Chamber of Commerce of Bolzano

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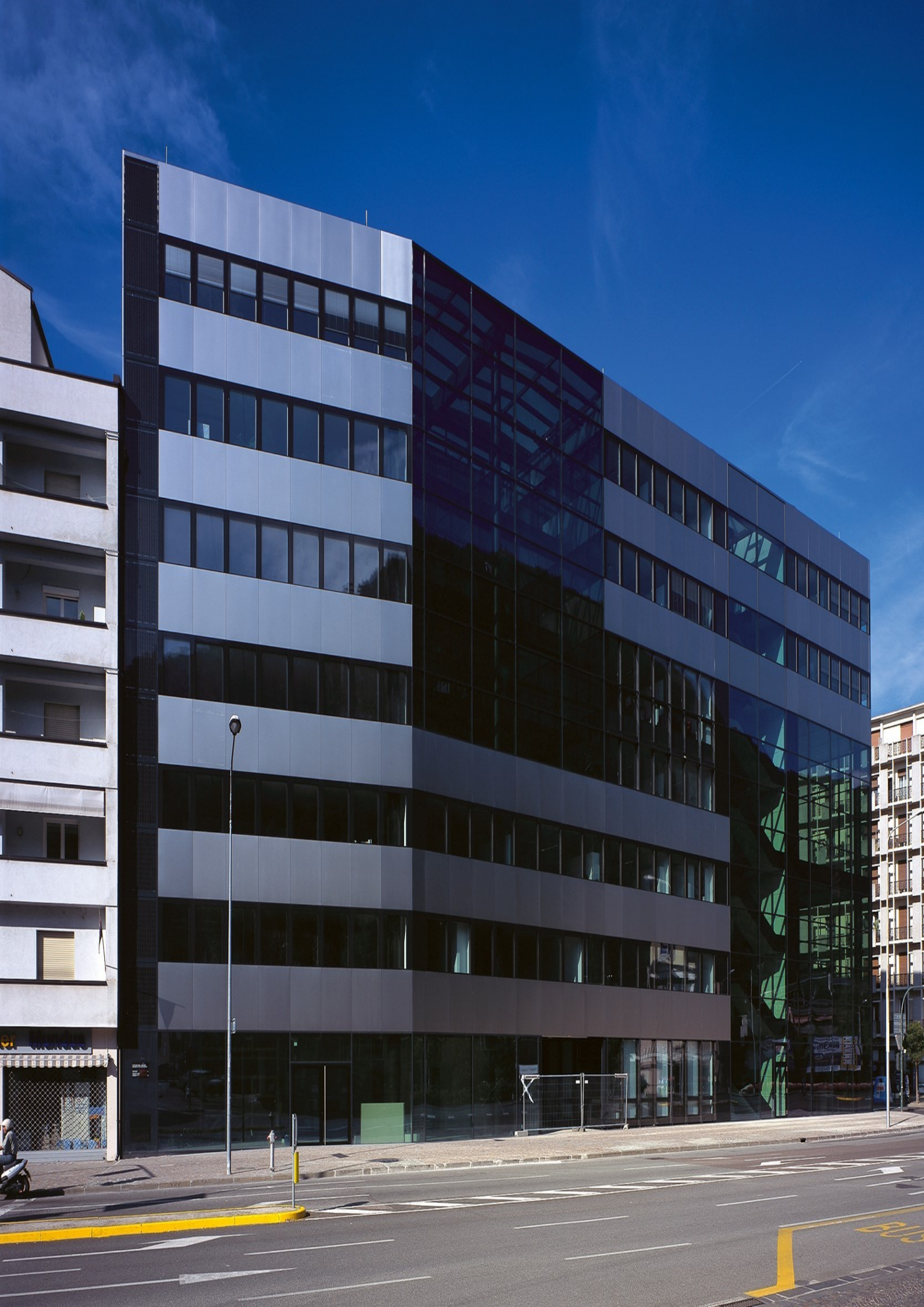

Aesthetic integration

The Chamber of Commerce building is facing a central thoroughfare in the city of Bolzano. The PV system creates a dark vertical band integrated on a highly visible front, which is characterized by a variation of different façade materials. Components like blasted stainless steel panels, parapets, structural glazing, coupled windows and daylighting elements (Frener & Reifer GmbH) form a single surface, creating a dynamic appearance marked by stringcourses. The same combination of different materials and colours is reproduced inside the building.

Energy integration

The BIPV system installed in the façade is a small plant added to a bigger PV plant applied on the building's flat roof. Its electric output is fully self-consumed (Obrist GmbH). The produced energy is also used in the efficient thermal energy systems. The heating and cooling demand is supplied through a water-to-water heat pump, a free cooling system and natural gas-fueled condensing boilers (Energytech Srl). The building is CasaClima A+ certificated.

Technology integration

The 13 integrated photovoltaic modules Solarwatt (M234-108 GEG LK) are standard black glass–glass panels made of 108 monocrystalline cells. The 'glass-glass' technology, where solar cells are between two glass panes rather than of standard glass and plastic back-sheet setup, is considered as an extremely durable and resistant solution, with an optimal cells protection. The PV plant is the top layer of an insulation element consisting of a metal sheet, an insulating layer and a concrete structure. An air gap (8 cm) is left between the panels and the metal sheet in order to allow natural ventilation. The modules are mounted as common curtain wall component. They are fixed to an aluminium frame made of cross and vertical beams, hiding the wiring system.

Decision making

The integration of some photovoltaic modules on the highly visible building facade represents a symbol of the Province of Bolzano to the community, highlighting the local energy policy, which aims at sustainability through the exploitation of renewable energy (Frener & Reifer GmbH).

Lesson learnt

The PV modules are used as opaque facade panels. However, according to the designer (Frener & Reifer GmbH), the integration of semi-transparent modules in the large glazed surfaces of the building could have been an opportunity, assuming the function of a shading system. The close by building casts a partial shadow on the BIPV system. Partial shadow of a PV system might cause severe power losses, since all cells and modules in an array are connected in series. The presence of bypass diodes in the PV modules can partially mitigate this problem, which anyway has to be carefully considered during the design phase.

PROJECT DATA

Project type	New construction
Building function	Office
Integration system	Opaque cold façade
Location	Via Alto Adige 60, Bolzano, Italy

BIPV SYSTEM DATA

Module type	Custom made modules
Solar technology	Monocrystalline silicon
Nominal power [kWp]	3.3
System size [m²]	30
Module size [mm]	1,290 x 1,775
Orientation	South-West
Tilt [°]	90

BIPV SYSTEM COSTS

Total cost [€]	26,800
€/m²	890
€/kWp	8,120

PRODUCER DATA

Producer	Solarwatt GmbH
Address	Maria Reiche Straße 2A, Dresda, Germany
Contact	info@solarwatt.net
Web	https://www.solarwatt.com/

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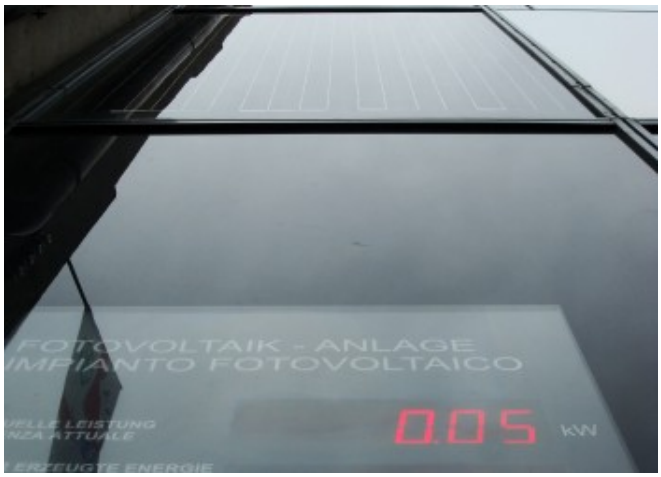

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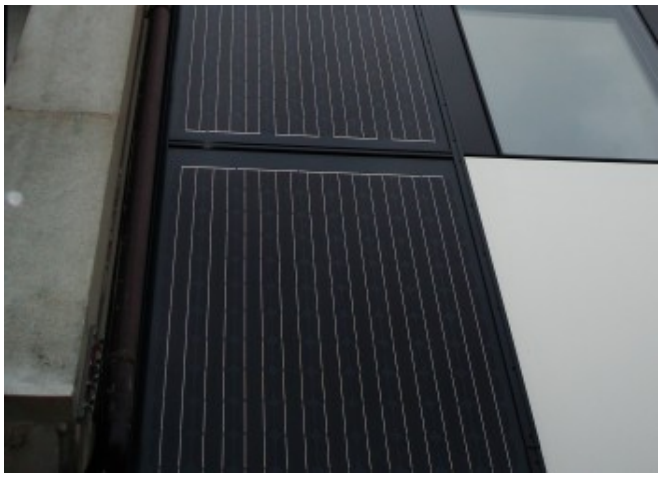

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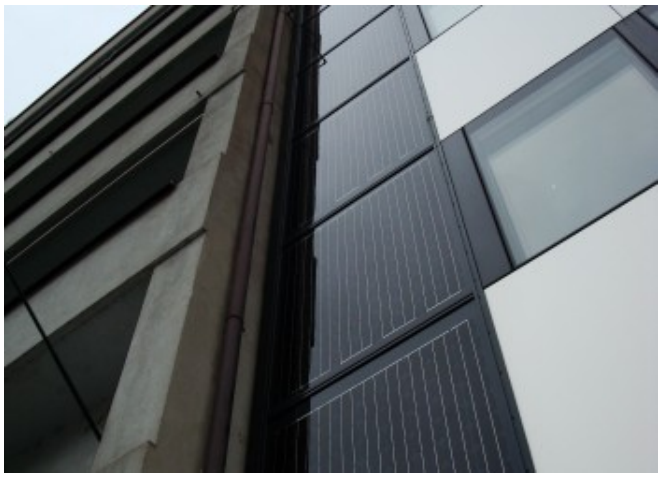

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1. Chamber of Commerce BIPV system as a vertical dark band on the left side of the building (Arch. Wolfgang Simmerle)
2. Internal view: combination of different materials and colours, the same as the building external façade (Frener & Reifer GmbH)
3. The modules are exposed on a heavily busy city path (Arch. Wolfgang Simmerle)
4. The photovoltaic energy output is visible on the façade surface (Eurac Research)
5. Detailed view of the monocrystalline modules (Eurac Research)
6. The photovoltaic dark band splits the modern Chamber of Commerce from the close traditional building (Eurac Research)
7. View of the south-facing glazed surfaces (Arch. Wolfgang Simmerle)