

Cable car station in Naturno



Aesthetic integration

The glass envelopes that protect the valley (a) and the top (b) stations of the cable car in Naturno from the elements are made from semi-transparent BIPV modules. The structures are located on a steep wooded slope of the Val Venosta in South Tyrol. The modules are integrated into both the lateral façades and on the southern pitch of the roofs. They were custom made in order to adjust the transparency and the size to the needs of the structures (Leitner Electro Srl).

Energy integration

With a nominal power of 19.4 kWp (a) and 30.4 kWp (b), the BIPV systems are estimated to produce 18,700 kWh/a and 24,800 kWh/a, respectively. The total annual energy production exceeds 50% of the demand (Leitner Electro Srl).

Technology integration

The BIPV plants are made from polycrystalline glass–glass modules produced by Scheuten Optisol (P082136 K) (a) and EnergyGlass (EGP32ST/EGP48ST) (b). They are supported by a steel trusses system. The BIPV modules are fixed to aluminium horizontal and vertical beams that hide the wiring system. They are naturally ventilated, due to the wide openings of the glazed structures.

Decision making

The client Seilbahn Naturno GmbH wanted to build a roof for the ropeway station, in order to protect the technical system from the weather conditions. Architect Götsch envisioned to install a photovoltaic plant to lower the energy consumption and contribute to a sustainable environment. Full integration of the PV system into the roof makes a dual use (energetic and weather protection) of the panels possible. The aesthetic point of view was of great importance to the client. BIPV with semi-transparent modules was a convenient way to still get sufficient natural light into the building (Leitner Electro Srl).

Lesson learnt

The flexibility of BIPV can increase its implementation into special places characterized by specific constraints (e.g. historical, environmental) as well as into different building typologies. This case study is an example of that since it is placed in a mountain context, on a steep wooded slope and it is a kind of building not commonly used for BIPV installations. The main building design did not need architectural alterations. The building roofs were optimally tilted (30°) for the application of a photovoltaic system. Since it is an 'open configuration', no problems for internal comfort can occur, as it would have been in case of closed configuration.

PROJECT DATA

Project type	New construction
Building function	Other function

Integration system	Semi-transparent tilted roof
Location	Frazione Monte Sole, Naturno (BZ), Italy

BIPV SYSTEM DATA

Module type	Custom made modules
Solar technology	Polycrystalline silicon
Nominal power [kWp]	19.3 (a) – 30.4 (b)
System size [m²]	190 (a) – 254 (b)
Module size [mm]	Several
Orientation	?40° (roofs), ?130°/+50° (façades)
Tilt [°]	30 (roofs), 90 (façades)

BIPV SYSTEM COSTS

Total cost [€]	316,748
€/m²	713
€/kWp	6373

PRODUCER DATA

Producer	Scheuten Solar Technology GmbH (a) – EnergyGlass Srl (b)
Address	Gelsenkirchen (German) (a) – Cantù (CO, Italy) (b)
Contact	contact@energyglass.eu (b)
Web	www.energyglass.eu (b)



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1. Seilbahn Naturns BIPV system (Eurac Research)
2. View of the downstream unit semi-transparent glass roof (Eurac Research)
3. View of the upstream unit semi-transparent glass façade (Leitner Electro Srl)
4. Steel trusses system supporting the BIPV plant (Leitner Electro Srl)
5. Detailed view of the glass modules mounting structure (Leitner Electro Srl)
6. External view of the semi-transparent polycrystalline modules (Leitner Electro Srl)
7. The ropeway station roofs were optimally tilted (30°) for the photovoltaic integration (Eurac Research)