Scheme for analyzing energy conservation performance of buildings using big data

Housing Department

A scheme was constructed to gather big data on the energy conservation performance of buildings and analyze them in the cloud system using a web program designed to judge conformance with energy conservation standards. This enables a detailed analysis of the relationship between design specifications and energy conservation performances, which used to be unclear with conventional investigation methods, as well as the efficient supply of useful data for proposing energy conservation measures.

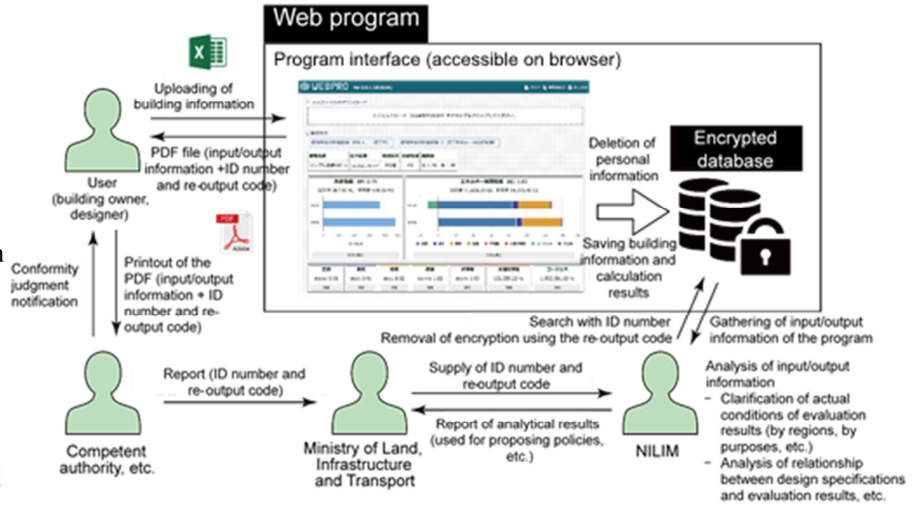
Social background and challenges

- ✓ Under the Global Warming Countermeasures Plan established based on the Paris Agreement and other measures, regulations are gradually being reinforced on large non-residential buildings, such as mandating the conformance with energy conservation standards under the Act on the Rational Use of Energy.
- ✓ It is important to properly identify actual energy conservation performances to efficiently promote energy conservation in the future.
- ✓ Currently, competent authorities are aggregating the results of evaluating energy conservation standards and reporting them to Ministry of Land, Infrastructure, Transport and Tourism (MLIT). Yet, all these procedures are being done manually, and thus the burden is large. In addition, detailed analyses cannot be done because information to gather is restricted to avoid increasing the burden.
- ✓ It is an urgent task to develop a scheme to comprehensively identify and analyze energy conservation performances without increasing burden on authorities.

Contents of research

Development of a scheme to gather energy conservation performance data using a web program

- The energy conservation standards require the evaluation of energy consumption performance using energy conservation standards conformance judgment program (web-based program) for buildings 300 m^2 or larger. The functions of this program will be expanded to gather data in the cloud system.
- Targeting non-residential buildings, data from 18,000 buildings per year (design specifications and evaluation results) will be encrypted and stored every year.



Trial of data analysis

- As a trial, the ID numbers of about 6,000 buildings for which applications were received in FY 2018 were obtained from some of the competent authorities.
- The data were analyzed to assist the amendment of the Act on the Rational Use of Energy (Cabinet Decision in February 2019), and the results were reported to MLIT.

This trial supported the proposal of energy conservation measures for buildings based on actual performances by supplying timely and proper information while reducing the workload of the authorities.

☞Relevant articles (introduction of relevant articles of the research laboratory)

- Identification of the actual conditions of energy conservation designs in non-residential buildings