

# Movement towards the revision of energy saving standards for buildings

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## 1. Introduction

Carbon dioxide emissions from buildings used as offices, stores, schools, hospitals etc. increased 31.2% since 1990 (as of 2009). And further countermeasures are required as with residential buildings. In response, from 2008 to 2010, the NILIM conducted “Research on a Comprehensive Evaluation Method and Design Method Related to Energy Conservation Performance of Non-residential Buildings”, researched energy consumption of buildings and equipment systems according to the way they are used, and studied energy consumption estimation methods based on actual performance.

## 2. Research on energy consumption of building equipment

Energy consumption of buildings and equipment varies greatly not only according to the configuration of equipment systems, but to the way the building is used. “Research on a Comprehensive Evaluation Method and Design Method Related to Energy Conservation Performance of Non-residential Buildings” analyzed past energy consumption data with a focus on office buildings, and obtained detailed data to prepare more precise models. Detailed data of central air-conditioning systems (heat source, auxiliary machinery, heat supply system) is measured, and the characteristics of each type of equipment and system

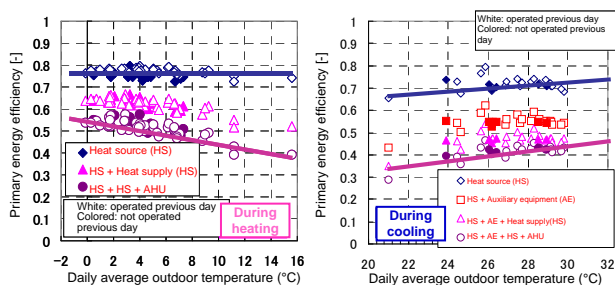


Figure 1. Results of Assessment of Efficiency of an Air-conditioning System

are examined (Fig. 1). Office automation equipment and freezing and refrigerating equipment, which generate air-conditioning load, were measured to model the relationship between the machines’ behavior, electric power consumption and heat production. For elevator and lighting, the usage condition and power consumption were researched to prepare technical documents.

## 3. Towards the revision of energy saving standards for buildings

Energy saving standards for buildings, which have been assessed based on the Perimeter Annual Load (PAL) and the Coefficient of Energy Consumption (CEC), are now being studied with their revision scheduled for 2012. Under the new standards, a method of assessing the envelope and opening performance of buildings and of equipment systems (air-conditioning, ventilation, lighting, hot water supply, elevators (Fig. 2)) based on the primary energy consumption of the whole building will be introduced. This assessment method, which will be made an obligation in the future, is based on concepts similar to the assessment method already introduced by Standards of Judgment for Residential Construction

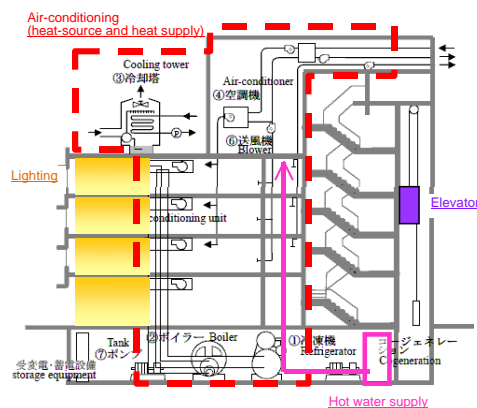


Figure 2. Example of the Building and Equipment Systems Evaluated

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Clients.

[Reference]

- 1) Nishizawa et al.: Study on the Characteristics of Central Air-Conditioning Systems for Verifying Monitoring Data, Proceedings of Conference of the Society of Heating, Air-Conditioning and Sanitary Engineers of Japan, p.1311-1314, 2010