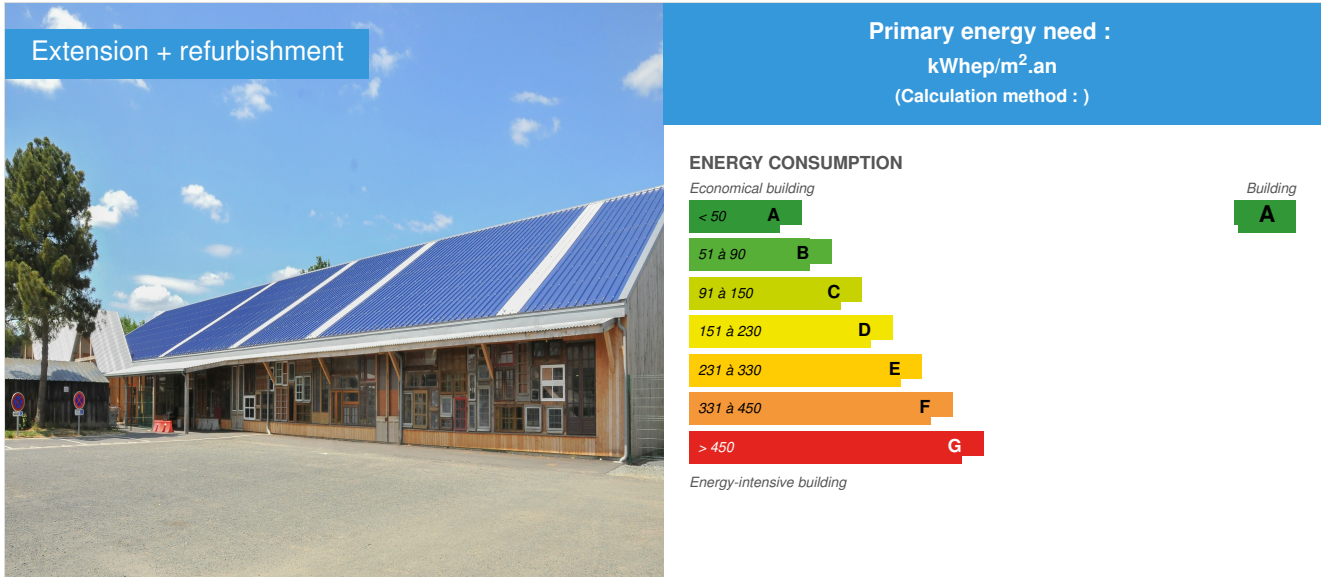


Redevelopment and extension of the Emmaüs Angers spaces - Saint-Jean-de-Linières

by François TERRIEN / 2023-05-22 20:05:56 / France / 366 / FR



Building Type : Other commercial buildings
Construction Year : 1990
Delivery year : 2023
Address 1 - street : Lieu dit Le Sauloup 49070 SAINT-LEGER-DE-LINIERES, SAINT-JEAN-DE-LINIÈRES, France
Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 3 907 m² SU
Construction/refurbishment cost : 1 992 158 €
Cost/m² : 509.89 €/m²

General information

The Emmaüs Angers community, located on the Sauloup site in Saint Jean de Linières, welcomes 60 companions who live on site and around a hundred volunteers who work and eat on site. In parallel with the accommodation part of the community, the site is the place for a certain number of activities and in particular the management of a waste disposal center/resource center operated by Emmaüs for the Angers Loire Métropole conurbation, thematic sorting workshops, two sales halls, covered and uncovered outdoor sales areas and an organic vegetable farm, all operated by companions and volunteers.

This project includes:

- A new sales room of 1160 m²;
- Extension and repair of the community restaurant;
- The requalification of a former sales room into new sorting and repair workshops (1100m²), more functional and heated;
- The extension of one of the original auction rooms by awnings.

Of the 4,434 m² of floor space that the site has in the end, the project has created 1,274 m² and renovated 2,633 m².

The project has set itself the objective of implementing as many elements of reuse or reform as possible. In total, an estimated **134 tonnes of recovered manufactured products are reused in construction**.

In addition, **certain parts of the structure were carried out within the framework of participatory work sites and of insertion**. The coexistence with the site,

which is mainly carried out by companies from the competitive sector, has proven to be particularly successful.



Building users opinion

The Emmaüs Angers community welcomes the choices made in terms of reusing materials, which is part of the DNA of the movement which, as Mr. Jourdain pointed out, has been working in the circular economy without knowing it for more than 70 years.

The project has gained in quality; for example, the reuse of a chestnut parquet floor for the community restaurant is much more comfortable and warm than the implementation of a simple tiling.

Emmaüs Angers is also proud to participate in the energy transition: wood heating of its new sales room, geothermal energy for heating its workshops, photovoltaic panels on its new room and photovoltaic shades on its car parks. Proud also to have used biosourced insulation materials (straw and Métisse) implemented as part of participatory projects.

If you had to do it again?

On the project for the new sales room, it was initially planned to reuse the mixed metal-wood structure trusses of the Valentin-Cailleau multisports hall located in Angers. One of the last witnesses of the Bessonneau empire, an industrial spinning, rope and weaving company active in Angers from 1900 to 1966, this building was slated for demolition in 2021. We wanted to reuse its trusses in order to perpetuate this testimony.

Unfortunately the constitution of these trusses and the lack of correspondence with computer data on the materials that compose them, did not allow the structural design office to validate the reliability of their use. We had to give up and implement a new structure in glued laminated wood.

Some salvage operations during deconstruction have failed due to poor coordination with the demolishers.

See more details about this project

<https://emmaus-angers.fr/communaute-emmaus-angers/nos-actions-2/>

Photo credit

François TERRIEN (Terrien Architectes) ; François COTTIER (Terrien Architectes) ; Jean-Marc LEGRAND

Stakeholders

Contractor

Name : EMMAUS FRANCE

Contact : Jean-Marc LEGRAND (Trésorier Emmaüs Angers), legrand.j-marc[a]wanadoo.fr

<https://emmaus-france.org/>

Construction Manager

Name : Terrien Architectes + Christophe Malet (OPC)

Contact : archi[a]jicilater.com / contact[a]bechristophemalet.fr

Stakeholders

Function : Contractor representative

EMMAUS ANGERS

Jean-Marc LEGRAND (Trésorier Emmaüs Angers), legrand.j-marc[a]wanadoo.fr

<https://emmaus-angers.fr/>

Function : Thermal consultancy agency

BatiMgie

William REY, william.rey[a]batimgie.fr

<https://www.batimgie.fr/>

Function : Others

Association Matière Grise

Thibaud SAINT-AUBIN, contact[a]matieregrise.org

<https://matieregrise.org/>

Sourcing for reuse, storage management for reuse

Function : Structures calculist

Even Structures

Mathieu BOULARD, m.boulard[a]even-structures.fr

<https://www.even-structures.fr>

Function : Others

Association L'Établi

Philippe Brissard, Coordinateur de l'Établi, coordination[a]letabli.org

<http://www.letabli.org/>

Supervision of the participatory construction sites of the bar and the facade of reused carpentry of the new sales room

Function : Others

ISOL'en Paille

Nicolaas OUDHOF, info[a]isolenpaille.com

<https://www.isolenpaille.com/>

Supervision of participatory straw insulation projects for the community restaurant and workshops

Function : Others

Tremplin Ateliers Services

Sébastien ROBERT, coordinateur[a]tas49.org

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

Work integration sites, installation of reused plywood wall coverings

Function : Company

SAS Luc DURAND

contact@lucdurand.fr

Lot 1 VRD

Function : Company

Sombat

info[a]sombat.fr

Batch 2 Structural work

Function : Company

Rousseau

contact[a]rousseaua.fr

Batch 3 Framework

Function : Company

AICP Desnoes

aicp.desnoes[a]wanadoo.fr

Lot 4 Asbestos removal

Function : Company

Batitech

service-administratif[a]batitech.fr

Lot 5 Steel cover & Lot 6 Waterproofing

Function : Company

Gay menuiserie EURL

adm[a]gaymenuiserie.fr

Lot 7 Joinery-Locksmithing

Function : Company

AMTI

amti.49[a]orange.fr

Lot 8 glass partitions

Function : Company

Covaci.V Plaquiste

mv.covaci[a]laposte.net

Batch 9 Dubbing

Function : Company

Chudeau

contact[a]chudeau.fr

Lot 10 Painting

Function : Company

Fouqueron

accueil[a]fouqueron.com

Lot 11 Electricity

Function : Company

Hervé thermique

angers[a]herve-thermique.com

Lot 12 Plumbing

Function : Company

Bonnier forages

forages.bonnier[a]wanadoo.fr

Lot 13 Forages

Contracting method

Other methods

Type of market

Not applicable

Allocation of works contracts

Separate batches

Energy

Renewables & systems

Systems

Heating system :

- Geothermal heat pump
- Water radiator
- Aerotherm Heater
- Wood boiler

Hot water system :

- Individual electric boiler

Cooling system :

- No cooling system

Ventilation system :

- Free-cooling
- Single flow

Renewable systems :

- Solar photovoltaic
- Heat Pump on geothermal probes
- Biomass boiler

Circular Economy

Circular economy strategy

Phase in which reuse has been integrated : Sketch study

Type of circular economy strategy implemented :

- Maximization of the number of impacted batches
- Targeting a few diversified products for testing
- Maximization of the carbon gain
- Maximization of the mass of waste avoided

Quantified targets for reuse? :

The project did not have an initial quantified objective in terms of reuse materials. The project manager's proposal was to maximize the use of reused materials for structural and finishing work depending on the deposits identified. The search for materials took place throughout the design phase (and even beyond) and the architectural project evolved over time.

Integration of reuse into the written contract documents : Integration of the reuse specifically in the special technical specifications of the concerned batches

Validation protocol for reused materials : Yes

Validation protocol for reused materials :

The project is experimental. This is the first project of this kind and of this scale on the subject of reuse in Maine-et-Loire, and even in the Pays de la Loire region. The architect therefore joined the local association Matière grise (called Bet-Réemploi) which was starting an activity to reuse building materials. Its action was previously limited to projects led by individuals and this is the first time that it has intervened on this scale.

The validation protocol therefore changed during the project.

Generally, the project management team (architect-economist-thermal consultancy agency reuse) first discusses the deposit identified by the thermal consultancy agency reuse, then proposes it to the client, and finally, gets in touch with the control office for validation... but the three stages are sometimes concomitant.

To validate the use of a reused material, we checked on a case-by-case basis the balance between:

- On the one hand: the feasibility of reusing the materials, their location, their cost;
- On the other hand: its architectural interest, its interest in terms of reducing GHG emissions.

Deposit validation form : Yes

Reuse : same function or different function

Batches concerned by reuse :

- Structural works
- Structural framework
- Roofing
- Facades
- Locksmithing-Metalwork
- Indoor joineries
- Outdoor joineries
- Floorings
- Partitions
- Isulation
- Landscaping
- others...

For each batch : Reused Materials / Products / Equipments :

Outdoor facilities / VRD

- Kronimus concrete slabs / 1800 units of 30x30x8cm or 13m³ / Origin: City of Angers / Floor use inside and outside the new sales room.

- Metal fence / 153 linear meters / Origin: And my house / Use outdoors and inside sales room n°1.
- Metal gate / 1 unit 7m x 2m high / Origin: Angers Loire Métropole / Use at the furniture unloading dock.
- All coming made up of demolition rubble / 1180m²; 1800T / Origins unknown / Use: as a foundation for the new sales room.

Locksmithing-Metallery

- Guard rails / 40 ml / Origin: purchase from a private individual / Use: protection of partitions in workshops and angles of unloading platform outside sales room n°1.

Big work

- Glass blocks / 744 units of 19x19x8cm / Origin: Et ma maison / Use: interior facade of the new sales room.

framework

- Glued-laminated wood frame of the old Haras ice rink / 16 beams of about twenty meters; Estimated weight: approximately 300 kg per beam, i.e. 4.8 T in total / Origin: City of Angers / Use: restaurant beams, bar counter in the new sales room, frame of the awning adjoining sales room n°1, primary framework of the South facade of auction room n°2.

Partitions

- Office partitions / height 3m; 81 ml / Origin: former offices of the CCI / Use: partitioning of workshops.

Facades

- Downgraded Douglas cladding / 580m² / Origin: Et ma maison / Use: cladding for the extension of the community restaurant and the new sales room.

Exterior wood furnishings

- Sectional door / 1 unit ht.2.12m*width. 2.38m / Origin: Bouvet company / Use: access to the bar in the new sales room.
- Reformed PVC windows (dimension error on the original project) / 18 units of 1m*1.65m / Origin: Bouvet company / Use: restaurant extension and smoking area.
- Aluminum windows / 16 units of 1.07m*1.60m / Origin: Hôtel du Département d'Angers / Use: workshops and new sales room
- Aluminum windows / 26 units of 1.10m*1.34m / Origin: Hôtel du Département d'Angers / Use: exterior and interior of workshops.
- Wooden joinery / total area: 90m² / Origins: Maison d'Adam, Hôtel des Charnières, 20th century pavilions, etc. / Use: facade of the new sales room.
- Glazed aluminum door / 15 units / Origin: Lino Ventura multipurpose hall in Avrillé / Use: suitable for creating sliding doors giving access to workshops.

Interior joinery

- Solid core laminated doors / 25 doors totaling 541m² / Origin: former CCI offices / Use: bar in the new auction room, cash desks in the new room and auction room n°1.
- Solid core laminated doors / Origin: Lino Ventura multipurpose hall in Avrillé (49) / Use: transformation into sliding workshop doors.
-

Flooring

- Chestnut sports parquet / 106.4 m² / Origin: gymnasium of a school facility, rue d'Antrain in Rennes / Use: on the ground in the extension of the community restaurant.

Interior coatings

- Plywood sheets / 1200 m² / Origin: Pilote motorhome company / Use: interior lining of the walls of the restaurant, the new room and the workshops.

Insulation

- Straw bales / about 90m³ / Origin: Isol'en straw, agriculture / Use: 28m³ on the restaurant, 62m³ on workshops.

Covers

- Reformed steel bins / 1600m² / Origin: Manufacturer Jorisode / Use: covering the new sales room and its awnings.

Reused materials rate :

Chestnut parquet reused as flooring for the community restaurant

Originally:

- drop-off location: gymnasium of a school facility in Rennes
- essence: solid chestnut, laid in stone cut or English style
- blade size: 60*800*22mm
- fixing system: slats nailed to 22*60mm joists, 40cm center distance

Removal/installation process:

1. 115 "slabs" of 108*202cm were cut, without separating the parquet from the joists.
2. Part of them were rested on new sleepers themselves resting on a concrete slab. The space between the joists (new and reused) being insulated with wood wool.
3. The junctions between parquet slabs have been adjusted by finishing wood profiles.

[Resource description](#) / [Photo of the pose](#)

Glued laminated timber beams

Originally:

- drop-off location: Patinoire du Haras, 6 allée du Haras, Angers. Building delivered in 1982.
- Removal by a carpenter designated by the city of Angers.

Storage:

Material requiring special handling, transport and storage precautions due to the risk of deformation of the material and/or modification of its technical properties: flatness of storage surfaces, protection against humidity, etc.

Removal/installation process:

1. The beams were cut on site into 3 pieces according to the diagram sent by Terrien Architectes. This cut made it easier to remove and transport. It had to be carried out at specific points so that the sections would be adapted to the future project.
2. On site, the beams were cut to size by the Rousseau company, then lifted by crane and installed in the conventional manner by bolting.

[Resource description](#) / [Photo1 after implementation in the restaurant](#) / [Photo2 after implementation in the restaurant](#) / [Photo implementation of the awning in sales room 1 during the construction phase](#)

Aluminum joinery

Originally:

- drop-off location: Hôtel du Département, Célestin Port building, boulevard Foch, Angers. Office space windows.
- Owner: Departmental Council of Maine et Loire

Storage:

- Protection of the frames by foam sleeves
- Protection of handles and strapping of windows made by the company
- Storage on pallets with reuse backslash in the "Grès" premises in Saint Jean de Linières

Removal/installation process:

1. Particularly neat drop-off on the site of the Hôtel du Département. It was necessary to avoid as much as possible the deformation of the aluminum frames.
2. On site, removal of old mastic joints.
3. Installed using new hardware.

[Resource description](#) / [Photo after implementation in the new sales room](#) / [Photo after implementation in the workshops \(in the construction phase\)](#)

Logistics

Rehabilitation and reconditioning operations (if project concerned by a cleaning/demolition stage) : Yes

Storage of materials for reuse in situ (if project concerned by a cleaning/demolition stage) :

- On site, on a dedicated area in a covered location
- On site, on a dedicated area not covered
- On an external platform, in combination with reconditioning operations

Storage of materials from external supply :

- On site, on a dedicated area in a covered location
- On site, on a dedicated area not covered
- No storage on site, but financial contribution for storage by the material supplier on his site

Insurance

Consultation of the technical controller : Yes

Specific mission given to the technical controller :

No

Insurance broker on the project : No

Insurer : MAIF Assurance

Consultation insurer : No

Discussion with the insurer :

The reuse part did not pose a problem for them insofar as the control office validated the project management.

Additional premium :

No

Environmental assessment

Impacts avoided : water, waste, CO2 :

Calculation Impact by category

Detailed impact RECAP

Note: as some materials are not listed, we have applied the following equivalences:

- Freeway slides <=> ironwork elements
- All coming made up of demolition rubble <=> Hollow brick - load-bearing wall
- Plywood <=> reconstituted wood false ceiling
- Glass pavers: no equivalent, this material is therefore not taken into account in the calculation.

Economic assessment

Total cost of reuse : 179 000 €

Reuse quantified in the companies' offers? : Yes

Purchasing process for reused materials :

- Purchase by the contracting authority from another contracting authority
- Others

Purchasing process for reused materials :

Purchase by the MOA from local authorities, construction companies, destocking companies or individuals; purchase on the right corner; purchase on auction site. Many of the materials in question have also been donated.

Fees of the contracting authority support : 24 000 €

More details on the economic balance :

- 134 tonnes of materials reused
- Based on reused materials compared to the same new materials (supplied installed): €220,000 excl. VAT (new) – €180,000 (reuse) – rental €15,000 or €40,000 excl. VAT in savings or 2.27% of the amount of the contract.

New business model and financial balance :

During the preparatory phases of the project, we anticipated the potential savings at around €80,000. At the end of the project, we would have saved €40,206 taking into account the rental of storage premises, the costs induced by the management of the flow of reused materials, and the difficulties inherent in implementations that are more difficult to systematize. . However, the materials reused to the tune of approximately 134 tons represent a saving of virgin material of approximately 4000 T.

This first experience in the region will, we hope, open up prospects for other projects that can use this experience to improve the process. We systematically share this experience with clients, associations and private individuals who request it.

The joint work of companies in the competitive sector of work integration sites and participatory work sites has been particularly interesting and fruitful. The experience acquired by the volunteers on the straw construction sites is likely to be put to good use on other construction sites, particularly in housing.

Communication

Communication on the process : Yes

If so, please specify :

- During the [inauguration of the new sales room](#) : presentation of the project on site to the public and elected officials of the municipality of Saint-Léger-de-Linières, the urban community of Angers Loire Métropole, the Department of Maine-et -Loire, from the Pays de la Loire Region in the presence of Christophe Béchu, Minister for Ecological Transition and Territorial Cohesion.
- Presentation of the project on site to the teams of the building department of Angers Loire Métropole.
- Presentation of the project on site to AMO Bretagne Pays de la Loire members.
- Presentation of the project on site to students from Polytech (Nantes University).
- Presentation of the project on site to members of the " [Étriché en transition](#) " association.
- Presentation of the project on site to the [Regional Chamber of Social and Solidarity Economy of Pays de la Loire](#) .
- Presentation of the project on site during the 30th anniversary of ADEME.
- Presentation of the project at the general meeting of IRESA (Inter Network of Social and Solidarity Economy in Anjou) held in the new sales room.
- Presentation of the project at La Fabrique, city dreams, in Le Mans.
- Presentation of the project at the Angers congress center as part of the conference cycle "Review of C' POSITIF projects" organized by Novabuild and the CAUE. [PDF presentation](#)
- Presentation of the project as part of the conference cycle of the A3A association, Angers.
- Webinar organized by Novabuild: <https://www.novabuild.fr/rendez-vous/webinaire-emmaus-angers-retour-sur-un-batiment-integrant-reemploi-photovoltaïque>
- Presentation of the project as part of the series of conferences "Living to exist" broadcast by the CROA of Pays-de-la-Loire: https://www.youtube.com/watch?v=_cOtiZFosMI
- Presentation of the project in Tours during the Reuse Day - DESIGNING AN ECONOMIC CITY, organized by the city of Tours.

These presentations were made either during the works phase or since their completion.

- [Report France 3 of 21/10/2022](#) .
- Press articles: [Anjou and me](#) / [Courrier de l'Ouest](#) / [Ouest France 02/10/2020](#) / [Ouest France 07/12/2022](#) / [Ouest France 09/27/2022](#) / [Le Petit Sarthois](#) / [Architecture of your region](#) (to be published)

Project visit : Yes

Social economy

Social economy and professional integration :

Participatory projects

- Straw insulation of the wooden frame walls of the community restaurant. [Photography](#)
- Straw insulation of timber frame walls in sorting and repair workshops.

These two projects were supervised by [Nicolaas Oudhof](#) , an engineer specializing in straw insulation and founder of the straw bale packaging company [Isol'en Paille](#) .

- Implementation of the [manifest facade of the reuse](#) of the new sales room. This façade is a trip back in time as it brings together windows and French windows from an 18th century private mansion, a 19th century neo-Gothic castle, a 20th century neo-15th century style (Adam's house), as well as woodwork from the current construction of pavilions and domestic architecture of the 20th century. Its structure is made up of recut pieces of the stud frame and reused joists from an old outdoor terrace.
- Implementation of the bar of the new sales room. This bar is made of reused solid core laminated doors. The counter is an old glued-laminated wooden beam lying on its side and resulting from the deconstruction of the cover of the old skating rink in Angers.

These two projects were supervised by [L'Établi](#) , an association whose mission is to serve as a laboratory for circular economy initiatives.

Integration projects

- Implementation of plywood wall coverings in the new sales room.
- Implementation of plywood wall coverings in the workshops.

These plywood sheets were donated by the motorhome manufacturing company Pilot. They were originally intended for landfill.

These integration projects were led by the [Tremplin Ateliers Services](#) association.

-> *The coexistence of these participatory and integration projects with companies in the competitive sector has proven to be particularly fruitful.*

Crowdfunding

The slope of the new south auction room is intended to carry 337 photovoltaic sensors on a surface of 573 m² in crowdfunding. This financing is carried by [CoWatt](#) , a group allowing groups of citizens to finance photovoltaic power plants in Pays-de-la-Loire.

Circular design

Responsible consumption :

Sales room no. 2 (built in 2011) was reused and adapted to accommodate the sorting and repair workshops.

Auction room n°1 (construction dating from the 1980s) was increased in surface area by external awnings rather than by closed spaces, in order to limit the consumption of raw materials induced by the construction.

The area of the community restaurant, which already exists, has been increased thanks to the extension of the existing building.

Functionality economy :

The principle of fitting out the workshops was to use an existing building by creating boxes within the box, to avoid having to heat the entire space. Each workshop has a partitioned space whose temperature can be regulated according to its occupation.

Industrial and territorial economy :

For nearly fifteen years, the community has been heating with wood, using local shredded wood. The new sales room is connected to the existing boiler room.

Another innovative solution is implemented for heating the new workshops: geothermal energy.

The corporate citizen CoWatt will soon install photovoltaic panels in the new sales room and Alter Énergie will install photovoltaic shades in the car parks.

Eco-design :

Deliberately, the floor of the new sales room was not insulated.

The use of this room is outside the RT thermal regulatory framework. We must maintain a constant temperature that during the sales week is about 8 hours a week, the rest we are frost-free.

- So the benefit of insulating the floor is called into question. Indeed, the ground being naturally at 12°C (on average), this is the temperature ultimately desired for the majority of the time. This limits the temperature maintenance by a heat emission system.
- By simulating the building in STD, we were able to validate our hypotheses, on the fact that we were going to balance the heating consumption in the version without and with insulation of the lower floor.
- We were therefore able to make significant financial savings on this item.
- The second advantage is that this non-insulation contributes to the improvement of summer comfort. As the ground is not insulated, we have the total inertia of the low floor and the ground below to absorb and limit the risks of summer overheating.

Sustainable supply :

- The insulation of the extension of the community restaurant and the workshops is made of straw.
- Métisse insulation, made from mostly cotton clothing, produced by Le Relais, a subsidiary of Emmaüs, was used to cover the new sales room.
- Wood wool was used to insulate the walls of the new sales room.
- Crushed concrete from the demolition was used as the bottom form of the floor of auction room n°2.

Recycling :

Métisse insulation, made from mostly cotton clothing, produced by Le Relais, was used to cover the new sales room.

Contest

Reasons for participating in the competition(s)

In response to a project to improve the living and working conditions of Emmaus companions and volunteers, our operation has set itself the objective of implementing as many reuse or reform products as possible, with the aim of reducing ecological footprint.

In addition, the implementation has endeavored to involve volunteers in participatory sites (straw, carpentry, cabinetmaking) or reintegration site (implementation of partition facings).

The energy choice aspect has been particularly carefully considered with the exploitation of the residual power of the wood boiler room, the use of geothermal energy and the installation of photovoltaic sensors on the roof.

Finally, at the same time, an organic vegetable farm was set up to meet the needs of the community.

