading policy found that market scale and reduction costs were negatively correlated [15]. Martin et al. focused on the impact of emissions trading on enterprise [16]. Other scholars used different models to explore the impacts of carbon trading on other affected groups.

The effectiveness of carbon emissions trading is relatively unexamined. The majority of the existing studies are qualitative research, predictive simulations, or are focused on specific industries or regions. At the national level, empirical research is scarce. Few empirical studies have analyzed the effectiveness of pilot emission trading systems on politics. Additionally, the performance of carbon emissions trading systems remains controversial. Even so, scholars have generally determined that China's carbon emissions trading system has successfully promoted carbon emission reductions [17].

Despite the fact that these studies investigated the efficiency of policies, the results they reached differed substantially due to discrepancies in their data and techniques. The emission reduction results of these systems under diverse viewpoints varied since some researchers concentrated on various core objects. Others adopted different policy evaluation methods, making it difficult to obtain unbiased estimates for the variable of carbon emissions. Similarly, the literature also provides a theoretical framework for the study of carbon emissions trading systems. Theoretical arguments for the emission reduction effects of these systems can certainly be made. However, they are frequently biased and ineffective. Stated another way, the majority of studies have focused on the direct impact of carbon emission trading systems while disregarding politics.

3. Political Mobility in the Context of China's Politics

Government officials actively participate in environmental governance as managers of society and advocates for government policies. The reasons behind their acts will inevitably have an impact on both their work performance and the government's. In most Western democracies, the political reputation model can explain how political incentives affect environmental governance [18]. Officials may decide to modify tax and environmental governance policies in accordance with the preferences of their constituencies to protect their chances of being re-appointed or re-elected.

Different from Western democracies, local officials in China are appointed by higher-level authorities, but local governments nevertheless retain a lot of power. Sometimes referred to as federalism with Chinese characteristics, this division of authority makes China's economic growth possible through administrative and fiscal decentralization [19]. However, this theory relies upon a high degree of institutional stability, which creates its own motivating effect. The Chinese promotion tournament theory proposes a Principal-agent relationship among the levels of government. China's administrative level-by-level contract system represents a typical type of strong incentive contract from the perspective of economics [20]. The central government, as the employer, holds political tournaments among provincial governments by virtue of personnel appointment or the recommendation power of the administrative head. From this point of view, in a political environment where vertical contracting and horizontal competition are highly unified, the extensiveness and unity of local government power provided by the administrative subject contract system gives the administrative subject enough space to play a significant role. Many studies have found that economic growth is the primary indicator of political promotion. Hence, local governments frequently devote their main resources to fostering economic growth [21]. Projects that result in short-term economic growth will be approved by local officials, regardless of any long-term environmental implications.

This situation is changing. Environmental protection has been a focal point since the Chinese government shifted its goals. Environmental protection is now included in the performance evaluation of local officials. This is important because the promotion tournament incentive structure has had severe consequences for environmental governance, such as global warming [22], excessive energy consumption and environmental pollution. Therefore, understanding the initial impact of carbon emissions on local officials is important for China's policy response to climate change. Strangely, the role of local officials in emissions reduction has largely been ignored by researchers.

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