



Proposal/Contract no.: FP6-503186

DEMOHOUSE

Design and Management Options for improving the energy performance of Housing

SPECIFIC TARGETED RESEARCH OR INNOVATION PROJECT

Thematic Priority 6

Deliverable 9 Lifecycle optimisation and CO₂ reduction

Due date of deliverable: October 2006

Actual submission date: October 2007

Start date of project: October 18th, 2005

Duration: 4 years

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Executive Summary

The EU - Demohouse project is a specific targeted research and innovation project supported by the EU – 6th Framework programme, which started in October 2005 and which 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 a main focus on housing renovation.

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

The life cycle costs and CO₂ emissions have been calculated for each Demohouse renovation building. This was then compared to the existing building and a standard renovation case. The simple pay-back times and CO₂ emission reductions were also calculated and optimal renovation measures in each renovation building identified.

In case of the Danish renovation building it was found that CO₂ emission reductions of 68 % are possible with a pay back time of 21 years. In case when heat recovery ventilation HRV, and improved air tightness was added to the renovation measures, the payback time was significantly reduced to approximately 9 years. In terms of savings made, there was 57% operation costs reduction compared to existing situation and 45% operation cost reduction compared to standard renovation. When including HRV system and improved air tightness are included the cost reduction was 29%. In case of the Spanish renovation project operation costs amounted to 68% CO₂ emission reductions, pay back time of 25 years with 63% operation cost reduction. In the Austrian renovation project the payback calculated is 25 years and reduction in operation costs of 40% compared to existing situation and 14% compared to standard renovation. For Hungary the pay back time is 35 years, with 60% operation costs reduction compared to existing situation and 46% compared to a standard renovation. For the project in Greece a 17 year payback is calculated for standard renovation. When including heat recovery ventilation and earth heat exchangers the pay back time is reduced to 6 years while it is 11 years when including building energy management system BEMS. The operation costs reduction is 66% compared to existing situation and 52% compared to standard new build.