

2008 HIGHLIGHTS

SHC Task 37

Advanced Housing Renovation with Solar & Conservation

THE ISSUE

Buildings are responsible for up to 35% of the total energy consumption in many of the IEA countries. And, housing accounts for the greatest part of this energy use. Renovating existing housing offers an enormous energy saving potential, and it is the only strategy that can achieve a substantial reduction in energy use in the housing sector in the short-term.

OUR WORK

The objective of *SHC Task 37: Advanced Housing Renovation with Solar and Conservation* is to develop a solid knowledge base on how to renovate housings to a very high energy standard and to develop strategies that support the market penetration of such renovations. SHC Task 37 focuses on both technical R&D and market implementation.

The Task has begun to analyze the building stock in order to identify building segments with the greatest duplication and energy savings potential. Examples of building segments are year of construction, type of building, type of envelope and components. Within these segments important topics for discussions are ownership and decision structures, inhabitants and their characteristics, and actual groups of retrofit market players.

In parallel, exemplary renovation projects achieving substantial primary energy savings while creating superior living quality are being analyzed. Important aspects are the energy performance and the owner's motivations behind the renovation. Insights from this international collaboration will be shared nationally with end users in a deliberate strategy to increase the market penetration of advanced housing renovations.

SHC Task 37 is a four-year collaborative project that will be completed in December 2009.

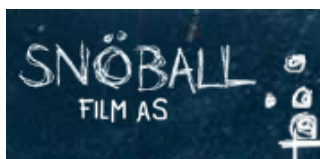
KEY RESULTS OF 2008

Film Clips on Low Energy Houses and Passivhouses

Nine film-clips were made by SNØBALL Film with financial support from The Norwegian State Housing Bank and Enova SF. SHC Task 28, Sustainable Solar Housing and this Task made this project possible.

PARTICIPATING COUNTRIES

Austria
Belgium
Canada
Denmark
Finland
Germany
Italy
Netherlands
New Zealand
Norway
Sweden
Switzerland



The film clips can be viewed or downloaded at www.lavenergiboliger.tv. Four of these film-clips are in English and German. By November 2008 this site was visited 15,000 times with 5,500 downloads of the film clips. Two of these film clips were shown at the conference “Energy Efficiency in Housing: EU Tools to Unlock the Potential” organized by CECODHAS and EEB in Brussels, Belgium on December 9, 2008.

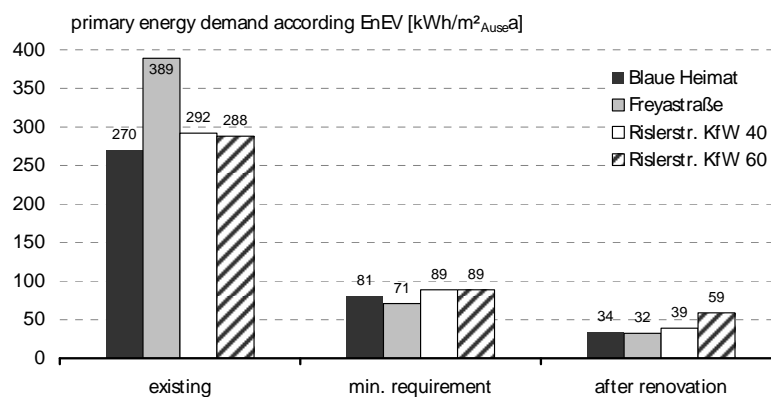
International Conference: *The climate challenge calls for dramatic energy measures in existing housing, Trondheim, Norway, September 2009*

This conference, arranged by The Norwegian State Housing Bank in cooperation with SHC Task 37 and the Norwegian project EKSBO, demonstrated the level and the volume of action that is needed, described how it can be done through national examples of strategies and projects, and spread inspiration and knowledge. About 100 persons participated in the conference as well as representatives from the Norwegian Ministry of Local Government and Regional Development.

Cross Analysis of Demonstration Projects

An in-depth cross analysis of the technology and energy performance of select demonstration projects based on a detailed energy monitoring was performed. The key findings regarding the buildings and their energy concepts were:

- **Energy:** projected targets were reached during actual operation and surpassed in some cases. Renovation can bring old buildings close to the passive house standard despite specific problems, such as ventilation, air tightness, and thermal bridges. The strict standard for the building itself means that parameters influenced by users (such as hot water consumption and ventilation) become more important, as do relatively minor energy flows (such as heat loss from distribution and storage), which then have to be taken into greater consideration during planning. The main consumption parameters are hot water and electricity. For example, the figures for *Blaue Heimat* demonstration building were heating: 18.9 kWh/(m²_{NFA}a), hot water: 28.4 kWh/(m²_{NFA}a), and electricity: 24.3 kWh/(m²_{NFA}a). Although considered during planning, the storage and distribution losses were almost half as high as the actual heating energy consumption.
- **Supply Systems:** thermal solar collectors make a significant contribution. If storage is properly dimensioned, a cogeneration unit can run at very high capacity utilization rates, thereby functioning as an efficient supply system after renovation and being an important part of a net zero energy strategy.



Comparison of calculated primary energy demand for heating, hot water and electricity for fans and circulation pumps in Rislerstrasse, Freyastrasse and Blaue Heimat.

Demonstration Projects

Several reported European housing renovation projects show a dramatic reduction in the energy demand, up to 95%. Twelve SHC Task 37 demonstration projects show energy reductions from 62 to 95%, with an average of 75%.

Many of these projects include a solar heating system for domestic hot water and/or space heating.



This Italian villa in Modena is under historic preservation. The renovation solution was to build a masonry wall on the room side of the existing wall. The cavity between it and the old wall is insulated with coconut and cork panels, 40 and 60 mm thick, reducing the U-value from 1.75 to 0.25 W/m²K. New insulating glass windows were installed on the room side of the old windows to preserve the character of the facade. Primary energy demand for space and water heating is reduced 81% from 367 to 70 kWh/m². The old 104 kW boiler could be replaced by a 35 kW condensing gas boiler. 12 m² of vacuum tube collectors on the south façade of the interior court space help cover this reduced energy demand.

Project Date	2006-2009
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Publications	http://www.iea-shc.org/task37/publications/index.html