


## #29Soto

by [Germán Velázquez Arizmendi](#) / ⌚ 2017-06-07 17:58:58 / Spanien /  
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New Construction



Primary energy need :  
**5.9** kWhpe/m<sup>2</sup>.year  
(Calculation method : RD: 47/2007 )

**ENERGY CONSUMPTION**

Economical building	Building
< 50 <b>A</b>	<b>A</b>
51 à 90 <b>B</b>	
91 à 150 <b>C</b>	
151 à 230 <b>D</b>	
231 à 330 <b>E</b>	
331 à 450 <b>F</b>	
> 450 <b>G</b>	
Energy-intensive building	

**Building Type** : Collective housing > 50m

**Construction Year** : 2017

**Delivery year** : 2017

**Address 1 - street** : Vicente Luis Garcera Lopez 31006 PAMPLONA, España

**Climate zone** : [Csa] Interior Mediterranean - Mild with dry, hot summer.

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**Net Floor Area** : 2 250 m<sup>2</sup>

**Construction/refurbishment cost** : 3 150 356 €

**Number of Dwelling** : 29 Dwelling

**Cost/m2** : 1400.16 €/m<sup>2</sup>

**Certifications :**



**Proposed by :**



## General information

This is the first block of housing certified in Spain under the Passivhaus standard, and therefore has a demand for heating below 15kWh / m<sup>2</sup>a, and a heating load of 10W / m<sup>2</sup>. This implies that a floor of 75m<sup>2</sup> will have a heating load of only 750W, so with a hair dryer there would be enough to heat two houses.

To achieve this the following principles have been applied:

1. Insulation: A continuous thermal envelope is projected on the exterior of the building, which is not interrupted on deck or on the ground floor. Exterior insulation minimizes thermal bridges.
2. Thermal bridges: all the construction details have been modeled with a thermal bridge calculation program, so that it can be guaranteed that at any point inside the building there will be at least 17°C of temperature. The terraces have been disconnected from the interior structure, the slab being cut so that the insulation line can have continuity, and the blinds go outside to avoid sealing problems, and the pre-frame has had to be extended to place a rigid insulation block, so that the facade rock wool has continuity to the carpentry itself.
3. High-performance carpentry and glazing: A set consisting of a high-performance PVC profile with a UfAlta tightness: in all the houses a door-blowing test has been carried out, applying standards en13829 and ISO 9972, and criteria foreseen by the Passivhaus Institut. The average tightness was 0.40 renewals / hour, a figure well below the 0.6r / h required by the Passivhaus Institute for certification.
4. Ventilation with heat recovery: When you have worked exhaustively the sealing makes perfect sense to use a mechanical ventilation of double flow, with recovery of heat of high efficiency. This allows the air to be preheated in winter to 17-18 ° C, so the differential is only 3-4 ° C. With a simple flow would have to raise the temperature of the outdoor air from 0 ° C on a winter day to 21 ° C setpoint.

## See more details about this project

<https://www.construible.es/2017/06/07/29-soto-primer-edificio-residencial-certificado-passivhaus-espana>

<http://www.eitb.eus/es/noticias/sociedad/videos/detalle/4093676/el-primer-bloque-de-pisos-passivhaus-del-estado-estara-en-pamplona/>

<http://www.noticiasdenavarra.com/2016/04/24/vecinos/pamplona/el-bloque-de-viviendas-con-mayor-ahorro-energetico>

<https://simaexpo.com/candidatura/29-soto-1er-bloque-residencial-passivhaus-en-espana/>

<https://www.construible.es/2017/06/07/29-soto-primer-edificio-residencial-certificado-passivhaus-espana>

## Data reliability

3rd part certified

## Stakeholders

### Stakeholders

Function : Contractor

Promociones Las Provincias

Laura Valencia

<http://www.promocioneslasprovincias.com/>

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Function : Construction Manager

Construcciones Erro y Eugui

Iñigo Eugui

<http://www.erroyeugui.com/>

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Function : Designer

VARquitectos

Germán Velázquez

<http://www.varquitectos.com/>

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### Contracting method

Lump-sum turnkey

### Owner approach of sustainability

The objective was to get the project with the lowest possible heating demand, so as to be able to offer houses without energy mortgage. For this, the Passivhaus standard was proposed,

which also offers many other advantages, such as maximum indoor air quality, avoid thermal bridges and therefore pathologies, maximum interior comfort, absence of noise thanks to high insulation and great air tightness, etc.

## Architectural description

The architecture could not be seen in any case mortgaged by the constructive solutions of high energy efficiency. For this, VArquitectos has done an intense work during the drafting of the project in order to be able to provide thermally adequate solutions to the architectural requirements. The most notable case are the large terraces which do not compromise in absolute efficiency of the building, since they are outside the thermal envelope.

## If you had to do it again?

Certain solutions implemented on site would be simplified.

## Energy

### Energy consumption

Primary energy need : 5,90 kWhpe/m<sup>2</sup>.year

Primary energy need for standard building : 24,20 kWhpe/m<sup>2</sup>.year

Calculation method : RD: 47/2007

Final Energy : 26,80 kWhfe/m<sup>2</sup>.year

Breakdown for energy consumption :

Heating 6.60kWh / m<sup>2</sup>a

ACS 17.76kWh / m<sup>2</sup>a

Cooling 2.5kWh / m<sup>2</sup>a

More information :

Demand for heating will be below 15kWh / m<sup>2</sup>a, as the Passivhaus certification proves.

### Envelope performance

Envelope U-Value : 0,17 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

The façade is composed of exterior to interior:

Ventilated composite aluminum facade

Thermal insulation of double density rock wool in 10cm

Waterproof coating

Half massive brick flagpole

Cast

Mineral wool 5cm

Cardboard plaster partition

Building Compactness Coefficient : 0,34

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

Air Tightness Value : 0,40

## Renewables & systems

### Systems

Heating system :

- Condensing gas boiler
- Low temperature floor heating

Hot water system :

- Condensing gas boiler

Cooling system :

- No cooling system

Ventilation system :

- Nocturnal ventilation
- Double flow heat exchanger

☞ La Ventilación de doble flujo con recuperación de calor cuenta con una distribución en estrella. De este modo, el calibrado de la instalación es más sencillo, y se garantiza la ausencia de ruidos por transmisión a través de los conductos.

Renewable systems :

- Solar Thermal

Renewable energy production : 30,00 %

Other information on HVAC :

A radiant floor is provided for the heating. The system is oversized for existing requirements, but it did not seem feasible to market a product without heating.

Solutions enhancing nature free gains :

The project has been completely modeled with the PHPP, the computer tool of the Passivhaus Institute. This has allowed to contemplate absolutely all the thermal gains, be they natural or internal gains, as well as the losses. For that

### GHG emissions

GHG in use : 5,60 KgCO<sub>2</sub>/m<sup>2</sup>/year

Methodology used :

CTE

Building lifetime : 75,00 year(s)

### Indoor Air quality

The quality of the indoor air is guaranteed through the double flow with heat recovery. The ppms will be stable between 500ppms and 1000ppms. When air is filtered, there will be no pollen, dust, pollution, etc.

### Comfort

**Health & comfort :** In the absence of thermal bridges and gradients, and with the correct ventilation provided, no internal condensation will occur, avoiding the appearance of pathologies, mold, etc. The comfort will therefore be maximum, with a stable temperature of 21°C, with a minimum expenditure on heating. In addition the absence of noises will be almost total thanks to the tightness of the houses and their high isolation.

## Products

### Product

Zehnder Comfoair

Zehnder

Koldo Monreal

<http://www.onhaus.es/>

**Product category :** HLK / Belüftung,  
Kühlung

Mechanical system of double flow with recovery of heat. A recuperator has been



placed per housing unit, with a star distribution.

The houses are not yet in use, but on the pilot floor, customers are very surprised by the absence of smells, noises, etc.

## Costs

### Construction and exploitation costs

Reference global cost : 2 800,00 €

Renewable energy systems cost : 45 000,00 €

Reference global cost/Dwelling : 2800

Cost of studies : 100 000 €

Total cost of the building : 3 150 356 €

### Energy bill

Forecasted energy bill/year : 5 600,00 €

Real energy cost/m<sup>2</sup> : 2.49

Real energy cost/Dwelling : 193.1

### Urban environment

Soto de Lezkairu is a neighborhood recently created in Pamplona. It is currently closed in more than 50%, and has all the services of a new neighborhood; Transport, bicycle lane, recreation areas and parks, pneumatic garbage collection, etc.

### Land plot area

Land plot area : 1 150,00 m<sup>2</sup>

### Built-up area

Built-up area : 45,00 %

### Green space

Green space : 180,00

## Parking spaces

Two basement floors, with space for 44 parking spaces, 29 storage rooms and 4 places for motorcycle.

## Building Environmental Quality

### Building Environmental Quality

- indoor air quality and health
- acoustics
- comfort (visual, olfactive, thermal)
- energy efficiency
- building process

## Contest

### Building candidate in the category



Energía & Climas Temperados







Premio de los Usuarios



Gran Premio de Construcción Sostenible

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