



La Capanna

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Roof Integrated Photovoltaic

Solar

What is the solution?

The solution deals with photovoltaic and solar-thermal systems that were applied on the roof of a pavilion structure close to the main building and part of the historic complex. The photovoltaic elements installed have a nominal power of 0.15 kWp / m². The photovoltaic system, which has a total power of 6 kWp, fulfils the whole building's energy needs.

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

The solution works because the historical value of the building is preserved due to what is called decentralised production of power, the panels are integrated into a building near the main historic building. The PV system is integrated according to aesthetic integration, energy integration and technological integration aspects. A pavilion attached to the main building houses on its roof the photovoltaic and solar thermal panels. The pavilion structure overlooks a basement of a pre-existing and more recently built volume than the main building. This system power the house and relates to it through an open-air living area. The basement, on the other hand, houses a living area as well as service areas, functional to the house and the pool. The hut integrates the photovoltaic and hybrid modules (solar thermal and solar photovoltaic) flat with polycrystalline silicon cells in a coplanar surface composed of the reflective score of the dark-coloured panels, bounded by the perforated sheet of the eaves and the ridge also of the same colour dark, with the function of ventilating the underlying part and collecting rainwater. The photovoltaic

system project pursues two integration criteria: landscape integration, which is found in the choice of the shape of the building that respects the morphology of the vernacular architectures typical of the place, in the spatial relationship that is established between the new and pre-existing building, as well as in the chromatic, morphological and reflectance choice of the panels towards of the surrounding landscape; aesthetic integration with respect to the new building, which is found in the coplanarity of the panels, in the coverage of 100% of the surface, in the type of panels chosen, in the selection of monochromatic cells, as well as in the study of the construction detail of the junction between the panels and sheet metal and rainwater drainage system. The photovoltaic panels perform the function of tiles.

Description of the context:

La Capanna is a building in the province of Lucca (IT). Initially, it was used for tobacco production and re-adapted to residential use in 2017. It is a typical 18th-century building common in the north-east of the Tuscany region. It looks like a compact volume with large symmetrical openings.

Pros and cons of the solution:

The historical value of the building is preserved due to decentralised power production. The system is more manageable for maintenance because it is installed on a single-story building. Due to the attention to design and colours that were chosen, it is aesthetically pleasing. The system is connected to an integrated webserver. Due to the high level of technological integration, the reversibility of the system is some way limited.

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

The solution described above was drawn from a real project that was presented as a PV integration best practice to an award for Solar Architecture in heritage context 2020.

Are there any related publications or pictures of the solution?



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