

# *The Role and Development of Low Carbon Ecological Planning in Urban Planning*

**Jun Wu**

*School of Urban Construction, Yangtze University, Jinzhou, Hubei 434025, China*

**Keywords:** Low carbon ecological planning, Urban planning, Problems and suggestions

**Abstract:** Thanks to the correct leadership of previous leaders and the unremitting exploration and efforts of the people, China's economy has achieved rapid development and has now become the second largest economy in the world. However, as a developing country with serious shortage of per capita resources, China should reduce energy consumption, save resources and adhere to low-carbon ecological sustainable development. At present, low-carbon development and ecological construction not only become the trend of the times, but also help to promote urban transformation and development. This paper first briefly discusses the connotation of low-carbon ecological city, then enumerates its role in urban planning, and finally puts forward scientific and reasonable suggestions and methods on how to carry out urban planning on the basis of low-carbon ecological planning.

## **1. Introduction**

Nowadays, the concepts of low carbon, green and ecology are widely rooted in the hearts of the people. In the process of urban planning, we also need to adhere to the concept of sustainable development with low-carbon ecology as the core. We not only need to pay attention to the economic benefits of urban development, but also need to strengthen the ecological benefits. We should scientifically and reasonably plan the city with the important starting point of creating an ecological city, so as to realize the high level of ecological construction and urban development. Finally, ecological planning and development mechanism in line with the concept of sustainable development will be formed. Urban planning based on low-carbon ecological planning can not only effectively reduce energy consumption and environmental pollution, but also promote the further optimization of urban industrial structure, and then greatly improve the efficiency of land use. Therefore, in the urban planning, we must base on the specific development situation and take the low-carbon ecological concept as the guidance to promote the harmonious development of ecological environment and urban development.

## **2. The Meaning of Low Carbon Eco-City**

As a typical compound concept, low-carbon eco-city is composed of two parts: one is low-carbon city, which is a new urban development mode characterized by low pollution, low

emission, low energy consumption, high efficiency, high efficiency and high efficiency; the other is eco-city, which is to create a resource-saving and environment-friendly city. In terms of connotation, it not only reflects the use of “low-carbon” mode to reduce the adverse impact of urban development on the ecosystem as much as possible, but also reflects the establishment of a good relationship between human and nature.

On the meaning of low-carbon eco-city, we can regard it as a scientific and reasonable determination of the development direction and construction path of modern city under the background of various planning, such as environment, city, ecology, etc., following the national construction policy and planning, guided by the urban ecological theory and social economic theory, and taking the realization of economic and ecological harmonious development as the fundamental goal. In the process of urban planning of low-carbon ecological city, we should focus on the issues of resources, environment and economy, and promote the sustainable, stable and long-term development of the city in the true sense.

### **3. The Role of Low Carbon Ecological Planning in Urban Planning**

#### **3.1 To Control Energy Consumption and Reduce Pollution**

At present, the rapid development of the city has caused serious damage and pollution to the ecological environment. Human beings are also facing various serious problems in the process of development, such as global warming, energy crisis, etc., which requires us to pay attention to and strengthen the restoration and protection of the ecological environment in the process of urban planning and construction, and actively apply low-carbon ecological technology and advanced and powerful energy-saving equipment. We should reduce energy consumption and environmental pollution as much as possible, so as to meet the material needs of human beings and not pollute the ecological environment, and to realize the harmonious coexistence of human development and ecological environment. [1]

#### **3.2 To Optimize Urban Industrial Structure and Improve Land Use Level**

With the continuous development of urbanization, the problem of land shortage is becoming more and more serious. Various high-rise buildings are standing up, while the park space for people's leisure and entertainment is decreasing. In the process of urban planning and development, adhering to the concept of low-carbon ecology and reasonable application of ecological technology can help people enhance their awareness of environmental protection and plan more venues for people's leisure and entertainment. Under the premise of high-energy and low-carbon industrial planning, we should promote the sustainable development of urban industrial structure under the premise of high-energy and low-carbon industrial planning.

### **4. Low Carbon Urban Ecological Planning**

#### **4.1 Building Energy Saving Technology**

According to statistics, in the total energy consumption of urban operation, building operation energy consumption accounts for as high as 33%. Therefore, in urban planning and construction, it is necessary to adopt reasonable technology and means to reduce building energy consumption according to the actual situation. Building developers should actively adopt a variety of mature and reasonable building energy-saving technologies when carrying out engineering projects, such as external wall energy-saving technology, door and window energy-saving technology, and roof

energy-saving technology. Low-carbon ecological, scientific and reasonable building planning and shape design can effectively adapt to the bad microclimate environment, not only can provide a comfortable and safe living environment for residents, but also can reduce the cost pollution and damage to the environment.

## **4.2 Geothermal Energy Technology**

In contrast, the application of geothermal energy technology in northern cities is relatively wide, and water source heat pump or ground source heat pump is often used. In the process of design and construction of ground source pump and water source pump, it must be perfectly integrated with architectural design. In the process of planning and construction, the cooling and heating range and utilization index of ground source heat pump should be adjusted scientifically and reasonably, so as to enhance the safety and reliability of the whole geothermal system, and clearly and reasonably divide the geothermal energy service area, so as to reduce energy consumption and promote energy efficiency.

## **4.3 Solar Technology**

In urban planning and construction, many cities have actively applied mature environmental protection solar energy technology, including solar energy heat collection technology. Among them, solar energy collection devices are usually flexibly and reasonably arranged on the top of buildings or other appropriate facade areas to provide heat for residents. However, in reality, there are sometimes some problems, such as the small lighting range and the failure of safe and effective configuration of heat collectors due to the reasonable layout of buildings. Therefore, the solar collector can be separated from the building, and the solar collector can be arranged and installed separately. However, due to insufficient consideration in the process of urban planning, the overall layout of buildings is not scientific and perfect. [2]

# **5. Suggestions on the Application of Low Carbon Ecological Concept in Urban Planning**

## **5.1 Innovation of Urban Planning Technology and Methods**

First, we should build and update the urban environment database. Relying on advanced and powerful information technology, we should build a database that can record and describe the urban carbon source and its distribution, strengthen the long-term investigation and analysis of meteorological and hydrological conditions, formulate various standardized and clear zoning maps, such as water consumption map, etc., strengthen the continuous monitoring of urban heat island effect, update the heat island map at regular intervals, and strengthen the monitoring of solar energy, solar energy, water consumption, water consumption, etc. Wind energy and other renewable green resources information recording and statistics provides a convenient and efficient information query platform for new energy utilization. Second, we should construct and optimize the index mechanism of the combination of objective and assessment. In the whole process of low-carbon ecological construction, a scientific and rigorous index system of low-carbon ecological construction is constructed by combining quantitative analysis mode and adhering to the premise of linking the goal-oriented and result assessment. Thirdly, we should build a rigorous and reasonable decision-making mechanism, introduce and apply the cost-benefit analysis method to ensure the correct and wise decision-making.

## **5.2 To Adjust and Improve the Urban Planning Management Mode**

From the perspective of planning management, in the process of low-carbon ecological planning, we should adhere to the planning procedures and administrative licensing, in order to promote the smooth and orderly development of urban planning and management under the premise of minimizing environmental pollution and damage. However, throughout the current urban planning, many planning approval procedures are unreasonable and not rigorous. To a certain extent, it can restrict the efficient and high-quality development of urban planning. Low carbon ecological planning can not completely rely on every developer to consciously and actively implement the relevant technical standards formulated by the state. It needs the active participation of the government departments and join the approval management through tough administrative means. Only in the process of construction and development can the project be approved and approved. We can adjust and improve the urban planning management mode, reasonably optimize the management process, reduce the complexity of approval, and encourage and guide more companies to actively participate in urban planning. [3]

### **5.3 To Optimize Low Carbon Ecological Planning Standards and Actively Improve Relevant Policies**

At present, many urban planning standards that are followed and used are formulated many years ago, and little consideration is given to the concept and technical requirements of low-carbon ecology. For this situation, we should adhere to the concept of sustainable development, scientific and reasonable adjustment and optimization of urban planning standards to ensure that the current standards conform to the concept of low-carbon ecology, which is conducive to urban sustainable development. In the process of urban planning, government departments also need to set an example and actively participate in urban planning and construction. Through the formulation and implementation of incentive policies, preferential policies in tax, finance and other aspects should be provided to companies consciously participating in urban low-carbon ecological construction, so as to stimulate their enthusiasm and initiative.

### **5.4 To Strengthen Publicity and Enhance People's Awareness of Low Carbon Environmental Protection**

We should vigorously publicize the concept of low-carbon ecology and actively promote the low-carbon ecological technology of energy conservation and environmental protection in the whole society, so that more people can fully and deeply understand the benefits of low-carbon ecological application in urban planning, and effectively stimulate the enthusiasm of people to participate in urban planning. Objectively speaking, only when the general public fully and deeply understand the benefits of low-carbon ecology and enhance the awareness of low-carbon environmental protection, can they actively support and join in the construction of low-carbon ecological city.

## **6. Conclusion**

As an important framework of modern urban construction and development, urban construction plays an indispensable role in promoting urban development and national stability. Therefore, in the process of urban planning, we must adhere to the concept of sustainable development based on the concept of low-carbon ecology, and build a set of rigorous, scientific, reasonable and feasible low-carbon ecological design planning on the basis of comprehensive consideration of the nature of the city, development status and other factors, so as to realize the real sustainable, stable and long-term development of the city.

## References

- [1] Zhang Qian, Gao Jieming. *Research and Discussion on urban planning under ecological background [J]. Housing and real estate*, 2018, 498 (13): 123
- [2] Wang Sifeng. *Discussion on the planning principles of low carbon eco city in ecologically sensitive areas -- Taking the planning of livable area in Zhaoqing New Area as an example [J]. Low carbon world*, 2018 (5): 14-15.
- [3] Qiao Lu. *Study on the indicator system of low carbon eco-city that is easy to plan and control -- Taking the regulatory planning of Zhaoqing New Area as an example [J]. Urban rural planning*, 2018, 000 (003): 88-97