

# 제로에너지건축물 조성 활성화를 위한 제도 개선 연구

An institutional study for the activation of zero energy building

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SUMMARY

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In addition to global efforts to reduce GHG emissions, Korea also announced its greenhouse gas reduction targets for buildings. As part of efforts to achieve this, the government announced mandatory planning Zero Energy Buildings. Therefore, in this study, we reviewed the possibility of mandatory zero energy building and the factor of inhibiting the zero energy building is derived to suggest the improvement policy and system of zero energy building.

The possibility of achieving Zero Energy Buildings was examined for the possibility of achieving Zero Energy Certification Level 5 by building use and scale. As a result, it was found that it is difficult to achieve zero energy in a certain volume ratio and coverage ratio. It has been shown that 3.2% of non-residential buildings and 1.9% of residential buildings are allocated to buildings built in the last five years. In addition, it was found that it is difficult to satisfy zero energy certification standards for apartment houses with more than 10 floors as a result of simulations of apartment houses where zero energy is expected to be most difficult to achieve. Therefore, it is urgent to find alternatives to the case where the new renewable energy production in the site can not meet the zero energy building standard.

Zero energy building case analysis showed that the inhibition factor of zero energy building is derived from two elements: legal institutional factor and socioeconomic factor. The first of the legal institutional elements is that the energy performance evaluation system is still insufficient. In the case of new and renewable energy sources, only PV, solar heat, cogeneration, and geothermal heat pumps are introduced into the evaluation system. It is necessary to expand it. In the case of residential buildings, cooling energy is not evaluated. If cooling is performed using a renewable energy source, evaluation of cooling energy should be included to facilitate the acquisition of zero energy certification. Secondly, because of incentive system operation problem, there is a case that the volume rate incentive does not appear as a conflict problem with district unit plan, local government ordinance, etc. In addition, tax incentives are not received due to licensing procedures, so it is necessary to improve the system for licensing procedures. The socioeconomic factors include the burden of additional cost due to the improvement of the building performance and the cost increase due to the introduction of new technology which is not yet commercialized. In addition, the lack of awareness of zero – energy buildings poses a problem in using it as a means of publicity to improve business performance.

We have looked at major countries' responses to the obstacles to zero-energy buildings. First, they propose ways of recognizing zero-energy buildings as regional countermeasures for lack of renewable energy production on the site, external purchasing methods such as REC purchasing, and ways to further improve energy efficiency. Secondly, with regard to the additional construction costs were the main features vary by country. In Germany, large budgets were invested. And for various situations, it provides packages such as mortgage loans and subsidy programs. In France, there are implications for establishing a company in the form of a public-private partnership, and for supporting technology, finance, etc. necessary for the implementation of energy efficiency improvement projects in buildings. The United States is developing a variety of financial programs. It offers a variety of programs ranging from traditional lending schemes to lease-based loans and fee-based loans in connection with esco companies. In addition, there is a big suggestion in Korea that a program is provided to present the program suitable for each situation to the consumer while managing each program in one place.

This study suggests the policy and system improvement strategy for the activation of the

zero energy building in Korea by integrating the obstacles to the establishment of zero energy buildings and the policy status of major foreign countries.

First, in relation to the improvement of the evaluation system, the basis for introducing off-site renewable energy was suggested, and the scope of off-site renewable energy sources is presented by dividing them into adjacent land and long distance, job installation and indirect installation. The assessment system proposed adding new and renewable energy sources and applying evaluation factors so that facilities for efficient use of new and renewable energy sources, such as ESS and heat accumulators, can be recognized. In addition, it is suggested that when the cooling energy value of the residential building is not inputted, the predetermined value is automatically inputted to calculate the energy amount, and when it is inputted, it can be evaluated favorably than the predetermined value. This is to include the cooling energy demand of the house in the management subject. It also suggested that the assessment of energy saving plan factors, such as natural ventilation, automatic flashing lights, and window frame performance, would be more precise. This is meaningful as a solution to the problem consciousness that can receive zero energy certification as a way to increase the production without decreasing the amount of energy and quantity of production because the current zero energy certification standard is organically evaluating the energy consumption and production quantity.

Secondly, in order to support additional construction costs, we proposed efforts for expanding budget, development of various financial programs and support windows in a unified package. In addition, we provided additional support measures such as providing incentives through greenhouse gas emission trading in the building sector and including zero-energy building projects in the investment items of the mandatory energy efficiency improvement system. And as a measure to solve the problem of volume incentive incentive, we proposed the revision procedure of each local governments to revise the district unit plan and the revision plan guideline to be reflected in the newly established district unit plan.

**Keywords :**

Zero Energy, Zero Energy building, Zero Energy Building Certification, Zero Energy Building Mandatory, System Improvement