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Study on the Path of Low-Carbon Development of Huaihe River Ecological Economic Belt under Dual-Carbon Goal

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ABSTRACT

The twentieth CPC National Congress proposed accelerating the transition to green development of society; green water and green mountains are golden silver mountains, and the realization of regional green development is an important connotation of high-quality economic development. The Huaihe River Ecological and Economic Belt is an important ecological barrier and economic zone in China, and it is of great significance for China's green and low-carbon development to promote the realization of the “dual-carbon” goal in the region. In recent years, the Huaihe River Ecological Economic Zone has achieved certain results in promoting regional green and low-carbon development, but the measurement of green and low-carbon development data in different regions reveals that the resource endowment and development level of different regions have large differences. This paper adopts the research method of establishing an indicator system to measure and assess the development level of green low-carbon construction in various regions of the Huaihe River Ecological Economic Belt, and combines with case studies to propose optimization paths from the perspectives of constructing green and economical infrastructures, attaching importance to a humane public environment, and implementing green innovations, so as to help the development of green low-carbon construction in the region.

KEYWORDS

Huaihe River Ecological and Economic Belt; “Double Carbon Target”; Industrial Structure; Low Carbon Development; Carbon Emission

1. INTRODUCTION

With the massive exploitation and use of fossil energy, the emission of carbon dioxide and other gases has led to global warming, resulting in the frequent occurrence of extreme weather events such as typhoons, droughts and torrential rains, and posing a great threat to the sustainable development of mankind. Over the years, China has maintained a proactive style of behavior and a serious attitude towards energy conservation and emission reduction, and in September 2020, China clearly put forward the 2030 “carbon peak” and 2060 “carbon neutral” goals. The establishment of the “dual-carbon” target demonstrates China's determination to realize green development and protect the climate environment.

Located between the Yangtze River and the Yellow River, the Huaihe River Basin is a key region connecting the Middle East, rich in mineral resources and an important coal and energy base. Despite

the region's high development potential, overall economic development is lagging behind, and it faces problems such as industrial and agricultural pollution, insufficient resource and environmental carrying capacity, and unbalanced regional development. Therefore, it is of great significance to analyze the carbon emission characteristics and influencing factors of the five provinces in the Huaihe River Ecological Economic Zone, and to explore the implementation path of low-carbon green development, in order to realize the goal of “dual-carbon” in China at an early date.

2. LITERATURE REVIEW

Threatened by global climate change, the international community and world organizations are urging countries to intensify their efforts in carbon management in order to achieve the goal of “carbon neutrality”. In this context, scholars at home and abroad have actively participated in the discussion and research on carbon peak and carbon neutrality, and the research results show a multi-perspective, multi-disciplinary and multi-disciplinary trend. Wang Shen et al. focus on the cost aspect of realizing the path to carbon peak and carbon neutrality, and through the establishment of a multi-objective model, they predict the coal consumption of various industries and the power generation methods required in the future. Yu, Biying et al. focus on the realities of China, build a self-developed national energy technology and economic model, set up different carbon neutral scenarios, simulate the carbon emission reduction responsibilities of different industries, and propose that China is expected to achieve carbon peak by 2025. Some scholars have also focused on regional economy, divided China into four economic regions, set up PVAR model, and used the systematic generalized moment estimation method to study the dynamic relationship between energy consumption, economic growth and carbon dioxide emissions. In order to achieve the goal of carbon peaking and carbon neutrality, China must establish a forcing mechanism to control the total energy consumption and coal consumption, and enhance the proportion of non-fossil energy, so as to promote the national energy transformation.

Some scholars have also explored the green and low-carbon development paths of the Yellow River Basin and Yangtze River Basin from the perspective of the river strategy, targeting the policies of ecological protection and systematic governance of large rivers. Zhao Zhongxiu et al. comprehensively analyzed the economic development, carbon emission and industrial structure of the nine provinces and regions in the Yellow River Basin, and proposed that regional emission reduction should emphasize the “holistic” nature of the national “double carbon” goal through the regional “double carbon” goal, and that the regional emission reduction should emphasize the “holistic” nature of the national “double carbon” goal. It is suggested that the regional emission reduction work needs to emphasize the “wholeness” and “synergy”, and more importantly, the “pertinence” and “applicability” of the pathway. On the basis of the previous research, Yang Yong et al. quantitatively estimated the carbon emission and growth rate of the Yangtze River Basin from the overall perspective and the perspective of provinces and regions, and put forward suggestions on energy saving and emission reduction measures in the next stage of the Yangtze River Basin based on the results of the research. Other scholars explore the spatial and temporal evolution of carbon emission efficiency in the Yangtze River Basin and the Yellow River Basin based on inter-basin and intra-basin comparative perspectives, and analyze their static and dynamic characteristics and differences.

By combing through the existing literature, it can be found that the research scope of domestic scholars on carbon neutrality and carbon peaking not only involves the uniformity at the national level, but also addresses the differences between regions, and the research methods and perspectives have been gradually diversified, which is of great significance for the research of this paper. However, the existing studies on the green and low-carbon development path of the Huaihe River Ecological Economic Belt are relatively few and single, mostly focusing on the level measurement and spatial and temporal layout of the carbon emission efficiency of the Huaihe River Basin, and not proposing

the path of carbon reduction for the five provinces of the Huaihe River Ecological Economic Belt in accordance with their carbon emission intensity, energy intensity, industrial structure and other characteristics.

In this paper, on the basis of absorbing relevant research results, we take the spirit of the 20th National Congress of the Communist Party of China (CPC) and the Huaihe River Ecological and Economic Belt Development Plan as the theoretical guidance, analyze the factors affecting the regional green and low-carbon development based on the goal of "dual-carbon" and combining with the case studies, and analyze the factors affecting the regional green and low-carbon development from the perspectives of building green and economical infrastructures, attaching importance to the humanized public environment, and implementing green innovations. It proposes optimization paths from the perspectives of building green and economical infrastructure, paying attention to humanized public environment, and implementing green innovations, etc., which will provide support for the government to introduce relevant policies and help the green and low-carbon construction of Huaihe River Ecological and Economic Belt.

3. CURRENT SITUATION OF GREEN AND LOW-CARBON DEVELOPMENT IN THE HUAIHE RIVER ECOLOGICAL AND ECONOMIC BELT

3.1. Basic Overview of Carbon Emissions in the Huaihe River Ecological Economic Zone

During the period 2000-2019, the average total carbon emissions of the Huaihe River ecological and economic belt were 1.272 billion tons, accounting for 17.03% of the national total carbon emissions. Within the study period, the total carbon emissions of the Huaihe River ecological and economic belt showed a general upward trend, with the total annual emissions ranging from 550 million tons in 2000 to 1.6 billion tons in 2019, but the proportion of the total national emissions has experienced a slow growth (2000-2008), a rapid decline (2009-2013) and a three phases of increase and decrease (2014-2019).The share of total carbon emissions was the largest in 2006, at 19.87%, and the smallest in 2013, at 14.55%. Overall, the proportion of carbon emissions is stabilized at about 17%, indicating that the Huaihe River Ecological Economic Zone has a more significant control of carbon emissions. With the promotion of the "double carbon" goal and the concept of "green mountains are golden mountains", provinces and cities have actively implemented the relevant national policies and calls. Low-carbon economy is taken as the development goal, and the energy consumption structure and industrial structure are effectively adjusted to reasonably and effectively control carbon dioxide emissions.

3.2. Industrial Structure Has not been Upgraded and Transformed

The Huaihe River Ecological and Economic Belt Development Plan points out that in the future, the Jianghuai River Basin will be committed to promoting the transformation and upgrading of industries, actively guiding the centralized layout of industries based on the industrial foundation and comparative advantages of each region, and developing and expanding local characteristic industries in accordance with local conditions. The report of the 20th CPC National Congress proposed to "develop characteristic industries in the countryside and broaden the channels for farmers to increase their income and become rich", which made a new deployment for comprehensively promoting the revitalization of the countryside. In recent years, all provinces in the Huaihe River Ecological Economic Zone have been making efforts to transform their industrial structure. However, according to relevant statistics, in the Huaihe River Ecological Economic Belt, the secondary industry accounts for 30 to 40 percent of the total, mainly including the more polluting paper, coal and power industries, which leads to a higher ecological and environmental cost. In contrast, agriculture accounts for a

higher proportion of the primary industry in the region, showing a lack of industrial structure upgrading and transformation, which still needs to be further optimized.

3.3. Uneven Economic Development in the Provinces

The Huaihe River Ecological Economic Zone involves 29 cities (counties), and there are significant differences in economic levels among the provinces, especially in terms of GDP per capita. Jiangsu Province has the highest GDP per capita and has experienced the most rapid economic growth over the past decade, while Anhui and Henan Provinces are lagging behind and have large gaps with other provinces. The main reason for this economic imbalance is that the coastal provinces have paid insufficient attention to the economic strategies of their cities and counties. Among the five provinces along the Huai River, Shandong Province focuses on the development of the eastern coastal cities, Jiangsu Province concentrates on the development of the southern region, Anhui Province focuses on the city of Hefei and along the Yangtze River, Hubei Province focuses on the urban agglomerations in the middle reaches of the Yangtze River, and Henan Province focuses on Zhengzhou City and the surrounding urban agglomerations. In addition, the cities along the Huaihe River have not yet formed a unified green development strategy, and the lack of relevant policies and the shortage of high-quality industries have limited the balanced economic development of each province, which in turn has a negative impact on the green economic development of the Huaihe River Ecological Economic Belt.

4. COUNTERMEASURES TO PROMOTE GREEN AND LOW-CARBON DEVELOPMENT OF THE HUAIHE RIVER ECOLOGICAL ECONOMIC BELT

4.1. Enhancing the Dynamics of Integrated Development of Rural Industries

Through the previous analysis, it can be seen that the proportion of secondary industry in the provinces along the Huaihe River Ecological Economic Belt is still relatively high, which has a significant impact on the ecological environment and poses a challenge to the high-quality development of the green economy in the region. Therefore, optimizing the industrial structure, giving full play to regional industrial advantages and seeking entry points for industrial upgrading have become important tasks in promoting the development of the Huaihe River Ecological Economic Belt.

First, to create a brand effect. The key lies in concentrating on enhancing the intrinsic value of rural product processing in the Huaihe River Ecological Economic Zone in order to realize the goal of improving quality and efficiency, thereby gaining a significant advantage in competition with other regions and industries. Extensive innovative thinking is encouraged, especially devoted to increasing the added value of rural products, thus creating a unique brand effect and injecting great momentum into the integrated development of the three industries in the countryside.

Secondly, it is necessary to cultivate the leading role of leading enterprises so that they can play a leading role. To this end, it is necessary to conduct in-depth research into the actual situation of rural industries and to utilize established leading enterprises to promote the development of other relatively lagging enterprises, in order to promote a deeper level of integration among rural industries.

Thirdly, it is expanding the scale of rural industries. With the help of “Internet Plus”, the collection and processing of information using big data will lay a solid foundation for the two-way integration of various industries. Ultimately, through cooperation and exchanges between different entities, strong impetus will be injected into the integrated development of rural industries.

4.2. Building Green and Economical Infrastructure

According to the provincial master plan notification for the development of modern infrastructure systems, relevant government departments need to conduct market research to understand local agricultural needs and potential opportunities, and to determine what infrastructure is needed, such as irrigation systems, roads, storage facilities, and so on. Detailed planning is then carried out to ensure that the project is in line with the long-term development strategy of the agricultural industry. Consideration is also given to the sustainability of the infrastructure, including resource management and environmental protection. For example, irrigation systems should be designed to use water efficiently, reduce water wastage, and reduce the risk of land erosion . In addition to this, a risk management plan needs to be developed, taking into account natural disasters, market fluctuations and other risk factors, and establishing an appropriate risk management program to ensure the sound operation of agricultural infrastructure.

4.3. Improving Technological Innovation and Realizing Regional Linkage Development

Technological advancement is an important driver of carbon efficiency. Effectively reducing energy consumption and pollution emissions through technological upgrading is the key. Cities along the Huaihe River Ecological Economic Belt should actively promote technological innovation, provide the necessary support to relevant enterprises, encourage them to develop clean energy, commit to building low-energy-consuming and high-output enterprises, and gradually phase out high-energy-consuming and low-output enterprises. At the same time, cities need to emphasize the introduction of scientific and technological talents and strengthen enterprise management. As a whole, cities in the Huaihe River Ecological Economic Zone should realize cooperation and technology sharing, and enterprises should support each other in order to promote the common development of cities and enterprises.

4.4. Improving the Quality of Foreign Business Introduction

There is an inhibitory effect of the level of openness to the outside world on the carbon emission efficiency of the Huaihe River Ecological Economic Zone. This suggests that the lower thresholds of cities along the route in attracting foreign investment may lead to the introduction of enterprises with high energy consumption and lower technological levels, which will increase energy consumption and reduce energy efficiency, and ultimately affect the local carbon emission efficiency. Among these cities, Lianyungang, as a coastal city, should appropriately raise the entry standards when attracting foreign investment in order to reduce the entry of high energy-consuming enterprises. At the same time, when attracting foreign investment, priority should be given to enterprises with technological innovation capabilities, and advanced foreign technologies should be fully utilized to enhance the development level of local enterprises.

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