Architectural Design and Innovation in a Low-Carbon Environme

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Abstract: The international community facing climate warming has taken many measures to develop a low-carbon economy. To this end, the Chinese government has also drafted a low-carbon economy development plan, and conducted a lot of research in academia around the plan. In recent years, China's urbanization process has accelerated, which has stimulated the vigorous development of the construction industry. Looking at the current status of the development of low-carbon buildings in China, China's construction industry has made some progress in low-carbon aspects, but there are still many deficiencies in the level of consciousness. Some construction companies pay great attention to the appearance and use of buildings, but they do not pay much attention to the energy-saving performance of the buildings themselves. There are misunderstandings about low-carbon technologies. They believe that this technology belongs to high-tech technology and requires a large amount of human, material and financial resources. Therefore, there are deficiencies in implementing low-carbon buildings. In view of this actual situation, it is particularly necessary to study architectural design strategies from a low-carbon perspective. By investigating the energy consumption of buildings in China, this paper finds that the current energy consumption of buildings accounts for more than 20% of the total and has not been effectively controlled. Therefore, the effective integration of low-carbon concepts into the construction industry is conducive to the development of the construction industry and effectively protects China's environment and environmental problems.

1. Introduction

With the rise of the mode of economic growth and the development of urbanization, China ’s previous high-input, high-output, extensive economic growth mode has been unable to adapt to the current market environment, and increasingly emphasizes the contradiction between economic development and resources and the environment. Problems such as energy shortages and environmental pollution have emerged. These two main issues have become challenges to China's sustainable development [1]. The construction industry is one of the main areas of people's livelihood. As the demand for better living conditions continues to grow, the construction industry is also growing. The energy consumption and high pollution of the traditional construction industry have brought tremendous pressure on resources and the environment. These benefits are temporary and cannot be obtained forever. sustainable development. Therefore, China's construction industry is constantly developing [3]. At the same time, as China vigorously advocates environmental protection in response to the national sustainable development policy, the building began to use low-carbon environmentally friendly materials, thereby reducing environmental pollution and waste [4-5]. On the basis of the low-carbon concept, the architectural design scheme is very useful for the sustainable development of the construction industry and has made an important contribution to China's environmental protection.

In the context of promoting low-carbon development at home and abroad, low-carbon economies are emerging in various countries. As one of the pillars of the national economy, the construction industry not only restricts economic development, but also promotes economic development. At the same time, the construction industry is a major energy consumer. China ’s total energy consumption

has risen from 10% in the late 1970s to 26.5% today. The energy consumption rate will continue to rise to about 35% [6]. Building energy saving has become one of the factors restricting economic development and a focus of research on building energy consumption, which has caused a lot of attention. One of the main differences between China and developed countries in building energy efficiency lies in the system's operating efficiency and level of operation management [7]. Comparing the energy consumption of office buildings in some Chinese cities and regions with Japan's energy-saving centers, it can be seen that, except for Beijing, Tianjin, and Taiwan, office energy consumption in other Chinese cities is lower than that of Japanese office buildings. If China's energy production efficiency can exceed that of Japan, then China's public buildings can reach lower energy levels, which indicates the need to improve China's energy efficiency [8-9].

Under the action of the low-carbon concept, targeted research on building design coping strategies can gradually improve the efficiency and quality of corresponding design work, realize a scientific response to building energy consumption problems, and enrich the design content in modern building practice. Therefore, in order to ensure the effectiveness of the architectural design response under the low-carbon concept and maintain its effective implementation of the response, it is necessary to find out and use effective response strategies to make the design and implementation of the architectural design plan more scientific and achieve Scientific application of low-carbon concepts [10].

2. Method

2.1 Management Method of Building Decoration under Low-Carbon Concept

2.1.1 Increase the use of low-carbon environmental protection materials

In building decoration works, the selection of building materials is very important. To meet the requirements of building decoration under the low-carbon concept, it is necessary to choose energy-saving and environmentally-friendly building materials. If the material is not selected properly, not only can the low-carbon energy-saving effect not be obtained, but even it will cause harm to the environment. Therefore, in order to reduce the carbonization demand of building decoration projects, it is necessary to select low-carbon and environmentally friendly building materials when purchasing building materials, so as to reduce the energy consumption of materials. Nowadays, in response to China's environmental protection policies and sustainable development strategies, many building material production companies have begun to produce low-carbon and environmentally friendly building materials. These materials can not only reduce the impact on the environment, but can also be used for a second time after use. It plays an important role in China's environmental protection.

2.1.2 Standardize construction procedures

The building decoration technology of low-carbon philosophies is currently progressing, but there is still room for improvement in the construction process of the project. Due to the problems in the construction process, not only will it affect the low-carbon effect of building decoration, but it will also cause waste of resources in the later stage. The project cannot meet the low-carbon environmental protection construction concept. Therefore, the building decoration construction unit should reasonably arrange and standardize the construction procedures in accordance with the requirements, such as the commissioning of energy-saving equipment and the design of indoor greening.

2.1.3 Strengthen the management of construction personnel

As for the personnel management in the building decoration construction project, first of all, the workers are required to carry out the construction operation strictly in accordance with the low-carbon green construction standards to strictly guarantee the construction quality. At the same time, it is necessary to inculcate the thinking of the construction workers, and they need to pay attention to green and environmental protection in the construction operation, so as not to cause

environmental impact. This is the low-carbon treatment of building decoration works from all aspects. In addition, during the construction of the building decoration project, it is first necessary to recycle the excess materials generated during construction in order to save resources.

2.1.4 Introduce low-carbon concept in building decoration construction

The construction process in building decoration construction has a very important influence on the low-carbon environmental protection effect of the construction result, so the low-carbon concept should be introduced in the building decoration construction to increase the environmental protection performance of the decoration. And, in the construction process, materials should be saved to avoid unnecessary waste. Save the remaining materials for future use. Many construction equipment in building decoration construction will have a long service life, so during the construction process, the equipment needs to be properly maintained to avoid damage, so as to extend the service life of the construction equipment and achieve the effect of environmental protection and energy saving.

2.2 Consider the Light and Heat Requirements in Building Design

When designing low-carbon environmentally friendly buildings, designers must fully consider the specific conditions of home lighting in order to provide more lighting to the building, and consider two lighting methods: active natural lighting and passive natural lighting. The designer should thoroughly check the facilities, distance, direction and environment of the building to ensure that the indoor environment meets the actual needs of the living space. At the same time, the best design and application of indoor environment, interior decoration and other lighting equipment should be carefully considered to ensure that indoor lighting meets actual requirements. During the construction of a house, it is important to consider not only the effects of light, but also the effects of heat, especially in winter and spring. In the summer, the sun's radiation intensity is high and the heat is very large. Solar glass is installed on the roof, and curtains are left to prevent the use of heat. In order to promote the increase of indoor heat in winter, we must fully consider the effect of light on the indoor environment. Therefore, the designer must pay full attention to the structure, structure, and level of solar radiation requirements of the building, and ensure that the indoor temperature is free in summer and winter, and that the building's lighting is complete. At the same time, we should also consider the greening of the environment, make full use of plants and trees to increase the demand for light and heat in the building, plant trees and trees according to the plan of the building, and promote the environmental cycle of the building. Solve the problem of noise pollution and air pollution of residents, improve the comfort and practicality of buildings, and better meet the urgent needs of people today.

3. Experiment

Building energy consumption can be divided into broad energy consumption and narrow energy consumption. In the broad sense of energy consumption, building energy consumption includes physical and chemical energy consumption and operation energy consumption. In the narrow sense of energy consumption, building energy consumption refers only to the energy consumption of the residents during the construction of the building. This article studies it from a narrow perspective. It only includes residential buildings and public buildings, and excludes industrial buildings.

As the data published in China's statistical yearbook adopts the characteristics of using the “factory method” by industry classification, rather than by industrial activity classification, the building energy consumption data is divided into different industries, so only indirect calculation can be used to measure building energy consumption. . Therefore, this paper selects the macro-model method as the statistical method of energy consumption, and draws on the annual development research reports of China's building energy conservation published by Xin, and divides building energy consumption into northern town heating coal consumption, public buildings except heating energy consumption and residential buildings except heating energy Consume three parts. In order to more accurately understand the energy consumption of buildings in China, the

energy consumption of houses is further distinguished from three aspects: electricity consumption, coal consumption, and other energy consumption.

Through research and arrangement of related data, we found that China ’s buildings consume high energy, lack energy-saving awareness, and have no relevant energy-saving measures. Therefore, building design in a low-carbon environment is imperative.

4. Results

4.1 Experimental Results and Analysis

As can be seen from Table 1, public building energy consumption increased from 12.205 million in 2014 to total building energy consumption in 2018 to 10 million. The heating energy consumption in northern towns is even more prominent, increasing from 22013 in 2014 to 33548 in 2018. The reason is closely related to the long-term past system of measuring energy consumption by area in northern China. At the same time, the large increase in time series also reflects the weakening of residents' awareness of saving under the defect system.

As can be seen from Figure 1, China's building energy consumption shows a "two increase and one decrease" evolution law. That is, the absolute increase in electricity and other energy sources and the relative reduction in coal. The combination of the two has caused China's building energy consumption to grow slowly in the total social energy consumption. From the perspective of electricity consumption, the construction sector accounted for 32.5% of the consumption in 2014. Consumption accounts for 42%, and has become the first driving force for energy consumption growth in the construction sector at an absolute growth rate. With the further diversification of China's energy structure, the proportion of other energy sources such as natural gas in building energy consumption has also shown a significant increase. Growing trend.

Table 1. China's building energy consumption value from 2014 to 2018(Unit / thousand tce)

Years	Residential energy consumption	Public energy consumption	Northern town heating	Total building energy consumption	Total social energy consumption	Building energy consumption
2014	220130	122050	153640	495820	2435870	20.3%
2015	253240	139450	179480	572170	2731460	20.9%
2016	283240	156470	195820	635530	2947510	21.7%
2017	301250	186410	209860	697520	3094150	22.5%
2018	335480	201450	224780	761710	3364840	22.6%

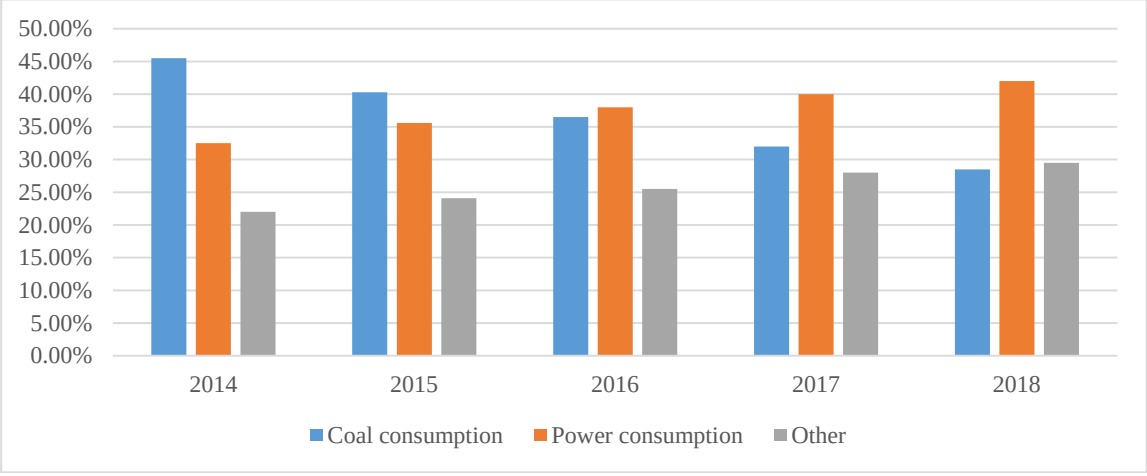

Figure 1. Main energy consumption structure of building

4.2 Precautions for Architectural Design in Low-Carbon Environments

As a major home building agent, builders and manufactured goods must be aware of the

low-carbon environment to ensure that they meet the actual needs of the low-carbon environment. First, we must do a good job in the design of low-carbon and environmentally friendly buildings. We should consider not only the structural shape of the building, but also the choice of materials and construction techniques. At the same time, we must fully understand and analyze the building's environment, understand the local terrain and land structure, and develop designs that meet actual conditions. Necessary low-carbon environmentally-friendly buildings; Second, do a good job in the construction of low-carbon environmentally-friendly buildings, pay attention to the accumulation of garbage, optimize the construction noise and the selection of building materials, and ensure that the buildings meet the requirements of low-carbon environmental protection. The owner of the building should have a good sense of ownership, pay attention to the environmental protection of the building, and actively respond to the government's low-carbon environmental protection policies and policies.

The concept of low-carbon home building is completely different from traditional home building, leading the concept of low-carbon environment and health. Modern technology is used to break the traditional design thinking and design technology, and thus form a new building model. . In order to ensure the effective completion of this task, relevant designers and technicians should continuously improve their quality, enhance their knowledge and skills, effectively develop low-carbon awareness, and incorporate the low-carbon environmental design concept into the building design process. Petrochemical buildings meet the urgent needs of today's society and are conducive to the sustainable development of low-carbon buildings.

5 Conclusion

Through the results of empirical research on the impact of building carbon emissions, it was found that carbon emissions intensity, energy structure, and energy intensity generally negatively affected the growth of carbon emissions on economic development and population carbon emissions. The impact of emissions intensity and restraint on carbon emissions has increased, and the impact of economic development on carbon emissions has also increased. As a result of research on low-carbon buildings, the optimization of energy buildings should begin with technological progress and reform of the price system, encourage technological progress, reduce energy intensity, increase energy prices, and increase carbon dioxide emissions. There are two ways to optimize the strength of technological advancement and energy structure.

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