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Research on the Development of Low Carbon Economy from the Perspective of Industrial Structure Adjustment

-- Empirical Testing based on Anhui Province

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Abstract

Anhui Province is currently in the late stage of industrialization, and economic transformation is urgent. To promote the upgrading of industrial structure and the development of green and low-carbon economy in Anhui Province, it is necessary to truly achieve the healthy and sustainable development of Anhui's economy. This study will first conduct theoretical analysis on the relationship between low-carbon economy and industrial structure, then describe and analyze the current situation of low-carbon economy and industrial structure in Anhui Province, and conduct empirical research on the development relationship between low-carbon economy and industrial structure in Anhui Province. Select two indicators of energy intensity (the ratio of gross domestic product to total energy consumption) and industrial structure upgrading degree (the ratio of value-added in the tertiary industry to value-added in the secondary industry) in Anhui Province from 2012 to 2022, and use cointegration and error correction models for empirical testing.

Keywords

Low-carbon Economy; Industrial Structure; Cointegration and Error Correction Model.

1. Introduction

At present, China is in a critical period of industrial transformation and upgrading, with prominent problems such as overcapacity and environmental pollution. Choosing green development is an inevitable requirement for accelerating the transformation of the economic development mode and improving international competitiveness. Compared to traditional industries, China has a relatively small gap with developed countries in emerging industries and new technologies, and has a broad domestic and international market. Therefore, in order to achieve the goal of green development, it is necessary to adjust the industrial structure, accelerate the development of strategic emerging industries, vigorously promote supply side structural reform, and advance the green transformation of traditional manufacturing.

In response to the current situation of Anhui's economy dominated by the secondary industry, the extensive and high energy consuming economic growth model is no longer suitable for the trend of green development. Anhui has a long way to go on the road of industrial transformation. In recent years, Anhui Province has actively responded to the national call and taken a series of measures to promote the sustainable development of green economy, achieving significant results. Therefore, it is of great significance to explore the impact of industrial structure adjustment on the level of green development based on empirical testing of urban agglomerations in Anhui Province.

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Anhui Province is located in the eastern region of China, in the middle and lower reaches of the Yangtze River and Huai River, with a superior geographical location and abundant resources. In recent years, with the rapid development of the Chinese economy, Anhui Province has also achieved significant results in its economy. However, with the growth of the economy, environmental issues have become increasingly prominent, seriously affecting people's quality of life and the sustainable development of the economy and society. Therefore, the Anhui Provincial Government attaches great importance to the development of green industries as an important strategy to promote economic transformation, protect the environment, and achieve sustainable development.

In terms of research background, Anhui Province has abundant natural and cultural resources, and has a good foundation for developing green industries. In addition, the Anhui Provincial Government has proposed a series of policy measures to support the development of green industries, providing strong policy guarantees for the construction of ecological civilization and sustainable development.

However, there are still many problems in the development of green industries in Anhui Province, such as low resource utilization efficiency, prominent environmental pollution problems, and insufficient green technology innovation capabilities. Therefore, it is necessary to conduct in-depth research on the background, current situation, and problems of the development of green industries in Anhui Province, in order to provide reference for government decision-making and promote the healthy development of green industries.

The aim of this project is to empirically examine the relationship between industrial structure and low-carbon economy through measurement. Based on the review of existing literature, this project proposes the following specific objectives: to sort out relevant literature and theories on low-carbon economy and industrial structure; Analyze the current development status of low-carbon economy and industrial structure in Anhui Province; Empirical analysis of the relationship between energy utilization efficiency and industrial structure deviation, and derivation of the relationship between low-carbon economy and industrial structure; Conduct model testing and correction on the data analysis results, draw conclusions, and propose feasible suggestions for low-carbon economic development from the perspective of industrial structure.

2. Literature Review

In order to actively address the challenges of global climate change and meet the inherent requirements of achieving sustainable development of the national economy, China proposed at the 75th United Nations General Assembly to strive for peak carbon dioxide emissions before 2030 and carbon neutrality before 2060. At the Fifth Plenary Session of the 18th Central Committee of the Communist Party of China, a new development concept of green development was also proposed. The three ministries and commissions of the country jointly issued the "Implementation Plan for Carbon Peaking in the Industrial Sector", which arranged six key tasks, the first of which is to deeply adjust the industrial structure, promote the optimization and upgrading of the industrial structure, resolutely curb the blind development of high energy consuming, high emission and low-level projects, and vigorously develop green and low-carbon industries. To achieve this goal, China is facing many difficulties and challenges, so exploring the impact of industrial restructuring on the level of green development is of great importance for solving practical problems. Below is a review of existing literature both domestically and internationally:

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2.1. Current Research Status in China

Domestic scholars' research on the development of green and low-carbon economy in industrial structure mainly includes the following aspects: (1) The relationship between industrial structure adjustment and the development of green and low-carbon economy: Scholars have explored the impact of industrial structure adjustment on the development of green and low-carbon economy, and believe that adjusting industrial structure can promote the development of green industries, reduce energy consumption and pollutant emissions. (2) Evaluation index system for green and low-carbon economic development: Scholars have constructed an evaluation index system for green and low-carbon economic development, such as energy consumption, carbon emissions, environmental pollution control investment, etc., providing a basis for measuring and evaluating green and low-carbon economic development. (3) Policy measures for promoting the development of green and low-carbon economy: Scholars have proposed policy measures to promote the development of green and low-carbon economy, such as formulating supportive policies, improving laws and regulations, and strengthening technological innovation. (4) Case analysis of green and low-carbon economic development: Scholars have explored the successful experiences, existing problems, and countermeasures of green and low-carbon economic development through case analysis of specific regions or industries.

Many scholars in China are currently studying the impact of industrial restructuring on green development efficiency (Zhang Mengfan, 2020), such as the spatial differentiation of industrial green development in the central area of the Yangtze River Delta from the perspective of industrial restructuring (Yang Ran, 2021), and empirical research on the impact of industrial restructuring on green development efficiency using Guangxi as an example (Zhu Zhuzhu, Zhang Mengfan, Wang Ping, Ye Shunxin, Liu Zehao, Yuan Shengjun, 2019). From this, it can be seen that Chinese scholars adopt empirical analysis, taking the impact of industrial structure adjustment and green development efficiency in different regions as an example, to provide more accurate targeted countermeasures and suggestions for different regions' specific situations, in order to leverage their own advantages and improve green development efficiency.

2.2. Current Research Status Abroad

Western countries attach great importance to sustainable development and environmental protection, and have achieved good results in sustainable development. These countries can largely reflect the feasibility of green development and the achievements of industrial restructuring. Domestic scholars' research on the development of green and low-carbon economy in industrial structure mainly includes the following aspects: (1) Green economic growth theory: Scholars have explored the theory of green economic growth and believe that there is an inverted U-shaped relationship between economic growth and environmental quality, that is, as the economy grows, environmental quality first decreases and then increases. (2) Green Total Factor Productivity: Scholars have studied Green Total Factor Productivity (GTFP), a productivity measurement method that considers environmental factors, to measure the level of green and low-carbon economic development. (3) Green Trade and Investment: Scholars have focused on the impact of green trade and investment on the development of a green and low-carbon economy, and believe that green trade and investment can help promote the dissemination and promotion of green technologies. (4) International Cooperation and Policy Coordination: Scholars have explored the role of international cooperation in promoting green and low-carbon economic development, advocating for strengthening international cooperation, coordinating policy measures among countries, and jointly addressing global issues such as climate change.

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In recent years, many domestic scholars have summarized and refined the sustainable development strategies and development methods of many foreign countries. For example, Han Xiaoli, Song Gongming, and Yao Runming (2018) explored the urban revitalization and industrial land transformation of sustainable development in the UK, and Li Sheng (2014) studied a new sustainable development strategy for high-density neighborhoods in French metropolises - park cities. In addition, some scholars have conducted research on the theoretical evolution of sustainable development from the perspective of the history of Western environmental economic thought (Yu Shan, 2022).

Overall, existing domestic and foreign literature has studied the relationship between industrial restructuring and green development from different dimensions, using different regions as examples. Existing domestic literature focuses on the impact of industrial restructuring on green development efficiency, but there is relatively little discussion on the related issues of industrial restructuring on improving the level of green development; For foreign research literature, the focus is on elaborating on the development path and methods of sustainable development. Therefore, we can draw inspiration from the exploration of industrial structure adjustment and green development in different countries, and adopt tailored and classified policies based on the industrial structure situation in different regions of China, in order to obtain effective assistance for adjusting industrial structure to improve the level of green development.

Through literature review at home and abroad, it can be found that research on the development of green and low-carbon economy in industrial structure has achieved certain results, but further in-depth research is still needed in terms of indicator system, evaluation methods, policy measures, and other aspects.

3. Theoretical Framework and Research Hypotheses

3.1. Theoretical Basis of Low-carbon Economy and Industrial Structure

The relationship between low-carbon economic development and industrial restructuring is bidirectional. Industrial restructuring promotes the development of low-carbon economy. Based on the development history of the old industrial base in Anhui Province and the important role of the secondary industry in the development of low-carbon economy, it is found that the key to developing low-carbon economy in Anhui Province lies in optimizing the secondary industry. The high-quality optimization of the development mode and industrial structure of the secondary industry should become an important focus to promote the development of low-carbon economy in Anhui Province; The transformation of low-carbon economy promotes the optimization and upgrading of industrial structure. The core goal of low-carbon economy is to improve energy efficiency, actively develop low-carbon economy, and promote the direction of healthy and sustainable economic development. It is a process of industrial structure transformation and low-carbon economic development.

Green and low-carbon transformation is a new direction for economic structural upgrading, which can nurture new space for economic growth. Based on the above analysis, conclusions are drawn on the current situation and challenges of the development of low-carbon economy and industrial structure in Anhui Province, as well as the development relationship between low-carbon economy and industrial structure. Feasibility suggestions for the development of low-carbon economy in Anhui Province from the perspective of industrial structure are also proposed.

This study measures the level of low-carbon economy and industrial structure development in Anhui Province using energy utilization efficiency and industrial structure deviation. The essence of low-carbon economy is the issue of energy utilization efficiency, and there is a long-term stable cointegration relationship between energy utilization efficiency and the

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development of low-carbon economy; The deviation degree of industrial structure is a reflection of the absolute quantity of labor rate, which is used to measure the efficiency of industrial structure. The smaller the gap between the proportion of employment and the proportion of output value, the higher the efficiency of industrial structure; On the contrary, the lower it is. Therefore, energy utilization efficiency and industrial structure deviation can better represent the level of low-carbon economy and industrial structure development. By analyzing data, the level of low-carbon economy and industrial structure development in Anhui Province can be analyzed.

3.2. Research Hypothesis

This study adopts a combination of theoretical and empirical methods, drawing on the research experience of domestic and foreign scholars on the relationship between industrial structure and low-carbon economy, and the development of low-carbon economy from the perspective of industrial structure. Combining with the current situation, it analyzes the problems and reasons for the development of low-carbon economy and industrial structure in Anhui Province, empirically analyzes the relationship between low-carbon economy and industrial structure, assumes that there is a connection between industrial structure adjustment and low-carbon economy, and provides feasible suggestions for the development of low-carbon economy and the upgrading of industrial structure in Anhui Province.

4. Empirical Analysis

4.1. Indicator Selection

Select two indicators of industrial structure upgrading degree and energy intensity from 2012 to 2022 for analysis. The symbol X represents the degree of industrial structure upgrading, which is the ratio of the added value of the tertiary industry to the secondary industry, representing the upgrading of the industrial structure; The symbol Y represents energy intensity, which is the ratio of regional GDP to total energy consumption, representing the process of green economy.

The relevant data are all from the Anhui Provincial Bureau of Statistics Yearbook and the National Bureau of Statistics Statistical Bulletin, and due to the inability to directly obtain these two types of variables, they were collected and organized in advance using Excel.

4.2. Model Setting and Variable Selection

Select two indicators of energy intensity and industrial structure upgrading degree in Anhui Province from 1995 to 2022, and apply ADF test method to test the stationarity of the dependent variables; Then, the E-G two-step cointegration test is used to test whether there is a long-term equilibrium relationship between the two indicators; Establish an error correction model to analyze whether there are short-term changes between the two and whether there is a correlation between them; Finally, the Granger causality test was used to verify whether there is a causal relationship between the two indicators, further validating the hypothesis.

4.3. Empirical Results and Analysis

4.3.1. ADF Stationarity Test

From the test results, at the 1%, 5%, and 10% significance levels, the critical values for the x unit root test are -4.420595, -3.259808, and -2.771129, respectively. The t-test statistic value is greater than the corresponding critical value, indicating the presence of unit roots in the x sequence; The critical values for the y-unit test are -4.297073, -3.212696, and -2.747676, respectively. The value of the t-test statistic is greater than the corresponding critical value. Both x and y are non-stationary sequences and are suitable for subsequent analysis.

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4.3.2. E-G Two-step Cointegration Test

The t-statistic of ADF has a value of -2.343650, which is lower than the critical value of -1.988198 at the significance level, thus rejecting H0, indicating that the residual sequence does not have a unit root and is a stationary sequence. Therefore, there is a cointegration relationship between y and x, that is, there is a long-term equilibrium relationship between the two. From the previous regression analysis results, it can be seen that the upgrading of industrial structure will bring about a change in energy intensity in the same direction. The upgrading of industrial structure helps to improve energy efficiency, and adjusting industrial structure upgrading has a positive promoting effect on the development of green and low-carbon economy.

4.3.3. ECM Error Correction Model

From the regression results, it can be seen that the estimated value of the coefficients before error correction is -0.572759, which is significant and consistent with the mechanism of the error correction model.

$$dy=0.085805+0.534064x-0.572759e(-1)$$

From this, it can be seen that changes in energy intensity are not only related to the degree of industrial structure upgrading during the period, but also have a lag effect. The number of deviations from equilibrium in the previous period will be reversed by 57% in the next period. The economic meaning is that when the industrial structure of Anhui Province deviates from the equilibrium point, the economic system will adjust towards the equilibrium point with an intensity of -0.57 times this deviation in the next period.

Based on the results of the cointegration test, the industrial structure is of great significance for the development of low-carbon economy in Anhui Province. There is a certain balance relationship between the industrial structure and the low-carbon economy in Anhui Province. In order to maintain a balanced state of development, it is necessary to maintain a balanced level of industrial structure upgrading in Anhui Province.

4.4. Granger Causality Test

According to the test results, when the null hypothesis is "x is not a Granger cause of y", the F-statistic has a value of 2.96441 and a P-value of 0.1288. At the 10% significance level, the null hypothesis is rejected, and x can be considered a Granger cause of y. When the null hypothesis is "y is not a Granger cause of x", the F-statistic has a value of 0.16829 and a P-value of 0.6939, and the null hypothesis cannot be rejected. Therefore, there is only a single Granger causal relationship between y and x, which means that only x can predict changes in y in the future period.

5. Case Study - Taking Anhui Province as an Example

5.1. Current Situation of Industrial Structure Adjustment and Low Carbon Economy Development in Anhui Province

5.1.1. Current Situation of Green Development

As one of the new development concepts proposed by the country, green development not only involves sustainable economic development, ecological environment protection issues, people's quality of life and well-being, but also relates to the long-term development of the country and the nation. Therefore, exploring the impact between industrial restructuring and green development has important practical significance, and in-depth exploration of industrial

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restructuring and green development has become a hot topic in existing literature at home and abroad.

5.1.2. Current Status of Industrial Structure Development

The secondary industry in Anhui Province is mainly based on manufacturing, involving multiple industries such as steel, non-ferrous metals, chemicals, building materials, machinery, automobiles, and home appliances. In recent years, Anhui Province has vigorously supported strategic emerging industries such as new materials, new energy, high-end equipment manufacturing, biomedicine, etc., promoting industrial transformation and upgrading. The tertiary industry in Anhui Province is mainly based on the service industry, including wholesale and retail, transportation, warehousing and logistics, finance, tourism, cultural and creative industries. In recent years, Anhui Province has accelerated the development of modern service industry, improved the level of service industry development, and promoted the optimization and upgrading of industrial structure. At the same time, Anhui Province actively cultivates and develops emerging industries such as artificial intelligence, big data, cloud computing, Internet of Things, new energy vehicles, etc., providing new momentum for economic growth. In addition, Anhui Province attaches great importance to the construction of ecological civilization, adheres to the concept of green development, promotes the transformation and upgrading of traditional industries, accelerates the development of green industries such as new energy, energy conservation and environmental protection, circular economy, etc., and strives to achieve coordinated development of economy and environment.

Overall, the industrial structure of Anhui Province has been continuously optimized, and the results of industrial transformation and upgrading are obvious. However, compared with developed countries such as the United States and Germany, there are still imbalances and inadequacies in the industrial structure of Anhui Province, such as relatively lagging development in the service industry, weak but large manufacturing industry, and insufficient development of strategic emerging industries. In the future, Anhui Province should continue to promote the optimization and upgrading of industrial structure, accelerate the development of green industries, and strive to achieve high-quality economic development.

At present, Anhui Province is in the middle and late stage of industrialization development. From 2018 to 2022, the overall economic development of Anhui Province has been stable with some progress, and the proportion of added value in the primary industry has remained relatively stable, increasing from 7.8% in 2018 to 8.4% in 2020 and then to 7.8% in 2022; The added value of the secondary industry has been decreasing year by year, from 41.3% in 2018 to 40.5% in 2021. Although it was 41.3% in 2022, overall it is a decreasing trend. The proportion of the tertiary industry has shown an increasing trend, growing from 50.8% in 2018 to 51.6% in 2021, and the service industry's role in driving economic development continues to strengthen. The overall industrial structure of Anhui Province has shown a good trend of upgrading and optimization. As a member of the Yangtze River Delta region, the proportion of the tertiary industry has been close to the national average level in the past three years.

Since 2023, in the face of complex and severe external environment and arduous tasks of reform, development and stability, the whole province has adhered to the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, fully implemented the spirit of the Twentieth National Congress of the Communist Party of China and the important instructions of General Secretary Xi Jinping's important speech on the work of Anhui, conscientiously implemented the decisions and arrangements of the Party Central Committee and the State Council, as well as the work requirements of the provincial party committee and the provincial government, better coordinated epidemic prevention and control, economic and social development, better coordinated development and security, highlighted the work of stabilizing growth, employment and prices, and the province's economy continued to recover,

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generally recovered, and made solid progress in high-quality development. According to the unified accounting results of regional gross domestic product, the province's gross domestic product in the first half of the year was 2307.3 billion yuan, a year-on-year increase of 6.1% calculated at constant prices. In terms of industries, the added value of the primary industry reached 126 billion yuan, an increase of 3.7%; The added value of the secondary industry was 966.1 billion yuan, an increase of 6.5%; The added value of the tertiary industry was 1.2152 trillion yuan, an increase of 6.1%.

5.2. Problems in the Development of Low-carbon Economy

(1) The task of industrial restructuring is arduous. Traditional industries account for a large proportion in Anhui Province, and the task of transformation and upgrading is arduous. It is necessary to continue to promote the optimization and upgrading of industrial structure and vigorously develop low-carbon economy.

(2) Insufficient research and development capabilities for low-carbon technologies. Anhui Province is relatively weak in low-carbon technology research and development, and needs to increase investment in technology research and development, strengthen cooperation with domestic and foreign scientific research institutions, and improve the level of low-carbon technology and independent innovation capabilities.

(3) The difficulty of adjusting the energy structure is relatively high. The energy consumption structure dominated by coal in Anhui Province is difficult to change in the short term, and it is necessary to actively promote energy structure adjustment and increase the proportion of clean energy.

(4) The low-carbon policy system is not yet perfect. The policy system for low-carbon economic development in Anhui Province is not yet perfect, and more detailed support policies need to be formulated in finance, taxation, land, finance and other aspects to guide and encourage enterprises to carry out low-carbon economic projects.

(5) The public's low-carbon awareness needs to be improved. The public's understanding of low-carbon economy is not deep enough, and it is necessary to strengthen the publicity and education of low-carbon economy, raise public awareness of low-carbon, and create a good atmosphere for the whole society to participate in low-carbon development.

(6) The level of international cooperation needs to be improved. Anhui Province still has great room for improvement in international cooperation on low-carbon economy, and needs to strengthen exchanges and cooperation with the international community in technology, management, policies, and other aspects to enhance the development level of low-carbon economy in Anhui Province.

(7) The construction of ecological civilization is facing challenges. Anhui Province still faces challenges in the construction of ecological civilization, and needs to further strengthen environmental protection, strictly implement environmental laws and regulations, and strive to achieve green development.

In order to solve the above problems, Anhui Province should actively take measures to promote the development of low-carbon economy, strengthen policy guidance, promote industrial structure adjustment, improve low-carbon technology level, build a low-carbon society, and strive to achieve sustainable development.

5.3. Suggestions for Promoting the Development of Low-carbon Economy in Anhui Province

5.3.1. Optimize Industrial Structure and Promote Green and Low-carbon Development

The specific requirements for optimizing the industrial structure of Anhui Province and promoting green and low-carbon development can be carried out from the following aspects: optimizing the industrial structure: adhering to the guidance of green and low-carbon,

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promoting the optimization and upgrading of the industrial structure, vigorously developing high-tech industries, modern service industries, and advanced manufacturing industries, gradually phasing out backward production capacity, and promoting industrial transformation and upgrading. Promote industrial greening: Encourage traditional industries to adopt green technology transformation, improve resource utilization efficiency, reduce pollutant emissions, and achieve green development. Developing green industries: Actively developing green industries such as new energy, energy conservation and environmental protection, and circular economy, cultivating green economic growth points, and increasing the proportion of green industries in the economy of Anhui Province. Promote the transformation of industrial parks: carry out green transformation of existing industrial parks, improve the green quality of parks, optimize industrial spatial layout, and promote the green development of industrial clusters. Improve energy utilization efficiency: Strengthen energy management, promote energy-saving technologies and equipment, implement energy-saving renovation projects, reduce unit energy consumption, and improve energy utilization efficiency. Promote the development of clean energy: vigorously develop renewable energy such as solar energy, wind energy, biomass energy, etc., increase the proportion of clean energy in energy consumption, and reduce dependence on fossil fuels. Strengthen green supervision: Strengthen environmental supervision, strictly enforce environmental laws and regulations, establish a corporate environmental credit evaluation system, and increase penalties for environmental violations. Increase green investment: Increase financial support for the development of green and low-carbon industries, encourage financial institutions to increase loan support for green projects, and guide social capital to invest in green industries. Strengthen technological innovation: Strengthen cooperation with universities and research institutes, promote the research and industrialization of green core technologies, and enhance the level of green technology and independent innovation capabilities. Enhance low-carbon awareness: Strengthen the promotion and education of low-carbon economy, raise the low-carbon awareness of the public and enterprises, advocate green and low-carbon lifestyles and production methods.

Through the above specific requirements, it will help optimize the industrial structure of Anhui Province, promote green and low-carbon development, and achieve sustainable development.

5.3.2. Strengthen Technological Innovation and Improve Energy Utilization Efficiency

The specific requirements for strengthening technological innovation, improving energy utilization efficiency, and promoting the development of green industries in Anhui Province can be carried out from the following aspects: increasing R&D investment: The Anhui Provincial Government should increase R&D investment in green technologies, support cooperation between enterprises, universities, and research institutes, and promote the research and development of green core technologies and the transformation of achievements. Cultivate innovative talents: Strengthen the cultivation and introduction of green technology talents, encourage enterprises to cooperate with universities and vocational colleges to cultivate green technology talents, and establish green technology innovation teams. Technological transformation and upgrading: Promote enterprises to adopt advanced and applicable energy-saving technologies, processes, and equipment, implement energy-saving transformation projects, improve energy utilization efficiency, reduce production costs, and enhance enterprise competitiveness. Developing circular economy: Promote circular economy technology in Anhui Province to achieve efficient utilization of resources, reduce resource waste, lower environmental pollution, and enhance the sustainable development capacity of industries. Promote clean production: Promote clean production technology, reduce pollutant generation from the source, lower environmental risks, improve production efficiency, and achieve green development. Building a technology innovation platform: supporting the construction of innovative carriers such as green technology research and development platforms and technology achievement transformation centers, promoting green technology

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exchange and cooperation, and enhancing Anhui Province's green technology innovation capabilities. Policy support: Develop green technology innovation support policies, increase funding support for green technology innovation projects, and encourage enterprises to increase investment in green technology research and development. Standard system construction: Establish and improve a green technology standard system, guide enterprises to innovate and transform according to green technology standards, and enhance the overall level of green industry in Anhui Province. Carry out green technology innovation cooperation: Strengthen cooperation with leading green technology regions at home and abroad, introduce advanced green technologies from home and abroad, and enhance the green technology innovation capability of Anhui Province.

Through the above specific requirements, we will strengthen technological innovation, improve energy utilization efficiency, promote the development of green industries in Anhui Province, and achieve sustainable development.

5.3.3. Develop Circular Economy and Build a Green Industrial Chain

The specific requirements for developing a circular economy and building a green industrial chain in Anhui Province can be discussed from the following aspects: planning guidance: formulating a circular economy development plan, clarifying development goals, key areas, and key tasks, and guiding the healthy and orderly development of the circular economy industry. Green industry system construction: With circular economy as the core, promote the construction of green industry system, create circular economy industry chain, and promote circular links between industries. Industrial park renovation: carry out circular transformation of existing industrial parks, build a green industrial system in the park, improve resource utilization efficiency, and reduce environmental pollution. Key project implementation: Focus on key areas of circular economy, organize and implement a number of circular economy key projects with demonstration effects, and drive the development of the upstream and downstream of the industrial chain. Technological innovation: Strengthen the research and development of key core technologies for circular economy, promote the application of advanced and applicable circular economy technologies, processes, and equipment, and enhance the level of circular economy development. Green supply chain management: Promote enterprises to establish a green supply chain management system, procure green raw materials, adopt green processes and technologies, produce green products, and achieve green development throughout the entire supply chain process. Recycling and utilization of waste materials: Strengthen the construction of the waste material recycling system, support the development of waste material recycling, sorting, processing, and reuse, and improve resource utilization efficiency. Promotion and training: Strengthen the promotion, education, and training of circular economy, enhance the understanding of circular economy among enterprises and the public, and create a good atmosphere for the development of circular economy. Policy support: Develop support policies for the development of circular economy, provide certain policy support in finance, taxation, land, finance, etc., and encourage enterprises to carry out circular economy projects. Evaluation and assessment: Establish a sound evaluation and assessment system for the development of circular economy, evaluate and assess the development of circular economy in various cities and counties, and ensure the implementation of circular economy policies and measures.

Through the above specific requirements, we aim to develop a circular economy, build a green industrial chain, promote the healthy development of green industries in Anhui Province, and achieve sustainable development.

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6. Conclusion and Suggestions

6.1. Conclusion

In recent years, Anhui Province has actively promoted green and low-carbon transformation, achieving certain results in energy conservation and emission reduction, clean energy development, and circular economy. However, there are still problems that need to be improved urgently, such as rapid growth in total energy consumption, large total carbon emissions, and lagging energy structure adjustment. The industrial structure of Anhui Province is mainly composed of the secondary and tertiary industries, with the secondary industry dominated by high energy consuming and high emission industrial sectors, and the tertiary industry dominated by traditional service industries. The development of green and low-carbon industries is relatively lagging behind. In order to achieve the goal of green and low-carbon economic transformation, Anhui Province still needs to further transform its industrial structure.

6.2. Policy Suggestions

The policy recommendations for optimizing the industrial structure and transforming into a green and low-carbon economy in Anhui Province can be discussed from the following aspects:

(1) Develop a green and low-carbon economic development strategy: Establish clear green and low-carbon economic development strategies and goals, guide governments and enterprises at all levels to develop a green and low-carbon economy, optimize industrial structure, and improve energy utilization efficiency.

(2) Promote green industry policies: Implement policy measures to support the development of green industries, encourage enterprises to invest in research and development and adopt low-carbon technologies, and support green industries such as new energy, energy conservation and environmental protection, and circular economy.

(3) Increase investment in technological innovation: Strengthen cooperation with universities and research institutes, increase investment in green core technology research and industrialization, and promote green core technology research and industrialization.

(4) Improving energy efficiency: implementing energy-saving and emission reduction policies, implementing dual control of total energy consumption and intensity, vigorously developing renewable energy, and improving energy utilization efficiency.

(5) Optimize industrial structure: Adhere to the green and low-carbon orientation, promote the optimization and upgrading of industrial structure, vigorously develop high-tech industries, modern service industries, and advanced manufacturing industries, gradually eliminate backward production capacity, and promote industrial transformation and upgrading.

(6) Strengthen the construction of ecological civilization: Strictly implement environmental laws and regulations, strengthen environmental pollution control, protect the ecological environment, and promote the construction of ecological civilization.

(7) Improve the green finance system: Encourage financial institutions to innovate green finance products and services, increase loan support for green projects, and guide social capital to invest in green industries.

(8) Implement the carbon emission trading system: Establish and improve the carbon emission trading market in Anhui Province, promote enterprises to reduce greenhouse gas emissions, and facilitate enterprise transformation and upgrading.

(9) Strengthen green international cooperation: Strengthen cooperation with the international community in the field of green and low-carbon economy, introduce advanced foreign technology and management experience, and enhance the development level of green economy in Anhui Province.

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(10) Strengthen policy coordination: Develop supporting policy measures to ensure the effective implementation of green and low-carbon economic development policies, form policy synergy, and promote the optimization of industrial structure and the transformation of green and low-carbon economy in Anhui Province.

The above policy recommendations will help optimize the industrial structure of Anhui Province, promote the transformation of green and low-carbon economy, and achieve sustainable development.

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