



La Certosa Island Park Venice

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Roof integrated Photovoltaic System

Solar

What is the solution?

The solution deals with the integration of PV systems in buildings included in a protected area in the Venetian Lagune. Three innovative photovoltaic systems integrated into the roof were built, transforming over 1110 square meters of opaque surfaces into an active roof using the BIPV system with coloured photovoltaic tiles. Overall, 184 kWp of power were installed, along with a storage system. The unique photovoltaic tiles were of double laminated glass which makes them more resistant than single glass panels. Visual continuity was obtained by adding some tiles of the same colour and material of the others where PV modules were not needed. Thanks to the colouring of the front glass of the tiles that simulates the terracotta effect, and the usage of custom tiles, the roof refurbishment resulted in a useful example of PV integration.

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

The solution works because the historical values of the protected area are not violated. The integrated PV system is built according to aesthetic integration,

energy integration and technological integration aspects. The photovoltaic panels used are equipped with double laminated glass. Thanks to the particular colouring of the glass paste of the front glass, a chromatic effect similar to terracotta is obtained. The terracotta colour is typical of the traditional roofing used in the lagoon area, and in most of the regions of northern and central Italy. This solution offered the possibility of obtaining a recovery of the well-exposed roof pitches that resulted in complete chromatic assonance with the other pitches, with the surrounding buildings and the rest of the lagoon. The photovoltaic roof installed was built with standard modules and custom modules. Not all inserted items are actively producing energy. Where necessary, filling modules with identical characteristics to the active modules have been installed to guarantee a homogeneous view of the roofs. The system has an installed power of 184 kWp producing about 211 MWh per year of clean energy. This energy is used for the needs of the buildings and partly accumulated in storage. The PV panels installed are equipped with fixing systems, drainage channels at the back and watertight systems that allowed their use to replace the tiles.

Description of the context:

The Isola della Certosa Park is located on the Certosa Island in the northern Venetian lagoon. The Certosa Island is the largest of the small lagoon islands. The island is currently part of the Venetian Lagoon Areas of Public and Cultural Interest as per Legislative Decree 42/04 art.128 and DM 1 December 1961 and Article 128 of Legislative Decree 42 / 04 of the Italian law. It is also included within the UNESCO sites and the Natura 2000 sites. During the Middle Ages, La Certosa was the seat of a prestigious monastery. The area was demolished during the Napoleonic era, except a portion of the Chiostro Minore dei Conversi, whose fragments are still visible today. From the Nineteenth Century until the Second World War, the area was used as a military warehouse and industrial plant for armaments production. The closure of the war industry left the island abandoned until the end of the Nineteen Century. Recently, the Municipality of Venice started a refurbishment of the area aiming at transforming it in a park. Currently, this project is close to completion. The Certosa Island acts as a laboratory and showcase hub for energy production from renewable sources projects in historic areas.

Pros and cons of the solution:

The use of terracotta-coloured panels makes the solution aesthetically integrated as the terracotta colour is commonly used in Italy for roof covers. For the latter and because PV systems are more conveniently applicable on roofs than on other building surfaces, this solution results highly replicable in other contexts. Due to the high degree of technological integration, the solution results not easily reversible.

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

The solution described above was drawn from a real project that was awarded as PV integration best practice in the Solar Architecture in heritage award 2020.

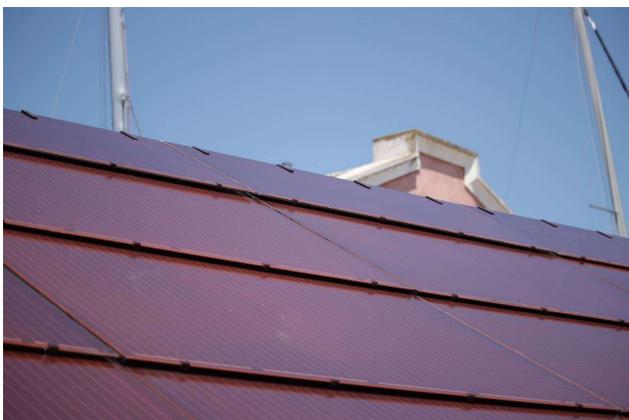
Are there any related publications or pictures of the solution?



Isola della Certosa - overview © GruppoSTG



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