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Research on the Relationship between Industrial Structure Upgrading and Carbon Emission in Fujian Province under the Background of "Dual Carbon"

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Abstract: Since the "dual carbon" goal was proposed, the topic of carbon emission reduction has become a hot topic in China. The academic community has conducted research on carbon emissions from various perspectives. Firstly, from the perspective of carbon emissions themselves, over time, there is an upward trend in carbon emissions. Secondly, in terms of spatial distribution, it was found that carbon emissions are higher in the east and lower in the west. Lastly, in terms of the influencing factors of carbon emissions, it has been found that the implementation of environmental regulations, the upgrading of industrial structures, and the enhancement of scientific and technological innovation are all beneficial for reducing carbon emissions. The upgrading of industrial structures serves as a link between the transformation of the economic growth model and the scale of economic development. It is also the transformation and upgrading that enterprises must undertake after the government implements environmental protection policies. It is generally divided into two aspects: one is the optimization of industrial structures and the rational allocation of resource elements, i.e., the level of rationalization. The rationalization of industrial structures is an objective condition for the economy to enter a new stage and an urgent requirement for industrial structural adjustment. It mainly promotes total factor productivity through "structural dividends," coordination capabilities, and correlation levels, thus promoting the transformation of the economic growth model and achieving green social development. The second is the continuous process of improving industrial structures from a low level to a high level, i.e., the level of optimization. The optimization of industrial structures is a symbol of China's economic level transitioning from low to high. It mainly achieves green social development by changing the original factor allocation mode and economic growth model.

1. Introduction

In the context of the global response to climate change, reducing carbon emissions has become a common challenge and responsibility for all countries. China has proposed a "dual carbon" goal, which means it will strive to achieve carbon peak by 2030 and carbon neutrality by 2060. Fujian province, as one of the economically important provinces in the southeast coastal region of China, has also actively responded to and promoted the realization of the "dual carbon" goal. This paper aims to study the relationship between industrial structure upgrading and carbon emissions in Fujian Province, discuss how to reduce carbon emissions through industrial structure upgrading, and provide a scientific basis for achieving the "dual carbon" goal.

2. Background of "dual carbon"

The "dual carbon" context refers to the dual goals of carbon peak and carbon neutrality proposed by China in the context of the global response to climate change. Specifically, carbon peaking means that at a specific point in time, carbon emissions peak and then begin to decrease gradually; carbon neutrality refers to the balance between carbon emissions and absorption at a specific point in time, that is, net zero emissions. The proposal of the "dual carbon" target means that China will participate in global emission reduction actions with a more proactive attitude and assume greater environmental responsibility. As one of the world's largest emitters of carbon, China's participation and efforts are of great significance to global climate governance. At the same time, achieving the "dual carbon" goal will also promote the transformation and upgrading of China's economy, and foster sustainable development and the construction of a green economy. In the context of "dual carbon," the Chinese government has taken a series of measures to promote carbon emission reduction and energy transformation. First, it has increased investment in and promotion of clean energy and increased the proportion of renewable energy. China has become the world's largest market for wind and solar power, increasing its installed capacity of clean energy. Second, it has accelerated energy restructuring to reduce reliance on coal. China has actively promoted the use of clean energy such as natural gas and nuclear power, and reduced the proportion of coal. In addition, improving energy conservation and energy efficiency is also an important way to achieve the "dual carbon" goal. The government encourages enterprises to adopt advanced energy-saving technologies to promote the optimization and improvement of industrial production processes. At the same time, the government will step up research, development, and application of carbon capture, utilization, and storage technologies, and explore effective ways to deal with and utilize carbon emissions. Under the backdrop of "dual carbon," various regions are also actively responding and formulating corresponding plans and policies for carbon emission reduction. Fujian Province, as one of the economically important provinces in the southeast coastal region of China, has also actively participated in and promoted carbon emission reduction actions. Fujian has taken a series of measures on energy structure adjustment to encourage the development and utilization of clean energy and reduce dependence on traditional energy. The province has also intensified support for energy conservation and energy efficiency improvement, and pushed enterprises to carry out technological transformation and upgrading. In addition, Fujian has focused on developing low-carbon transportation and green travel, promoting the use of new energy vehicles and public transportation, and reducing motor vehicle exhaust emissions. However, it still faces a series of challenges and difficulties in achieving the "dual carbon" goal. On the one hand, China's rapid economic growth and urbanization have brought great pressure to bear on carbon emission reduction. On the other hand, the cost of carbon emission reduction technology and equipment remains high, necessitating further efforts to reduce costs and improve the feasibility and reliability

of the technology. Moreover, carbon emission reduction also needs to coordinate the interests of all parties and balance the relationship between economic development, social stability, and environmental protection.

3. Problems of industrial structure in Fujian Province under the background of "dual carbon"

Under the context of "dual carbon", the industrial structure in Fujian province is facing a series of challenges. As an integral part of a region's economy, the industrial structure significantly impacts carbon emissions and environmental effects. First of all, the industrial structure in Fujian province is still predominantly composed of traditional manufacturing sectors, particularly those with high carbon emissions such as petrochemicals, steel, and cement. The production processes in these industries typically entail high energy consumption and carbon emissions. Secondly, the development of the service industry in Fujian province is relatively slow, occupying a fairly low proportion. The service industry is characterized by low carbon emissions and high value addition, and it contributes relatively little to carbon emissions. Third, there are also issues with the agricultural structure in Fujian. Traditional agricultural production methods often involve the extensive use of pesticides and fertilizers, leading to waste of land resources and environmental pressures. Finally, Fujian province needs to address social equity and employment issues as it upgrades its industrial structure. The restructuring may cause some traditional industries to contract and result in job losses.

4. Research measures on the relationship between industrial structure upgrading and carbon emissions in Fujian Province under the background of "dual carbon"

Under the context of "dual carbon", the study on the relationship between industrial structure optimization and carbon emissions in Fujian Province aims to discuss how to mitigate carbon emissions through the optimization of industrial structures and achieve carbon emission reduction goals. This paper will suggest several research methodologies to thoroughly investigate the correlation between industrial structure optimization and carbon emissions in Fujian Province.

4.1 Data Collection and Analysis

(1) Gather carbon emission data from various industries in Fujian province, including energy consumption, raw material usage, and waste discharge. (2) Examine the evolution and present state of the industrial structure in Fujian Province to grasp the development trends and characteristics of diverse industries. (3) Compare and assess the carbon emission levels of the prominent industries in Fujian Province, and pinpoint industries and key sectors with substantial carbon emissions.

4.2 Research on the Influencing Factors of Carbon Emissions:

(1) Investigate the factors influencing carbon emissions related to the industrial structure in Fujian Province, including aspects such as industry composition, technological level, energy composition, and industrial layout. (2) Analyze the primary sources of carbon emissions within different industries in Fujian Province, and identify the critical stages and influencing factors. (3) Delve into the potential impact of industrial structure optimization on carbon emissions in Fujian Province, including the reduction of carbon-intensive industries and the promotion of clean energy to supplant conventional energy sources.

4.3 Research on the impact of industrial structure upgrading on carbon emissions:

(1) Analyze the policies and measures of industrial restructuring in Fujian Province and understand their impact on carbon emissions. (2) To study the potential impacts of different industrial structure upgrading schemes on carbon emissions in Fujian Province, and compare the carbon emission reduction potential of different schemes. (3) To evaluate the economic, social and environmental benefits of the industrial structure upgrading in Fujian Province, including employment growth, economic growth and carbon emission reduction effects.

4.4 Policy suggestions and implementation path:

(1) Based on the research results, corresponding policy suggestions are put forward, including optimizing the industrial layout, strengthening technological innovation, and promoting the development of clean energy. (2) Formulate specific implementation paths and timelines, clarifying the implementation steps and objectives for each policy. (3) Considering the impact of industrial upgrading on economic growth and employment, supporting measures should be formulated to ensure the sustainability of industrial structure upgrading and carbon emission reduction.

4.5 Case study and Experience summary:

(1) Based on the cases of Fujian Province and other regions, this paper analyzes the actual effect of industrial structure upgrading on carbon emissions. (2) Successful experiences and lessons are summarized to provide reference for the industrial structure upgrading in Fujian Province. By implementing the above research measures, we can gain a deeper understanding of the relationship between industrial structure upgrading and carbon emissions in Fujian Province, and propose corresponding policy suggestions and implementation paths. This will provide a scientific basis for Fujian Province to achieve its "dual carbon" goals and promote low-carbon transformation and sustainable development.

5. Conclusion

In summary, this study aims to explore the relationship between industrial structure upgrading and carbon emissions in Fujian Province, and put forward corresponding policy recommendations and implementation paths. Through in-depth research on the industrial structure and carbon emissions of Fujian province, we can provide a scientific basis for realizing the "dual carbon" goal, and promote the low-carbon transformation and sustainable development of Fujian province.

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