



Kindergarten and apartments - Chur, Switzerland

Author: Cristina Polo (SUPSI)

Roof-integrated Photovoltaic system/ Local sharing

with neighbor building

Solar

What is the solution?

With the energetic renovation and an innovative heat network concept with the adjoining apartment building (MFH) with three families, the city of Chur is paving the way for the energy transition. There is a combined PV and thermal system on the roof. It covers its own energy requirements with 28,300 kWh/year to 95%. The solar excess heat of around 9,100 kW /year, which cannot be used in the transition period and in summer, is delivered to the neighbouring MFH. In the winter half-year, the pellet heating of the neighbouring MFH supplies the kindergartens and penthouses with 8,800 kWh of heat.

Why does the solution work in terms of compatibility with conservation and technical aspects?

The photovoltaic system on the south and west roof produces approximately 8,800 kWh of electrical energy per year. This corresponds approximately to the electrical energy consumption of 2.5 households. The electrical energy is used directly by the residents (self-consumption). If the consumption is higher than the PV production, the additional energy is obtained from the IBC, if the PV production is higher than the consumption of the residents, the excess is fed into the IBC network.

Description of the context:

The complex is divided into two structures. The residential building is characterized by the building height and the facade design as the main volume of the ensemble. The previous commercial building is deeper and, due to its L-shaped geometry, forms an inner courtyard which, with its round arches and the widely projecting roof, has a high spatial quality. The specifications of the city of Chur as client were clear. The artistically valuable ensemble was to be preserved in its original expression. The earlier interventions should be dismantled, the change of use of the annex should be visible from the outside as a renewal but should be connected with the original design. And in addition: "Since Chur has been an energy town since 2011, it was necessary to incorporate the latest findings in energy and building physics into the renovation."

Pros and cons of the solution:

The PV system complies with many of the geometric and spatial and construction compatibility criteria required by current regulations for the integration of solar systems in historic buildings (grouping, coplanarity with the water table, respect for the eaves lines, joint precision, etc.). The aesthetic, material and colour compatibility with the existing roof is not optimal, but the final result is good and well-integrated with other new elements incorporated in the renovation of the building such as the dormers.

Type of data available (level of information, simulation):

The project manager of the architectural office did his master thesis (sustainable building) on the property.

Are there any related publications or pictures of the solution?



West front with BIPV © Ralf Feiner, Malans



Picture of the roof © Ralf Feiner, Malans



Picture of the roof © Ralf Feiner, Malans

https://www.hiberatlas.com/smartedit/projects/148/Tech21_160108.pdf

TEC21, Espazium Schweizerische Bauzeitung, Januar 2016

https://www.hiberatlas.com/smartedit/projects/148/Pagine da KIGA_150916_A3.pdf

Energy concept - Factsheet, Pfleger + Stöckli Architektur GmbH

[https://www.hiberatlas.com/smartedit/projects/148/g-16-09-22_dwhg_und_doppelkindergarten_chur_def\[1\]_1.pdf](https://www.hiberatlas.com/smartedit/projects/148/g-16-09-22_dwhg_und_doppelkindergarten_chur_def[1]_1.pdf)

Swiss solar prize fact-sheet, Solar Agentur Schweiz