



IEA – SHC Task 37

Advanced Housing Renovation with Solar and Conservation



Advanced Housing Renovation with Solar and Conservation

A research and demonstration project of the International Energy Agency, Solar Heating & Cooling Programme (IEA SHC). Duration: 2006 - 2009

Buildings are responsible for up to 35 percent of the total energy consumption in many of the IEA participating countries. Housing accounts for the greatest part of the energy use in this sector. Existing housing must often be renovated to meet contemporary expectations and life styles. When energy saving is also a goal of such renovations, this large national end-use of energy can be substantially reduced.

Many exemplary renovation projects have been carried out, but the experience gained has not been systematically analyzed and such projects are at best only locally known. Because most property owners are not even aware

how far energy demand can be economically reduced, they too often set mediocre goals. This is a missed opportunity to prepare buildings for the future energy era.

This programme will analyze and publicize highly successful renovations (Subtask B). From this analysis innovative concepts will be identified and further developed for the most important housing market segments (Subtask C). The global environmental impact of such solutions will also be examined (Subtask D). Priority will be given to housing types and concepts with a large multiplication potential and marketing strategies developed (Subtask A).

Results

The four subtasks of the programme will publish results primarily on the Internet site of the IEA SHC Programme: www.iea-shc.org.

Results will be uploaded throughout the programme's duration, including:

- Housing types with large multiplication and energy saving potential (Subtask A).
- Strategies for increased market penetration of housing renovation in se-

lected market segments (Subtask A).

- Exemplary renovation projects: design, performance and motivations (Subtask B).
- Technically and economically robust concepts for housing renovation (Subtask C).
- "Basics" on the design and construction of sustainable renovation projects considered at a larger scale (Subtask D).



Apartment Building in Zurich, CH



Husby Terrasse Housing in Stjørdal, NO



Apartment Building in Freiburg i.B., DE

Four Subtasks

(A) Marketing and Communication Strategies

To identify building types and concepts with the greatest multiplication and energy saving potential national statistics on existing housing stocks will be reviewed. Feedback from building owners, real estate managers, planners and occupants will be considered as well. To maximize the impact of SHC Task 37 market strategies for companies, authorities and research institutes will be developed and flanked with targeted communication plans.



Leader Subtask A
Are Rødsjø, NO

(B) Advanced Projects Analyses

Exemplary renovation projects will be selected which make use of an innovative approaches, achieve major improvement in living quality and aesthetics, and are affordable. A standard reporting format and units will be used to allow cross comparisons. Data will be collected from owners, property managers, planers and occupants of renovated projects. The objective is to characterize the renovation process, motivations, benefits and opportunities for improvement.



Leader Subtask B
Robert Hastings, CH

(C) Concepts Development

Drawing on market analyses (A) and the analyses of exemplary projects (B) concept packages will be identified and analyzed in detail to maximize their life cycle benefit/cost ratio (in the broader sense of “benefits” and “costs”). The work will draw on simulations, monitoring of in-place applications and feedback from industry. Details of solutions, design advice and examples of phased, compatible renovation measures will be reported.



Leader Subtask C
Sebastian Herkel, DE

(D) Environmental Impact Assessment

The environmental impacts of a sample of renovation projects will be assessed. Factors such as: CO₂, water, waste, materials flow, use of urban space and health as well as social consequences will be considered. Projects will be favored which embrace the “long life – loose fit” principle (ability of a structure to accommodate changing demographic demands). Life cycle analyses will be carried out in the full range of scales from components to urban neighbourhoods.



Leader Subtask D
Sophie Trachte, BE



Operating Agent
Fritjof Salvesen



Single family house in Kristiansand, NO



Apartment Building in Rotterdam, NL



Apartment Building in Linz, AT

Task National Contacts and Participating Organisations

Austria

Thomas Mach
thomas.mach@tugraz.at

Participants:

- Graz University of Technology
- Österreichische Gesellschaft für Umwelt und Technik
- Arseanal Research
- AEE INTEC

Belgium

Sophie Trachte (Leader Subtask B)
trachte@arch.ucl.ac.be

Participants:

- Université Catholique de Louvain
- Passiefhuis-Platform vzw
- Belgian Building Research Institute

Canada

Anil Parekh
AParekh@NRCan.gc.ca

Participants:

- CANMET Energy Technology Centre
- University of Waterloo; Fac. of Environmental Studies

Denmark

Olaf Bruun Jørgensen
o.b.joergensen@esbensen.dk

Participants:

- Esbensen Consulting Engineers AS

Finland

Mia Ala-Juusela
mia.ala-juusela@vtt.fi

Participants:

- VTT Building and Transport

Germany

Sebastian Herkel (Leader Subtask C)
sebastian.herkel@ise.fraunhofer.de

Participants:

- Fraunhofer-Inst. Solar Energy Systems
- Passivhaus Institut
- Fraunhofer-Inst. Bauphysik

Italy

Valerio Calderaro
valerio.calderaro@uniroma1.it

Participants:

- University La Sapienza of Roma

Netherlands

Henk F. Kaan
kaan@ecn.nl

Participants:

- ECN - Energy Research Centre Netherlands
- DHV B.V.
- Dutch PassiefHuis Holland
- moBius consult

New Zealand

Albrecht Stoecklein
albrechtstoecklein@branz.co.nz

Participants:

- BRANZ Ltd.

Norway

Are Rødsjø (Leader Subtask A)
are.rodsjo@husbanken.no

Fritjof Salvesen (Operating Agent)
fs@kanenergi.no

Participants:

- Norwegian State Housing Bank
- KanEnergi AS
- SINTEF Buildings and Infrastructure
- Segel AS

Sweden

Ulla Janson
ulla.janson@ebd.lth.se

Participants:

- Lund University - Energy & Bld. Design
- Skanska Sweden AB / Skanska Technology

Switzerland

Robert Hastings (Leader Subtask B)
robert.hastings@aeu.ch

Participants:

- AEU GmbH

IEA / SHC

The International Energy Agency (IEA) was established in 1974 as an autonomous agency within the framework of the Economic Cooperation and Development (OECD) to carry out a comprehensive program of energy cooperation among its 25 member countries and the Commission of the European Communities.

Collaborative programs in many energy technologies areas are conducted under Implementing Agreements of which there are currently 42. These

cover fossil fuel technologies, renewable energy technologies, efficient energy end-use technologies, nuclear fusion science and technology, and energy technology information centres.

The Solar Heating and Cooling Programme was one of the first IEA Implementing Agreements. Since 1977, its 21 members have been collaborating to advance active and passive solar, and photovoltaic technologies and facilitate their application in buildings.

Apartment Building in Ludwigshafen, DE



www.iea-shc.org