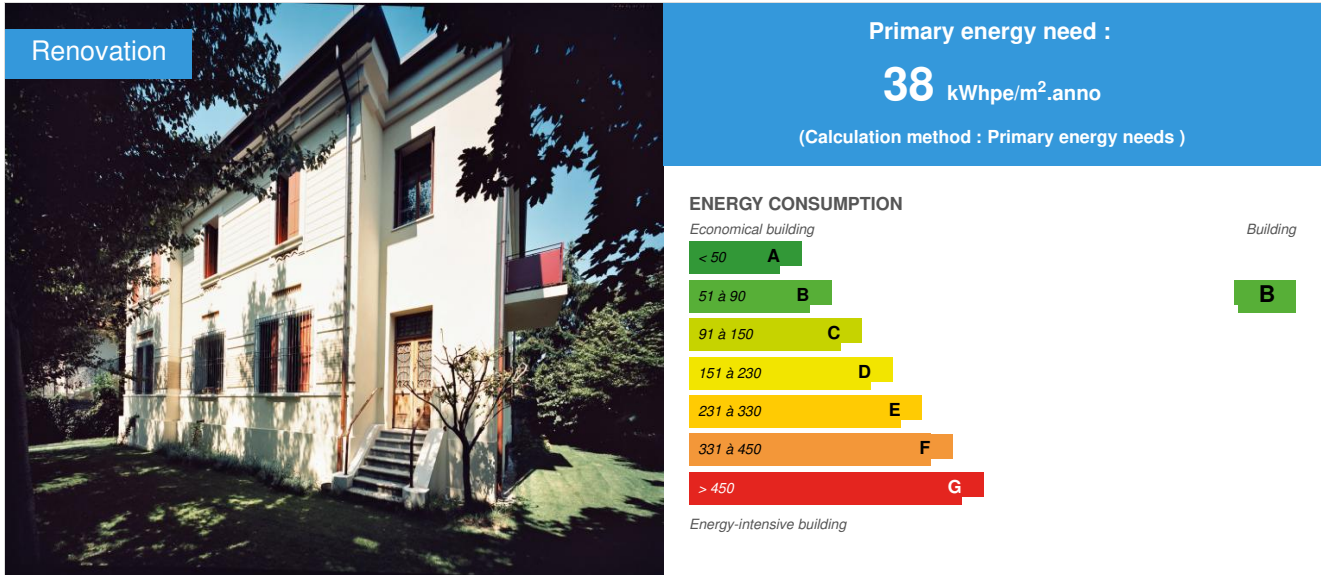


## Casa Borghesan-Corti CasaClima B+

by [lucia corti](#) / 2013-02-19 16:06:40 / Italia / 7449 / IT



**Building Type :** Terraced Individual housing  
**Construction Year :** 2009  
**Delivery year :**  
**Address 1 - street :** via forcellini 35127 PADOVA, Italia  
**Climate zone :**

**Net Floor Area :** 280 m<sup>2</sup> SHON (fr)  
**Construction/refurbishment cost :** 340 000 €  
**Cost/m<sup>2</sup> :** 1214.29 €/m<sup>2</sup>

### General information

This historic 1927 ArtNouveau home was practically in its original state, untouched by renovation efforts that would have deprived it of its beauty and dignity. Our daily commitment is to every aspect of sustainable architecture. This is especially important with historical buildings, the renovation of which requires respect, reversibility, restoration, and where possible, the use of renewable energy sources. Re-use and recycling of primary resources and building materials are the cornerstones of our designs. The grey energy incorporated in all building materials is great. As such, the decision to sacrifice valuable and still usable architectural components results in a great loss of energy. Substitution with new materials involves an even further loss of energy in terms of the costs of transport, production and disposal. This project design was thus constrained by a series of objectives that guided the choices throughout its execution:

1. Respect for the façade's moldings and friezes that so strongly define the Art Nouveau movement;
  2. Restoration of the masonry walls damaged by moisture;
  3. The systematic recovery and reuse of all possible original materials, including large southern exposed windows and the original external French doors;
  4. The use of materials originating from renewable resources
  5. The systematic adoption of removable and/or reversible designs in construction and interiors.
- Principal Modifications Completed:**
- Excavation around the entire perimeter of the house to create an external passage in which air circulates, allowing for both the drying of walls and masonry and the placement of insulation both above and below ground.
  - Placement of external insulation comprised of two layers of wood fiber panels to a total depth of 12 cm.
  - In the portions of the façade with moldings and friezes of architectural interest, the wood fiber panel insulation was placed internally.
  - The roof was insulated with one layer of wood fiber panels to a depth of 20 cm.
  - Specially designed roof ventilation allows for evaporation of excess humidity.

Systems:

. Since the house is completely insulated and present day living habits involve much time spent away from home, the necessary exchange of air inside the building is no longer guaranteed by the manual opening and closing of outside doors and windows, or by drafts let in by poorly fitted windows. This results in a less healthy environment within the home.

. For this reason, and also to reduce energy lost for ventilation purposes, the building has been outfitted with a centralized Mechanically Controlled Ventilation System for the recirculating of heat. In historical buildings such as these, in which internal wall insulation is required so as to maintain unaltered the external façade, the control of internal humidity levels becomes an absolute necessity.

. Thermal Solar and Photovoltaic Energy Supply

### How can the building help to improve the quality of life in a city?

The house is a valuable asset, that should pass down from generation to generation. In houses and in buildings, we spend most of the time of our lives: family time, work time, leisure time. In buildings we need more energy than elsewhere, since the energy is essential for their construction and functionality, as well as for maintaining our standard of living: we can say that they are responsible for half of global energy consumption. In this context we can therefore find the greatest potential for energy savings to significantly reduce the environmental implications, without changing our standard of living. The building can help to reduce CO2 emissions and to improve the air quality of a city.

The building undergoing a renovation and at the same time improving energy helps to preserve and respect the memory of our historical heritage with renewed potential for comfort and energy savings. Although it is a building characterized by timeless materials such as wood, stone, brick, clay and lime, has an efficient technology heart that makes it a cutting edge machine.

In addition:

- . It helps to keep alive the typical character of the place in which it is located, the memory of the city
- . Increases the use of old construction techniques that we should remember, helping local craftsmen keeping alive some trades
- . Improves indoor air quality through the use of environmentally friendly materials, free of pollution and chemicals
- . Prevents loss of land that today is not more sustainable for our country, whose landscape undergoes continuing violence for years

How can the building make a positive contribution to the infrastructure of the "city of the future"?

Design based on the intrinsic features of the site, the latitude, the solar gains, the exposure of the building, is one of the cornerstones of the city of the future. Sustainability will shape the cities of the future, and this will affect the morphology of the area.

The havoc perpetrated since the war, have made our city uninhabitable, polluted and socially disintegrating.

Networks of energy-efficient homes, built on the principles of biocompatibility will become the city of the future, which, in some ways, is nothing more than the city on a human scale of our past.

Ferry historical heritage into the future also means to build on constructive rules that never grow old and, indeed, are increasingly present.

Specifically:

- . domotics allow an efficient method of control and management of facilities and devices for energy efficiency
- . geothermal energy sources are environmentally advantageous from the economic point of view which allows winter heating and summer cooling
- . preparation for district heating represents an important opportunity for rational use of energy resources and control of local pollution, as well as a containment system of energy expenditure both for the community and for individual users.
- . the potential recycling of water, tanks and irrigation tanks constructed wetlands are designed to save water smartly. In addition, the mixing of air and flow regulators is a great help for a timely and effective water saving
- . an appropriate study of green areas can be very useful for creating a microclimate favourable to comfortable living and efficient urban shading.
- The testimony of building techniques that are no longer used, processes and products into disuse will enrich the city of the future

How can the building be integrated into the infrastructure of the "city of the future"?

- . the preparation of the double drain for wastewater and drinking water is very useful in anticipation of a new urban network becoming more dynamic with separate collection
- . keeping the permeability of the land is a good way to avoid flooding during summer storms which become more copious
- . in the case of future new construction projects there will be no need to provide for disposal of special waste (mineral fibers, cement, polystyrene, resins, toxic paints, glues components). Most of the materials used can be reused or recycled.

photos by Arch. Alberto Andrian

## See more details about this project

<http://www.agenziacasaclima.it>

## Data reliability

Assessor

Stakeholders

Stakeholders

Function : Contractor

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Function : Company

Giovanni Piazzon

<http://www.piazzongiovanni.it/>

Function : Company

Pozzobon serramenti

<http://www.pozzobon.it/>

Function : Certification company

Agenzia CasaClima

<http://www.agenziacasaclima.it/it/casaclima/1-0.html>

Function : Company

## Owner approach of sustainability

The unique atmosphere and charm of this house have convinced us to take a careful restructuring and an energy reorganization that gave new life to the property. Among the objectives that we set at the beginning of the project: . Recovery and reuse of all materials and original artifacts affected by the intervention . Using materials from renewable or recycled materials . Compliance with all the moldings and friezes of the façade . access to income tax deductions

## Architectural description

The house was built in 1927 and shows all the typical features of the building in the liberty style. In its main front, showed signs of an old prosperity: large windows, beautiful moldings and friezes. Even the consistency of the walls was in line with the custom of the Twenties: three / four heads of bricks in the south, in the public facade, only two in the northern front. Large and colorful rooms, high ceilings combined to give the interior an air of experienced and friendly. The urgency of interventions was due to winter discomfort, over-consumption for heating, and the fear that the tax deductions were not renewed. In this way began an adventure that has led designers and developers to a unique approach that combines the restructuring and the energy reorganization. One of the first steps was to achieve an excavation perimeter of the house for the drainage of water and to ensure the isolation of the underground part of masonry through the laying of panels of XPS thickness of 12 cm. The outer casing has been isolated with a insulation wood fiber on the three fronts devoid of ornaments and decorations of relief. On the public front, we have opted for an inner insulation made of wood fiber combined with a thermal plaster. The original structure of the roof has been preserved; we proceeded to insulation with wood fiber and implementation of a system ventilated by warping of joists. We choose a machine of Controlled Mechanical Ventilation and Heat Recovery which allows air exchange in 24 hours. Were applied photovoltaic panels for electricity and solar thermal panels for hot water.

## Energy

### Energy consumption

Primary energy need : 38,00 kWhpe/m<sup>2</sup>.anno

Primary energy need for standard building : 66,00 kWhpe/m<sup>2</sup>.anno

Calculation method : Primary energy needs

Initial consumption : 279,00 kWhpe/m<sup>2</sup>.anno

### Envelope performance

Envelope U-Value : 0,42 W/m<sup>2</sup>K

More information :

On the north and east and west sides an outer insulation wood fiber with a thickness of 12 cm was placed. On the south side a insulation of wood fiber of 6 cm and a combined outside thermal plaster were placed. The plinth of the entire outer perimeter of the building was insulated with panels XPS. On the roof were installed 22 cm of wood fiber. The insulation of the floor against the ground consists of a layer of XPS of 20 cm.

Building Compactness Coefficient : 0,56

## Renewables & systems

## Systems

### Heating system :

- Condensing gas boiler

### Hot water system :

- Solar Thermal

### Cooling system :

- VAV Syst. (Variable Air Volume system)

### Ventilation system :

- humidity sensitive Air Handling Unit (hygro A)

### Renewable systems :

- Solar photovoltaic

Renewable energy production : 65,49 %

## Environment

### GHG emissions

#### Methodology used :

XClimate Software

GHG before use : 128,00 KgCO<sub>2</sub> /m<sup>2</sup>

### Life Cycle Analysis

Eco-design material : Outer insulation of wood fiber PAVATEX, interior paintings in AURO lime, plaster and mortar of NATURAKALK, oil treatment of wooden parts AURO, macroporous insulating plaster SANAWARME, breathable decorative plaster based on potassium silicate, Botticino and natural pigments NATURALIA internal insulation PAVADENTRO, panels fibrogesso FERMACELL.

## Products

### Product

PAVADENTRO, PAVATHERM, DIFFUTHERM, PAVAFLEX, PAVAPLANUM

NATURALIA-BAU

<http://www.naturalia-bau.it/it/naturalia-bau-e-per-te.html>

Product category :

STAMISOL DW, STAMISOL ECO, STAMISOL PACK

NATURALIA BAU

<http://www.naturalia-bau.it/it/naturalia-bau-e-per-te.html>

Product category :

Fermacell s.r.l.

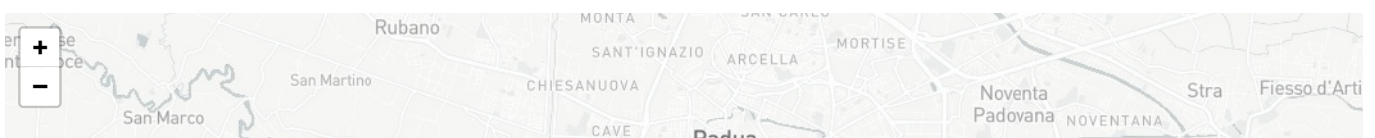
[http://www.fermacell.it/#\\_sub1943](http://www.fermacell.it/#_sub1943)

Product category :

AURO

<http://www.auroitalia.it/>

Product category :





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