

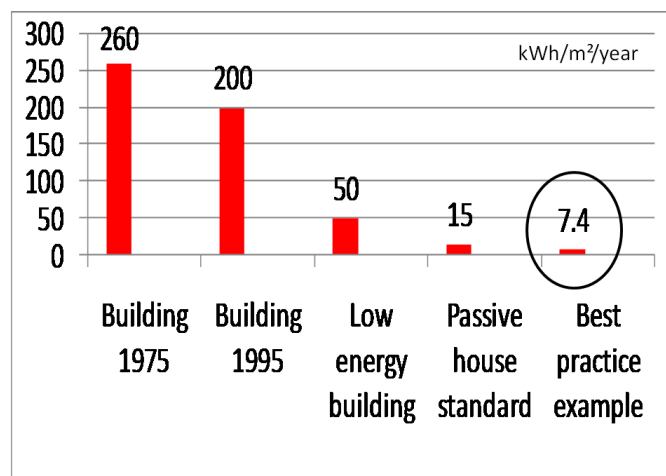
The ECO-BUILD newsletter aims at informing the construction industry, researchers and public administration about the results and development of EU-funded research on energy efficiency in the building sector. This is the first of a series of newsletters dealing with a wide range of topics, ranging from new technologies and best practice models to the discussions surrounding the recasting of the European Directive on the Energy Performance of Buildings.

This issue focuses on the role of innovative technologies in highly energy-efficient new and refurbished buildings. The examples provided below are intended to illustrate the main findings of the first part of the ECO-BUILD project and indicate the policy relevance of ongoing research activities. Furthermore, the newsletter will provide some interesting links and web-based resources for experts in the field of energy-efficient buildings.

Preliminary results

Best practice models

An analysis of current best practice models clearly shows that practically all new residential buildings can be built to high energy performance standards at a very reasonable cost. One example includes a 10,000m² residential building complex completed in 2007 by a housing co-operative in Vienna. In order to meet the criteria for public social housing subsidies, the construction costs had to remain below 1,450 Euro per m². Nonetheless, the actual energy consumption for heating and cooling is only 7.4 kWh/m²/year (see figure).



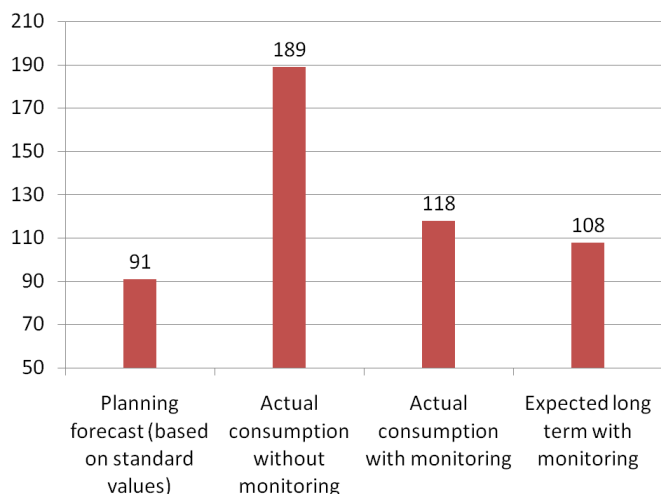
At the same time there are none of the compromises to comfort previously associated with highly energy-efficient buildings; all apartments have balconies or terraces, each room can be heated separately and there is a subterranean garage under the building. The stunning energy performance is largely achieved by complete insulation and a great deal of ingenuity was devoted to preventing heat bridges from balconies and the garage. Warm water is produced in decentralized fashion by ambient air heat pumps in each apartment. Air Inflowing into the building can be 'passively' pre-heated in winter or pre-cooled in summer by means of an underground pipe system. The only drawback of the building in terms of energy efficiency is the heating system. For reasons of construction cost and simplicity it was decided to use electrical radiators at the air inlet in each room. For more information please visit www.ecobuild-project.org.

Monitoring of new buildings

In the buildings studied in the ECO-BUILD project two problems frequently arose due to a lack of monitoring. First, it is well known that many newly constructed buildings do not meet the energy efficiency levels calculated and projected on the basis of the standard values for energy efficiency certificates. This is partly the result of shortcomings in the calculation methods, but equally important are problems concerned with following the original building plans precisely.

Second, innovative technologies require a certain amount of fine tuning and monitoring after the building has gone into operation. This also includes instructions for the users of the building. A striking example of this need for monitoring is the case of refurbishing a 19th-century building, i.e. part of the city hall in Cambridge, Massachusetts. According to the planners' calculations, the overall energy consumption (incl. lighting and appliances) was expected to be 91kWh/m²/year after renovation (see figure). When measuring the actual consumption during the first year of its operation, it turned out that the building was actually using 189kWh/m². First

it was believed that this large discrepancy was due to errors in the initial calculation and to construction flaws, especially in the insulation. An 'energy agent' was brought in to check and fine-tune the system and train the users of the building. After the second year of its operation the energy consumption of the building was brought down to 119kWh/m² and it is expected that some further fine tuning of the heating and lighting systems will reduce consumption even further.



The main lesson of this case is the sensitivity of state-of-the-art technologies to very small operational changes and thus the need for regular expert monitoring during the operation phase of the building. For more information please visit www.ecobuild-project.org.

Key to success in refurbishment

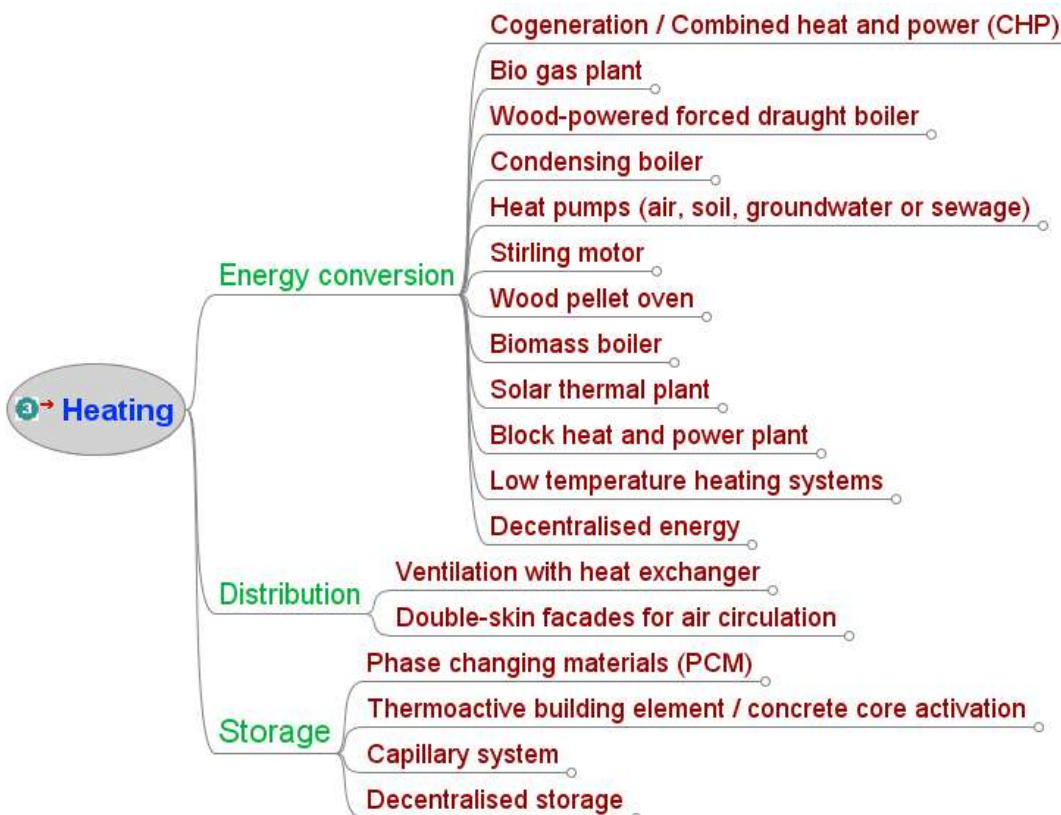
The analysis of refurbishment cases shows that, apart from choosing technologies which complement complement one another, the most important key to success is actually the ingenuity of adapting these technologies to each specific building and set of

circumstances. Two of the most striking examples include the thermal insulation of an 18,000 m² residential building in Berlin constructed in 1974 and a 19th-century farmhouse in the Austrian countryside. In the first instance for

architectural reasons it was not possible to cover the entire building with insulation and yet a thermal envelope was created that reduced the consumption for heating to 'low energy house' standards. In the second case a technique was developed for thermal insulation beneath the foundations of an existing building. For more information please visit www.ecobuild-project.org.

Innovative concepts and technologies

Innovative concepts and technologies are at the heart of striving towards more energy efficiency in the building sector. On its website, the ECO-BUILD project provides an online overview of most currently available concepts and technologies with short descriptions and a wide range of web-links for more in-depth information. The concepts and technologies are organized into eight categories; insulation, ventilation, heating, cooling, control/monitoring systems, building envelope/glazing, lighting and decentralized electricity production. An example of the category 'heating' is presented in the figure below. For a full overview, descriptions and web links please visit www.ecobuild-project.org/technologies.



Events and meetings – past and upcoming

'Innovative Concepts and Technologies for Energy Efficiency in the Building Sector'

1st Ecobuildings Cluster Workshop, May 2008, Brussels

The workshop presented an overview of the most promising technologies and concepts currently available in the building sector. It was attended by 60 experts from the fields of research, industry and architecture. All papers and presentations, as well as the main conclusions of the workshop, are available for download at www.ecobuild-project.org.



Participants at first Workshop

'Visions and Policies for Improving Energy Efficiency in the Building Sector'

2nd Ecobuildings Cluster Workshop, 5 – 6 March 2009, Brussels

The upcoming second workshop will focus on the effectiveness of concrete policy measures, including the successes and failures of different types of policy interventions in various EU Member States. Broadly speaking, this will include three groups of possible interventions; rules and regulations, subsidies and incentives, and information and awareness-raising. In the framework of the recasting of the European Energy Performance of Buildings Directive it will be important to analyze the experiences with different types of policy measures and their complementarities when implemented as a package. The workshop will be attended by approximately 100 policy-makers, researcher and industry representatives. For further information and registration please visit www.ecobuild-project.org.

Interesting Links

Online bookmark database

ECO-BUILD provides an online database of bookmarks for energy efficiency in the building sector. Use of the system does not require registration, but registered users may contribute their own bookmarks and help the system grow. For more information visit <http://delicious.com/ecobuild>

EPBD Website

The Energy Performance of Buildings Directive (EPBD) website is an information resource established by the European Commission to support practitioners, consultants, experts in energy agencies, interest groups and national policy makers with issues arising from the implementation of European legislation. For more information see www.buildingsplatform.org.

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