Schlossgut Meggenhorn - Meggen, Luzern, Switzerland

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Roof-integrated PV system

Solar

What is the solution?

The complex generates 90,000 kWh annually. It thus covers 190% of the electricity requirements of around 47,400 kWh/a for the Meggenhorn castle and farm. The battery, consisting of 200 cells decentralized 55 kW electricity storage with a capacity of 115 kWh, has a double benefit: On the one hand, it should save an expensive grid expansion, on the other hand it should contribute to the stabilization of the electricity grid.

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

The solar-powered 55 kW battery storage system has a capacity of 115 kWh. The plot Schlossgut Meggenhorn with the barn, the castle and the company building is connected with a transformer, and forms a distribution network on grid level 7 (230/400V). Thanks to the storage and the regenerative control, a complex network reinforcement with a long cable runs are not necessary. The production peaks are fed into the grid with a time delay. The pilot project will test whether decentralized electricity storage facilities can be used as a replacement for conventional network reinforcements which are technically and economically feasible and suitable for the provision of balancing energy. The project is supported by various representatives of the regional solar industry. Further objectives are the balancing of product peaks, the control of reactive power and grid feedback as well as the grid stabilisation. The perfectly

integrated plant, which improves the townscape worthy of protection, has a model character and won the Swiss Solar Prize 2014.

Description of the context:

The 580 m2 PV roof system is exemplary fully integrated and flush with the roof and is combined with a decentralised power storage unit. The example shows how a PV system not only respects a site of national importance worthy of protection, but upgrades it. As the roof takes up the colours of the castle roof, the Roofscape is more harmonious. In a nearly two-year approval process involving the preservation of historical monuments, finally, the demanding objectives of monument conservation were implemented.

Pros and cons of the solution:

The solar roof system of Schlossgut Meggenhorn is perfectly flush with the roof and fully integrated into the building. The architecture is preserved; the new PV roof matches the colour of the castle roof. The townscape worthy of protection is upgraded and appears modern.

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

Winner of the Swiss Solar Prize 2014 "C" category for energie plants. INTERREG case study for protected building's retrofit. Link (German and Franch): https://www.solaragentur.ch/sites/default/files/g-14-10-03_schlossgut_meggenhorn_solpreiskatenergieanl.pdf Information PV Modules: Orientation: South Tilt angle: 34° PV surface area: 580 m2 Rated power: 99.8 Wp Energy production: 90,000 kwh/a Final yield: 902 KWh/Wp Active solar ratio: >75% (roof) Manufacturer: BE Netz AG Module technology: monocrystalline Cell color: Blue

Are there any related publications or pictures of the solution?

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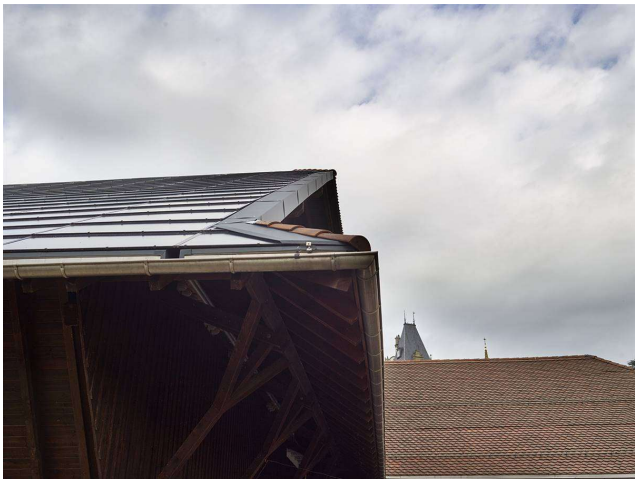

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Solaragentur Swiss Solar Prize 2014