

Research on the Optimization of Industrial Upgrading Paths in the Western Region under the Background of Carbon Neutrality

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Abstract: Against the backdrop of achieving carbon neutrality by 2060, the dual pressures of ecological and economic sustainability in the central and western regions urgently need to be alleviated. Therefore, based on the perspective of industrial development and urbanization, the provincial Panel data from 2000 to 2018 in the central and western regions are used to build a spatial lag model to simulate the spatial relationship between industrial development, urbanization, and carbon emissions. The challenges faced by industrial development in the central and western regions are a microcosm of the prominent problems exposed in China's current economic development. Analyze the problems and constraints of industrial structure optimization and upgrading, and propose corresponding countermeasures and suggestions, to be helpful for the adjustment of industrial structure in the central and western regions.

Keywords: Industrial Upgrading, Western Region, Carbon Neutrality

1. INTRODUCTION

Reducing carbon emissions and achieving "carbon neutrality" has become a global consensus to jointly address climate change. On September 22, 2020, China also proposed at the United Nations General Assembly that "CO₂ emissions should strive to peak before 2030 and strive to achieve 'carbon neutrality' by 2060", which has become the will of the whole nation. To this end, China has proposed relevant policies for phased optimization and adjustment of industrial structure, and advocated energy-saving and low-carbon lifestyles.

However, most of the leading industries in the central and western regions of China are heavy chemical industries, which are characterized by high input, high output, and high pollution. They are mainly heavy industries such as Coal mining and coking. The rapid development of heavy industry depends on many mineral resources consumed and relatively low production costs. The extensive economic development model is manifested in the following aspects: the economic development mode and industrial structure are single, the ecological environment is damaged, and the gap between rich and poor is widened, it has also become a major issue restricting the new round of economic growth in the central and western regions. As the country with the largest carbon dioxide emissions in the world, China has various fossil energy industries such as chemical, petroleum, coal, steel, electrolytic aluminum, etc. These industries account for about 80% of the total carbon dioxide emissions in the country and are pillar industries that promote social and economic development.

The proposal of the concept of "carbon neutrality" and low Carbon cycle will force hundreds of coals, oil, and gas enterprises, such as Sinopec and PetroChina, to make in-depth changes in their own investment decisions, industrial structure, production and operation methods, asset allocation, etc., such as replacing or closing energy intensive industries with high carbon emissions. Under the framework of the

global value chain, the production activities of a certain product are realized globally. The activities of a country or enterprise are a part of the global value chain, jointly participating in the production and value creation activities of a certain product. The value creation determines the position of the country or enterprise in the global value chain.

If a country or enterprise is not competitive in the value chain, it can only exist at the bottom of the value chain and obtain a small increase in value. Enterprises in the western region undertake industrial gradient transfer as a certain link in the global value chain, and their value creation depends on their position in the value chain. At the same time, with the acceleration of urbanization and the growing importance of cities in the global Carbon cycle, many scholars have studied the role of urbanization and carbon emissions using different models in different research regions and levels, such as national, provincial and urban levels, combined with different types of data.

The research results confirm that there are spatial differences in the impact of urbanization on carbon emissions. The construction of the "the Belt and Road" has become China's opening strategy under the new situation, which is of great significance in expanding the influence of opening up in the central and western regions and improving the level of economic development in the central and western regions. Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang and other provinces play an important role in connecting with the traditional Eurasia Continental Bridge in the construction of the "New Silk Road" economic belt. However, the strategy of cultivating strategic and competitive industry in the central and western regions is not obvious enough. It lacks initiative in taking on and promoting the industrial structure and economic restructuring in the eastern region, and it still lacks economic strategic industries in terms of digesting excess capacity by virtue of the "New Silk Road". From now on, I

2. THE PROPOSED METHODOLOGY

2.1 The significance of promoting the transformation and upgrading of industrial structure and industrial chain in the western region under the background of carbon neutrality

Under the guidance of the "carbon neutral" energy conservation and emission reduction goal, the state will gradually reduce the direct consumption of coal such as raw coal, clean coal, bulk coal, coal water slurry, briquette, pulverized coal, etc., and reduce the proportion of coal in Primary energy consumption, to make transportation, electricity, and heating. However, the western regions that undertake industrial gradient transfer, like Dongguan, Wenzhou, and other places in the past, by participating in the value creation and distribution process of a certain industry, joining the global value chain division of labor in that industry. However, the western region still undertakes the transfer of some energy-efficient and labor-intensive industries, or outsourcing production of links with relatively low added value. This type of industrial transfer not only accelerates the integration of the western region into international division of labor, but also further utilizes the cheap labor and natural resources in the western region to create value for multinational corporations or foreign-funded enterprises. According to the Industrial organization, the level of industrial development can be described and measured from the two dimensions of resource allocation and technological progress.

Among them, industrial resource allocation refers to the allocation efficiency of social resource elements among the three industries within a certain range. The more reasonable the allocation of resources, the more significant the economic benefits will be the more unreasonable the allocation of resources, the significantly lower the economic benefits and hinder economic development. Meanwhile, with the increasingly prominent role of China's market mechanism in the allocation of resource factors, the transfer and flow of labor between the three industries is the most direct manifestation of the transfer and flow of social resource factors between industries. Scientifically positioning the driving force for industrial development, with a focus on leveraging the advantages of the service industry to drive its development.

The optimization of industrial structure under the New normal needs to position the driving force of industrial development as improving the quality of the population, improving the scientific and technological innovation ability of enterprises, coordinating the industrial layout and development ratio, and adjusting the input of economic factors. The positioning of the new industrial development impetus will help enterprises and even local governments broaden their industrial development ideas, improve the competitiveness and market adaptability of regional industries, the quality of industrial employees and the technological innovation ability of enterprises. Regard industrial structure adjustment as an important task for regional economic development, focus on developing service industries, scientifically and reasonably locate the sources of industrial development momentum, and thus form regional advantageous industrial types. The production and construction of traditional fossil and manufacturing industries often rely on thermal power generation as the largest source of carbon emissions, while the construction of other new energy

power generation projects is slow and there is no unified electricity trading service market.

For some renewable energy generation projects such as hydropower, solar energy, wind energy, etc., it is difficult to allocate and trade various electricity resources through specific electricity markets, auxiliary service markets, capacity markets, and other channels due to the limited amount of electricity generated during a certain period, making it difficult to consume the existing stock of electricity energy. Therefore, by vigorously developing and deploying renewable energy such as hydropower, solar energy, and wind energy, and increasing the market share of new energy, it will drive the standardized construction of the renewable energy electricity market. Undertaking industrial gradient transfer is not the goal of the development of Western China, and the purpose of development is to achieve industrial upgrading through undertaking industrial gradient transfer.

2.2 Research on Strategies for the Transformation and Upgrading of China's Industrial Chain under the Background of Carbon Neutrality

In the process of economic globalization, a form of participation in international industrial division of labor through OEM not only makes China an important processing location in the global market, but also enables Chinese manufacturing enterprises to participate in the global value chain division of labor and value-added distribution. However, due to being at the low end of the global value chain, Chinese manufacturing enterprises are beginning to face competition bottlenecks, and there is a clear imbalance between the scale, quality, and efficiency of their products. This forces these enterprises, after experiencing a certain degree of growth, to propose the need to develop towards the high end of the value chain and seek industrial upgrading through industrial gradient transfer.

The core of improving resource allocation efficiency lies in reducing external diseconomies in industrial development. At present, the main functional area strategy has induced the government to lead the ecological compensation mechanism, while the division of responsibility between enterprises and the government is not sound enough, resulting in a lack of coordination between ecological protection and economic development. Therefore, it is necessary to further improve the efficiency of resource allocation, incorporate the external effects of industrial development into the process of resource allocation, and coordinate the relationship between the government and the market.

Improve the government's regulatory and regulatory capabilities, streamline administration, and delegate power, and return the original market power to the market; Better leverage the decisive role of the market in resource allocation, build a more scientific and legal market-oriented system, improve resource allocation efficiency, and promote orderly industrial structure adjustment. The proposal of dual carbon goals such as "carbon compliance" and "carbon neutrality" has driven the rapid development of clean energy industries such as wind power generation, photovoltaic power generation, hydropower generation, and nuclear power generation. For example, since the "the Belt and Road" initiative, China has reached cooperation with more than 100 countries along the line in the wind power, hydropower, photovoltaic and thermal energy industries, with an annual investment of about \$2 billion in renewable energy projects.

In addition, in recent years, China's ecological environment departments have signed various agreements with other countries to jointly develop new energy technologies such as carbon capture, utilization and storage technology (CCUS), Hydrogen fuel cell technology, smart grid technology, and apply them to passenger cars, oil field flooding, food preservation and storage, synthetic biodegradable plastics, fire extinguishers and other fields. The western region should recognize that to maintain a competitive advantage, enterprises need to have advantages in certain specific strategic links of the value chain. In other words, the western region needs to pay attention to the true resource status of the organization, approach the strategic links of the value chain through industrial upgrading, and cultivate the ability to obtain high added value in the strategic links of the value chain.

3. CONCLUSION

The central and western regions should increase efforts to optimize the efficiency of industrial resource allocation and achieve industrial structure upgrading. At present, more emphasis should be placed on optimizing the efficiency of industrial resource allocation. Therefore, the central and western regions should focus on improving the allocation level of resource factors among industries. Gradually ban the traditional development mode that consumes high resources and seriously endangers the ecological environment, actively deploy and develop renewable energy businesses such as wind, solar, hydrogen and geothermal energy, strictly control the carbon emissions of high energy consuming industries every year and optimize the stock capacity, so as to drive the transformation of the fossil energy industry chain and the adjustment and innovation of the product manufacturing mode.

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