


## CASA UD

by [Monterisi Tiziana](#) / 2018-03-13 15:34:41 / Italie / 8059 / IT

Heritage renovation



Primary energy need :

# 11.74 kWhpe/m<sup>2</sup>.anno

(Calculation method : )

**ENERGY CONSUMPTION**

*Economical building* *Building*

< 50	A
51 à 90	B
91 à 150	C
151 à 230	D
231 à 330	E
331 à 450	F
> 450	G

*Energy-intensive building*

**Building Type** : Terraced Individual housing  
**Construction Year** : 2017  
**Delivery year** : 2017  
**Address 1 - street** : 11020 FRAZIONE LA VILLE, CHAMOIS, Italia  
**Climate zone** : [H] Highland Climate(mountainous terrain).

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**Net Floor Area** : 105 m<sup>2</sup>  
**Construction/refurbishment cost** : 430 000 €  
**Number of Dwelling** : 1 Dwelling  
**Cost/m2** : 4095.24 €/m<sup>2</sup>

Proposed by :



### General information

Construction of a residential building built on the remains of an old dry stone cottage built in 1834.

The lot enjoys an excellent exposure, in a panoramic position towards the valley. The south windows, partly fixed and partly openable, contribute to the dialogue between the interior and the valley and provide the house with the solar energy necessary to make it passive.

The load-bearing structure of the roof and the perimeter walls has been realized in carpentry with prefabricated frames in wood and straw and assembled in place in just 4 days. Through this construction technique, the environmental impact has been reduced to a minimum because only natural materials with low gray energy have been used. Due to the impossibility for traditional means of transport to reach the site, the helicopter was used for the assembly of the cottage and for the transport of certain materials.

The set of formal and material choices were dictated by the desire to reinterpret the tradition using ancient materials in a modern key. The wooden surfaces were treated with natural oils, while the walls were completed internally with clay and paint derived from plant chemistry.

The energy requirement is extremely reduced thanks to the high insulation provided by the straw infill of the frame structure and the cellular glass against the

ground. It does not need a heating system as it uses the passive contribution of the sun, ventilation and natural lighting.

## See more details about this project

<http://www.coltivarelacitta.it/portfolio/casa-ud/>

## Data reliability

Assessor

## Stakeholders

### Contractor

Name : Privato

### Construction Manager

Name : Tiziano Monterisi Architetto

Contact : via Giorgio Cantono 23, 13811 Andorno Micca (BI)

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

### Stakeholders

Function : Construction company

Novello Case in Legno

via Scipione Ronchetto 18, 21040 Oggiona Santo Stefano (VA)

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

Function : Construction company

Vertalpina snc

via E. Chanoux 55, 11027 Saint-Vincent (AO)

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

Function : Structures calculist

ARPOSTUDIO

via Longuelo 78, 24129 Bergamo

<http://www.arpostudio.it>

Function : Other consultancy agency

geometra Andrea Mantovani

via Mazzini 38, 13818 Tollegno (BI)

<http://www.studiomantovani.info/>

### Contracting method

Build and sell construction

### Owner approach of sustainability

The meeting between the client and the designer stems from a journey from different realities linked by mutual affinity towards the use of ethical and sustainable natural materials that represent both focal point and stimulus for the respective professional activities.

The agility in sharing design choices and identifying finishes has allowed us to find space also for the client's creativity in designing a line of fabrics directly inspired by the project and integrated with style and personality in the creation of the same.

The choice that inspired the client was born from the desire to recover an ancient ruin in a place characterized by the absence of cars in a building with almost zero energy, while maintaining the characteristics of the alpine style unaltered. This has allowed us to create a high quality building that at the same time excels for its performance, reducing to the minimum the ecological footprint generated and limiting the maximum impact on the surrounding environment.

## Architectural description

The project concerns the construction of an almost zero-energy house on the remains of an old dry stone 1834 farmhouse. The lot enjoys an excellent exposure, in a panoramic position towards the valley. The windows, to the south, partly fixed and partly openable, contribute to the dialogue between the interior and the valley, but above all they provide the house with the solar energy necessary to make it a passive house. The load-bearing structure of the roof, walls and floors in prefabricated frames made of wood and rice straw, was built in carpentry and installed in just 4 days. Due to the impossibility of using traditional means of transport to reach the site, the helicopter was used for assembly. The 41 cm-thick frame elements solve the entire construction structurally and energetically.

Through this construction technique, the environmental impact has been reduced to a minimum because only natural materials with low gray energy have been used. The external covering has been realized with the splitted local stone, recovered from the demolition of the previous skeleton worked and laid dry to integrate the building with the existing village. The gallery and the inserts in the East façade are made of larch wood to recall part of the traditional architecture of the middle alpine strip. A house, on three levels, which houses kitchen, dining area and relax on the ground floor, the master bedroom and bathroom on the first floor and two bedrooms with mezzanine at the last. The stratigraphy of the walls solves the external climatic variations both winter and summer; the clay finish on the inside naturally regulates the concentration of moisture in the various rooms. The space is reduced, bound by the previous structure, combined with the choice of materials, has been enhanced with the intent to create a feeling of "home" evoking this cardinal value of much rural architecture. The recovery of the larch wood planks from the demolition of the rustic allowed to create the staircase that joins the three levels on the north side of the building.

The set of choices, formal and material, were dictated by the desire to reinterpret the tradition using ancient materials in a modern way. All the wooden surfaces have been treated with natural oils, while all the wall surfaces have been treated internally with clay and paints deriving from plant chemistry. The energy requirement has been reduced to a minimum (7 kw / m2) thanks to the high wood and straw insulation of the frame structure and the cellular surface of the ground floor. It does not need the heating system as it uses the passive contribution of the sun, ventilation and natural lighting. Through a 2 kw photovoltaic system integrated into an accumulation plant, the primary energy requirements are met

## Energy

### Energy consumption

Primary energy need : 11,74 kWhpe/m<sup>2</sup>.anno

Primary energy need for standard building : 27,31 kWhpe/m<sup>2</sup>.anno

Calculation method :

### Envelope performance

Indicator : EN 13829 - n50 » (en 1/h-1)

## Renewables & systems

### Systems

Heating system :

- No heating system

Hot water system :

- Individual electric boiler

Cooling system :

- No cooling system

Ventilation system :

- Natural ventilation

Renewable systems :

- Solar photovoltaic

## Environment

### Life Cycle Analysis

Eco-design material :

The use of natural materials is the basis of the philosophy that led to the construction of the building.

Specifically, the following were used:

- rice straw bales for the plugging of the outer envelope;
- fir wood for the structure;
- recycled cellular glass plates for insulation in the ground;
- sheep's wool for insulation in the air gap and the impact sound;
- oak wood treated with oil and wax for interior furnishings;
- larch wood recovered from the existing building for some elements such as the balconies and the internal staircase;
- stone for the covering mantle and the external covering (in this last case recovered from the existing building);
- wax-treated metal for some finishing elements;
- raw earth for plasters (in slabs for the background plaster);
- linen fabrics for furnishing elements.

Furthermore, the use of dry technologies has made it possible to avoid the use of glues and consequently increase the concentration of VOC inside the building.

## Indoor Air quality

The natural ventilation is guaranteed by a correct positioning of the openings that allow to have crossed air flows, such as to guarantee the complete air exchange.

The use of exclusively natural materials (in particular straw, raw earth and wood with oil and wax treatments) that do not contain toxic substances, such as formaldehyde, offers the guarantee for a healthy environment.

The raw earth is able to absorb important quantities of moisture (up to 20 times more than the best brick bricks) and to release it gradually inside the environment, maintaining the constant and optimal level of humidity throughout the year.

The clay, fundamental constituent of the earth, is also non-toxic: it does not undergo alterations or complex and impactful processes.

## Comfort

### Health & comfort :

From the data collected through a thermometer and hygrometer placed in the building, it is clear how the temperature and humidity remain constant even with significant climatic variations on the outside.

In winter, despite having an outdoor temperature down to -17 ° C, the internal temperature remains variable between 18 and 21 ° C with a humidity of around 45%.

In summer, vice versa, with outside temperatures reaching up to 30 ° C, the internal temperature varies between 23 and 25 ° C and humidity is around 40%.

## Products

### Product

#### RESOURCE

Ricehouse srl

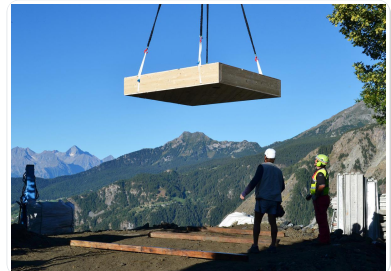
info@ricehouse.it

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

#### Product category :

Prefabricated frames in lamellar fir wood and infill in bales of rice straw from the rice fields of Vercelli. The bracing of the structure is guaranteed by the closing plank in fir wood placed at 45 ° on both sides.

The product has been appreciated by the client and by the workers thanks to the considerable ease and speed of installation, and a consequent substantial reduction in construction time.



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## Costs

### Construction and exploitation costs

Renewable energy systems cost : 8 500,00 €

Cost of studies : 34 000 €

Total cost of the building : 460 000 €

## Energy bill

Forecasted energy bill/year : 470,00 €

Real energy cost/m<sup>2</sup> : 4.48

Real energy cost/Dwelling : 470

## Urban environment

The typological characters of the area in which the property is inserted are the result of a direct response to a series of needs dictated by a rural economy and met with locally available techniques and materials. The buildings were of such dimensions as to represent a sort of "existenz minimum" dictated by the rules imposed by the external environment and built not only around the man and his movements, but also to the livestock, to the products of the fields and to that set of gestures dictated by a lifestyle that is always the same and repeated.

The property in question is part of an elongated body that includes another property, with which it shares the north front, which is therefore blind; the west and east elevations, as per tradition, have a small amount of openings and small dimensions. The main façade, on the other hand, is that the building located at the border of the village, on the downstream side, is totally exposed to the south, and has two openings on each floor.

Great attention was paid to the reading of the morphological structure of the territorial context, to the precise analysis of degradation, structural instability and consolidation.

First of all, the principles that lead to the rereading of the building through techniques that conform to their original constitution have been identified: volumes, slopes, facades, dimensions of the openings, fixtures, materials, and therefore the entire building unit have been safeguarded as much as possible. , through the use of techniques and materials that have not altered the typology, the spatial unity and the overall image of the building.

The external cladding in splitted local stone, the gallery and the wooden shading elements used in the façade, integrate the building to the existing village and refer to the archetypes of traditional alpine architecture.

## Land plot area

Land plot area : 245,00 m<sup>2</sup>

## Built-up area

Built-up area : 24,00 %

## Parking spaces

The township is not accessible by cars

## Building Environmental Quality

### Building Environmental Quality

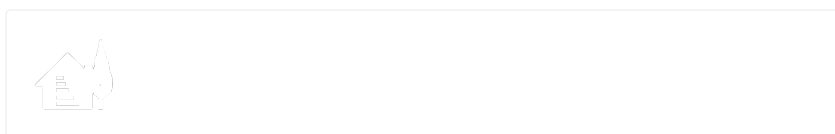
- indoor air quality and health
- works (including waste management)
- acoustics
- comfort (visual, olfactive, thermal)
- energy efficiency
- renewable energies
- integration in the land
- building process
- products and materials

## Contest

### Reasons for participating in the competition(s)

Prefabricated single-family building with elements made of wood and rice straw

### Building candidate in the category





Energia e Climi Temperati



Bassa Emissione di Carbonio



Salute e Comfort



Utenti Preferito

