

# Prefabricated Systems for Low Energy Renovation of Residential Buildings

## ANNEX 50

Energy conservation is largely dominated by existing buildings. In most industrialized countries new buildings will only contribute 10% - 20% additional energy consumption by 2050 whereas more than 80% will be influenced by the existing building stock. If building renovation continues at the current rate and with the present common policy, between one to over four centuries will be necessary to improve the building stock to the energy level of current new construction.

Currently, most present building renovations address isolated building components, such as roofs, façades or heating systems. This often results in inefficient and in the end expensive solutions, without an appropriate long term energy reduction. Optimal results can not be achieved by single renovation measures and new problems could arise, including local condensation or overheating.

The objectives are the development and demonstration of an innovative whole building renovation concept for typical apartment buildings based on:

- Prototype, prefabricated roof systems with integrated HVAC, hot water and solar systems,
- Highly insulated envelopes with integrated new distribution systems for heating, cooling and ventilation.

The advantages of these prototypes include:

- Achieving energy efficiency and comfort for existing apartment buildings comparable to new advanced low energy buildings;
- Optimised constructions and quality and cost efficiency due to prefabrication;



*Mounting a prefabricated, highly insulating façade element.*

## INTERNATIONAL ENERGY AGENCY

The International Energy Agency (IEA) was established as an autonomous body within the Organisation for Economic Co-operation and Development (OECD) in 1974, with the purpose of strengthening co-operation in the vital area of energy policy. As one element of this programme, member countries take part in various energy research, development and demonstration activities. The Energy in Buildings and Communities Programme has co-ordinated various research projects associated with energy prediction, monitoring and energy efficiency measures in both new and existing buildings. The results have provided much valuable information about the state of the art of building analysis and have led to further IEA co-ordinated research.

## EBC VISION

By 2030, near-zero primary energy use and carbon dioxide emissions solutions have been adopted in new buildings and communities, and a wide range of reliable technical solutions have been made available for the existing building stock.

## EBC MISSION

To accelerate the transformation of the built environment towards more energy efficient and sustainable buildings and communities, by the development and dissemination of knowledge and technologies through international collaborative research and innovation.

- Opportunity to create attractive new living space in the prefabricated attic space and by in-corporating existing balconies into the living space;
- A quick renewal process with minimised disturbances for the inhabitants.

The project has been structured according to the following five research areas:

- Concept definition and specification
- Integrated roof systems
- HVAC and solar systems
- Façade elements
- Monitoring and dissemination

### Project duration

Completed (2007 - 2011)

### Operating Agent

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### Participating countries

Austria, Czech Republic, France, the Netherlands, Portugal,  
Sweden, Switzerland

### Further information

[www.iea-ebc.org](http://www.iea-ebc.org)