

# Energy Retrofit of a Nursing Home in Stuttgart, Germany

The Filderhof demonstration project is a nursing home, which was built originally as a classy hotel in 1890. Now, the building was renovated and enlarged by an extension. The old building and the extension are linked up with an atrium. Since the energy consumption of the old building was very high, compared to the public building stock of Stuttgart, the city decided to do an energy retrofit.



New windows and insulation for the entire building envelope was part of the retrofit. Originally it was intended to insulate the walls from the outside. But the exterior façade of the old building has many historical elements, which are worth to be kept. For instance the balcony, the frame of the entrance door and the architrave block of the building. Therefore an internal insulation had to be realised.



With the internal insulation many technical details had to be solved in order to prevent thermal bridges. Furthermore a high quality control was necessary with regard to the vapour barrier.



Interior view during construction



Renovation of the roof



Aluminium frame for the internal insulation



Internal insulation with vapour barrier

The old heating system was completely replaced. The new heating plant consists of two gas condensing boilers and a combined heat and power unit. Furthermore a solar thermal plant is realized for domestic hot water. It consists of 25 collectors with a total surface of 60 m<sup>2</sup>. Thereby the solar thermal plant provides 32 % of the domestic hot water demand.

To reduce the electricity consumption the daylight use was improved and the nursing home got an energy efficient lighting system. The new atrium, which combines the old building with the new building, gets natural daylight via roof skylights. Two independent ventilation systems were installed for the new bathrooms and the kitchen. The heat recovery rate of these ventilation systems is over 80 %. A photovoltaic system with a surface of 105 m<sup>2</sup> is also installed. The maximum power of the plant amounts to 12.6 kWp.



condensing boilers and CHP



Thermal solar plant



Photovoltaic System



Roof skylights in the atrium

The aim of the project is to reduce the primary energy demand as a summary of the heat and electricity demand by around 56% (635 MWh/a). Through the retrofit of the old building there'll be about 140 tons less CO<sub>2</sub> Emissions. The energy use of the Building is controlled by a Building Energy Management System (BEMS).

## Germany: Stuttgart



Nursing Home Filderhof

## Great Britain: Plymouth



City College Plymouth

## Norway: Asker



Borgen Community Centre

## Norway: Hagafoss



Church Hol Commune

## Denmark: Copenhagen



Cultural Centre Proevhallen

## Greece: Athens



Evonymos Ecological Library

## Czech Republic: Brno



Social Centre "Brewery"

## Lithuania: Vilnius



Main Building Vilnius Gediminas University

