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A Study on the Improvement of the System for the Green Remodeling of Private Buildings

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Summary

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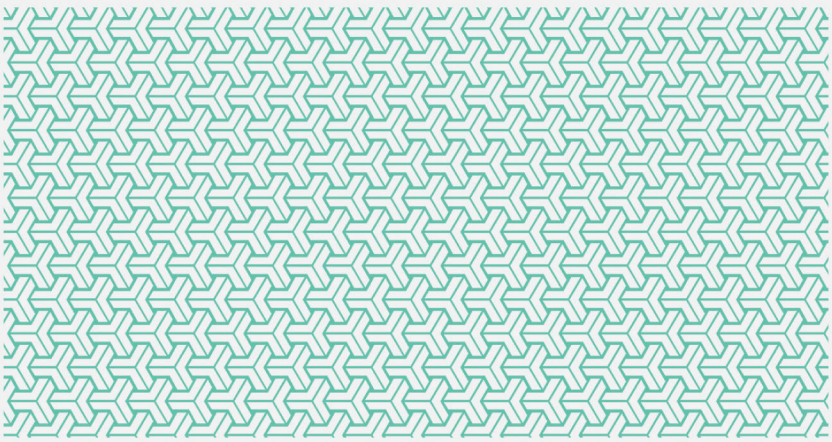

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The Korean government announced that it would establish the Korea 2050 Carbon Neutral Strategy in December 2020 under the IPCC's Paris Climate Agreement to realize carbon neutrality, economic growth, and quality of life at the same time. Also, the raised 2030 Nationally Determined Contribution (NDC) set the goal of reducing greenhouse gases by 40% by 2030 compared to 2018 as the second interim goal for follow-up measures of 2050 carbon neutrality. In addition, through the 2050 carbon-neutral scenario, the contents of the conversion by sector, such as conversion, transportation, and buildings, and the direction as a mid- to long-term roadmap for the Korean version of the Green New Deal policy were presented.

In the case of the building sector, carbon reduction targets were set in the 2030 Nationally Determined Contribution (NDC) upward plan and the 2050 carbon neutral scenario. However, there are no specific reduction targets or detailed plans as both zero-energy construction for new buildings and green remodeling for existing buildings are included in the "energy efficiency improvement" category at the same time. In particular, existing private buildings account for about 97% of all buildings, so it is practically impossible to achieve the goal of 2050 carbon neutrality in the building sector unless green remodeling of private buildings is activated.

Therefore, this study aims to find ways to improve green remodeling of private buildings. To this end, Chapter 2 reviews the current status and limitations of green remodeling of private buildings, and based on this, Chapter 3 presents various measures to improve green remodeling of private buildings. In Chapter 4, the cost-benefit analysis of green remodeling was conducted by dividing it into residential (single-family house/apartment house) and non-residential buildings, and the impact of each green remodeling improvement plan was analyzed. Chapter 5 proposed a system improvement plan and a policy implementation plan.

The green remodeling improvement plan for private buildings according to the green remodeling issues and diagnosis in this study is as follows. First, it was proposed to introduce a more effective recognition system as an intermediate stage system for recognizing energy performance improvement. Unlike new construction, certification for remodeling is not mandatory for existing buildings, and the number of Green Standard for Energy and Environmental Design (G-SEED) - the remodeling certification in green building - is very low because the actual benefits are not significant compared to the time and financial

costs required for certification. Therefore, even if it does not reach the level of green building certification, it is necessary to introduce a recognition system as an intermediate stage system that can recognize the effect of improving energy performance due to the implementation of the green remodeling project. It is expected that the recognition system will include green remodeling activities that have been individually conducted but not recorded in addition to remodeling within the license as a national management area and contribute to improving real estate value.

Second, it is necessary to improve the procedures and expand the scope of support for project of supporting interest rate of loan for private building to alleviate the administrative and financial burden on green remodeling projects. Currently, the amount of budget for project of supporting interest rate of loan for private building is significantly small compared to the total project cost, so the initial project cost is very burdensome. In addition, in the case of detached houses and non-residential houses, the measurement of energy performance improvement itself is complicated and the cost is high, so the project of supporting interest rate of loan for private building is concentrated on apartment houses. Therefore, it is necessary to expand financial support through consultations with the Korea Housing Guarantee Finance Corporation and related institutions in the future to improve interest rates and support standards and loan methods. In addition, it is proposed to standardize projects by type, simplify green remodeling procedures, and prepare a one-stop service system according to the applicant's situation.

Third, in connection with the policies of the central government, it is proposed to expand the financing plan to utilize various funds of local governments. As green remodeling is included as a type of K-taxonomy, the demand for green remodeling by ESG funds or ESG management companies is spreading, so it is necessary to propose a plan to raise funds. In addition, it is necessary to improve laws and systems and come up with specific measures to actively secure funds through links with various funds such as the Housing and Urban Fund, Private Green Finance, and the Energy Efficiency Resource Standard (EERS).

Fourth, it is necessary to induce private interest with competitions or initial pilot projects through diversification of pilot projects, and to secure economic feasibility such as tax benefits and loans for building owner' investment. Related projects by ministries should be reviewed, and business models should be diversified in connection with them, focusing on local government projects such

as house repair and empty house improvement projects and urban regeneration projects. From a residential welfare perspective, it is also possible to consider a plan to carry out green remodeling by uniting areas where vulnerable people live in old buildings. In addition, various pilot projects, such as selecting and operating a green remodeling pilot project district and promoting flagship specialized projects for buildings representing regions, industries, and daily lives, should be implemented to induce interest in green remodeling and improve awareness.

Fifth, in addition to project of supporting interest rate of loan for private building, it proposed diversification of direct support methods that can reduce the burden of initial project costs. The 3-4 percent of the project of supporting interest rate of loan for private building is low in practical sense. Therefore, an effective project is needed to reduce the burden of initial project costs through active direct support in the form of subsidies along with expanding support for the project of supporting interest rate of loan for private building. In addition, from a mid- to long-term perspective, it is necessary to provide continuous benefits such as deduction of maintenance fees of house and utilization of carbon point systems due to reduction in energy use after green remodeling.

Sixth, a plan was proposed to strengthen the standards for private buildings for the purpose of renting public institutions. Currently, leases in the public sector are excluded from the management of greenhouse gas targets and the contribution of greenhouse gas targets by institutions operating rental offices is insufficient. On the other hand, the number of government building leases in major cities is large, and the area of leases in government and public institutions is significant. Therefore, through the revision of the 「Green Buildings Construction Support Act」 and 「the Government Building Management Regulations」, it is necessary to promote the mandatory disclosure of energy performance information on buildings when renting public institutions and strengthen standards. Through this, it is expected that public institutions will be able to create demand for the expansion and induction of green remodeling of non-residential buildings.

Chapter 4 presents experts' predictions and opinions on the six private green remodeling improvement plans presented above along with the analysis of green remodeling cost benefits by building type. First, the cost-benefit analysis of green remodeling by building type was conducted by sample of 69 building data that carried out the project of supporting interest rate of loan for private building

provided by LH and the results are as follows. Detached houses showed the highest cost-benefit ratio with 1.162, followed by non-residential buildings with 0.7, and apartments with 0.384. In the case of detached houses, 20 years after the project was implemented, the cost-benefit ratio exceeds 1. However, the cost-benefit ratio of apartments and non-residential buildings did not exceed 1, resulting in insufficient cost compared to the average energy performance improvement construction cost of each building.

[Analysis of Green Remodeling Cost Benefit by Building Type (based on '20)]

Type of housing	Benefit (B)	Cost (C)	B/C
Detached houses	30.87 million won	29.11 million won	1.162
Apartment	4.5 million won	10.8 million won	0.384
Non-residential buildings	1.284 billion won	2.5 billion won	0.7

Source: Created by researchers.

Until now, the green remodeling policies focused only on improving energy performance, failing to consider the benefits of users, and for this reason, there was a limit to the expansion of the private market. In the future, green architecture, including green remodeling, is expected to contribute to improving the quality of life of users by considering not only improving energy performance for carbon neutrality but also improving environmental performance and user benefits.

Keywords :
Green Remodeling, Green Remodeling of Private Buildings, Green Architecture, Recognition System