Topics

Support for the development of an evaluation method for energy saving in houses concerning the Energy Saving Standard

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1. Evaluation of energy saving for newly built houses

A new standard for the evaluation of energy saving of newly built detached houses was introduced in April 2009 (Top Runner Standard for Houses). In this standard, in order to comprehensively evaluate diversifying energy saving methods such as the solar water heater and heat pump technologies, energy saving performance is evaluated based on the primary energy consumption instead of the thermal envelope performance. Primary energy consumption can be calculated by the equation in the figure. In addition to correctly evaluating the envelope performance, it is therefore important to evaluate the efficiency of the equipment and appliances such as DHW systems, ventilation systems.

2. Evaluation of the efficiency of residential equipment and appliances

For example, gasoline mileage depends on how to the vehicle is driven. Similarly, the efficiency of the equipment and appliances is largely dependent of the operating condition and usage of the occupants, NILIM has performed a study to clarify which parameters effect the efficiency of the equipment and appliances in houses under the real condition, and developed a framework for the evaluation of energy saving.

Related research projects started in 2001[1)], and through the recent research results[2)], the research results are used in the calculation of the energy saving performance in Top-Runner Standard for House. The framework of the evaluation for the housing equipment and appliances has already been completed, and the research continues in order to develop more accurate assessment methods for particular technologies.

3. Evaluation of energy saving renovations of existing detached houses

As the effective utilization of the existing houses has become important in recent years, it is now also necessary to develop the energy saving potential for renovating existing houses in addition to developing the energy saving potential for newly built houses. NILIM is therefore carrying out a research project in order to develop the evaluation method for energy saving potential of renovations[3)]. To calculate and compare the primary energy consumption of the houses before and after renovation, we are developing calculations or calculation rules such as, [1] evaluation of the thermal performance for the construction unique to the renovation such as windows replacements, [2] evaluation of the partial renovation such as renovating only the envelope of a living room, and [3] evaluation of the thermal and energy performance of the existing envelope and appliances whose performance is difficult to clarify by some inspections. This research will be used for some kind of the standards for energy saving renovation.

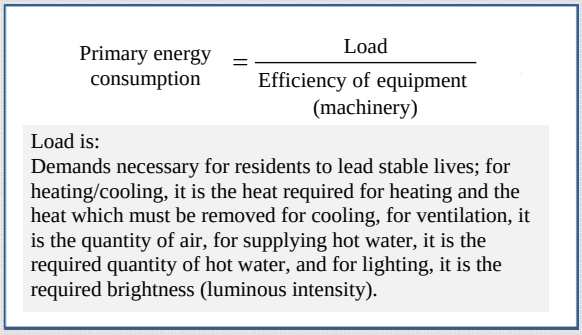

Figure Concept of Calculation of Primary Energy Consumption

[References]

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2) For example, Environment Research & Technology Development Fund, Research on

the Development and Promotion of Energy Saving Technologies on Houses (2003- 2005)
3) Development of Energy Consumption Performance Evaluation Methods for Various Types of Houses (2010 - 2012) http://www.nilim.go.jp/lab/icg/4_shouenekaishuu.htm