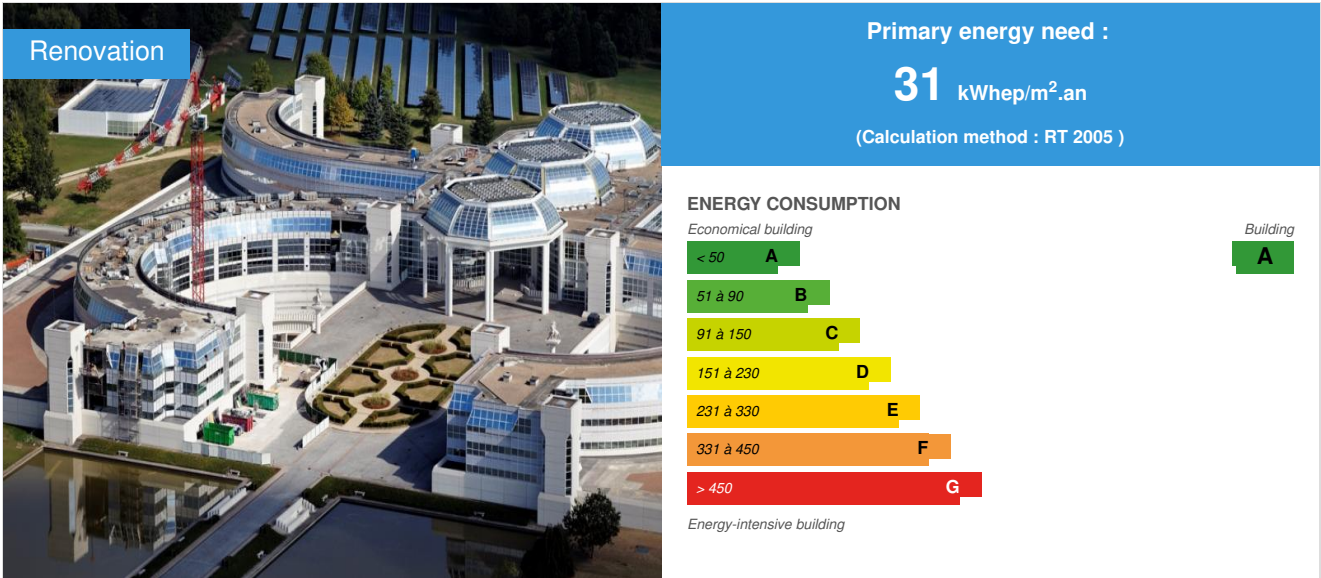


## Challenger

by Jean-Charles Bertrand / 2013-02-13 19:05:39 / France / 11711 / FR



**Building Type** : Office building < 28m  
**Construction Year** : 1988  
**Delivery year** :  
**Address 1 - street** : 1, avenue Eugène Freyssinet 78 061 GUYANCOURT, France  
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 67 000 m<sup>2</sup> SHON  
**Construction/refurbishment cost** : 150 000 000 €  
**Cost/m<sup>2</sup>** : 2238.81 €/m<sup>2</sup>

### Certifications :



### General information

Following the triple HQE Exceptional, Outstanding BREEAM and LEED Platinum, the renovation of Challenger, headquarters of Bouygues Construction, which opened its doors in 1988, aims to divide by ten primary energy consumption (from 310 to 31 kWhep / m<sup>2</sup> / year), while improving the working environment and the comfort of 3400 employees.

The city of the future will consist of existing buildings renovated more than new construction. Bouygues Construction has requested through this renovation project complete expose its expertise in this field and test across one the latest innovations from its R & D programs

After the renovation of Challenger in 2014, the site will have more than 21,500 m<sup>2</sup> of photovoltaic panels that will provide nearly 2,000 MWh of electricity per year, or about 40% of its needs. During periods of the year when production will exceed consumption site, electricity will be sold. Storage solutions for photovoltaic power are also tested.

The consumption across a building or a neighborhood, is a workable solution for the city of the future as it responds in part to the problem of saturation may encounter grids during peak consumption and thus could avoid costly work of resizing networks.

Station phytoremediation retirement all wastewater and water valve Challenger, about 125 m3 per day. The recycled water naturally, thanks to the filtering action of plants and micro-organisms growing around the roots is then reused for irrigation of green spaces. Stormwater is also treated through a specific basin and reused to supply sanitary station and car washing adiabatic cooling. Challenger retirement and locally throughout its waters, with no release into the public sewer, and reduces water consumption city 40%, from 46 700 to 28 000 m3. Composed of wetlands, the resort phytoremediation fits into the 30 hectares of Challenger and contributes to the development of local biodiversity.

#### **SUB Award 2013: this building contribution to the "city of the future"**

- Renovated an existing building that has seen its consumption energy divided by 10.
- The local energy production, consumption and for eventual participation in building the balance of local power grid.
- Reprocessing local sewage diminishes to 40% water consumption.

## Sustainable development approach of the project owner

Bouygues Construction wanted, through the renovation of its headquarters, to perform a showcase for its expertise in the field of sustainable renovation. The objective was to increase its energy and environmental performance to bring it to the very best today, including new construction. All technical solutions have been proposed to divide by ten primary energy consumption, and only the most successful have been retained: 24 000 m<sup>2</sup> of replacement double glazing in a naturally ventilated double skin wall, installation of 21,500 m<sup>2</sup> 420 m<sup>2</sup> photovoltaic panels and solar thermal panels, installation of 75 probes and dry on a geothermal doublet ground water ... Challenger becomes a laboratory study of new technologies for R & D teams of Bouygues Construction.

## Architectural description

Challenger consists of a main building divided into four wings, connected to a central atrium, and two triangular buildings. Entourré a park of 30 hectares, accounting for 67 Challenger 000 m<sup>2</sup> of floor space. The renovation project is conducted with the strong desire to make "Challenger Challenger rest." The architecture is fully respected.

## See more details about this project

[http://www.wat.tv/video/renovation-challenger-5ac7b\\_2ibt7\\_.html](http://www.wat.tv/video/renovation-challenger-5ac7b_2ibt7_.html)

## Stakeholders

### Stakeholders

Function : Contractor

Bouygues Construction

<http://www.bouygues-construction.com/>

Function : Assistance to the Contracting Authority

Elan

<http://www.elan-france.com/>

Function : Construction Manager

SRA Architectes

<http://www.sra-architectes.com/>

Function : Construction company

DV Construction

<http://www.dv-construction.fr/>

Function : Construction company

Bouygues Energies & Services

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

Function : Facility manager

Bouygues Energies & Services FM France

<http://www.bouyguesenergieservices.com/facility-management>

Function : Other consultancy agency

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Function : Other consultancy agency

Ferro Ingénierie

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Function : Other consultancy agency

Amstein et Walther

<http://www.amstein-walther.ch/fr.html>

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Function : Company

Phytorestore

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

## Type of market

Global performance contract

## Energy

### Energy consumption

Primary energy need : 31,00 kWhEP/m<sup>2</sup>.an

Primary energy need for standard building : 150,00 kWhEP/m<sup>2</sup>.an

Calculation method : RT 2005

Breakdown for energy consumption : - Treatment room inside = 15.10 kWhEP / m<sup>2</sup> - Heating loop = 2.61 kWhEP / m<sup>2</sup> - Cooling loop = 2.78 kWhEP / m<sup>2</sup> - Auxiliary (loop + ventilation) = 45.12 kWhEP / m<sup>2</sup> - Lighting = 36.89 kWhEP / m<sup>2</sup>

Initial consumption : 310,00 kWhEP/m<sup>2</sup>.an

### Envelope performance

Envelope U-Value : 0,69 W.m<sup>-2</sup>.K<sup>-1</sup>

More information :

The facade is retained naturally ventilated double skin wall. It therefore consists of a double glazed inside and outside single glazing. Between the two walls, an automated store to limit the impact of solar radiation.

Air Tightness Value : 1,70

## Renewables & systems

### Systems

Heating system :

- Geothermal heat pump

Hot water system :

- Solar Thermal

Cooling system :

- Others
- VRV Syst. (Variable refrigerant Volume)

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- Solar photovoltaic
- Solar Thermal
- Heat pump (geothermal)
- Heat Pump on geothermal probes

Renewable energy production : 42,00 %

## Smart Building

### BMS :

Management system of the building coupled with a CMMS VIZELIA

## Environment

### Urban environment

Challenger is located in Guyancourt, is about thirty kilometers south-west of Paris. To facilitate access to the site by public transport, shuttle was set up morning and evening between the site and the station of Saint-Quentin-en-Yvelines, which is used by about 10% of employees. Locker rooms with showers and lockers were also installed for employees wishing to come by bicycle and electric bikes are available, in particular to make the trip to the sports center located at Bouygues Construction proximités Challenger.

## Products

### Product

DRV Multi V Water

LG

<http://www.lg.com/fr>

**Product category :** Génie climatique, électricité / Chauffage, eau chaude

Description of need: Challenger thermal regulation is provided with a water loop 250 m3, which feed climatiseurs DRV installed in technical rooms on each floor of the buildings. Belimo valve coupled to the DRV air conditioner regulates water consumption according to its needs, thus reducing the power consumption of the pumps circulating the water in the thermal loop.



Alizé

BOUYGUES ENERGIES ET SERVICES

<http://www.bouyguesenergieservices.com>

<http://www.bouyguesenergieservices.com/solutions/alize.php>

**Product category :**

Alizé est une offre clés en main, compatible avec toutes les bornes de recharge électrique du marché, à destination des collectivités et des entreprises. Aujourd'hui, la variété des infrastructures, tant en termes de durée de recharge (lente, semi-rapide, accélérée) que de fonctionnalités apportées (type de prise, support mural ou borne, protections, accès libre ou restreint, communication, identification, comptage, paiement, protection, télégestion, etc.), rend le choix du client difficile. OBJECTIFS Donner confiance aux clients potentiels dans le marché émergent du véhicule électrique, les accompagner dans le choix de la borne la plus adaptée à leurs besoins grâce à une offre complète, y intégrer des services évolutifs CARACTERISTIQUES L'offre Alizé de Bouygues Energies et Services propose une infrastructure et des services clés en main offrant de déployer des solutions de transition énergétique de modes de transports thermiques vers des modes de transport "décarbonés". L'avantage de l'offre Alizé est double : Pour l'utilisateur final (conducteur) :-La géolocalisation des bornes, accessible grâce à une application web ou mobile -Une information sur l'état des bornes (libre, réservée, en maintenance ou en utilisation), avec une possibilité de réserver à distance l'une d'entre elles Pour le client propriétaire de l'infrastructure :-La gestion des utilisateurs (identification, consommations, etc.) -La gestion des infrastructures (détection des défauts et déclenchement de la maintenance) -Une gestion énergétique dynamique (adaptation des recharges en fonction de la puissance disponible) -Des solutions pour la facturation du service de recharge Bouygues Energies & Services a notamment noué un partenariat avec G²Mobility, start-up ayant développé certains services. PRINCIPAUX ATOUTS -Compatibilité : cette solution est compatible avec toutes les bornes du marché (selon le protocole OCPP) : le client n'est plus contraint par un choix de borne pour son exploitation. -Évolutivité : les services d'Alizé peuvent être déployés en fonction de l'évolution de la réglementation. Cette interopérabilité permet ainsi un maillage national du réseau de bornes, ainsi que leur géolocalisation et le paiement du service. Plus de 5 000 bornes sont installées à travers le territoire pour une multitude de clients tels que Bouygues Immobilier, Bouygues Telecom, le Conseil général des Hauts-de-Seine, le ministère de l'Économie et des Finances, Renault, Nissan, SIEL (Syndicat Intercommunal d'Énergies du Département de la Loire). L'offre Alizé positionne Bouygues Energies & Services comme opérateur de services à forte valeur ajoutée (au-delà des installateurs classiques).



## Health and comfort

### Water management

Consumption from water network : 38 500,00 m<sup>3</sup>

Consumption of grey water : 34 060,00 m<sup>3</sup>

Consumption of harvested rainwater : 41 997,00 m<sup>3</sup>

## Indoor Air quality

Measurements were performed at the reception of the work to determine the concentration of various pollutants in the building. These measures help to ensure that minimum levels required are well respected and verify compliance with comfort parameters for future occupants. The results of these measures have been successful since all measurements are consistent.

## Carbon

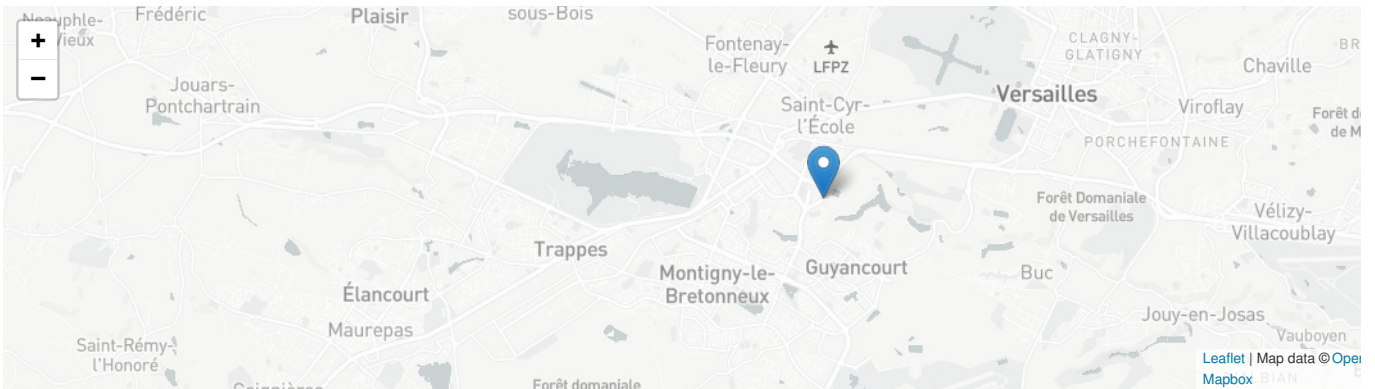
### GHG emissions

GHG in use : 2,20 KgCO<sub>2</sub>/m<sup>2</sup>/an

GHG before use : 22,00 KgCO<sub>2</sub> /m<sup>2</sup>

Building lifetime : 20,00 année(s)

## Contest



Date Export : 20230326112233