



District heating plant of Laces

Introduction

The district heating plant is placed below a wooden slope of the Ötztal Alps. The photovoltaic system is integrated on the West- and South-facing building façades.

Aesthetic integration

The BIPV system creates a dark envelope, which is aesthetically embedded in the surrounding landscape. The modules comply with the irregular shape of the building. The plan was designed based on the biomass burners (Eng. Klaus Fleischmann) and the fronts follow the sloped roof, where another PV plant is applied.

Energy integration

Together with the roof PV system, the integrated modules are measured to cover the 20–30% of the electricity building demand, mainly required by the burners (Eng. Klaus Fleischmann).

Technology integration

The integrated PV modules ([Solarwatt M140-36 GEG LK XL](#)) are standard semi-transparent glazed panels made of 36 monocrystalline cells. On the building's west façade, they are fixed through aluminium profiles to the opaque concrete surface with a distance of 8 cm. The air gap generates a stack effect that guarantees the modules natural ventilation. On the building's south façade, the modules are used as an exposure opening for the burner house, creating a warm façade directly exposed to the internal space. Thanks to a 10–20% transparency, they allow a natural illumination inside. The same mounting system is fixed to a wooden structure.

Decision making

The building owner (EGL cooperative energy company of Laces) decided to equip the building with a PV plant to partially cover the electric demand of the biomass burners. This was inspired by the provincial programmes aimed to promote solar energy production (Eng. Klaus Fleischmann). The use of renewable energy, which is locally generated, decreases the costs and the environmental impact of the district heating plant. The initial idea was to build a plant on the roof. Later it was decided to install an additional plant on the façades, using the semi-transparent glass modules (Eng. Klaus Fleischmann). Public institutions (European, national and regional) played a crucial role in planning and partially financing the works.

Lessons learnt

On the south-facing facade, the photovoltaic modules are integrated also replacing transparent glazed surfaces. Other than performing the common functions of building envelope components, they are used

as shading devices, guaranteeing the internal visual comfort. The same modules are integrated covering opaque surfaces to give a uniform appearance to the building façades. For the same reason, some fake modules were used (non-rectangular modules) on the top of the West facade, following the sloped roof profile. During the construction works, some panels turned out not to have the correct size and were replaced with other ones. (Eng. Klaus Fleischmann)

PROJECT DATA

Project type	new construction
Building use	industrial
Building address	Via Nazionale 2a, Laces (BZ), Italy

BIPV systems

BIPV SYSTEM DATA

Architectural system	rainscreen, warm façade
Integration year	2009
Active material	monocrystalline silicon
Module transparency	semi-transparent
Module technology	glass-glass, recognizable PV, standard modules
System power [kWp]	48.9
System area [m ²]	446.7
Module dimensions [mm]	1,600 x 800
Modules orientation	South, West
Modules tilt [°]	90

BIPV SYSTEM COSTS

Total cost [€]	357416
€/m ²	800
€/kWp	7309

Stakeholders

Main building designer

Arch. Werner Pircher

BIPV system designer

Fleischmann & Jansen

BIPV system installer

Wallnöfer Günther & Rudolf Snc
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BIPV components producer

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The plant covers the opaque parts as a cold façade system generating a stack effect © Eng. Klaus Fleischmann



Steel system supporting the modules that cover the opaque building façades © Günther Wallnöfer



Detailed view of the semi-transparent frameless modules © Günther Wallnöfer



View from inside the building: the supporting wood structure and the modules semi-transparency are visible © Günther Wallnöfer



Building West façade: the faked modules on the top follow the roof profile © Eng. Klaus Fleischmann



The irregular building shape complies with the surrounding mountain landscape © Google maps

Case study author:

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