SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

EBC
Energy in Buildings and Communities Programme

Factsheet

Deep Renovation of Historic Buildings Towards Lowest Possible Energy Demand and CO_2 Emissions

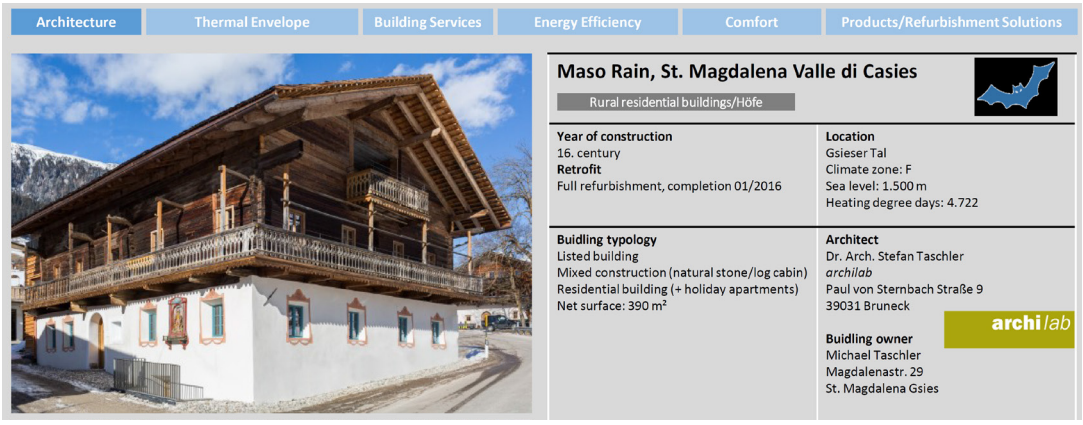
EBC ANNEX 76 - SHC TASK 59

In many countries historic buildings represent a significant share of the existing building stock. They are the distinctive features of numerous cities, and will only survive if maintained as living spaces. To preserve this heritage, it is necessary to find conservation-compatible energy retrofit approaches and solutions, which allow the historic and aesthetic values to be maintained while improving comfort, lowering energy costs and minimizing environmental impacts.

Completed examples have shown that reducing the energy demand by 75% may be possible for historic buildings while preserving their heritage value. A considerable reduction in demand - together with optimised use of passive solar design - opens up the possibility of proceeding with an effective solar contribution towards a net zero energy building (NZEB). In this context, the opportunities for using solar energy in historic buildings are far more substantial than one might initially expect, especially if solar panels / collectors are compatible in colour and design, are wisely integrated as to not interfere aesthetically with the building, and their installation is reversible.

PROJECT OBJECTIVES

1. developing a solid knowledge base on how to save energy in renovation of historic and protected buildings in a cost efficient way and identify the energy saving potential
2. identifying and assess replicable procedures on how experts can work together with integrated design to maintain both the heritage value of the building and at the same time make it energy efficient and develop tools which support this procedure and its individual steps
3. identifying and assess conservation compatible retrofit solutions with a 'whole building perspective', specifically identify the potential for the use of solar energy (passive and active, heating, cooling and electricity) and promote best practice solutions



Draft template for the web-based database of best practice
Source: Eurac Research

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The International Energy Agency (IEA) was established as an autonomous body within the Organisation for Economic Co-operation and Development (OECD) in 1974, with the purpose of strengthening co-operation in the vital area of energy policy. As one element of this programme, member countries take part in various energy research, development and demonstration activities. The Energy in Buildings and Communities Programme has co-ordinated various research projects associated with energy prediction, monitoring and energy efficiency measures in both new and existing buildings. The results have provided much valuable information about the state of the art of building analysis and have led to further IEA co-ordinated research.

EBC VISION

By 2030, near-zero primary energy use and carbon dioxide emissions solutions have been adopted in new buildings and communities, and a wide range of reliable technical solutions have been made available for the existing building stock.

EBC MISSION

To accelerate the transformation of the built environment towards more energy efficient and sustainable buildings and communities, by the development and dissemination of knowledge and technologies through international collaborative research and innovation.

ACHIEVEMENTS

The project achieved the following main deliverables:

- a web-based collection and documentation of approximately 50 case studies of best practice from all participating countries,
- an integrated platform with tools for holistic historic buildings retrofit to support the planning process towards conservation compatible NZEBs,
- reports on conservation compatible energy retrofit technologies and strategies to achieve high energy and environmental performance.

To reach the project's objectives, the IEA Solar Heating and Cooling-led team has co-operated with the IEA Energy in Buildings and Communities and IEA Photovoltaic Power Systems Technology Collaboration Programmes.

The following reports have been published as the official project deliverables: Renovating Historic Buildings Towards Zero Energy

Project duration
Completed (2017 - 2021)

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