Zero-energy-residential project Sunny Woods, Zurich

Picture source: Beat Kämpfen

Zero-energy-residential project Sunny Woods, Zurich

Multi-family house with solar collectors integrated into the façade

PROJECT

Sunny Woods was Switzerland's first zero-heating residential project and has received both the Swiss Solar Prize 2002 and the European Solar Prize 2002. The six-family dwelling (each of 200 m^2) is located on a south facing hill close to the woods in a residential area of Zurich. Solar energy and wooden construction were the themes of the design. Each dwelling has the character of a single family house and is directly accessible from the street with a level difference of half a storey up or down.

The energy consumption is only 10% of the consumption of a traditional building. The remaining demand is provided by the building itself and can be described as Zero-Energy. Solar-tube-collectors act as a transparent balustrade for the balcony and the roof is equipped with photovoltaic cells. Heat recovery ventilation creates a comfortable atmosphere in every room.

SHC
SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

Picture source: Beat Kämpfen

Project information

The project is based on passive solar design combined with the following technical features:

- Highly insulated, airtight building envelope
- Minimised thermal bridges
- Energy efficient windows
- Efficient ventilation with heat recovery and ground preheating
- PV-roof, grid connected thin film solar cells
- Vacuum collectors for DHW and heating
- Efficient appliances

Total heated area : 1 387 m^2

Heating system

Solar thermal system:
6 m2 vacuum collectors serve as the balcony railing, the storage tank contains 1400 l (combined domestic hot water and space heating).

Heating:
Heat is distributed by the fresh air supply, heated with a water-air heat exchanger supplied by the solar collectors or heat pump. There are radiators in the bathrooms.

Picture source: Beat Kämpfen

SOLAR COLLECTOR

Type:
Vacuum collectors: B. Schweizer Energie AG, Chnübrächi 36, CH-8197 Rafz

ECONOMY

Everything considered, the pure construction costs exceeded the costs of a conventional building by around 5 %.
The energy consumption is only 10% of the consumption of a traditional building. The remaining demand will be provided by the building itself.

ENERGY PERFORMANCE

Space and ventilation heating	14.7 kWh/m²a
Energy source:	
solar thermal system, electricity	
- calculated -	
Domestic hot water	8.4 kWh/m²a
Energy source:	
solar thermal system, electricity	
- calculated -	

Picture source: Beat Kämpfen

GALLERY ➡

PHOTOS; Beat Kämpfen

- Built:
  2000 - 2001
- Architect / site engineer:
  Beat Kämpfen, Kämpfen Bau GmbH, Zurich
- Energy planning and domestic technique:
  Naef Energietechnik, Zürich
  Ganz Installationen AG, Volketswil
- Timber construction engineering:
  Makiol + Wiederkehr, Beinwil am See
- Contact:
  Beat Kämpfen, architect; (info@kaempfen.com)
  Daniela Enz, AEU GmbH; (daniela.enz@aeu.ch)
- Location:
  Im oberen Boden 165, 8049 Zürich-Höngg
- Type of project:
  Multi-family house

- Read more: http://www.kaempfen.com/, http://www.iea-shc.org/task28/publications/Switzerland_Zurich.pdf