

## 2013 HIGHLIGHTS

### SHC Task 47 Renovation of Non-Residential Buildings towards Sustainable Standards

#### THE ISSUE

The EU Parliament approved in April 2009 a recommendation that member states have to set intermediate goals for existing buildings as a fixed minimum percentage of buildings to be net zero energy by 2015 and 2020.

For the existing non-residential buildings, a dramatic reduction in primary energy consumption is crucial to achieve this goal. A few renovation projects have demonstrated that total primary energy consumption can be drastically reduced together with improvements of the indoor climate. However, most property owners are not even aware that such savings are possible, and they set energy targets that are too conservative. Buildings renovated to mediocre performance can be a lost opportunity for decades. It is therefore important that building owners are aware of such successes and set ambitious targets.

#### OUR WORK

The objectives of this Task are to develop a solid knowledge base on how to renovate non-residential buildings towards the NZEB standards in a sustainable and cost efficient way as well as to identify the most important market and policy issues as well as marketing strategies for such renovations.

The Task began by analyzing highly successful renovations and innovative concepts for the most important market segments.

To reach local authorities, companies and planners who need the knowledge on how to achieve market penetration using such solutions, the Task is communicating success stories and planning knowledge with target audiences to support the acceleration of a market break-through of highly effective renovations in non-residential buildings.

#### PARTICIPATING COUNTRIES

Australia  
Austria  
Belgium  
Denmark  
Germany  
Italy  
Norway

**Task Date** 2011-2014  
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## KEY RESULTS OF 2013

### Exemplary Renovations

Twelve exemplary renovation projects are available on the Task webpage. The projects are described in 8-page brochures presenting the key renovation actions as well as energy performance numbers, decision-making processes and costs. Eight new project brochures were completed in 2013 (Austria, Denmark, Germany, Italy, Norway).

The projects show a 50-90% reduction in heat consumption and a 50-70% reduction in overall energy demand. One of the buildings from Norway shows that it is possible to achieve a plus energy standard combined with the highest possible BREEAM score, Outstanding.

The researchers in Task 47 interviewed key actors in the decision process in nine of the projects from six of the partner countries. It is too soon to draw any conclusions as a cross analysis will be done in the second quarter of 2014. Interestingly, in some projects the ambition level changed during the process. How and why this happened will be discussed in a final report of Subtask B.

The performance of eight buildings was analyzed in terms of energy consumption and thermal comfort achieved using long-term monitoring data in high time resolution. In particular, a comparison was made between the performance before and after the retrofit. These buildings studied show that they achieved their ambitious target values set during the design stage.

The Task work also is addressing indoor comfort and quality of life, with a special focus on school buildings refurbishment (Subtask D). Most schools in Europe are old, outdated and sorely lacking comfort. This discomfort has important consequences on the health of children and teachers (who represent a large proportion of the European population), but also on the learning and teaching abilities. The objective of this work is to offer designers and developers renovation guidelines to significantly improve the energy performance of schools, the comfort of children and teachers, and the quality of life and use of school buildings.

All these recommendations will be included in a Guide, with chapters on:

- Improve the comfort and quality of life
- Reduce the consumption of fossil fuels
- Reduce the consumption of non-energy resources (materials, water, etc.)
- Reduce waste (waste water, building and domestic waste)

The Guide will be illustrated with innovative concepts of exemplary projects and links with the BREEAM Assessment methodology.

**Renovation Examples**

**Schiuco Italian Headquarter**  
november 2013 - PDF 2,05MB - Posted: 11.25.2013  
By: S. Pansa, T. Poli  
The building from 1990 includes several solar energy installations: 600 kWp PV system, solar absorption chiller 15 kWf and 10 m2 solar collectors for DHW

**Boligselskapet Sjælland Office Building**  
november 2013 - PDF 1,73MB - Posted: 11.25.2013  
By: Jørgen Rose and Kirsten Engellund Thomsen  
The office building from 1968 was extended with a penthouse to the top of the building. 130 m2 PV-system included.

**Office and Workshop Building at Fraunhofer ISE - Germany**  
**Fraunhofer ISE Campus**  
august 2013 - PDF 1,76MB - Posted: 8.14.2013  
By: Doreen Kalz and Arnulf Dinke  
Building from 1975 renovated in 2011. Wall insulation including ventilation ducts.

**Powerhouse Kierbo – Norway**  
august 2013 - PDF 1,6MB - Posted: 8.14.2013  
By: Arne Ferland-Larsen  
Two office buildings from early 1990s are renovated to a plus energy standard using high insulation standard, PV and ground coupled heat pump.

**Printing Workshop and Office Building - Germany**  
august 2013 - PDF 0,96MB - Posted: 8.14.2013  
By: Doreen Kalz  
Building from 1978 renovated in 2005 and 2011. Thermal comfort evaluated both in summer and winter condition.

**Kampen School, Norway**  
mars 2013 - PDF 1,4MB - Posted: 3.12.2013  
By: Mads Mysen and Anna Svensson  
A demonstration project where new concepts for energy efficient ventilation and lighting are integrated, using the existing ducts and demand control sensors.

**School in Schwanenstadt - Austria**  
januar 2013 - PDF 1,1MB - Posted: 2.10.2013  
By: Claudia Dankl, Thomas Steffi and Susanne Supper  
School building from 1990s with numerous expansions. Renovated in 2006/07 to meet the passive house standards.

**Osrøm Culture Centre – Denmark**  
januar 2013 - PDF 1,6MB - Posted: 2.10.2013  
By: Jørgen Rose and Kirsten Engellund Thomsen  
Built in 1953 as an industrial building and renovated in 2009. The first prefabricated building in Copenhagen.

