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Analysis of Obstacle Factors for Suitable Green Reconstruction of Existing Public Buildings

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Abstract

This paper investigates and analyzes the research status of the existing public buildings suitable for green renovation, and summarizes the obstacles that existing public buildings are suitable for green renovation from six aspects, such as technology, economy, management, system, market and society, so as to provide reference and basis for promoting the green transformation of existing public buildings.

Keywords

Existing Public Buildings; Green Renovation; Obstacle Factors.

1. Introduction

When China started the work of suitable green transformation of existing public buildings, it was mainly carried out for energy-saving transformation or structural reinforcement and other aspects. Appropriate green transformation is a relatively new concept, which covers more comprehensive contents, referring both to the amount of buildings of different scales and the transformation requirements of different environments, with the aim of achieving green building performance, i.e., reducing the total energy consumption of buildings, intensively and economically using resources, and improving the safety, comfort and health of buildings.

2. Current Status of Research in Suitable Green Transformation of Existing Public Buildings

2.1. Section Headings

2.1.1. Sub-section Headings

The section headings are in boldface capital and lowercase letters. Second level headings are typed as part of the succeeding paragraph (like the subsection heading of this paragraph). All manuscripts must be in English, also the table and figure texts, otherwise we cannot publish your paper. Please keep a second copy of your manuscript in your office. When receiving the paper, we assume that the corresponding authors grant us the copyright to use the paper for the book or journal in question. When receiving the paper, we assume that the corresponding authors grant us the copyright to use the paper for the book or journal in question. When receiving the paper, we assume that the corresponding authors grant us the copyright to use.

At present, in the process of suitable green transformation of China's existing public buildings, there is still a need to improve the corresponding policy mechanism, establish and improve the corresponding standards, specification system, form and promote the technical system that can be promoted and replicated on a large scale, and the industry presents industrial development, etc. In general, China's existing public buildings are still in the stage of exploration and accumulation of suitable green transformation. According to the literature survey, most of the studies on suitable green transformation of existing public buildings are focused on technology, cost and evaluation.

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In general, most of the current research focuses on the technical aspects, which are mainly the two common greening technologies, passive and active technologies, and the adoption of the technologies should be selected by combining the actual conditions of the renovated project. For example, Yu Guobao [1] advocates the optimization of external envelope structure plus energy-saving technologies such as refined design of air conditioning equipment; Zhang Baochao [2] proposes to analyze the sources and composition of building operation energy consumption first, and then upgrade the corresponding technologies according to the analysis results; Cong Yuanwei and Li Minghui [3] conduct on-site survey and research on existing public building projects in Nanjing and propose suitable green renovation and seismic strengthening technologies.

In terms of cost, He Xiaojian [4] constructed a calculation model of incremental economic benefits of building energy renovation, which is based on the project whole life cycle theory; Cui Swen [5] used value-added life cycle theory to realize his research on how the evaluation system and method of overall benefits of energy renovation of existing buildings can respond more comprehensively.

In terms of evaluation, the latest version of the national standard "Evaluation Standard for Green Retrofitting of Existing Buildings (Draft for Public Comments)", was publicly consulted on December 25, 2020; Wang Yanhe [6] first completed the establishment of a networked self-assessment platform and designed a green retrofitting evaluation system for public institution buildings within the platform; Yang Fan [7] constructed a post-sustainability evaluation model for green retrofitting projects in existing buildings, which is based on the first-right-one topology theory; Wang [8] et al. constructed an evaluation model based on the material element topology method, which is from a purely mathematical perspective.

Therefore, this paper analyzes and summarizes the suitable green transformation barrier factors of existing public buildings, which has important practical value and guiding significance for promoting the further development and promotion of suitable green transformation of existing public buildings.

3. Analysis of Barrier Factors

Due to the many fields and wide coverage of the suitable green transformation of existing public buildings, there are many obstacle factors that affect the suitable green transformation of existing public buildings, and in order to facilitate summarization, this paper will analyze the obstacle factors from six perspectives: technology, economy, management, system, market and society.

3.1. Technical Barrier Factors

Firstly, the design team lacks the design experience of green building and does not combine with the actual needs of the main body of transformation, which cannot meet the requirements of suitable green transformation and causes the barriers to the promotion of suitable green transformation; secondly, the construction experience of suitable green transformation is lacking, and in the current construction of suitable green transformation, it is inevitable to encounter the application of new materials, new technology and new equipment, and the lack of corresponding construction experience is an obstacle that affects the transformation. Finally, it is necessary to improve the efficiency of technical input and achievement transformation of suitable green transformation, which is also one of the unavoidable technical obstacle factors for the emergence of new industries. Suitable green transformation involves theoretical research, technical research and products in green, energy saving, environmental protection and emission reduction, but ultimately implemented into the actual transformation projects, all need to realize industrialization, and higher efficiency of technical research and development

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can help promote the rapid development of industrialization of suitable green transformation technology.

3.2. Economic Barrier Factors

Firstly, the survey and design fees in the decision-making stage in the early stage of suitable green transformation, because the current survey and design fees still adopt the "Engineering Survey and Design Fees Management Regulations" issued by the State Planning Commission and the Ministry of Construction in 2002, which is 20 years ago, coupled with the fact that the survey and design of suitable green transformation projects involve a wide range of fields, which inevitably causes the corresponding survey and design fees to be unreasonable and become suitable for green transformation. Secondly, in the construction stage, the new equipment and new technology adopted in the suitable green transformation project may make the construction more difficult, thus causing the project to be postponed and bringing the corresponding cost increase risk, which becomes an obstacle factor for the promotion of the suitable green transformation; Thirdly, in the operation stage of the green transformation of the existing public buildings, the management cost increases obviously, such as the intelligent software is not Thirdly, in the operation stage of green transformation of existing public buildings, the obvious increase of management cost, such as the irregular maintenance of intelligent software and the training cost of relevant property personnel, will also become an obstacle factor for the promotion of suitable green transformation.

3.3. Managing Barrier Factors

The operation and management mode of green transformation of existing public buildings is called Energy service companies (ESCOs) (1), which is different from the current property management mode, and the lack of corresponding management talents and management experience of relevant management units is one of the main management obstacles. In the design stage, the current design concept of green transformation of existing public buildings is different from the traditional construction concept, which also causes different degrees of synergy, interaction and priority among various design specialties, bringing new problems to the management and coordination in the design stage; in the construction stage, the lack of implementation of policies, systems and specifications for the green transformation of existing public buildings and the lack of attention to them are also common obstacles in management.

3.4. Institutional Barriers Factors

At present, the appropriate green transformation of existing public buildings involves many areas, covering a wide range, the latest corresponding transformation norms are not perfect, according to the official website of the Ministry of Housing and Urban-Rural Development response to the relevant questions (2) mentioned that "the urgent preparation of the full text of the mandatory norms "existing building maintenance and transformation of general specifications" "existing building identification and transformation of general specifications", and constantly improve the existing building green Greening transformation-related norms and standards"; secondly, at present, as the connotation of greening transformation continues to expand, the corresponding evaluation standards also need to be constantly updated and expanded, the General Office of the Ministry of Housing and Urban-Rural Development on December 25, 2020, issued a notice of "Evaluation Standards for Greening Transformation of Existing Buildings (Draft for Comments)" for public consultation, so as to constantly adapt to the current of the progress of suitable green retrofitting.

3.5. Market Barriers Factors

As far as the demand side is concerned, the market demand for suitable green renovation of existing buildings is not large, mainly led by the government, and private renovation projects

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are relatively few. For the supply side, due to the many fields and wide coverage of green transformation projects, coupled with the low demand, many companies do not have corresponding experience and do not want to do it or dare to do it, resulting in no market competitiveness and the inability to form a mature market rule of suitable green transformation of existing public buildings.

3.6. Social Barriers Factors

Subjectively, on the one hand, consumers' awareness of suitable green transformation of existing public buildings is not high, and there is no obvious demand awareness for suitable green transformation of existing public buildings, which has become the biggest obstacle factor in promoting suitable green transformation; on the other hand, practitioners involved in the project have vague knowledge of the connotation of suitable green transformation and lack of professional training and education for relevant personnel. Objectively, on the one hand, the appropriate green transformation of existing public buildings is a relatively new concept, which has not yet formed a scale effect, and the corresponding transformation advantages need time to be fully reflected; on the other hand, there is a lack of construction of an appropriate green transformation exchange platform for existing public buildings, which prevents effective exchange, interaction and promotion of transformation experience in the whole industry. This is undoubtedly an obstacle factor for the development of suitable green transformation of existing public buildings.

4. Epilogue

Although China is now paying more and more attention to the appropriate green transformation of existing public buildings, targeted policies, norms and requirements continue to be introduced, the awareness of consumers and practitioners continues to improve, and the obstacles that restrict the appropriate green transformation continue to be solved, compared to the past has been relatively large, but with the continuous development of the times, the connotation of the appropriate green transformation continues to expand and deepen, I believe that new obstacles will also continue to emerge, this paper intends to throw a brick to draw in the jade, the summary of combing obstacles may not be comprehensive, but only a small contribution to the promotion and development of the appropriate green transformation of existing public buildings.

5. Notes

(1) Energy service companies (ESCOs): Energy service companies, where the compensation of the ESCO is based on the amount of energy saved through the project, thus reducing the risk of carrying out energy saving projects for the customer.

(2) "Letter of Reply to the Proposal No. 0983 (No. 021 of Urban and Rural Construction) of the Fourth Session of the Thirteenth National Committee of the Chinese People's Political Consultative Conference".

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