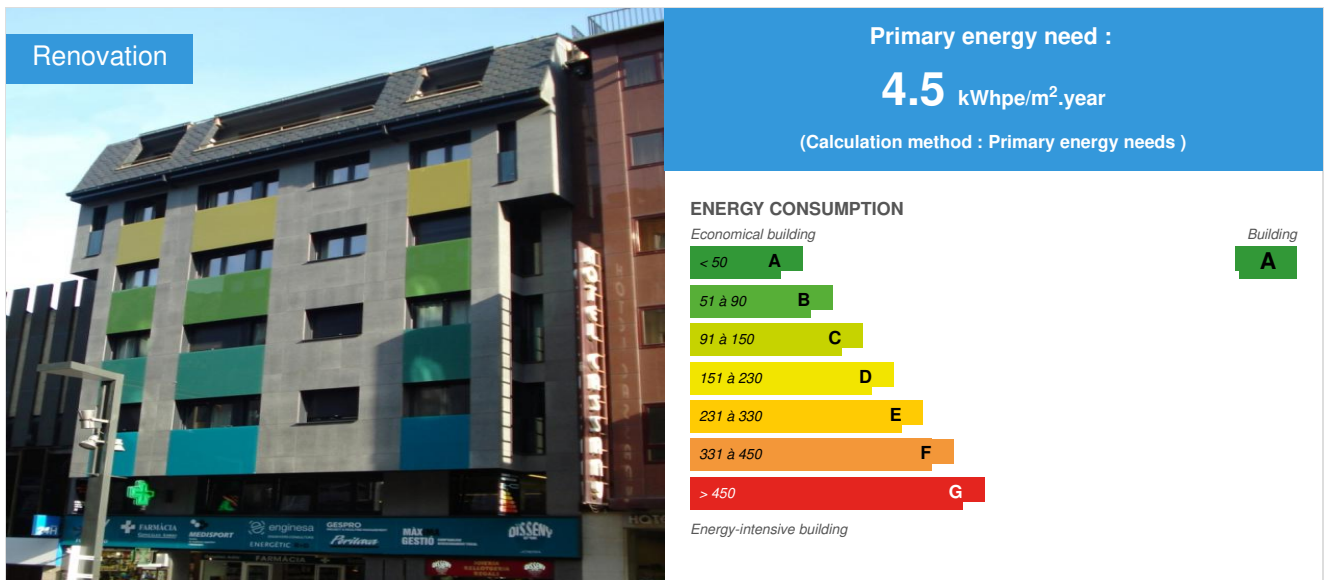


## EDIFICI ACONCAGUA

by jordi llovera / 2015-06-29 12:47:13 / Internacional / 14520 / EN



**Building Type** : Collective housing > 50m  
**Construction Year** : 1982  
**Delivery year** : 2011  
**Address 1 - street** : meritxell 30 00500 ANDORRA LA VELLA, ANDORRA, Andorra  
**Climate zone** : [Cfc] Marine Cool Winter & summer- Mild with no dry season.

**Net Floor Area** : 2 300 m<sup>2</sup> Superficie útil  
**Construction/refurbishment cost** : 340 000 €  
**Number of Dwelling** : 24 Dwelling  
**Cost/m<sup>2</sup>** : 147.83 €/m<sup>2</sup>

**Certifications :**

MINER<sup>G</sup>IE-ECO<sup>®</sup>

**Proposed by :**



### General information

Reformed building with 27 apartments, applying energy efficiency criteria.

It's situated in an alpine zone.

The winter's minimum temperature is -12°C.

Reduced heating consumption by 82%.

Acting on facade insulation and heating system: thermographic study, 15 to 20cm insulation, triple glazing LowE, blower door test, etc.

## See more details about this project

<http://www.construction21.org/espana/case-studies/es/aconcagua.html>

<http://www.construction21.org/articles/fr/low-energy-renovation-winner-2015-aconcagua-andorra.html>

## Stakeholders

### Stakeholders

Function : Designer

ENGINESA

info@enginesa.ad

<http://www.enginesa.ad>

architects and thermal engineering designer

### Contracting method

Separate batches

### Type of market

Table 'c21\_spain.rex\_market\_type' doesn't exist

### Building users opinion

Users are happy because their heating cost is very low and the comfort has increased.

Owner is happy too because he can grow up the price to rent the apartments, even if the users pays less than before (because the heating cost). He is happy too because he has a waiting list to rent their apartments.

## Energy

### Energy consumption

Primary energy need : 4,50 kWhpe/m<sup>2</sup>.year

Primary energy need for standard building : 55,00 kWhpe/m<sup>2</sup>.year

Calculation method : Primary energy needs

CEEB : 0.0001

Breakdown for energy consumption : heating made by central heat pump. Consumption 4.5 kWh/m<sup>2</sup>/year

hott water production by heat pump. consumption 21 kWh/m<sup>2</sup>/year

lighting 104.5 kWh/m<sup>2</sup>/year

Initial consumption : 212,00 kWhpe/m<sup>2</sup>.year

### Envelope performance

Envelope U-Value : 0,24 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

Primary facade, U=0.24 W/m<sup>2</sup>/K

Secondary facade U=0.34 W/m<sup>2</sup>/K

Facade to neighbor U=0.27 W/m<sup>2</sup>/year

Building Compactness Coefficient : 2,90

Indicator : n50

Air Tightness Value : 2,40

### Real final energy consumption

Final Energy : 130,00 kWhfe/m<sup>2</sup>.year

Real final energy consumption/m<sup>2</sup> : 130,00 kWhfe/m<sup>2</sup>.year

Real final energy consumption/functional unit : 4,64 kWhfe/m<sup>2</sup>.year

Year of the real energy consumption : 2 013

### Systems

#### Heating system :

- Heat pump
- Water radiator

#### Hot water system :

- Heat pump

#### Cooling system :

- No cooling system

#### Ventilation system :

- Natural ventilation

#### Renewable systems :

- No renewable energy systems

Renewable energy production : 100,00 %

#### Solutions enhancing nature free gains :

solar gains control by blinds

### Smart Building

#### BMS :

Control on/off, viewer of any parameter like temperatures, % opened of motorized valve, pump parameters (% velocity, flow, pressure, energy), instant and cumulated electrical and thermal energy consumption

Users' opinion on the Smart Building functions : facility controlled by a Desigo Insight central control by Siemens

## Environment

### Urban environment

Building in Andorra la Vella down town, shopping zone

Land plot area : 350,00 m<sup>2</sup>

Built-up area : 100,00 %

## Products

### Product

rockwool external pipe insulation 2x5cm each pipe

**Product category :** Table 'c21\_spain.innov\_category' doesn't exist SELECT one.innov\_category AS current,two.innov\_category AS parentFROM innov\_category AS oneINNER JOIN innov\_category AS two ON one.parent\_id = two.idWHERE one.state=1AND one.id = '0'

exterior pipe insulation

very good insulation with this thickness

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daikin heat pump

**Product category :** Table 'c21\_spain.innov\_category' doesn't exist SELECT one.innov\_category AS current,two.innov\_category AS parentFROM innov\_category AS oneINNER JOIN innov\_category AS two ON one.parent\_id = two.idWHERE one.state=1AND one.id = '0'

Heat pump for heating low temperature (max 50°C) and high efficiency COP between 2.84 to 3.77, ESEER 3.78.

It works at proportional temperature to outdoor temp to achieve always maximum COP.

We use with this heat pump, existing old radiators (high temperature and high emission) to heat this buiding after refurbishment, working at low temperature and low emission.

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daikin altherma for DHW

**Product category :** Table 'c21\_spain.innov\_category' doesn't exist SELECT one.innov\_category AS current,two.innov\_category AS parentFROM innov\_category AS oneINNER JOIN innov\_category AS two ON one.parent\_id = two.idWHERE one.state=1AND one.id = '0'

High temperature heat pump to produce domestic hot water (DHW)

Produces low cost hot water. No problems

grundfos magna 3 for heating and DHW

**Product category :** Table 'c21\_spain.innov\_category' doesn't exist SELECT one.innov\_category AS current,two.innov\_category AS parentFROM innov\_category AS oneINNER JOIN innov\_category AS two ON one.parent\_id = two.idWHERE one.state=1AND one.id = '0'

Electronic pump with connection to BMS control system, data transmission: pressure (bar), flow (m3/h), instant consumption (W), cumulate consumption (kWh), thermal flow (kWh).

Working at constant temperature function (hot water production) or at constant pressure function (for heating facility)

Sometimes the pump stops without any order

## Costs

### Construction and exploitation costs

Renewable energy systems cost : 35 000,00 €

Cost of studies : 22 000 €

Total cost of the building : 340 000 €

Subsidies : 30 000 €

## Contest

### Building candidate in the category



Low energy renovation

  
**Green Building  
Solutions** Awards 2015

powered by  Construction21

