

Research on Construction Management Strategies for Building Engineering Based on Low-Carbon Economy

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Abstract: The effectiveness of construction management directly impacts the overall quality and benefits of building engineering projects. Especially in the current context of the low-carbon economy, when undertaking building engineering projects, to ensure economic management outcomes, the principle of low carbon should be prioritized, thereby promoting the sustainable development of China's building engineering enterprises and the industry as a whole. It is evident that traditional construction management models for building engineering can no longer meet the development needs of the modern building engineering field. Therefore, it is essential to actively introduce low-carbon and green construction management concepts, enrich and improve engineering construction management plans, and address numerous practical issues faced in traditional building engineering project construction. Based on this, this paper conducts targeted research on construction management strategies for building engineering based on the low-carbon economy, hoping to provide some experience for the stable development of building engineering enterprises in the future.

1. Introduction

Old Civil Engineering Projects: Building engineering projects is one of the most important components in the field of China's engineering construction. However, due to the long construction period, large scale and many materials and energy types of building engineering projects in formal construction units, excessive consumption of materials and energy often induce environmental pollution problem. This has not only severely damaged the surrounding natural ecology, but also hindered the modernization and sustainable development of China's building engineering industry. As investment in ecological environment governance in China increases, the low-carbon economy has gradually been introduced into building engineering project construction, which provides a basis for engineering construction management. To cope with the wishes to balance socio-economy and ecological environment, under the construction industry low carbon environmental protection direction of development, limited engineering construction energy The consumption and environmental pollution, can relieve the resource scarcity problem in Chinese construction industry. But in the contemporary building engineering construction management aspect deploy low-carbon economy some practical problems are also still cannot be avoided, such as: resources, utility rate is lower, contain a lot of works procedure high environmental pollution. Since such issues have an objective existence, the efficiency of implementing the concept of low-carbon economy is not at high level. So, it is based on the demand of modernization development of China's building engineering field that we expand specific application strategies for low carbon economy in construction management.

2. Brief Analysis of the Low-Carbon Economy Concept

"Low-carbon economy" is a more complex concept, generally refers to in the sustainable economic growth and carbon emission reduction to achieve coordinated development through innovation and institutional innovation, new economic model formation process. This model promotes the steady and healthy development of related industries, promotes the rationality of the scale of socio-economic system. When carrying out a critical analysis of deducing low-carbon

economy, we can see that its features can be summarized as follows: first green production. The low-carbon economy highlights the development of a circular economy, environmental conservation through getting more out of less, and so that relevant industries can be able to green and clean production during operation every day. This reduces the extent to which pollution dust spreads into surrounding natural ecosystems greatly in production processing. Secondly, energy transformation^[1]. The promotion of clean energy by the low-carbon economy, such as wind energy, solarenergy and tidal power generation, not only improves the utilization rate of energy to a certain extent and better controls Environmental performance in the process of energy production and use system to promote an efficient transformationof energy towards it but also aims at effectively reducing carbon dioxide emissions.

3. Analysis of Existing Problems in Building Engineering Construction Management Based on the Low-Carbon Economy

3.1 Resource Utilization Efficiency Needs Improvement

In this context, doing construction management for building engineering projects under the low-carbon economy, in order to optimize relevant resources at most efficient level within given time and space range is undoubtedly pretended as not only a core task of management but also helps to ensure overall effective business operations of enterprises and promote sustainable and sound development for industry. Currently, although the low-carbon economy concept has been effectively transformed and applied to Chinese building engineering construction field, negative energy consumption and even improving economic benefits by reducing resource factors of production in building engineering project construction is widespread, leading to a low resource utilization efficiency^[2]. This is related to the fact that building engineering construction itself is a high energy-consuming industry. This is particularly true because in the context of China's social modernization and economic level improvement, the scale of building engineering project construction continues to expand. Thus, with the increasing total consumption of materials and energy in the whole construction stage of building engineering projects construction, it is increasingly likely that material and energy waste occur in some construction processes and details. Conducting fine-grained control over material and energy waste in individual construction processes is not easy, which is the primary reason for the remaining unsatisfactory level of engineering resource utilization efficiency^[3].

3.2 Numerous Construction Processes Prone to Environmental Pollution

In addition, due to the large amount of construction procedures in building engineering projects that are implemented on site, even though the low-carbon economy is widely practiced in the domestic field of building engineering, according to the excluded report on research into energy use and emissions in Chinese buildings in 2022, by way of noting that national overall carbon emissions over a completed construction environment are approximately up to 5.08 billion tons outdone half of all country wide total carbon discharges. From the summary and analysis of what has studied above, we can see that although the low-carbon economy concept implemented is able to change the specific thought for building engineering project construction management, so that key points and methods during management are more intuitive and explicit in nature, but it does not change the objective fact^[4] which "building engineering industry is the highest carbon emission industry in China". When some combination of modern building engineering projects has expanded in scale and integration with modern technologies during construction, the functions of at least two construction have become multi-faceted. But at the same time, construction processes have changed and carbon emission processes get to appear more than once. In fact, the total carbon emissions generated during modern building engineering construction have also increased rapidly, and its impact on the surrounding ecological environment has also become particularly severe.

Take engineering construction as an example, during engineering construction, the overall noise level of pollution in buildings is relatively high due to the fact that various large-scale machinery

are used for construction operations (such as cranes + mixers + dynamic compaction equipment + loaders + crushers). These machines not only need a large amount of energy to run, but also produce significant noise pollution. The superposition of noise from many large-scale mechanical equipment increases the degree of noise pollution significantly. High noise decibel levels not only disturb the daily lives, learning, and working of nearby residents [5].

An additional scenario is dust pollution, which can be the most in line with all pollution issues ultimately building engineering project setting up sites. In the construction engineering earth cement sand and other materials are used. The mechanical equipment and the wind in nature easily touch these materials to produce fine particles to form dust. Floating in the air, it will greatly reduce the local air quality, promote greenhouse effect and have a great harm to the physical health of local residents and passersby.

4. Exploration of Building Engineering Construction Management Strategies Based on the Low-Carbon Economy

4.1 Actively Use Green and Low-Carbon Building Materials to Reduce the Negative Impact of Engineering Construction on the Ecology and Human Body

The definition of low-carbon environmental protection has now been deeply rooted in people's hearts. In building engineering project construction, building engineering enterprises should also actively respond to low-carbon environmental protection concept and set foot on the road of low-carbon economy development. Therefore, the low-carbon environmental protection material application and innovation can highlight the environmental protection characteristics of construction engineering project while reducing the engineering cost. At the moment, a number of new energy-conserving and environmental protection constructing fabrics such as constructing power garage fabrics, constructing power-saving fabrics, and constructing energy-generating materials have been utilized in engineering on-site construction. These materials applied effectively alleviate the carbon emissions at construction sites and facilitate the industry-wide transformation of the direction forth to green low-carbon development in building engineering project [6]. Based on the current low-carbon economy background, the building engineering field has gradually formed a "dual carbon" development goal. In order to realize this goal, it is necessary to further enhance the promotion and application of green low-carbon building materials in modern building engineering project construction [7]. In particular, it is explicitly required to fully utilize green and low-carbon building materials and minimize the adverse human health effects of on-site construction engineering on surrounding ecological environment by considering:

Firstly, use prefabricated concrete. Now take prefabricated concrete compared with traditional concrete, we can find that in the process of configuration and production of traditional concrete there is a lot of cement consumption, thus producing non-negligible CO₂ emissions easily leading to ecological environmental pollution. As for the prefabricated concrete materials, it is helpful to reduce carbon emissions effectively, and its strength and durability are also higher than those of ordinary concrete. From the current production state of prefabricated concrete, a large number of energy-saving and environmental protection-related technologies such as solid waste utilization and green production integration technologies are actively applied to provide effective guarantee for the establishment of energy-saving and environmental protection advantages in concrete materials while reducing material costs.

Secondly, use environmental protection coatings. In China's modern building project, environmental protection coatings have gradually become common low-carbon environmental protection materials. Comprising a major share including water-based wood lacquers, latex paints, and water-based coatings. Their advantages of saving energy and protecting the environment can also be reflected in their low heavy metal content. They do not generate non-volatile harmful substances and have low toxicity, with little adverse effect on the surrounding ecological environment and human body when they are used in building engineering project construction. This indicates that in future modern building engineering project construction, the use of environmental

protection coatings should be increased to actively cope with the low-carbon economics idea [8].

Finally, use paper-faced gypsum boards. Paper-faced gypsum board is a new type of building materials, which mainly used natural gypsum and waste paper as raw material. No asbestos and other material is added during the board production and manufacturing process; low energy production expense; non-poisonous, no-harm to body. When used for the construction of modern building engineering projects, it can also realize optimization design of acoustic insulation, fire resistance and other functional characteristics of buildings, and has many green environmental protection advantages.

4.2 Develop a Fine-Grained Management Plan Based on the Specific Scale and Attributes of the Engineering Project

Construction management plan builds the foundation for us to apply low-carbon economy concept effectively in construction phase of building engineering project source. The intensity of and residents surrounding the engineering projects apply to an already developed construction management plan. Then the work can create a finer management program construction, construction on-site with these works will damage the ecological environment outside less, help reduce impacts to physical health and mental of people around. In the current stage of development, China's low-carbon economy continues to expand its scope of influence, and most construction units have actively adapted to the concept of low-carbon economy, based on special scales (for example, planning and design) of construction projects Multi-dimensional relationships such as special functional attributes, cost and engineering techniques combine theory with practice to refine construction management models into characteristic plans for low-carbon environmental-protection energy-saving construction. However, in order to ensure that the management plan above can play the expected effect at a certain implementation stage, it is necessary to continuously improve the degree of refinement of the plan and implement fine-grained construction management.

In particular, construction unit is required to introduce a more economical mean of management mode according to the specific situation of construction site based on traditional construction management, which can achieve effective integration among each process during the actual work in site. It successfully regulates the errors during construction and substandard quality in a particular construction process, which is also the key to enhancing total quality of modern building engineering construction. In addition, site construction managers are also required to manage the equipment and materials in the construction process, mainly involving storage management, maintenance management and requisition management, so as to avoid materials or even equipment because of improper storage at the construction site affects its original performance. This will also at the same time lower the total amount of wasted material and energy. Furthermore, the climate factors at the construction site should also be considered comprehensively. E.g. Concrete materials should be maintained at a offline condition targeted, and this work done flexibly based on lighting conditions and precipitation at the construction site to some extent they will guarantee good performance of concrete material and responsible for avoiding more total amount into the site area that is also an important path for low carbon construction.

5. Conclusion

In brief, deepening the low-carbon economy background, in order to build our country building engineering industry storey health development needs to combine with actual situation step up slowly introduces to set forth wide promotion of low-carbon environmental protection construction idea, carry on optimization is carried out for draft construction management plan in traditional practical experience. Not only the above requirements but also combined with some problems easily existing in the on-site construction of building engineering, such as noise pollution, environmental pollution, dust pollution and other impacts produced during construction, so that set up construction management plan more low-carbon environmental protection attribute and feasibility. The methods can take different forms from facilitating green and low-carbon of building materials to elaborated management plans in each stage of construction process based on the scale, characteristics of

engineering project. In addition, the information of construction management plan should be gradually optimized to effectively control the total carbon emissions in building engineering projects in on-site construction operations, thereby creating additional space for further development of China's building engineering industry.

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