

11. Effect of ZEB Renovations at the Technical Research Institute Head Office - Energy Use Reductions and Evaluations of Comfort -

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The concept of net zero energy buildings (ZEB) is an important decarbonization initiative. In addition to new construction, the ZEB concept is expected to be applied to renovations. The head office at the Okumura Technical Research Institute is a mid-sized office building defined as “Nearly ZEB” - that is, achieving reductions in energy use of 75% or more compared to standard reference values. This building is aimed to be a “Nearly ZEB” demonstration facility for proactively proposing environmental technologies based on the knowledge gained in the process of operation.

To confirm the energy balance during building operations, the authors compared the actual values for monthly energy consumption against the design values and reviewed operating methods. It was confirmed that the facility achieved Nearly ZEB status over the course of one year, with energy use reduced by 84% compared to the standard value. The authors also undertook surveys based on questionnaires to assess worker comfort. Based on these surveys, the authors determined satisfaction with the indoor environment, the factors contributing to this satisfaction, as well as the variations in worker response depending on equipment output.

Key words: net zero energy building, renovations, offices, energy balance, indoor environment, comfort