



**Farm building in San Genesio**

## Introduction

The building, an old construction, was retrofitted through integrating a PV system into the building roof. It is a traditional 2-story farmhouse, with a barn upstairs and stalls downstairs, currently used as farm equipment storage. The owner Thomas Widmann was supported from the first design stages by the engineering firm Blasbichler in finding the best architectural solution to apply to the existing buildings. The Blasbichler team provided a preliminary economic assessment and was responsible for the BIPV technical design. Elektro Lahner Srl and Solarxpert Srl were involved in the plant installation, completed in 2011.

## Aesthetic integration

The building is located in a little village, high above the valley entrance of the Sarentino Valley. It is embedded in the charming scenery of the Salto high plateau, far away from the main traffic lines. The BIPV system is modern technology surrounded by a natural landscape characterized by meadows, larch trees and traditional buildings. The semi-transparent PV modules create an interesting light and shadow pattern inside.

## Energy integration

The BIPV system is estimated to produce 41,327 kWh per year. It feeds the total generated electricity into the grid together with second PV plant integrated on a nearby building, of the same owner. A solar thermal installation is integrated close to the second PV plant (Ing. Studio Blasbichler Srl).

## Technology integration

188 Scheuten Multisol Vitro (P6-54) photovoltaic modules are integrated on the southeast facing roof of the building. The modules are frameless glass-glass products. The polycrystalline cells are inserted between a highly transparent low-iron tempered safety glass, with anti-reflective-coating (front), and a heat strengthened safety glass (rear). The cells do not cover the whole module area leaving gaps to let light through. The glazed PV modules are mounted with special aluminium Solrif profile frames and fixed to the wood substructure. Special mounting clamps brace two modules to the frames in the overlapping area, ensuring the system's weather tightness.

## Decision making

When the owner decided to integrate a photovoltaic system into the farm building, he wanted to exploit the building structures' available surface in order to produce renewable energy to be fed into the grid and indirectly guarantee coverage of the building's energy consumption. He was also encouraged by the possibility of receiving economic incentives (Conto Energia) (Ing. Studio Blasbichler Srl).

## Lessons learnt

The BIPV modules create a semi-transparent surface able to partially shade the upstairs barn. They allow a fair amount of sunlight to penetrate, guaranteeing natural illumination and contributing to the building heating. However, they prevent an excessive solar gain. In this case study, the potential of the BIPV multifunctional technology is highly exploited. All the functions of a traditional roofing system (e.g. mechanical resistance, thermal insulation, protection from atmospheric agents, water tightness, etc.) are connected with the shading function that controls the internal visual and thermal comfort, without compromising the electric energy generation. It is an interesting example of BIPV application on an old construction, which is located in a high-value natural environment.

## PROJECT DATA

<b>Project type</b>	renovation
<b>Building use</b>	agricultural
<b>Building address</b>	Brunner Avigna 1, San Genesio (BZ), Italy

## BIPV systems

### BIPV SYSTEM DATA

<b>Architectural system</b>	Skylight
<b>Integration year</b>	2011
<b>Active material</b>	Polycrystalline silicon
<b>Module transparency</b>	semi-transparent
<b>Module technology</b>	glass-glass, recognizable PV, standard modules
<b>System power [kWp]</b>	39.6
<b>System area [m<sup>2</sup>]</b>	346
<b>Module dimensions [mm]</b>	1,488 x 988
<b>Modules orientation</b>	South-East
<b>Modules tilt [°]</b>	35
<b>Annual FV production [kWh]</b>	41327

### BIPV SYSTEM COSTS

<b>Total cost [€]</b>	146202
<b>€/m<sup>2</sup></b>	423
<b>€/kWp</b>	3701



## Stakeholders

### **BIPV system designer**

Ing. Studio Blasbichler Srl

### **BIPV system installer**

Elektro Lahner Srl

Via Johann Georg Mahl 40, Brunico (BZ), Italy

info@elektro-lahner.com +39 0474 773636

<https://www.elektro-lahner.com/it/home/>

### **BIPV components producer**

Scheuten Solar Technology GmbH (closed)

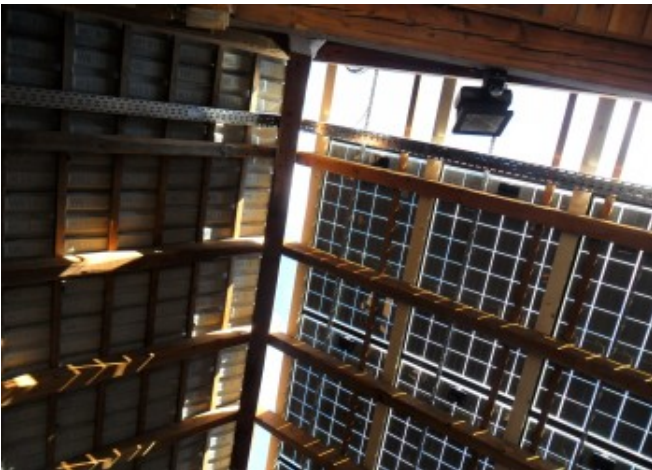
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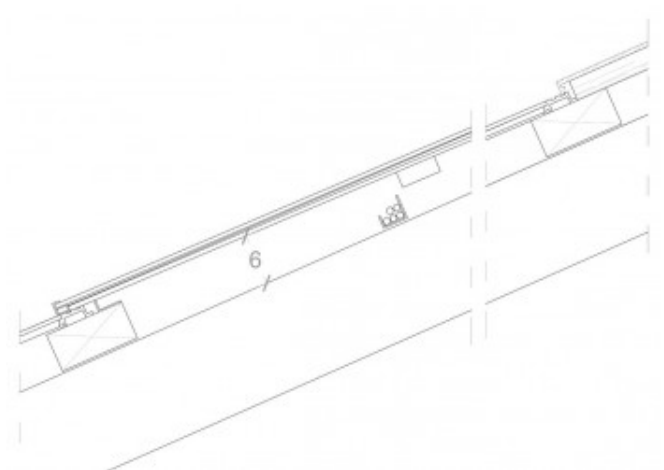
The building embedded in the mountain surrounding of the Salto high plateau © Ing. Studio Blasbichler Srl



The modern PV technology is integrated into a traditional context © Ing. Studio Blasbichler Srl



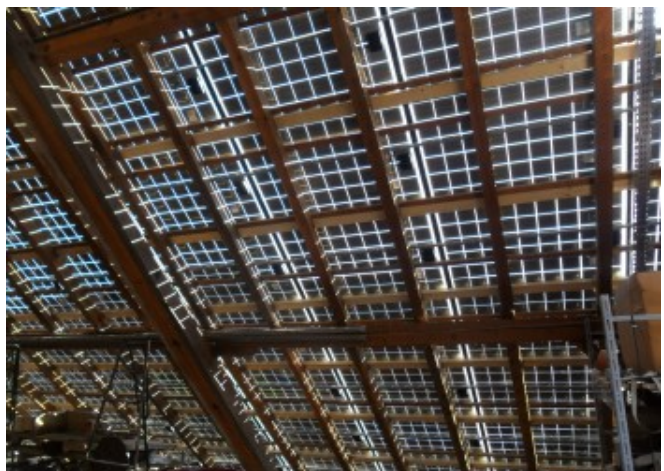
Wood structure supporting the BIPV plant © Ing. Studio Blasbichler Srl



Technical detail of the modules fixing system, re-drawn by Eurac © Ing. Studio Blasbichler Srl



Detailed view of the 'Solrif' mounting system © Ing. Studio Blasbichler Srl



BIPV shading effect © Ing. Studio Blasbichler Srl

Case study author:

Eurac Research