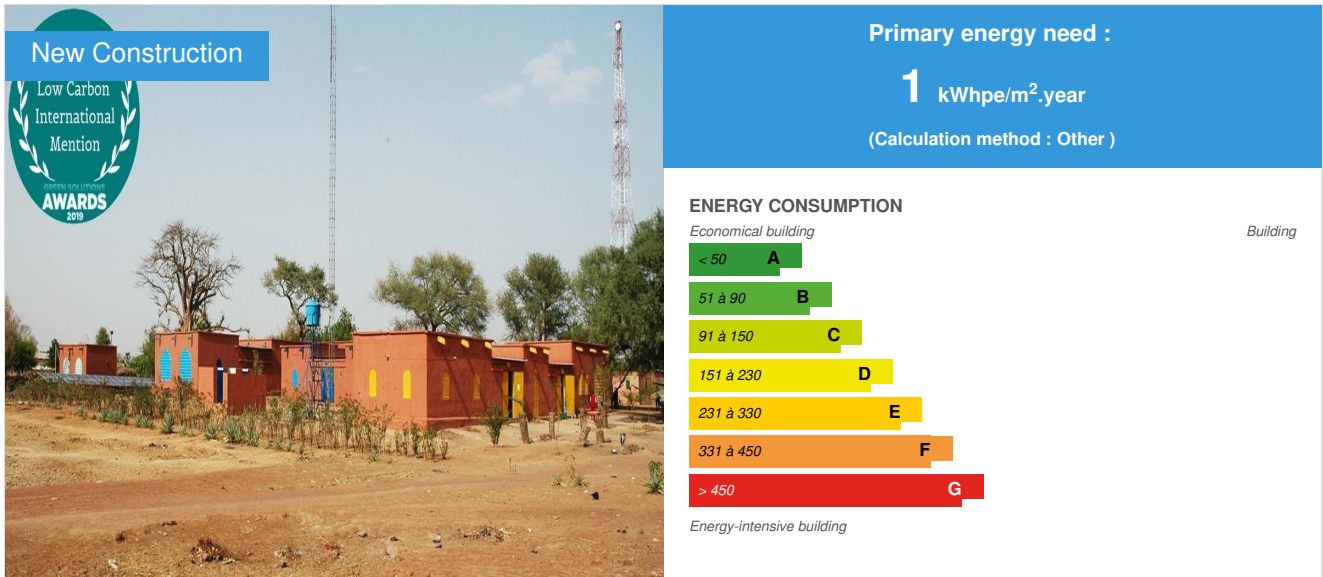


Konseguela business Area, Mali

by Mathieu Hardy / © 2019-06-27 17:12:40 / International / 10199 / EN



Building Type : Other commercial buildings
Construction Year : 2016
Delivery year : 2016
Address 1 - street : Konséguela , Sikasso 0000 KONSÉGUELA, Other countries
Climate zone : [Aw] Tropical Wet & Dry with dry winter.

Net Floor Area : 579 m²
Construction/refurbishment cost : 60 000 €
Cost/m² : 103.63 €/m²

General information

Konseguela won the Low Carbon Award of the 2019 Green Solutions Awards at the national level + a mention for the international Low Carbon Award.

The Electrified Activity Zone (EAZ) is an innovative project developed by the Renewable Energy, Environment and Solidarities Group (GERES) to meet the energy needs of Very Small Enterprises (VSE) in rural Mali. In Konséguéla, this first EAZ brings to the inhabitants of the commune and surrounding villages new products and services that have been expensive or unavailable. The infrastructure allows to host up to 15 craft and service activities (modern bakery, carpentry workshop, oil mill, multi-service computer center, cold /freezing service, soap factory, nutritional flour manufacturing unit, community radio ...) and to welcome customers to the site. This initiative contributes to the economic and social development and stability of the rural territories of Mali; the model is currently reproduced in the regions of Sikasso, Ségou and Kayes ...

This project may be qualified as sustainable for the following reasons:

- The buildings are built according to the principles of the Nubian Vault Technical Concept promoted by the Nubian Vault Association (AVN) in Sahelian Africa for about twenty years. Raw earth and local stone are the materials used to make all the structures: underpainting structures in cyclopean concrete / masonry raised structures with adobe. Only certain outdoor spaces between buildings are embellished with light IPE + steel box covers, allowing to generate shaded and ventilated useful spaces at a lower cost.

- The architecture proposed by Al-Mizan consists of an arrangement of small simple buildings all designed on the basis of the same module and organized around outdoor spaces allowing a fluid circulation. The set generates many shady places at different times of the day while allowing good natural ventilation.

-Finally, the EAZ is entirely autonomous in terms of energy. An electric production center equipped with a field of 53 solar panels with a power of 12.5 KW / C provided the basic needs and can be relayed by a 20 KVA auxiliary generator powered by the Jatropha pure vegetable oil, agrofuel farmer produced locally since 2008. The supply of energy 100% renewable is provided 24/7 to companies of the EAZ.

See more details about this project

<https://www.geres.eu/fr/actions/zone-dactivites-electrifiee-au-mali-zae/>

<https://www.lavoutenubienne.org/-the-nubian-vault-concept-61->

Photo credit

Camille Sanon / Mathieu Hardy / GERES / GERES - King fototala Massassy / GERES - Fertl Ink / AVN

Stakeholders

Contractor

Name : Groupe Énergies Renouvelables, Environnement et Solidarité (GERES)

Contact : Gilles Michel / g.michel@geres.eu / Bamako, Mali

<https://www.geres.eu/fr/>

Construction Manager

Name : Groupe Énergies Renouvelables, Environnement et Solidarité (GERES)

Contact : Gilles Michel / g.michel@geres.eu / Bamako, Mali

<https://www.geres.eu/fr/>

Stakeholders

Function : Developer

Association la Voûte Nubienne (AVN)

Thomas Granier / thomas.granier@lavoutenubienne.org

<https://www.lavoutenubienne.org/>

Partenanaire technique / expertise technique et formation VN

Function : Others

Al-Mizan - Architecture, development, Ecology in Sahel

Mathieu Hardy / m.hardy.architecte@gmail.com

Architectural design + project management assistance

Function : Others

Association Malienne d'Éveil au Développement Durable (AMEDD)

Execution partner

Function : Construction company

Entreprise Karim Dembélé + artisans et apprentis VN

Execution company

Contracting method

General Contractor

Type of market

Table 'c21_belgium.rex_market_type' doesn't exist

If you had to do it again?

The power generation system has been overdimensioned.

Building users opinion

See GERES video

Energy

Energy consumption

Primary energy need : 1,00 kWhpe/m².year

Primary energy need for standard building : 1,00 kWhpe/m².year

Calculation method : Other

Envelope performance

More information :

The envelope consists of a massive adobe masonry (molded mud bricks and dried in the sun) + earth mortar, including the vaulted roof made without formwork, then loaded to form a roof terrace. The gabled walls (non-load bearing) are 40 cm thick, the load-bearing walls are 60 cm thick, and the roofs at their thinnest part are about 30 cm thick. The casing thus has a good thermal inertia, guaranteeing a better comfort of use compared to other current local constructive solutions (cement + sheet / cement + slab).

More information

The EAZ is entirely autonomous in terms of energy. An electric production center equipped with a field of 53 solar panels with a power of 12.5 KW / C provides the basic needs and can be relayed by a 20 KVA auxiliary generator powered by the Jatropha pure vegetable oil, agrofuel farmer produced locally since 2008. The supply of energy 100% renewable is provided 24/7 to companies of the EAZ.

Renewables & systems

Systems

Heating system :

- No heating system

Hot water system :

- No domestic hot water system

Cooling system :

- No cooling system

Ventilation system :

- Natural ventilation

Renewable systems :

- Solar photovoltaic
- Other, specify

Renewable energy production : 100,00 %

The photovoltaic installation ensures the production of electricity of the zone of activities. A generator running on the pure vegetable oil of jatropha produced on the zone from seeds cultivated locally ensures the needs of peak, the "backup" in the event of breakdown on the installation, of insufficient sunshine or of non-electrical consumptions. planned. An electrical energy storage device is put in place to ensure continuity of services.

Environment

Urban environment

The ZAE Konséguéla is located in a rural area, at the entrance to the commune of Konséguéla. It is served by the main track that connects the town to the town of Koutiala (+/- 50 km).

Land plot area : 4 400,00 m²

Built-up area : 935,00 %

Green space : 3 400,00

Products

Product

Adobe

Local bricklighters / artisanal production mostly informal

Product category : Gros œuvre / Structure, maçonnerie, façade

The adobe is a mud brick molded and dried in the sun. The basic material is the building earth, whose main characteristics are: non-organic earth; fairly high clay content (25/30%) and good cohesion; worked in the plastic state (water content +/- 30%).



The Nubian Vault Technical Concept uses two models of adobe:

1 / A brick size 38 x 17 x 15 cm, used for walls, foothills and some arcades

2 / A smaller brick size 25 x 15 x 5 cm, used for vaults and common arches

Brick mortar is made with an earth mortar, generally of the same nature as that used for the production of adobes.

The product has been very well accepted by all parties involved in the project. The project owner chose the VN Technical Concept based on this material; the execution company complied with the specifications and integrated VN masons and craftsmen into its teams; the users appreciated the architectural qualities of the buildings (aesthetics, comfort, functionality).

Costs

Construction and exploitation costs

Renewable energy systems cost : 70 000,00 €

Cost of studies : 5 280 €

Total cost of the building : 60 000 €

Health and comfort

Life Cycle Analysis

Not available

Eco-design material :

It can be estimated that more or less 85% of "Nubian vault" buildings are produced from sustainable materials (there are no eco-labels in Sahelian Africa): raw earth and stone.

Over 30 years, it is estimated that the ZAE avoids > 960 tonnes CO₂eq > 200 m³ of diesel

Water management

The EAZ is equipped with a borehole which feeds a water tower.

Indoor Air quality

The buildings are made entirely of raw earth, material considered particularly eco friendly.

Ventilation is exclusively natural.

Comfort

Health & comfort : The strategy developed to optimize the comfort and health of users is the use of a suitable constructive solution called the Nubian Vault
Technical Concept: sustainable and eco materials; massive carrying envelope; good inertia; natural ventilation.

Calculated indoor CO2 concentration :

Not available

Measured indoor CO2 concentration :

Not available

Calculated thermal comfort : Not available

Measured thermal comfort : Not available

Acoustic comfort : The characteristics of the envelope are at the origin of the good acoustic comfort of the buildings: massive carrying envelope

Daylight factor : Not available

Carbon

GHG emissions

Building lifetime : 30,00 year(s)

GHG Cradle to Grave : 105,00 KgCO₂ /m²

The calculations are taken from the reference document "Study on the Nubian Vault as a Construction Model - Final Report; p.40-46". The figure 105 KGCO₂ / M² corresponds to the phases "construction" and "building maintenance".

Contest

Building candidate in the category

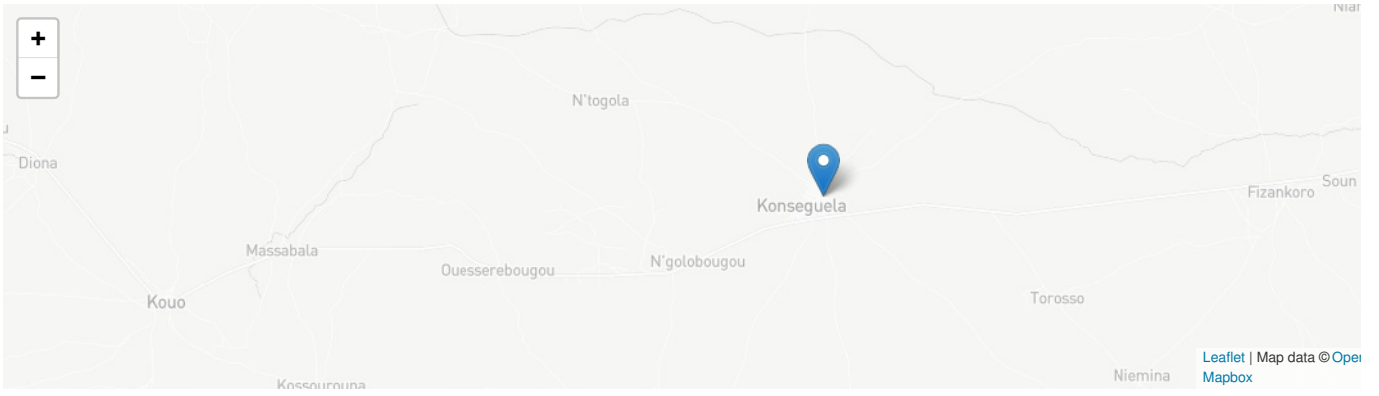


Energy & Hot Climates



Low Carbon





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