Analysis of the Construction Path of Low-carbon City in Fuzhou

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Abstract. With global warming and urban pollution becoming more serious, high energy-consuming and polluting industries have also brought about a large number of carbon emissions and environmental pollution problems when solving employment and promoting economic growth. How to resolve the conflict between economic development and environmental protection is already an unavoidable economic and social issue. And building a low-carbon city can not only achieve sustainable economic development, but also meet the needs of people for a better life. This paper takes Fuzhou as the research object, firstly introduces the achievements made by Fuzhou in the process of building a low-carbon city in recent years; then it analyzes its remaining problems; and finally puts forward countermeasures and suggestions.

Keywords: Low-carbon city, Environmental protection, Energy saving.

1. Introduction
Fuzhou is the capital city of the economic zone on the west side of the Straits. In the industrial structure of Fuzhou City, traditional industries such as textile chemical fiber, machinery manufacturing, and metallurgical building materials still account for a large proportion. As early as 2017, these industries exceeded 100 billion yuan in output value, and the chemical fiber industry achieved a total industrial output value of more than 270 billion yuan. The growing size of the industrial industry has not only added a lot of employment opportunities to Fuzhou, but also reflects the city's economic achievements. However, from the perspective of environmental protection, these industries consume a lot of energy and have high carbon emissions, which objectively hinders the construction of low-carbon city in Fuzhou. Low carbon is a concept put forward under the background of increasingly severe environmental pollution. The construction of low-carbon city is an important way to resolve the conflict between economic development and environmental pollution. Its connotation can be described from three levels. First, the city should take a low-carbon economy as the development direction; second, local citizens should take a low-carbon life as their behavior; third, the local government should take a low-carbon society as the goal of construction. The Fuzhou Municipal Government has clearly put forward the concept of low-carbon as early as 2010. Taking Gulou District as an example, the Gulou Government stated in its “Government Work Report” that it would work to build a low-carbon living circle, improve the municipal road network, and improve public Supporting level and livable quality. The model of building a low-carbon city and developing a low-carbon economy has the characteristics of low cost and low resistance. A low-carbon city pays close attention to the harmony between man and
nature in the process of economic development. Efforts to build low-carbon cities have become the common pursuit of major cities in the world.

2. Achievements of low-carbon city construction in Fuzhou

2.1. Economic aspects

Industry has always been an important part of the economic structure of Fuzhou. In recent years, with the continuous advancement of the construction of low-carbon city in Fuzhou and the continuous implementation of energy conservation and emission reduction, a large amount of resources have been tilted towards low-carbon and high-tech industries. According to data published by the Fujian Province National Economic and Social Development Statistical Bulletin and the Fuzhou Statistics Bureau, the proportion of the tertiary industry in the three major industrial structures has gradually increased in recent years, as shown in Figure 1. This trend has not only promoted a strong promotion of economic development, but also further promoted the historical process of low-carbon city in Fuzhou. In terms of GDP energy consumption, Fuzhou has realized a downward trend for successive years. Taking the data released by the Fuzhou Statistics Bureau in 2018 as an example, the total energy consumption for the year was 13.48 million tons of standard coal, an increase of 4.6% over the previous year; but GDP energy consumption fell by 3.4%.

![Figure 1. Changes in the proportion of the three major industries in recent years](image)

2.2. Policy level

As early as 2010, the Fuzhou Municipal Government has adopted low carbon as a long-term governance goal. Since then, the Fuzhou Municipal Government has continuously formulated and issued relevant policy plans, which have broadly covered industrial, construction, energy, and green industries. Specific contents include: optimizing the industry and energy structure, implementing energy conservation and emission reduction projects, and promoting ecological test areas. This paper summarizes Fuzhou's representative policies in support of low-carbon development in recent years, as shown in Table 1 below. For example, in April 2014, the “Fuzhou Port Construction Green Cycle Low Carbon Port Thematic Project Implementation Plan (2014-2016)” passed the review by the Ministry of Transport. The document requires the Fuzhou Municipal Government to strive for the completion of Fuzhou Port within 3 years. Green cycling low carbon port. In January 2015, Fuzhou formulated the “Implementation Opinions on Accelerating the Development of Green Buildings in Fuzhou”. This document requires vigorously promoting the construction of ecological civilization, actively exploring the path of green, low-carbon, sustainable development, and creating an environmentally livable ecological civilization.
city. In September 2017, the “Fuzhou City's Thirteenth Five-Year Work Plan for Controlling Greenhouse Gas Emissions” was announced, which requires that all efforts be made to promote the construction of an ecological civilization pilot zone and promote the development of a green and low-carbon cycle. In February 2018, the “Fuzhou City's 13th Five-Year Plan Comprehensive Work Plan for Energy Conservation and Emission Reduction” was announced, which requires vigorous development of a circular economy, optimization of the industry and energy structure, and implementation of key projects for energy conservation and emission reduction. In November 2019, the Fuzhou New District implemented “A Green and Low-carbon Construction Operation Model” to create a high-quality municipal environment.

Table 1. Representative policies for low-carbon city construction in recent years

| Time            | Policy Name                                                                 |
|-----------------|------------------------------------------------------------------------------|
| April 2014      | Fuzhou Port Construction Green Cycle Low Carbon Port Thematic Project Implementation Plan (2014-2016) |
| January 2015    | Implementation Opinions on Accelerating the Development of Green Buildings in Fuzhou |
| September 2017  | Fuzhou City's "13th Five-Year Plan" Work Plan to Control Greenhouse Gas Emissions |
| February 2018   | Fuzhou City's "13th Five-Year Plan Comprehensive Work Plan for Energy Conservation and Emission Reduction |
| November 2019   | A Green and Low-carbon Construction Operation Model                           |

2.3. Social level
In recent years, Fuzhou has adhered to the concept of green and low-carbon development, actively advocated and promoted green development, and made low-carbon development an important mission of economic and social development. After many years of efforts, the construction of low-carbon city has achieved remarkable results. Specifically, it includes high air quality, high forest coverage, significant optimization of the industrial structure, and high citizen satisfaction. Fuzhou's achievements have been widely recognized by all sectors of society. For example, in 2016, the overall average quality assessment of citizens in Fuzhou was 85.85 points, an increase of 3.72 points over the previous year, which is at the same level in the same city in the country. In May 2017, the Twelfth World Low Carbon City Alliance awarded Fuzhou the “2016 Low Carbon City Sustainable Development Award”. In the same year, in December 2017, Fuzhou won the title of “2017 Beautiful Mountain City”.

3. Problems facing the construction of low-carbon city in Fuzhou

3.1. Analysis of economic structure and industrial problems
Developing a low-carbon economy and building a low-carbon city is a systematic project. From the perspective of economic structure and industry, there are two main ideas to achieve this goal. On the one hand, we must optimize the economic structure. Eliminate high energy consumption and high pollution enterprises; on the other hand, we must strengthen innovation and develop low-carbon emerging industries. In China, high-pollution and high-energy-consumption companies are often large employment and taxpayers, and are also an important source of support for the supply of social goods. In Fuzhou's economic structure, high energy-consuming industries such as machinery manufacturing, textile and chemical fiber, light industrial food, metallurgical building materials, and petrochemicals are still important parts of providing employment and developing the economy. In order to promote energy conservation and emission reduction and achieve low-carbon production, it is not in line with the law to forcibly eliminate or shut down such enterprises. In reality, governments tend to prioritize employment and taxation. In the process of implementing energy conservation and emission reduction, implementation efforts will be discounted. In addition, the low-carbon industry is a capital-intensive and technology-intensive industry, and the degree of development of the industry largely depends on the
support of funding and scientific research. Fuzhou still has many problems to deal with in these two aspects.

3.2. Analysis of policy and legal issues
In China, policies and laws have a strong political support function. The construction and promotion of low-carbon city cannot be separated from policies and laws. Over the years, Fuzhou has issued a number of policy documents related to low-carbon development. On the surface, policy documents reflect government encouragement and support, but in fact most of these documents are general and guiding, and lack substantial incentive content and support funds. And because the level of formulation is not high, and the pertinence is not strong, it is easy to greatly discount in actual implementation. In addition, Fuzhou's low-carbon construction is mostly dominated by policy documents and lacks the formulation and promulgation of laws and regulations. Therefore, supporting laws and regulations related to the construction of Fuzhou's low-carbon city need to be established and improved.

3.3. Analysis of the degree of collaboration between different subjects
Different levels of interests determine the complexity and systemicity of low-carbon city construction. In other words, the government, enterprises, communities, the media, and the public are all important participants in the construction of low-carbon city. The level of synergy among these entities will, to a certain extent, affect the construction of low-carbon city. For example, the government's role is to guide the flow of social resources to low-carbon and high-efficiency industries to accelerate its development; but in practice, the government often achieves economic and employment stability by sacrificing the environment and the interests of small and medium-sized enterprises for short-term performance. The role of enterprises in the construction of low-carbon city is the most important. It is related to the optimization and transformation of the economic structure; however, the situation facing a large number of small and medium-sized enterprises is not friendly. The media has played a role in propagating and promoting the concept of low-carbon environmental protection in the construction of low-carbon city, and the media in reality have not fulfilled their responsibilities in this regard. Due to cultural and social mechanisms, the general public's sense of participation and enthusiasm in the construction of low-carbon city is not high. This phenomenon also affects the construction process of low-carbon city in Fuzhou to a certain extent.

4. Countermeasures and suggestions

4.1. Speed up the optimization of economic structure and industrial transformation
First, through scientific planning and guidance, the backward production capacity will be gradually eliminated. For traditional industries with a large employment impact, Fuzhou needs to adopt a gradual and gradual approach to guide high-energy-consuming and high-polluting companies to upgrade technologies or eliminate outdated production capacity so that companies can meet environmental protection and low-carbon standards. Second, the government provides credit support to relevant enterprises, especially small and medium-sized enterprises through the support of credit funds, and encourages enterprises to transform and upgrade to a low-carbon direction. Third, the government provides technical support for related enterprises' transformation and upgrading through the industry-university-research cooperation approach, thereby driving the development of low-carbon industries.

4.2. Strengthen the improvement and implementation of policies, laws and regulations
First, on the basis of existing policies and in combination with the conditions faced by Fuzhou in the process of low-carbon construction, the government should supplement and modify the policies in a timely manner to better adapt to the new situation and new requirements. Second, local people's congresses and even the central government can improve the centripetal force and cohesion of the whole society for the construction of low-carbon city by formulating higher-level laws and regulations. Third, all sectors of society in Fuzhou should work hard to promote the implementation of policies, laws and
regulations, which not only requires the government to govern in accordance with the law, but also requires enterprises to know the law and abide by the law and citizens' active supervision.

4.3. Improving collaborative governance capabilities
First, improve coordination and communication mechanisms between government departments. In the process of building a low-carbon city, various departments are susceptible to their own interests or kicking the ball for problems due to their own interests. Therefore, the Fuzhou Municipal Government can set up a coordination mechanism led by the Municipal Government to break down the information barriers between functional departments and form political cohesion. Second, improve the information exchange mechanism between various social relations such as government and enterprise, government and media, community and citizens. Third, the media, communities, and villages must give full play to their propaganda role and work hard to increase public enthusiasm for the construction of low-carbon city.

5. Conclusion
In our country, building low-carbon cities is an important way to achieve ecological civilization and people's happiness. Completing the planning and construction of a low-carbon city is a systematic and complex large-scale project; therefore, the successful construction of a low-carbon city cannot be achieved without the joint efforts of various entities such as the government, enterprises, media, and the public. Specifically, this not only requires government departments to give full play to the guiding function of social resources and the supporting function of policies, but also requires the concerted efforts of enterprises and the media, and the extensive participation of the public.

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