

## РАЗДЕЛ 3

### APPLIED ECONOMICS, MANAGEMENT AND ECOLOGY

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#### SUSTAINABLE DEVELOPMENT OF CHINA'S CONSTRUCTION INDUSTRY

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The article discusses the features of the sustainable construction industry formation and development itself and its components: sustainable building materials, sustainable building layout. The peculiarities of the transition to the model of sustainable development of the Chinese construction industry are described. The main problems of the development of the industry within the framework of the new model are highlighted.

**Keywords:** sustainable development; sustainable construction; sustainable building materials; sustainable building layout.

#### УСТОЙЧИВОЕ РАЗВИТИЕ ПРОМЫШЛЕННОГО СТРОИТЕЛЬСТВА КИТАЯ

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В статье рассматриваются особенности формирования и развития индустрии устойчивого строительства и ее составляющих: экологических строительных материалов, рациональной компоновки зданий. Описаны особенности перехода к модели устойчивого развития строительной отрасли Китая. Выделены основные проблемы развития отрасли в рамках новой модели.

**Ключевые слова:** устойчивое развитие; устойчивое строительство; экологичные строительные материалы; устойчивая планировка здания.

China is a big country with a large population. With the development of economy and technology, all spheres of life are undergoing digital transformation. Combined with the urgent problems of transformation and development faced by Chinese housing construction and real estate industry, the sustainable green development model of Chinese housing is put forward for the future [1].

A review of the background of Chinese housing construction in the past hundred years, combined with the research and practice of its development process, can be found that the continuous progress of urbanization has been a theme of the development of human society in the past several hundred years, which has significantly improved the global economic level and people's living quality, but also brought great changes to people's production and life style. On the one hand, among many human activities, construction activities can be called one of the activities that have the greatest impact on natural resources and environment. Generally speaking, construction activities use 40 percent of the total natural resources used by human beings, and the construction waste accounts for 40 percent of the total waste generated by human activities [2]. Different from the outdoor activities of the agricultural society and nomadic society of the past, modern people live in the indoor environment for a much longer time. Studies have shown that people in many parts of the world, especially in developed countries, spend up to 90 percent of their time in built environments such as buildings and vehicles [3]. On the other hand, the increase in urban population density, the proliferation of high-rise buildings and the wider use of building heating and air conditioning systems have also led to a series of problems such as the increase in building energy consumption, the increase of direct or indirect carbon emissions, and the intensification of urban heat island effect, which have further led to a series of new challenges in global energy, resources, climate and ecology. Therefore, how to coordinate the relationship between human, architecture and nature and realize the sustainable development of the city has become an important and urgent topic to create a harmonious society.

The development of construction industry plays a very important role in the constant upgrading of Chinese economic level. However, in the process of developing construction industry, it has seriously damaged the ecological environment of our country. Therefore, the paper analyzes the concrete ideas and measures of the sustainable development of construction economy in our green economic development, hoping to be beneficial to the long-term development of construction industry. Peak carbon refers to a point at which

the growth of carbon dioxide emissions stops reaching a peak and then gradually falls back.

This concept as the core, will also have a deep impact on the development of Chinese architecture, this paper will also from the use of building materials and building structure layout two aspects of narrative research.

### *Building materials*

The development of early buildings ignored energy consumption and simply relied on mechanical equipment for lighting, ventilation, heating and humidity reduction, which greatly wasted resources. Skyscrapers with glass facades are the most typical energy-consuming buildings. Modern construction industry is one of the better developed industries in our country, and the construction industry is also the industry which applies the most resources, especially the natural resources on the one hand. For example, the rising price of concrete materials in the construction market in recent years reflects the shortage of modern resources to some extent. On the other hand, it also shows that the concrete materials with the proportion of natural materials are not cost-effective in the application of construction projects at the present stage. Based on this, green high-performance building materials are a key point of the construction industry, which can provide reference for the improvement of social and economic benefits of modern construction engineering [4].

For a long time, building materials have been researched and developed from the practical value of the material itself, often pursuing the mechanical properties of the material itself, ignoring the value of saving and reuse of the material itself, so that a large number of building materials in the process of processing has been constantly lost, not only the waste of resources, but also caused irreversible losses.

The production and consumption of building materials is one of the main factors affecting the ecological environment. To realize the sustainable development of building materials industry, in addition to economic benefits, but also must strengthen the ecological benefits of building materials. The development path of «pollution first, treatment later» building materials must be stopped. Therefore, to achieve sustainable development of building materials, the following problems should be considered first:

1) the construction industry should establish the correct concept of development;

2) establish and improve the technical standards of the building materials industry, strengthen the market supervision of the building materials industry and standardize the building materials market;

3) strengthen the research and development of building materials reuse, and strengthen scientific and technological innovation.

### *Building layout*

On the other hand, small and medium-sized rooms can not reduce home life because of the small size of the apartment, there should be various functional space. The innovation of the small and medium-sized room design should also be such as there are more and more detailed functional space , dedicated air space such as sitting room balcony separation. The concept of housing decoration is very necessary in the design of small and medium-sized housing, which can also promote the better development of housing industrialization technology system [5].

China's first green building evaluation system, «Green Olympic Building Evaluation System», will ensure that the 2008 Beijing Olympic buildings achieve the green and sustainable development goals. The 2022 Beijing Winter Olympic Games has made a new breakthrough in green buildings: under the cold and low temperature conditions, all the newly built venues not only meet the requirements of the competition, but also insist on building energy saving, water saving, land saving and material saving, and make full use of zero-carbon energy, which has obtained the three-star design logo of China's green buildings. Therefore, the 2022 Beijing Winter Olympics will not only promote China to become a sports and ice power, but also set a model for the green design and construction of ice and snow sports venues in China.

The construction sector, which accounts for one-third of global carbon emissions, will play a pivotal role in achieving China's «double carbon» goal. It is a huge challenge for the construction industry to meet people's growing demand for a happy life while at the same time becoming carbon neutral by 2060. At the same time, the proposal of the "double carbon" goal not only brings great challenges to the construction industry, but also brings great opportunities for the healthy development of green buildings, which is also an important opportunity to export the «Chinese plan» of green buildings to the world.

The 21st century is a century of environmental protection, a century of sustainable development strategy, and a century in which people pay more attention to the ecological environment and ecological health. As a sunrise industry in the new century, the construction industry must integrate the strategic thought of sustainable development into it. Under the premise of low energy consumption and low loss, the comprehensive utilization rate and renewable utilization rate of building material resources should be improved, and the building space should be rationally distributed and planned to further realize the sustainable development strategy of the building.

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