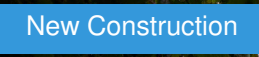



## Villa Seres

by [Rodolphe Deborre](#) / 2015-06-11 15:19:32 / Francia / 14092 / FR

Primary energy need :

# 76 kWhep/m<sup>2</sup>.an

(Calculation method : RT 2012 )

**ENERGY CONSUMPTION**

*Economical building* *Building*

< 50	<b>A</b>	
51 à 90	<b>B</b>	<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** : Isolated or semi-detached house  
**Construction Year** : 2014  
**Delivery year** : 2014  
**Address 1 - street** : 59930 LA CHAPELLE D'ARMENTIÈRE, France  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 80 m<sup>2</sup>  
**Construction/refurbishment cost** : 70 000 €  
**Number of Dwelling** : 1 Dwelling  
**Cost/m<sup>2</sup>** : 875 €/m<sup>2</sup>

**Certifications :**



**Proposed by :**

SMART  
MODULE  
CONCEPT

### General information

Wood show house for a residential subdivision project.

RT 2012 Modular timber construction by the Smart Module Business Concept

### Sustainable development approach of the project owner

Nacarat is a developer fully committed to sustainable development. To do this, an ecodesign approach is systematically applied in all programs since 2011.

This project is a test project of the market's ability to foster modular timber construction, with high environmental performances, within an environment that usually is terribly conventional (detached houses subdivisions). This is also the first effective collaboration between Smart Module Concept, a subsidiary of Rabot Dutilleul who builds wooden buildings in a factory 4.0 and Nacarat, the developer of the Rabot Dutilleul group. The project presented is the show house built in a few days. Another 21 houses of 80m<sup>2</sup> are still to be built yet.

## Architectural description

With their wooden siding, the Seres Villas offer a contemporary architecture in perfect harmony with the green landscape with trees of the neighborhood. Covering an 80m<sup>2</sup> area, they generously open to the outside thanks to beautiful bay windows and all have a nice garden to relax with family.

## Building users opinion

not available

## If you had to do it again?

Smart Module Concept became subsidiary of Rabot Dutilleul, like Nacarat. The objective is indeed to deploy as much as possible to this industrial tool

## See more details about this project

## Stakeholders

### Stakeholders

Function : Developer

Nacarat, groupe Rabot Dutilleul

Sebastien Fourmeaux

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

Function : Construction company

Smart Module Concept

Thibaut Leroy

<http://smartmoduleconcept.com/>

Function : Designer

AKT 3 ARCHITECTURE

## Contracting method

Off-plan

## Energy

### Energy consumption

Primary energy need : 76,00 kWh<sub>ep</sub>/m<sup>2</sup>.an

Primary energy need for standard building : 37,00 kWh<sub>ep</sub>/m<sup>2</sup>.an

Calculation method : RT 2012

CEEB : -0.0006

Breakdown for energy consumption : Heating: 46.9

Hot water: 20.6

Lighting: 4.0

Auxiliary: 2.7

### Real final energy consumption

Final Energy : 62,50 kWh<sub>ef</sub>/m<sup>2</sup>.an

### Envelope performance

Envelope U-Value : 0,12 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

#### Structure

Three dimensional timber construction system: 2 bunk modules of 5 m wide and 10.5 m long

Factory Integration of thermal insulation in timber frame

- significant reduction in thermal bridge, allowing living space gains.
- Sound insulation: the housing structures are completely independent (no common party wall and floor).

#### Facades coverings

- Made of poplar treated by cross-linking, an ecological process that can make the wood exceptionally stable, durable and resistant. Wood protective treatments that meet the standards. Natural resistance and maintenance-free wood. Flat sheets of fiber cement.

Indicator : I4

Air Tightness Value : 0,60

## More information

Studies were carried out for a group of 4 houses during design stage. To date, only the show house has been delivered. The results presented are the worst values.

## Renewables & systems

### Systems

Heating system :

- Others

Hot water system :

- Heat pump
- Other hot water system

Cooling system :

- No cooling system

Ventilation system :

- Humidity sensitive Air Handling Unit (Hygro B)

Renewable systems :

- No renewable energy systems

Solutions enhancing nature free gains :

Qualité de conception de l'enveloppe et confort de montage en usine assure l'étanchéité requise au moindre prix.

## Environment

### Urban environment

Land plot area : 105,00 m<sup>2</sup>

Built-up area : 60,00 %

Urban surroundings of Lille. New neighborhood with mixed typology.

## Products

### Product

Heat pump water heater

Atlantic

Resp commercial

<http://www.atlantic.fr/nos-produits/tous-les-produits-ventilation/tous-les-produits-vmc-chauffe-eau/vmc-hygroreglable-chauffe-eau/vmc-hygroreglable-et-chauffe-eau-thermodynamique-aeraulix>

Product category : Table 'c21\_italy.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 = '18'

2in1 system:

Controlled ventilation + water heater. Hot extracted air enters the 2in1 system, drawn in by the fan of the controlled ventilation. The heat pump collects the calories contained in the extracted air and heats the water in hot water cylinder. The cooled stale air is then discharged to the outside. The house is ventilated, the water is heated!

n/a



Hydro Front panel Copanel

Copanel

Resp Commercial

<http://www.copanel.fr/>

**Product category :** Table 'c21\_italy.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 = '6'

**FIBRE CEMENT SHEETS NEW GENERATION:** tinted mass, high density (HD), doubly compressed, self-clavées and reinforced with mineralized cellulose fibers.

Mineral facade panels for timber frames.



## Costs

### Construction and exploitation costs

Total cost of the building : 199 000 €

## Carbon

### GHG emissions

GHG in use : 5,00 KgCO<sub>2</sub>/m<sup>2</sup>/an

Methodology used :

LCA tool by CSTB: Elodie

### Life Cycle Analysis

**Eco-design material :** Smart module concept offers space modules wood frame, three-dimensional, almost all of the construction is done in the factory, flooring, tiles, kitchen, bathroom, networks, valves, etc. Of the 18 professions that intervene during the construction of a house only 3 worked on the construction site. The timber used in the building is "Lamibois" and "I-shaped beams" in solid wood core particle. In walls, butted solid wood .

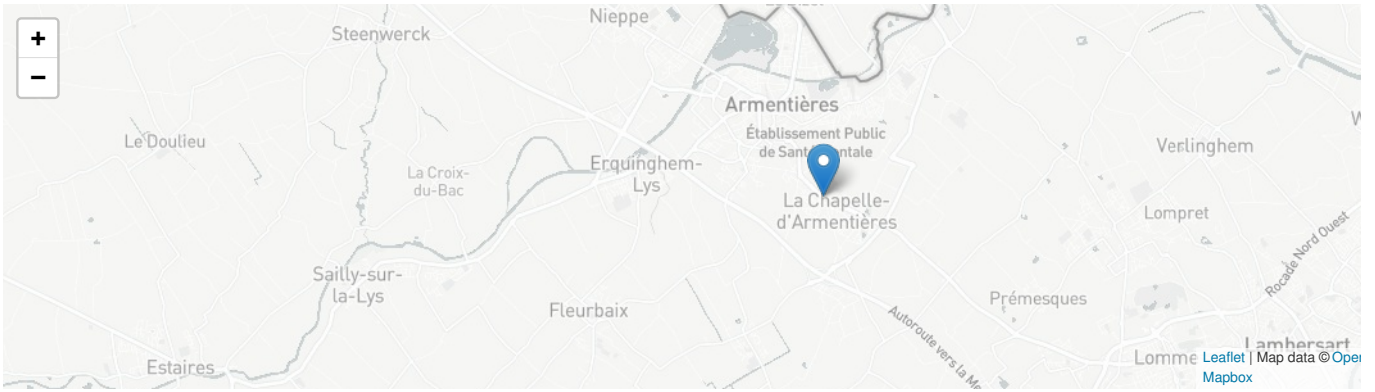
## Contest

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

First RT2012 (French thermal regulation) house in a housing development project, using a revolutionary modular timber construction mode: Smart Module Concept.

Third Industrial Revolution: - Energy Efficiency- Circular Economy





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