

Off-grid system at the Hörnlihütte

Matterhorn, Switzerland



The Challenge

The Hörnlihütte is a Swiss mountain cabin situated at 3260m altitude directly at the foot of Matterhorn, the famous pyramid-shaped mountain. It constitutes the starting point for ascending the mountain and also serves as a refuge during changes in weather conditions.



Solarbau Lowel GMBH

First built in 1880 it recently underwent a major renovation to guarantee its sustainable development of energy and water supply and wastewater management. At this altitude there is no utility grid available. The only way to guarantee a reliable power supply is to create it yourself.

Why Studer

Changing batteries, supplying diesel and maintenance work at high altitude is extremely costly. The Xtender inverter/charger is controlling the generator, thus optimizing diesel consumption and runtime. Its fully automatic charge management ensures an optimal battery charge which significantly prolongs the battery lifetime. Strong temperature fluctuations on the solar generator surface and snow reflections greatly affect the solar generator's operating voltage. The VarioString MPPT solar charge controller always handles the high voltage field precisely and with high efficiency.

The Solution

Before transformation, the mountain cabin was neither insulated nor heated and received its energy supply from a diesel generator. The new 72kVA off-grid energy supply system in three-phase with a 30kVA diesel generator as backup, guarantees a sustainable, efficient and trouble-free operation of the mountain-cabin. The roof surfaces exposed to maximum sunlight is fitted with photovoltaic modules to produce electricity and the facade is equipped with solar thermal collectors to generate hot water. The system performance can be increased to 105kW with CHP (Cogeneration Heat and Power).

System components

- Solar modules:** 59 PV panels Swiss Premium-Solarmodul M280-60-w GG (16kWp)
- Batteries:** 3x 36 cells SUN + 1830 (NiCa) from Saft (263kWh)
- Inverters:** 9 Studer Xtender XTH 8000-48
- Solar charge controllers:** 3 Studer VarioString VS-120
- Racking:** Tritec for snow and wind load
- Remote communication:** 1 Studer Xcom-LAN and 1 Studer Xcom-232i
- Other:** 1 Studer RCC-02 remote control

Project outcome

The new renewable energy system provides reliable electrification 24/7 for the mountaineers and tourists visiting the mountain cabin from June until September. Hörnlihütte's sustainable development and modernisation was carried out to meet today's requirements for eco-friendliness, safety, hygiene and functionality. The water collection and supply have been improved and safeguarded. The new wastewater treatment system purifies and reuses the water multiple times. The modernised cabin contains 120 beds, WiFi, a community room for 130 persons, toilets and showers on each floor.

The Company

Solarbau Lowel GMBH is a Swiss company that plans and executes solar thermal or photovoltaic system in the canton of Schaffhausen and the surrounding area. Among their services are professional planning including overvoltage concepts for PV systems, turnkey solutions and supply of high quality material.

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