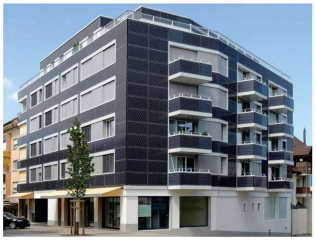

Renovation Building - Romanshorn, Switzerland

Author: Cristina Polo (SUPSI)

Facade attached renewable

Solar

What is the solution?

The south and west façade of the PEB-MFH with the optimally integrated 295 m2 PV modules generate with 53 kWp a good 25',650 kWh/a. The flat roof mounted 26.3 kWp PV system and the 69 m2 solar collectors produce 64,050 kWh. The almost 7 m high 60',000 litre storage tank in the former lift shaft stores thermal solar energy, which covers the heating and hot water requirements together with an air-to-water heat pump. Unfortunately, the outside space is lacking for a more efficient ground source heat pump. Viridén's PEB falls below the 2000 watt specifications by 120% (with a total energy requirement of 84,100 kWh) and is a trendsetting building in every respect with exemplary character. It proves that practically every municipal building can be PEB, or as the magazine "Hochparterre" aptly puts it: "Both in terms of greenhouse gas and energy indicators, [the] building allows the 2000 Watt society and Minergie-A old look."

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

The office Viridén+Partner is implementing the "dense building" required by the new spatial planning law (RPG) in an exemplary manner also in the city centre of Romanshorn. Viridén expanded the multi-family house (MFH), built in 1962 with 3 shops, from 6 to 22 exemplary renovated apartments at socially acceptable rents. Energy consumption to date has fallen thanks to the Minergie-P building envelope from 296,120 kWh/a by more than 70% to 84,100 kWh/a. The 53 kWp monocrystalline PV system is optimally integrated into the

facades and balconies of the MFH. Another PV plant with 26.3 kWp is mounted on the roof next to the 69 m2 solar panels. Together the solar systems generate a good 89,700 kWh/a. In an average year, this flagship PlusEnergieBau (PEB) with 56% more living space has an energy supply of 107% (EEV) on. Enough to power three electric cars with zero emissions.

Description of the context:

Viridén+Partner's PlusEnergie Building shows with integrated PV facades in an exemplary manner, the perfect combination of technology, aesthetics and functionality. The renovated MFH convincingly demonstrates how today's solar architecture can also be used in urban local area and can significantly enhance street imagesappearance. Built in 1962, the residential and commercial building is the most important first energetically exemplary energy PEB refurbishment with more than five storeys. The number of apartments rose from 6 to 22; alsoalso, the 3 shops were renovated.

Pros and cons of the solution:

The completely successful densification from 1,517 to 2,361 m2 (+56%) shows in perfection how the new RPG can also be implemented in cities: massively more living space - without building over 1 m2 of cultivated land - with excess electricity for emission-free traffic. This ingenious solar architecture deserves the 1st Norman Foster Solar Award 2013.

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

Solargentur Swiss Solar Prize 2013: 107%-PEB-Sanierung Viridén, 8590 Romanshorn/TG. Link (German and French): https://www.solaragentur.ch/sites/default/files/g-13-09-17_solarpreispublikation_2013_def_ka_viriden_romanshorn.pdf Orientation: East, North, South, West; Tilt angle: 144°East, 0°North, 170°South, 260°; PV surface: 144 m2 PV roof, 295 m2 facade, 69 m2 solar thermal collectors; Rated power: 26.3 kWp PV roof, 53 kWp facades; Energy production: 89,700 kWh/a; Final yield: 1'131 kWh/Wp; Producer: HOLINGER SOLAR AG - PV, Ernst Schweizer AG - Solar collectors-, PV module: Monocrystalline and thin film; Type glass: Satiny; Cell color: black; Dimensions: 1'600 x 860 mm; Specific power (system): 176.60 kWh/m2;

Are there any related publications or pictures of the solution?

Credits: Solargentur Swiss Solar Prize 2013: 107%-PEB-Sanierung Viridén, 8590 Romanshorn/TG

Solargentur Swiss Solar Prize 2013: 107%-PEB-Sanierung Viridén, 8590 Romanshorn/TG_Before the renovation

https://www.hiberatlas.com/smartedit/projects/221/g-13-09-17_solarpreispublikation_2013_def_ka_viriden_romanshorn.pdf
Solargentur Swiss Solar Prize 2013: 107%-PEB-Sanierung Viridén, 8590 Romanshorn/TG