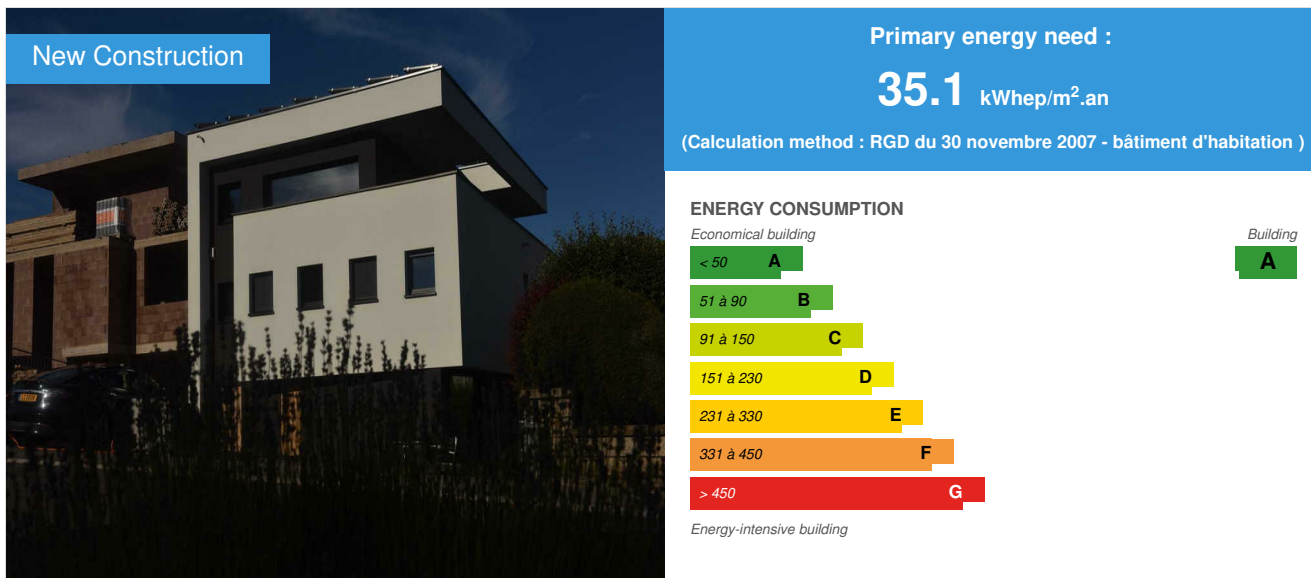


## Self Sufficient Energy House in Rédange (Luxembourg)

by [Leslie vandenbussche](#) / 2015-06-29 20:36:35 / Luxembourg / 12378 / FR



**Building Type** : Isolated or semi-detached house  
**Construction Year** : 2015  
**Delivery year** : 2015  
**Address 1 - street** : 36 rue de Nagem 8509 RÉDANGE SUR ATTERT, Luxembourg  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 225 m<sup>2</sup>  
**Construction/refurbishment cost** : 530 000 €  
**Cost/m<sup>2</sup>** : 2355.56 €/m<sup>2</sup>

Proposed by :



### General information

Construction of a new passive house which uses solar panels to generate all of its own electricity to meet its heating and lighting requirements and which also produces its own water for daily use by collecting rainwater and treating it with UV light. In addition, the house also produces electricity for an electric vehicle which travels +/-25000km a year.  
 Heating is supplied using a ground-water heat pump and the air is renewed by a dual-flow CMV.

[See more details about this project](#)

<http://lc.cx/ZAFJ>

**Data reliability**

Self-declared

## Stakeholders

### Stakeholders

Function : Designer

aiplus

Vandenbussche Leslie

<http://www.aiplus.lu>

Function : Contractor

Mr et Mme Boon-Bellinaso / Vandenbussche

### Contracting method

Separate batches

### Owner approach of sustainability

As both the client and contractor on this project, we wanted to make a self-sufficient home in terms of energy and water and we opted for a 100% electric car which will be powered by our own electricity generated by the solar panels. All energy-consuming devices have been chosen for their low electricity consumption (e.g. LED lighting).

### Architectural description

Massive passive house, using: 1) the ground to power a ground-water heat pump which heats the house, 2) rain to supply all water outlets, 3) the sun to generate the electricity required for heating and for domestic electricity as well as for "fuelling" an electric car which travels +/-25,000km/year.

## Energy

### Energy consumption

Primary energy need : 35,10 kWh/m<sup>2</sup>.an

Primary energy need for standard building : 95,00 kWh/m<sup>2</sup>.an

Calculation method : RGD du 30 novembre 2007 - bâtiment d'habitation

CEEB : 0.0001

Final Energy : 32,91 kWh/m<sup>2</sup>.an

Breakdown for energy consumption :

heating: 4.14kwh/m2/year

domestic hot water: 4.71kwh/m2/year

secondary heating and ventilation + cooling: 4.96kwh/m2/year

lighting and domestic appliances + office for freelance professional: 19.1kwh/m2/year

More information :

the house is fitted with solar panels which meet all of the annual electricity requirements.

In addition, the panels meet the requirements of an electric car which travels +/-25,000km/year.

### Envelope performance

Envelope U-Value : 0,23 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

Concrete-structure house. Expanded polystyrene insulation on the sides, polyurethane on the floor and roof. Triple-glazed window frames.

Building Compactness Coefficient : 0,54

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

Air Tightness Value : 0,54

## Renewables & systems

### Systems

#### Heating system :

- Geothermal heat pump
- Low temperature floor heating

#### Hot water system :

- Heat pump

#### Cooling system :

- Geothermal heat pump
- Floor cooling

#### Ventilation system :

- Free-cooling
- Double flow heat exchanger

#### Renewable systems :

- Solar photovoltaic
- Heat Pump on geothermal probes

Renewable energy production : 200,00 %

## Environment

### GHG emissions

GHG in use : 8,60 KgCO<sub>2</sub>/m<sup>2</sup>/an

### Water management

Consumption from water network : 6,00 m<sup>3</sup>

Consumption of harvested rainwater : 70,00 m<sup>3</sup>

Water Self Sufficiency Index : 0.92

Water Consumption/m<sup>2</sup> : 0.03

Water Consumption/Dwelling : 6

Provision on the network for future integration into a system for recovering domestic waste water.

## Products

### Product

Stiebel Eltron WPF5cool heat pump

Stiebel Eltron

<http://www.stiebel-eltron.fr/>

<http://www.stiebel-eltron.fr/>

Product category : HVAC, électricité / heating, hot water

Power 5.92KW, performance coefficient (COP) 4.46

selected jointly by the various stakeholders for this plot



## Costs

## Urban environment

Semi-detached house in a residential street of detached houses

## Land plot area

Land plot area : 640,00 m<sup>2</sup>

## Built-up area

Built-up area : 122,00 %

## Building Environmental Quality

### Building Environmental Quality

- water management
- energy efficiency
- renewable energies

## Contest

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

Le bâtiment produit toute l'énergie nécessaire pour ses propres besoins de fonctionnement (chauffage, électricité, eau) mais aussi pour un véhicule roulant.

### Building candidate in the category



Bâtiment zéro énergie

