



Doragno Castle - Rovio, Ticino, Switzerland

Author: Cristina Polo (SUPSI)

Photovoltaic Roof-integrated System

Solar

What is the solution?

The system has been designed and developed specifically to be perfectly integrated. BIPV Module Peak power: 16.4 kWp . Energy production: 16,400 kWh/year. Building skin application: Solar tiles. Product: Custom made Manufacturer: ISSOL Switzeland SA. Architect: deltaZERO / Stefano De Angelis e Maria Mazza. Photovoltaic installer: Greenkey Sagl – Kim Bernasconi.

Why does the solution work in terms of compatibility with conservation and technical aspects?

The architects have studied and developed this BIPV solar system with a specific mounting system to improve the integration of the solar modules in the roof and to achieve a good integration in the landscape and in the building concept. This has required a specific static verification and the use of BIPV frameless modules (frames) to create a uniform and complete surface of the roof, as well as specific termination elements (ridge line and points where there are ventilation chimneys) specially designed.

Description of the context:

The glass is fixed by gluing on cross rails connected to the roof structure in a stable manner. In total, each glass is fixed along three support lines.

Pros and cons of the solution:

PRO 1. production of electricity that reduces the overall energy consumption of the building. VERSUS 1. greater difficulty in planning and execution (the plant is

perfectly integrated into the roof and does not entail any aesthetic damage even in the case of a historic building) 2. From the financial point of view: in the short term a photovoltaic system represents a higher cost, which, however, by analyzing the costs on the 1st life cycle of a building (about 40 years), leads to an important gain.

Type of data available (level of information, simulation):

The simulation has been done using the tool PV*SOL premium. Climatic zone Cfb (Warm temperature, fully humid, warm summer).

https://www.hiberatlas.com/smarteredit/projects/28/1_simulazione.pdf Several information is published regarding this project and is available in the architect's web page and projects documentation, DeltaZero SA,

<https://www.deltazero.net/en/what-2/6-icon-projects/doragno-castle/> Maria Mazza & Stefano De Angelis Effrem, deltaZERO Architettura, Il Castello di Doragno, Restauro e sostenibilità energetica, Archi magazine, Rivista svizzera di architettura, ingegneria e urbanistica. August 004, 2020. Pages: 26-29.

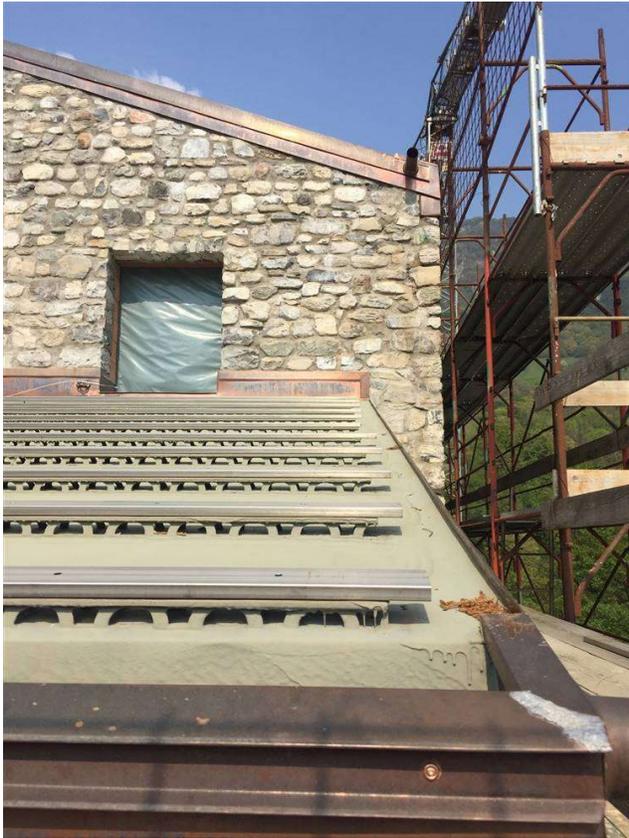
Publisher: espazium. ISSN 1422-5417, https://www.espazium.ch/it/archi4-20_castello Solar web platform www.solarchitecture.ch:

<https://solarchitecture.ch/in-a-nutshell-doragno-castle>

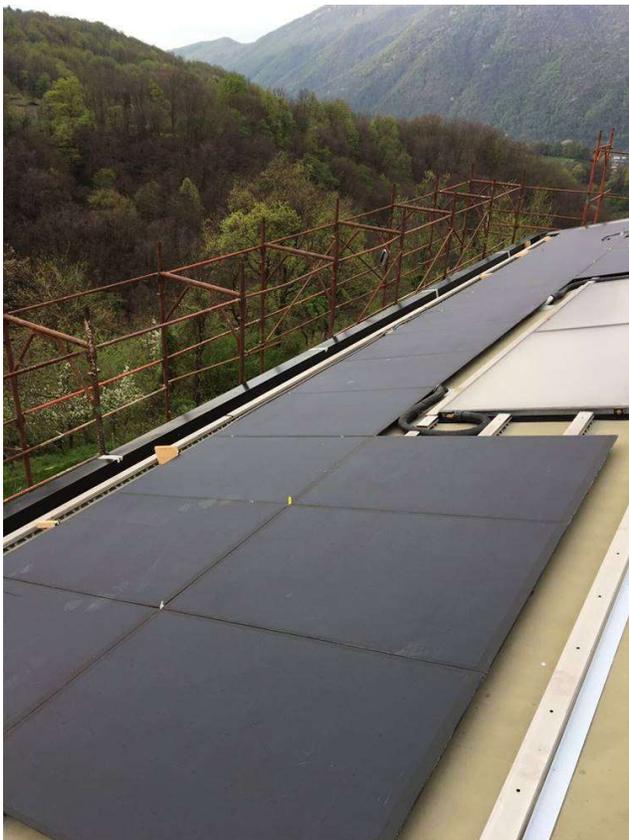
Are there any related publications or pictures of the solution?



PV system © Greenkey



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Simulation using the tool PV*SOL premium