



## La Certosa Island



Operazione co-finanziata dall'Unione Europea, Fondo Europeo di Sviluppo Regionale, dallo Stato Italiano, dalla Confederazione elvetica e dai Cantoni nell'ambito del Programma di Cooperazione Interreg V-A Italia-Svizzera. (Codice progetto 603882)

## Introduction

La Certosa Island is the largest of the minor islands in the Venice lagoon, with two-thirds of its twenty-two hectares occupied by a park. Home of a prestigious monastery in medieval times, the area was razed to the ground during the Napoleonic era, and only part of the monastery complex has survived to this day. Abandoned for a long time after being used as a military depot and industrial plant, La Certosa was the subject of a redevelopment project involving the conversion of abandoned areas into an urban park since the 1990s. The redevelopment and reclamation project, developed in a public-private partnership with the municipal administration, recently reached full completion. Today, the island is characterised by the coexistence of multifaceted activities related to boating, crafts, tourism, food and wine, and culture. It is home to three renovated buildings with coloured photovoltaic modules that were specially developed by Solmonte (GruppoSTG).

## Design approach

La Certosa is included in the areas of considerable public interest in the islands of the Venetian lagoon (Italian Legislative Decree 42/04 art. 128 and Italian Ministerial Decree of 1 December 1961) and the areas of cultural interest pursuant to art. 128 of Italian Legislative Decree 42/04 (part two of title one) and being part of UNESCO sites and Natura 2000 sites. However, the island is currently a privileged laboratory and showcase for the experimentation of innovative projects for producing energy from renewable sources. One of these experimental operations involved some abandoned buildings dating back to reconstructions in the 1990s, on which BIPV roofs were integrated.

## Aesthetic integration

BIPV modules are similar in colour to terracotta, typical of the traditional roofing used in the lagoon area and most regions of northern and central Italy. Together with the inactive elements added to complete the entire area of the roof, they create surfaces with a uniform aspect.

## Energy integration

The three BIPV roofs cover the electrical demand of the utilities on the island thanks to the annual production of about 211 MWh and the support of an accumulation system.

## Technology integration

The BIPV tiles cover over 1,110 square metres of surface. They are produced with double laminated glass, making them more resistant than modules with a single glass support. Thanks to the special colouring of the vitreous paste in the front glass, a colour effect similar to terracotta is achieved. The modules are attached using a system of brackets, channels, and drains built into the back to ensure water tightness.

## Decision making

Due to the desire to enhance the area and in compliance with the applicable regulations, since 2010, the construction of infrastructures that are unusual for the lagoon area has been allowed. In the same vein, the roofs of existing buildings were intended to be equipped with photovoltaic elements, and future constructions should include them from the outset. This context directed and supported the photovoltaic tile design.

The company responsible for carrying out the redevelopment project employed designers and installers who helped make the project a technical solutions laboratory and showcase and also contributed winning management strategies. The close dialogue between the customer and the designers has made it possible, for example, to abandon the idea of using classic framed photovoltaic elements, which were initially requested by the client, in favour of frameless modules. This made it possible to maximise the collection surface and, consequently, the system's power.

## Lessons learnt

The public-private partnership at the heart of the redevelopment and reclamation project was the key to the synthesis achieved between public and private needs.

Thanks to the traditional roofing elements being converted into photovoltaic modules, the recovery and enhancement of the island is a positive example of territorial requalification and the sustainable development of unused municipal areas.

Photovoltaic systems like the ones installed can be replicated in other typical Italian landscapes. Plus, thanks to the wide range of colours available, these BIPV systems can also have a functional and stylistic place as active coverings for ventilated façades, where possible.

## PROJECT DATA

<b>Project type</b>	renovation
<b>Building use</b>	industrial
<b>Heritage constraint</b>	conservation area
<b>Building construction technique</b>	industrial
<b>Building address</b>	Venezia (VE), Italy

## BIPV systems

### BIPV SYSTEM DATA

<b>Architectural system</b>	Opakes Dach
<b>Integration year</b>	2020
<b>Active material</b>	Monocrystalline silicon
<b>Module transparency</b>	opaque
<b>Module technology</b>	glass-glass, hidden PV, customized modules
<b>System power [kWp]</b>	184
<b>System area [m<sup>2</sup>]</b>	1,100
<b>Module dimensions [mm]</b>	1,000 x 1,500 x 9
<b>Modules orientation</b>	South
<b>Modules tilt [°]</b>	18° - 25°
<b>Annual FV production [kWh]</b>	211000

### BIPV SYSTEM COSTS

<b>Total cost [€]</b>	500000
<b>€/m<sup>2</sup></b>	454
<b>€/kWp</b>	2715

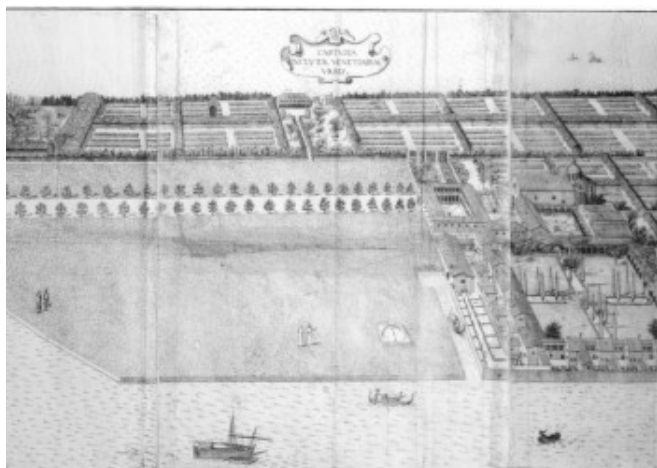
## Stakeholders

### **BIPV system designer**

GruppoSTG srl

### **BIPV components producer**

GruppoSTG Srl  
Via P. Paleocapa 19, Bergamo (BG), Italy  
+39 035-0510171  
<https://www.gruppostg.com/it/>



Period plan of the Carthusian Monastery on the island La Certosa



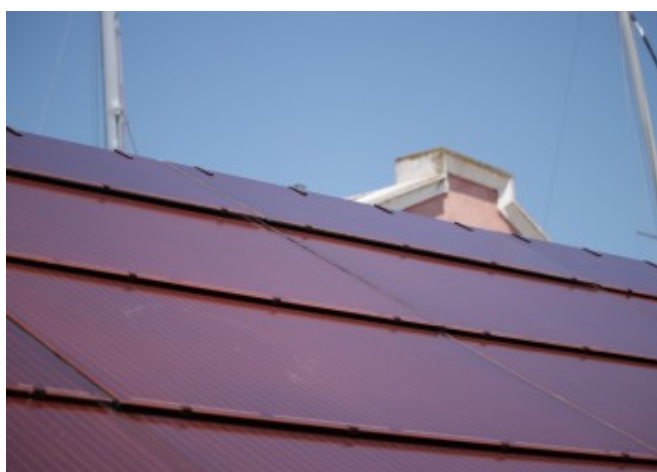
The building in question post-refurbishment



Positioning of the photovoltaic tiles in place of the terracotta tiles



Building with photovoltaic tiles and the Venice lagoon in the background



Overlapping of the photovoltaic tiles



Panoramic view of the island La Certosa

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