Architecturally appealing solar thermal systems – a great marketing tool in order to attract new customers and market segments

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Abstract

Architectural integration is a major issue in the development and spreading of solar thermal technology. Unfortunately, the architectural quality of integrated solar thermal systems in many existing buildings is poor, which often discourages new potential users [1].

Henning studied the attitude among people towards solar collectors and systems from a social anthropological point of view in 2000 [2]. Evidence showed that strengthened legitimacy and increased branch status is needed in order to attract new customers and market segments.

As a contribution from IEA-SHC Task 39 [5] to the challenge of making solar thermal systems more desirable, a database consisting of showcases where solar collectors have been successfully integrated into the architecture have been established. The idea is to make solar thermal more desirable by showing examples of visually appealing solar systems – something people really would want to put on their houses and something architects would want to implement in their design of new buildings.

Keywords: architectural integration, solar thermal systems, marketing

1. Introduction

Although mature technologies at competitive prices are largely available, solar thermal is not yet playing the important role it deserves in the reduction of buildings fossil energy consumption. There has been a rapid market growth over the last few years, but the spread of solar thermal installations is still very modest taking into account the fact that the technology is highly efficient and proven with a payback time much shorter than lifetime and a cost per kWh of 6 to 10 times cheaper than photovoltaic [3]

The cost effectiveness and simplicity of solar thermal systems indicate that this is not the sole reason for the general lack of interest for these technologies by both end users and building professionals.

The general impression of solar thermal systems today, is that these are suffering from a low-tech/low status image (technically complicated but low-tech), especially when compared to photovoltaic systems. Contributing to this view, are all the published photos and illustrations of solar collectors randomly put up on roofs (fig.1).

Fig. 1 Solar collectors randomly mounted on roofs.

More effort should be put into presenting products, systems and projects in an appealing way.

2. Architectural integration as a marketing tool

2.1. Motivation and background

The architectural quality of integrated solar thermal systems in many existing buildings is poor and is pinpointed by many experts as one major reason for the lack of popularity of the technology. Because the solar systems are relatively large in relation to the building envelope, the architectural quality of their integration has a major impact on the visual quality of the building [1]. This should, together with the fact that public acceptance of solar energy to a high extent depends on the quality of the architectural integration, stimulate and motivate a much stronger focus on making solar systems visually appealing– something people really would want to put on their houses and something architects would want to implement in their design of new buildings.

Fig. 2 Solar collectors integrated into the architecture.

In the most developed solar thermal markets, combined systems for both domestic hot water preparation and space heating/cooling are increasing their market share. Such systems cover a bigger part of the total energy demand in the building, but require larger areas for collector installation. In this perspective, the implementation of solar thermal collectors into façades becomes very interesting. Here large areas can be found. However façade integrated collectors are visually exposed to a much higher extent than roof integrated collectors;

- *Façade integrations are much more delicate than their roof counterpart because of the high visibility of the collectors. As the façade is the public face of the architecture, the collectors cannot simply be used as added technical elements; their architectural integration need to be satisfactory and the design controlled* [1]

2.2. Architectural integration – finally a hot topic

Evaluation of architectural quality is a complex debate and a very hot topic in architectural sciences nowadays. The topical importance has resulted in a new Task - "Solar Energy and Architecture" - dedicated to the architectural aspects of solar technologies and applications. This is the first

time that the word 'Architecture" appears in a Task title, after 30 years of IEA researches and 40 Tasks mainly focusing on solar technologies for building application. One of the main objectives of Task41 is to define general architectural quality criteria and extract recommendations for solar components and systems, to support manufacturers in developing existing products as well as new products [4].

This increased interest from architects in solar energy as a solution for heating is considered to be of great importance, both when it comes to product development (collectors, jointing, framing etc.) and of course the general quality of solar thermal installations.

2.3. Architectural integration from a marketing perspective

Our (the SHC/Task39 group) approach to the topic is to look at successful architectural integration as a marketing tool, simply because we believe that people are inspired by visual impressions. The appearance of a product certainly counts in making a first impression on a customer and often plays a decisive role in the final decision to buy or not. Effective use of design and high visual quality adds value to the product and builds trust and confidence. Attractive design also helps in differentiating between competing products.

When it comes to solar thermal systems, the collector design is only one part of the final product. Placement of the collector field and good architectural integration is more important for the final result that will be judged by the public. To focus on showing really good examples of harmonic and well designed solar thermal systems can be a important parameter for market development and help to re-define solar thermal to the public as something high-tech, good looking and sustainable.

3. Web-Database

3.1. Visually appealing solar thermal installations as a source of inspiration

As a contribution from IEA-SHC Task39 [5] to the challenge of making solar thermal systems more desirable a database consisting of showcases where solar thermal energy systems have been successfully integrated into the architecture has been established. The idea is to make solar thermal more desirable by showing visually appealing solar systems – something people really would want to put on their houses and something architects would want to implement in their design of new buildings. It presents a range of buildings where not only function, but also aesthetics and architectural integration, have been in focus when designing and installing solar thermal systems.

The technical and economical key data are only briefly listed in the database while photos and illustrations are emphasized.

3.2. Collecting showcases for presentation

Information about the database was sent out to over 30 collector producers, distributors of solar thermal systems and architects together with a call for projects proposals. We asked for good photos and used a short and simple questionnaire to collect relevant project information like;

- general project data (type and size of building, location etc.)
- type of solar heating system (domestic hot water system, combi-system etc.)
- collector area
- auxiliary heating
- type and size of heat store
- collector description and economic figures

3.3. Evaluation of project proposals

We received 21 project proposals as a result of the first call. The proposals have been evaluated by a group of experts, considering both technical and architectural aspects.

Architectural evaluation is done by **Susanne Gosztonyi**, architect, AIT (Austrian Institute of technology) and **Bjorn Larsen**, architect, chairman of the board, Norwegian Solar Energy Society.

Technical evaluation is done by **Karl-Anders Weiss**, Dipl. Phys.- oec., Head of Team Analytics at Fraunhofer ISE and **John Rekstad**, Professor, Department of Physics, University of Oslo.

The following formal aspects were considered;

- innovative system design
- dimension and orientation compared to the type of application
- multifunctionality
- formal architectural appearance
- colour adjustment with envelope
- frame/jointing quality and integration design
- proportions of envelope/collector position & field
- collector field position & combination

3.4. Examples – showcases

Fig. 3 I-Box concept, Storelva/Tromsoe Norway (collector producer: Viessmann).

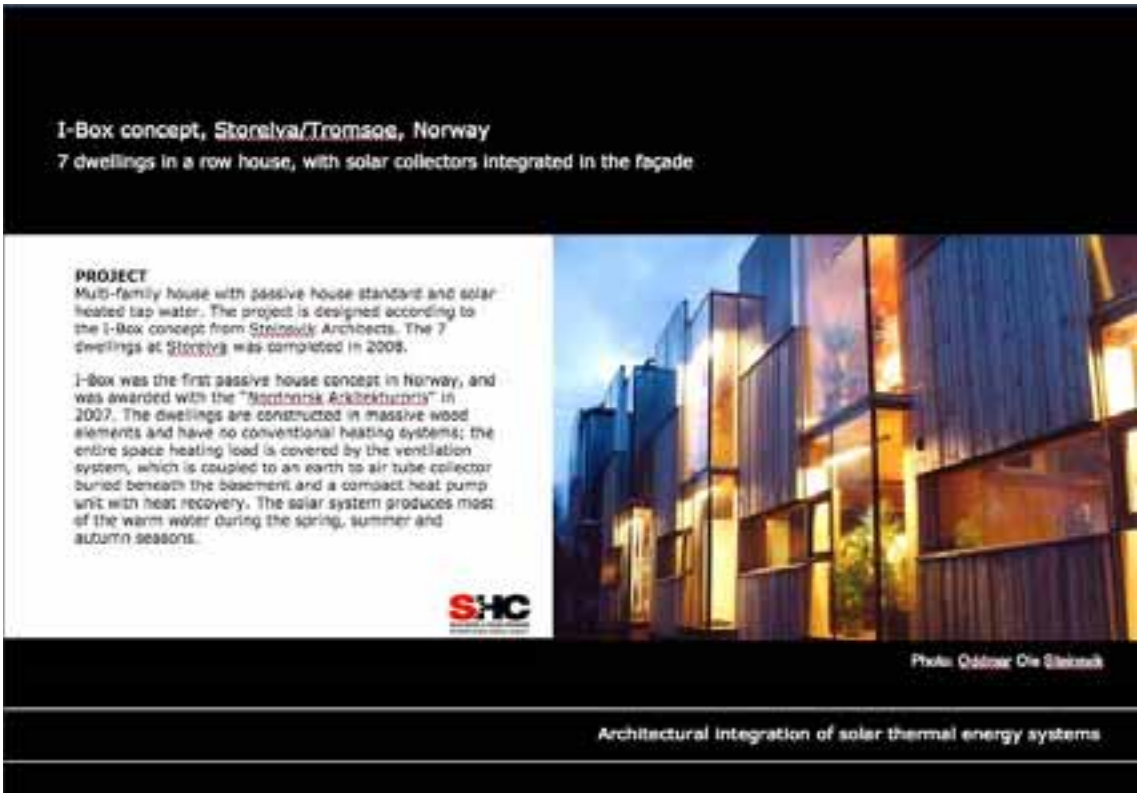

Fig. 4 Penthouse Vienna, Austria (collector producer: Viessmann)

Fig. 5 “Home for life” concept house, Aarhus/Denmark (collector producer: Velux)

Fig. 6 Bjoernveien 119, Oslo/Norway (collector producer: Aventa AS)

Fig. 7 Hotel Jezerka, Czech Republic (collector producer: Thermosolar Ziar)

4. Summary

As a contribution from IEA-SHC Task39 [5] to the challenge of making solar thermal systems more desirable a database consisting of showcases where solar thermal energy systems have been successfully integrated into the architecture have been established. The objective is to show projects where not only function, but also aesthetics and architectural integration have been in focus when designing and installing solar thermal systems. A group of experts (architects and solar thermal engineers) evaluate the incoming projects and select the best examples. The database will be hosted by the website of IEA-SHC (www.iea-shc.org), with a direct link from its homepage since this topic is seen as a major issue for the growth of solar thermal technology.

Our intention is that the database will be extended with more showcases over time, that new excellent project presentations will be regularly added to the collection and help to spread the use of these technologies by making them appealing to both users and building designers.

5. References

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[4] IEA-Solar Heating & Cooling Programme /Task 41, Solar Energy and Architecture; http://www.iea-shc.org/task41/index.html.

[5] IEA- Solar Heating & Cooling Programme/ Task 39, Polymer materials for solar thermal applications; http://www.iea-shc.org/task39/