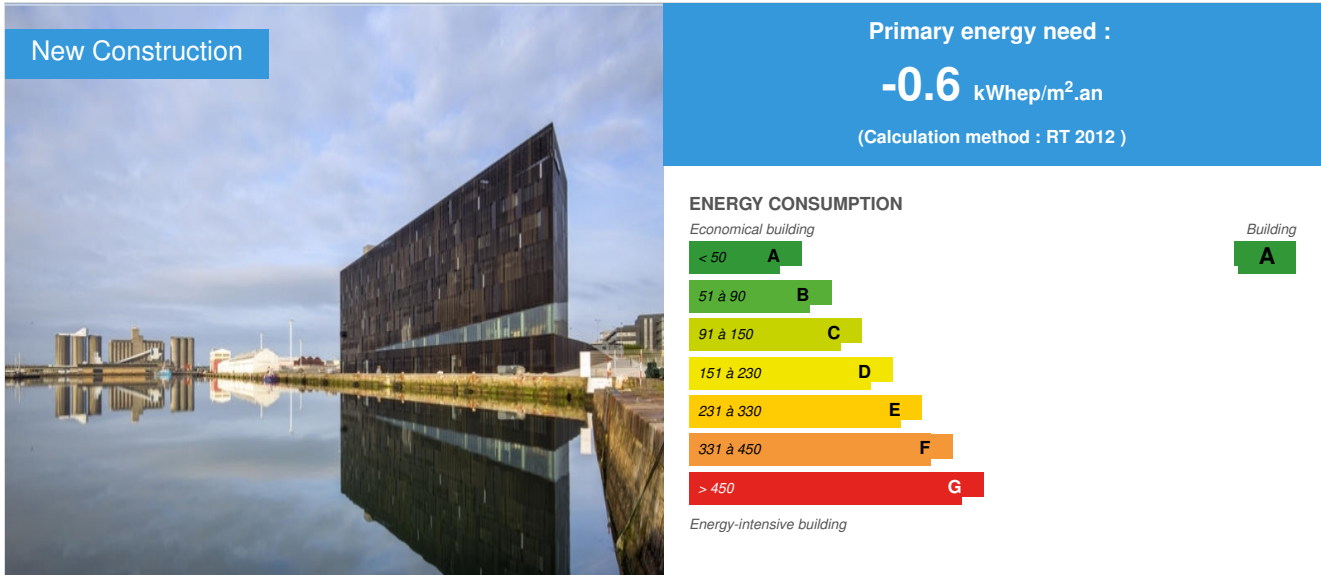


## ENSM : Maritime School of Le Havre

by Nathalie MEHU / 2017-05-19 11:01:25 / France / 11164 / FR



**Building Type** : School, college, university  
**Construction Year** : 2015  
**Delivery year** : 2016  
**Address 1 - street** : 76600 LE HAVRE, France  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 11 242 m<sup>2</sup>  
**Construction/refurbishment cost** : 18 960 000 €  
**Number of Pupil** : 650 Pupil  
**Cost/m<sup>2</sup>** : 1686.53 €/m<sup>2</sup>

**Certifications :**



### General information

A 100m long building evoking the silhouette of a ship's bow and configured as a training ship, will accommodate 650 pupils / year. It has 7 levels on almost 10 000 m<sup>2</sup>. This project was carried out by Sogea Nord Ouest, a subsidiary of VINCI Construction France.

### Sustainable development approach of the project owner

Sustainable Development is a theme that the CODAH is already looking to integrate, with exemplary approaches to project management. With the construction of the ENSM, many environmental parameters have been optimized, such as the environmental footprint (Carbon Footprint), energy autonomy (SMART GRID ready building). In particular, the autonomy of the building in resources has been particularly thorough until achieving a high environmental performance, through the exploitation of solar and maritime renewable energies. The use of seawater for cooling (via the geocooling process) and the heating of the building (via a heat pump with high energy efficiency on seawater) is a special feature of this project. This results in a building whose energy balance is positive, mostly thanks to the implementation of a photovoltaic roof.

## Architectural description

The pupils are immersed in open sea conditions closest to the real world, including machine simulation rooms, a marine engine and a dozen 'walkway' simulators distributed over three levels. The architectural bias of AIA is to consider the whole school in the spirit of a "school ship". The whole structure is thus configured: from its forecourt to the gangway of embarkation until the ascent to the upper deck through the engine room, the technical rooms located in hold, the sixteen rooms and Four amphitheatres overlooking the basin. Beyond the specific spaces of the program, the different interior spaces are treated in the spirit of those of a ship where the presence of the technique is everywhere visible and omnipresent.

## See more details about this project

<http://www.vinci-construction.fr/oxygen>

## Stakeholders

### Stakeholders

Function : Designer

AIA Associés

aia.associés@a-i-a.fr

<http://www.a-i-a.fr/>

Function : Other consultancy agency

ECHOS

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

Design office for eco-design of buildings

Function : Company

SOGEA Nord Ouest

Function : Contractor

Communauté de l'Agglomération Havraise (CODAH)

Function : Construction Manager

AIA Ingénierie

m.meftah@a-i-a.fr

<http://www.a-i-a.fr/ingenierie/>

## Energy

### Energy consumption

Primary energy need : -0,60 kWh<sub>ep</sub>/m<sup>2</sup>.an

Primary energy need for standard building : 71,50 kWh<sub>ep</sub>/m<sup>2</sup>.an

Calculation method : RT 2012

## Renewables & systems

### Systems

Heating system :

- Geothermal heat pump
- Water radiator

Hot water system :

- Other hot water system

#### Cooling system :

- No cooling system

#### Ventilation system :

- Double flow heat exchanger

#### Renewable systems :

- Solar photovoltaic
- Heat pump (geothermal)

## Environment

### Urban environment

Having placed the ENSM near the port of Le Havre is an asset for the quality of the education provided. In addition, a shopping center and restaurants close to the school participate in the animation of student life.

## Products

### Product

PAC 6 tubes ERACS 1302 W-Q

CLIMAVENETA

climaveneta@pec.climaveneta.it

<http://fr.climaveneta.com/Web/>

Product category : HVAC, électricité / heating, hot water

The Heat Pump features:

- a base and a supporting structure made of hot-dip galvanized steel sheet
- a control cabinet with a main disconnect switch (according to EN60204-1 / IEC204-1)
- a CLIMAVENETA W3000 microprocessor controller with dry contacts: On / Off and

Synthesis of defects + screen interface

- 2 semi-hermetic screw compressors with power modulation of 50 to 100% or 3 (50, 75 and 100%). These compressors are equipped with de-oiler, suction valve, Discharge and a heating resistor crankcase.

- of 3 R134 exchangers / multitubular water

- An evaporator, which makes it possible to produce the refrigerating energy
- A condenser (called RECUPERATOR in the supplier data sheet), which allows To produce calorific energy

- An exchanger (called the CONSENT in the supplier data sheet), which allows To evacuate the surplus calorific or refrigerating energy (via a valve 3 Modulating channels).

These 3 heat exchangers are equipped with a differential pressure switch, thermally insulated and equipped with electrical resistance.

- a MODBUS communication card for communication with the GTC
- flow controller on each exchanger



## Costs

## Contest

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

Avec la construction de l'ENSM, de nombreux paramètres environnementaux ont été optimisés, tels que l'empreinte environnementale (Bilan Carbone), l'autonomie énergétique (bâtiment SMART GRID ready).

En particulier, l'autonomie du bâtiment en ressources a été particulièrement approfondie jusqu'à atteindre une haute performance environnementale, via l'exploitation des énergies renouvelables solaire et maritime. L'utilisation de l'eau de mer pour le refroidissement (via le procédé de géocooling) et le chauffage du bâtiment (via une pompe à chaleur à haute efficacité énergétique sur eau de mer) est une vraie particularité de ce projet. Ceci aboutit un bâtiment dont le bilan énergétique est positif, en majeure partie grâce à la mise en œuvre d'une toiture photovoltaïque.

## Building candidate in the category



Energie & Climats Tempérés



Coup de Cœur des Internautes

