



Proposal/Contract no.: FP6-503186

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**DEMOHOUSE**

Design and Management Options for improving the energy performance of Housing

SPECIFIC TARGETED RESEARCH OR INNOVATION PROJECT

Thematic Priority 6

**Deliverable 6 Catalogue of best available technologies**

Due date of deliverable: xxx  
Actual submission date: xxx

Start date of project: October 18<sup>th</sup>, 2005

Duration: 4 years

**Cenergia Energy Consultants**  
Peder Vejsig Pedersen

## Executive Summary

The EU- Demohouse project is a specific targeted research and innovation project supported by the EU – 6<sup>th</sup> Framework programme. It started in October 2004 and is ongoing for 4 years until October 2008. Demohouse is here an acronym for Design and Management Options for Improving the Energy Performance of Housing. ECN from Holland is coordinator and there are realised demonstration projects in 5 countries – Denmark, Austria, Hungary, Spain and Greece, with main focus on housing renovation.

The main goal of WP2 is: “Generation of solutions and technical designs”, which is coordinated by Cenergia from Denmark, is to assist with the development of a new quality and value oriented design process in connection to renovation projects in the housing sector.

The energy use for space heating in dwellings can be reduced by well insulating and air-tight external walls, floors and roofs, and using energy efficient windows. Here it is important to minimise cold bridges and limit the heat loss occurring through them. Typically in concrete construction housing blocks with balconies, the concrete balcony slab is directly connected without any insulation to the floor concrete slab. It is recommended to connect refurbished balconies with an insulation layer towards the inner of the building. Attention should also be given to use windows in renovations that have insulated frames, so the overall heat losses through is minimised. It is also important to consider energy savings in connection to the mechanical ventilation system. Here new ventilation solutions with low cost and high-efficiency heat recovery should be considered, also to improve the indoor air climate. Effort should be made to reduce the electricity use for operation of fans and pumps as much as possible.

Furthermore, renewable technologies could be used, such as solar thermal or PV electricity to cover part of already reduced energy demand with other energy efficient measures. An optimised energy supply solution with reduced heat losses should be provided e.g. district heating, gas heating or use of heat pumps. Here it is important to have minimised distribution heat losses from both space and domestic hot water heating.

In terms of best practice technologies presented in this report are:

- Windows
- Insulation
- Air tight constructions
- Heat recovery ventilation
- Condensing gas boilers
- District heating systems
- Combined heat and power production
- Heat pumps
- Natural, hybrid and PV-assisted ventilation
- Solar domestic hot water heating systems
- PV installations
- Energy Signature monitoring and follow-up system.

When using mature technologies such as improved insulation of the building envelope and energy-efficient windows, a substantial potential for energy reduction in renovation projects exists. When combined with somewhat newer technologies like PV, heat recovery ventilations systems, heat pumps, energy savings are even greater. Interestingly, the current Best Available Technologies offer better energy performance than energy demands expected to be implemented in 2011 based on the EPBD, European Performance in Buildings Directive. In the last part of the report the EU-Demohouse partners participating countries requirements for different best practice technologies are presented.