

Green Building Cost Influence and Control Strategy Based on the Full Life Cycle

Ruoyu Chen*

School of Economic Management, China University of Geosciences, Wuhan, 430000, China

*Corresponding author: dahongpao8@gmail.com

Abstract. With the attention of society on environmental protection issues, green buildings have gradually increased their influence. Compared with traditional buildings, green buildings have advantages in terms of energy conservation, resource utilization, and coexistence with nature. However, because green building technology is more complicated, at the same time, during the operation stage, its cost is high. Cognition is also limited, so green building projects face certain challenges in terms of cost control. How to control its cost has also become a serious issue. This article will start analyzing the cost, weight and control strategies of green buildings from the perspective of the full life cycle of green buildings. At different stages of the life cycle, the influencing factors of green building costs are also different. During the preparation stage, the decision-making and design of the enterprise is the main influencing factors. During the construction stage, the company's strategies for the use of green building materials, enterprise water saving, energy conservation, and other strategies, and the control of indoor environmental quality will have an impact. During the operating stage, the use of intelligent use in the field of green construction, the treatment of domestic waste, and government policy are all important influencing factors. During the demolition stage, the demolition and green treatment of waste facilities, the ecological restoration meeting after the demolition of green buildings, the demolition of green buildings, it affects costs. In terms of cost-influential factors, the core of green building projects is often various types of energy-saving measures, which is also the biggest influencing factor in weight. At the different stages of the full life cycle, the government can formulate relevant policies, and enterprises can control cost control through reasonable selection of building materials and other methods.

Keywords: Green buildings, full life cycle, green building cost.

1. Introduction

With the continuous development of science and technology, people's demand for resources has gradually increased. At the same time, the problems of over-mining of resources, environmental pollution, and climate change have gradually become serious, so the protection of the environment is urgent [1]. As an industry with a large carbon emissions, the construction industry has become more prominent in demand for energy conservation and emission reduction and environmental protection. For example, traditional buildings will use traditional building materials such as cement and bricks in large quantities, and a large amount of greenhouse gases will be generated during the production process of these materials. At the same time, compared with green buildings, traditional buildings have low efficiency of resources. As more and more people are aware of the importance of environmental protection, the recognition of green buildings in the industry is getting higher and higher [2,3].

"High energy efficiency" and "low emissions" are important features of green buildings. At the same time, many merchants have also regarded "low carbon discharge" as a big selling point for green buildings [4]. Green buildings often adapt to local conditions, combine the environment of the building, and comprehensively consider many indicators such as environmental protection and humanistic care. At the same time, green building projects often focus on the harmonious development of man and nature during the construction stage. It is as complete as possible to use natural conditions such as light and reduce the damage and change of the environment.

At present, although green buildings have many advantages in environmental protection, the cost problem still needs to be resolved. It is a very effective way to start with a full life cycle [5,6]. The

concept of incremental cost of the full life cycle of green buildings is to combine the concept of green building with the theory of the full life cycle, emphasizing that in the entire life cycle of planning, design, construction, use, and maintenance of buildings, consider green technology and strategy considering green technology and strategy Effect on cost.

This study will first introduce the research background of the green construction industry in various places, and introduce the concepts and characteristics of green buildings. This article is mainly to explore the impact of various factors in the full life cycle of the green building, and to formulate a certain control strategy from various aspects such as construction, policy, etc., in order to achieve the purpose of reducing costs and efficiency, improving the economy of green building economy income. Finally, this article will put forward conclusions and the future of the industry.

2. Related concept

2.1. Green Building Concept

According to Chinese national standards, green buildings are to maximize resources, protect the environment, and reduce pollution through measures such as energy saving, land saving, water - saving, and materials [7]. Space and realize harmonious symbiosis with nature. Green buildings emphasize the concept of sustainable development, focus on the application of the theory of the full life cycle, and optimize the cost and quality of the building, and ultimately promote the realization of the goal of sustainable development.

In the whole process of building design, construction, operation, and demolition, green buildings focus on environmental protection, energy conservation and emission reduction, and recycling of resources, and can maximize the ecological benefits and functions of the building. Its characteristics are reflected in the aspects of building materials, energy consumption, indoor environmental quality, and resource utilization. First of all, green buildings use low-carbon, environmentally friendly, and renewable building materials to reduce dependence on natural resources and reduce environmental pollution. Secondly, green buildings often fully consider natural conditions [8,9]. By optimizing the building layout and facial design, the maximum natural lighting, ventilation and heat control are achieved, and energy consumption such as artificial lighting and air conditioning is reduced.

In terms of energy conservation, water saving, land saving, materials, and reducing pollution, green buildings have excellent performance. Through reasonable energy management and use of renewable energy, such as solar energy and wind energy, green buildings can greatly reduce energy consumption and reduce greenhouse gas emissions. In addition, green buildings are often equipped with high efficiency water saving facilities to reduce waste of water resources and improve resource utilization. During the construction process, green buildings also advocate the recycling and utilization of waste and environmental protection management at the construction site, which helps reduce construction waste and pollution. On the whole, when green buildings improve the living environment, they have also made important contributions to saving social resources and reducing environmental pressure.

The full life cycle of green buildings includes all stages such as planning, design, construction, operation, maintenance, and demolition. First of all, in the planning and design stage, green buildings emphasize the reduction of the negative impact on the environment from the source and adopt sustainable architectural design concepts. During the construction stage, the use of low -carbon environmental protection materials and construction methods is used to minimize energy consumption and waste discharge in the construction process. During the operation stage, green buildings can reduce energy consumption and improve use efficiency through efficient energy management systems, intelligent equipment and energy-saving facilities. During the maintenance stage, green buildings will regularly evaluate energy benefits and conduct necessary repairs and transformation to ensure its long -term environmental protection performance. Finally, during the demolition stage, the demolition of green buildings should also minimize the waste of resources, promote the recovery and reuse of building materials, and reduce the secondary pollution of the

environment. Through the management of this full life cycle, green buildings can continue to maintain an efficient environment and resource benefits.

3. Factors affecting the cost of green building

3.1. Impact factors research method

Before conducting research, you need to establish a research method first. The common research methods of green building costs are as follows [10]: The layered analysis method can more systematically analyze the cost of green building costs by constructing a hierarchical structure model, which can be more clearly analyzed. Vague comprehensive assessment method is a means to deal with uncertainty. Entropy values calculate the entropy rights of data to reflect the degree of discrete and information of the data.

3.2. Main influencing factors

When analyzing the cost of green buildings, analyzing the full life cycle, different influencing factors have occurred at different stages, and the weights of these influencing factors are different. During the preparation stage, the decision-making and design of the enterprise is the main influencing factor, while government policies, the green consciousness of the enterprise, the design plan of the enterprise, and the project positioning will all affect corporate decision-making; the regional environment and local climate have a certain impact on project design. During the construction stage, enterprises have an impact on the use of green building materials, water-saving, energy-saving, materials, land-saving strategies, and land-saving strategies. During the operating stage, the intelligent use of enterprises in the field of green construction, the treatment of domestic garbage, the reuse of waste resources, the maintenance of green facilities, the cost of repair, and the relevant government policies are important factors. During the demolition phase, the demolition and green treatment of waste facilities, and the ecological repair after the demolition of green buildings will affect the cost [1,11].

During the preparation stage, the society's awareness of environmental protection and the continuous improvement of environmental protection needs, the environmental awareness of enterprises and society is an important influencing factor. In the construction stage, green buildings need to use advanced technical means to achieve the requirements of energy efficiency, water resources management, and building materials selection. Technological innovation is the main influencing factor. In the operation stage, in order to encourage the development of green buildings, it has launched some encouragement policies, such as energy efficiency standards and green building certification, etc., which will also have a certain impact on the cost of green building. At the same time, with the improvement of green environmental protection awareness, the demand for green buildings has gradually increased, and the market is also an important influencing factor in cost.

Green building materials are usually slightly higher than traditional building materials in initial investment. Due to the large investment of green building materials in R & D, production technology and marketing, the cost is higher than that of traditional buildings. For example, high-performance thermal insulation materials, new environmentally friendly concrete and other materials need to adopt advanced technology and technology during the manufacturing process, resulting in increased costs. Nevertheless, with the gradual maturity of the large-scale production and markets of green building materials, and the continuous progress of science and technology, its cost is expected to decline [12].

Green building materials usually have lower operation and maintenance costs. This is due to its excellent performance, such as durability, insulation, fire prevention, etc., which reduces maintenance, replacement and energy consumption in the service life. For example, the use of high-efficiency energy-saving windows and wall insulation materials to significantly reduce the energy consumption of heating and cooling, thereby reducing long-term energy expenditure [13].

3.3. Green building cost affects factors

First estimate the cost of the full life cycle of green buildings. Among them, the cost of the preparation phase mainly includes design costs, simulation costs, hiring labor costs, etc.; The cost of the construction stage mainly includes water -saving technology costs, energy saving technical costs, cost -saving technical costs, land -saving technical costs and indoor environmental quality costs; During the operation stage, there are mainly green property management costs, equipment maintenance costs and intelligent system management costs; the cost of the demolition stage mainly includes: the cost of demolition of green buildings, the cost of restoration of ecological environment and the recovery of green building materials [3].

Related literature on the cost of green buildings shows that policy and corporate development direction is a key factor that determines the cost of green buildings, and the employment costs of various management technologies and green technologies during the operation stage are directly affected by factors. It is a variety of energy -saving measures, which is also the biggest influencing factor in weight [3].

4. Main influencing factor control strategies

First of all, the control cost strategy is needed during the preparation phase. On the one hand, the government should formulate a certain development strategy based on the level of local development and improve the corresponding laws and regulations. For example, it can promote the development of green building -related industries through appropriate tax cuts. On the other hand, enterprises should focus on the development environment of green buildings and design green buildings that meet nearby ecology to reduce costs to a certain extent. You can also find the position of the enterprise itself, formulate reasonable preliminary plans, and strengthen management [3].

Secondly, the control cost strategy is implemented during the construction stage. For example, rationally use and select building materials, evaluate different materials, and try to choose materials that are relatively environmentally friendly, have less impact on the environment, and have higher energy efficiency [1]. At the same time, resources are carried out, and resources are used more efficiently and reasonably. At the same time, reduce the waste of resources in the construction process, and use recyclable resources as much as possible.

Finally, try to control cost strategies during the operation stage. Encourage relevant personnel to actively respond to local green building policies, rationally use relevant incentive policies, actively transform and upgrade buildings, and improve competitiveness [1].

5. Conclusion

This article explores the cost influencing factors of green buildings in the full life cycle. During the different stages of the life cycle, government policies, the selection of materials of the enterprise, and the recycling of waste facilities will affect the cost. At the same time, this article analyzes its proportion, and various energy saving measures are often the biggest influencing factor in weight. This article also explores possible control cost strategies. At different stages of the life cycle, the government can formulate relevant policies, and enterprises can control the cost control through reasonable selection of building materials and other methods. By analyzing the cost and cost reduction of green buildings through the cost of full life cycle, it can help owners and decision makers to better evaluate the return on investment in green buildings, optimize the design and construction process, reduce operating costs, and improve the overall performance and sustainability of the building.

The development of the green construction industry is inseparable from the development of science and technology, and the development of the green construction industry can provide new opportunities for the development of the construction industry. In the future, with the popularity of intelligence, green buildings will further improve efficiency and adaptability to the environment, and the green construction industry will have better development.

References

- [1] Zhao Xiaohan. Study on the influencing factors and control strategies based on the incremental cost of green buildings based on the full life cycle. Shandong University of Architecture, 2024.DOI: 10.27273/d.cnki.gsajc.2024.000517.
- [2] Qian Yanxin. Research on incremental costs of green buildings based on the full life cycle. Shandong University of Architecture, 2023.DOI: 10.27273/d.cnki.gsajc.2023.000057.
- [3] Meng Kun. Research on the influencing factors and control strategies of green building incremental costs. Tianjin Urban Construction University, 2023.DOI: 10.27355/D.cnki.GTJSY.2023.000046.
- [4] Qu Xiaowei. Analysis and evaluation system of the cost influence of green building costs. Qingdao University of Technology, 2020.Doi: 10.27263/d.cnki.gqudc.2020.000282.
- [5] He Le. Research on incremental costs and incremental benefits of green buildings based on the theory of full life cycle. East China Jiaotong University, 2020.Doi: 10.27147/d.cnki.Ghdju.2020.000460.
- [6] Zhang Qian. Study of the influencing factors of green building development based on urban perspective. Chongqing University, 2017.
- [7] Xiao Xudong. Research on the cost of carbon emissions and life cycle of green building life cycle. Beijing Jiaotong University, 2021.DOI: 10.26944/D.cNKI.GBFJU.2021.002750.
- [8] Wang Ya. Research on the development of green building development based on incremental cost benefits. Chongqing Jiaotong University, 2020.Doi: 10.27671/d.cnki.gcjtc.2020.000586.
- [9] Zhan Qing. Research on incremental costs based on green buildings based on the full life cycle. Anhui University of Architecture, 2021.DOI: 10.27784/d.cnki.gahjz.2021.000300.
- [10] Wang Jin. Comprehensive evaluation of green buildings based on incremental cost benefits. Xi'an University of Technology, 2018.
- [11] Yang Zhongxuan, Zhang Xiaoke. Study on the factors of the cost influencing factors of green building costs based on the whole life cycle. Building materials technology and application, 2024, (04): 91-94.doi: 10.13923/J.CNKI.cn1291/TU. 2024.04.018.
- [12] Qu Rong, Ye Jiahong, Zhang Xue. The green low-carbon building renovation research hotspots and trends in the background of urban renewal. Green building, 2024, (06): 69-77.
- [13] Pan Yingying. The selection of green building materials and cost benefits analysis. New City Construction Technology, 2024,33 (10): 169-171.