

# Eco46 administrative building - City of Lausanne - 2011

## PROJECT DESCRIPTION

**Contracting authority** City of Lausanne, Finance and Green Heritage Department, Parks and Estates Department

**Representative of the project owner** City of Lausanne, construction management, architectural department

**Architect (design, construction management, training):** CArPE (Collectif d'Architecture Participative et Ecologique, Lausanne)

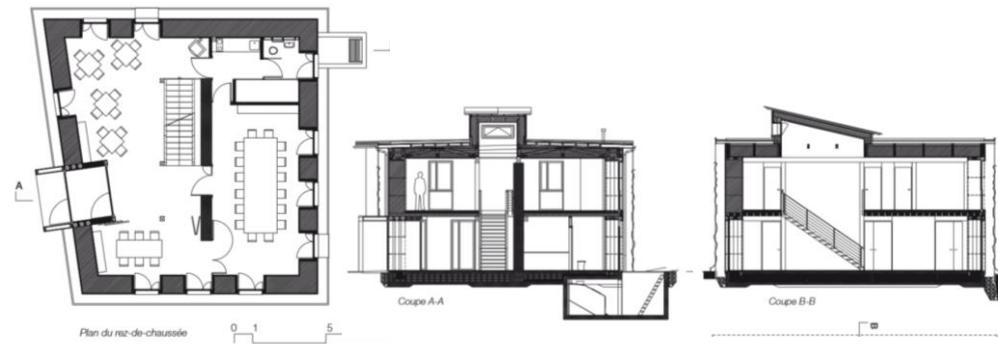
**Civil Engineer:** Normal Office Sarl, Freiburg

**Ventilation engineer:** Planair SA, Yverdon-les-Bains

**Consulting and heat balance:** Roxana Carrel, Grenilles

**Surface:** 293 m<sup>2</sup>

**Cost:** 1,687,500 CHF

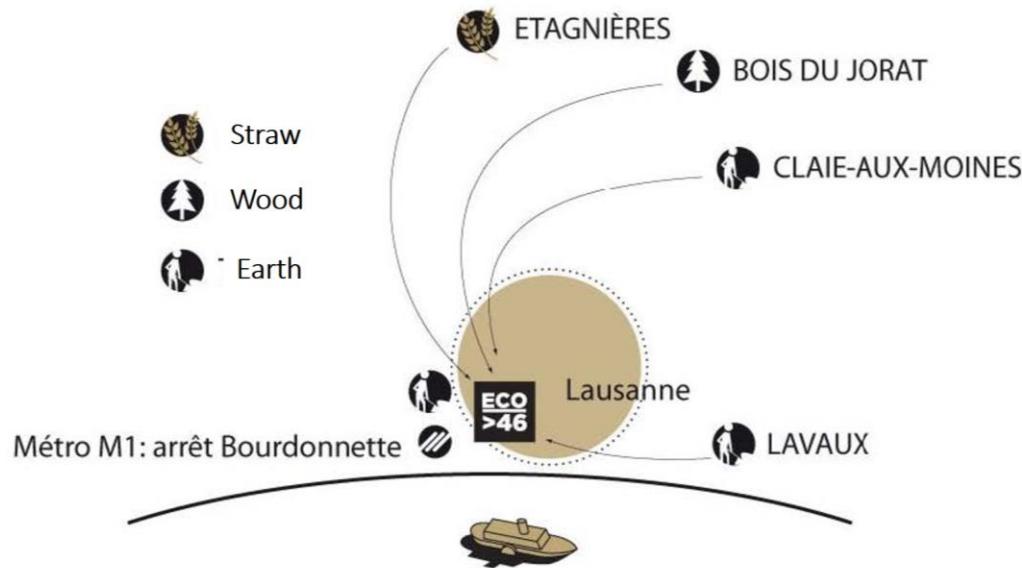


## MATERIAL SOURCING

**WOOD:** Three wood species have been used for the construction and interior finishing: red beech, white fir and oak. Almost the entire volume of wood comes from Lausanne's forest and represents less than 1% of the annual forest production of the city

**STRAW:** 260 straw-bales were used for the building. 45 tons of straw was harvested, corresponding to 0,02% of the cereal production of Vaud Canton.

**EARTH:** Over 50 tons of earth were used, coming the excavation of earth of the project site, the Lavaux's region and the Cliae-aux-Moines's gravel quarry. Earthen material is used for the load-bearing rammed earth central wall, compacted slabs, filling walls between offices and plasters.



# BUILDING DIFFERENTLY

## Exchange of know-hows

the participatory approach encouraged the transfer of knowledge to professionals. theoretical and practical courses were offered in exchange for work on site. They brought together: companies and craftsmen from the region, city staff and other participants.



## Information platform

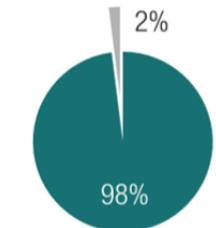
10% of the total budget has been invested into training and communication in order to raise awareness.

From the preliminary project, several communication measures were put in place to accompany the key stages of the construction site: press conference, guided tour, open day. A permanent exhibition of the construction site and six short films presenting the key stages of the construction site are available.

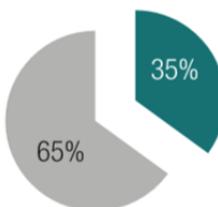
## Highlighting local workers:

The building has a construction cost similar to that of a conventional building with the same energy requirements. However, the distribution of the budget between materials and labour differs significantly. As the used raw materials sometimes have a very low cost price, most of the construction costs are allocated to local companies and craftsmen. It permits to highlight local skills and know-hows.

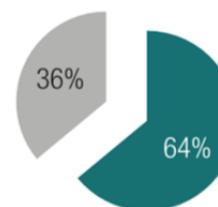
- Manpower
- Materials and equipment



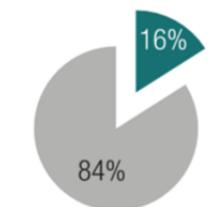
RAMMED  
EARTH WALL  
(LOCAL EARTH)



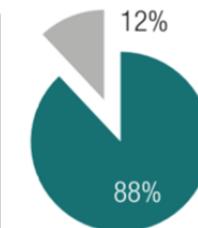
REINFORCED  
CONCRETE  
WALL



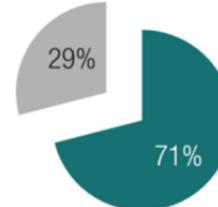
LOAD-BEARING  
STRAW-BALE  
WALL



PREFABRICATED  
TIMBER WALL



PLASTER  
(LOCAL EARTH)

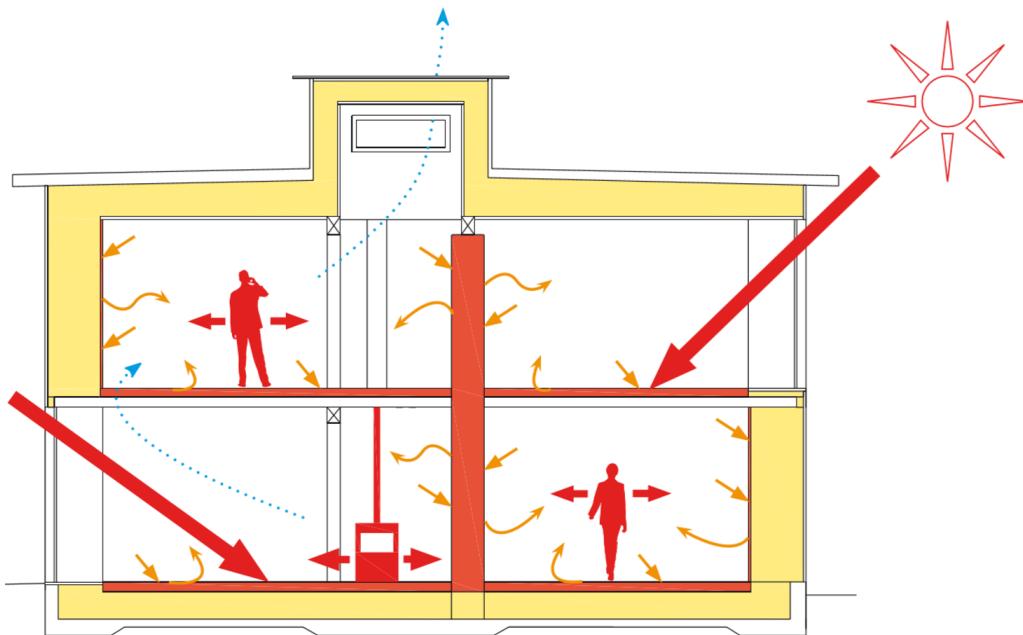


LIME PLASTER  
(READY TO USE)

*Less than 8 months of site work, 43 course participants, 147 days of work and training*

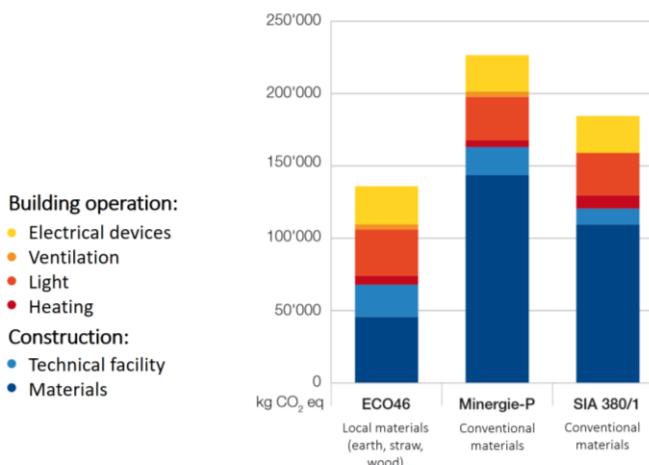
# ENERGY: ENVIRONMENT AND COMFORT

- ➡ Internal heat supply, sun
- ➡ Storage (heat/coolness)
- ➡ Release (heat/coolness)
- ➡ Ventilation natural + controlled
- ➡ Envelope (straw + glazing)
- ➡ Thermal mass (rammed earth, slab, plasters)

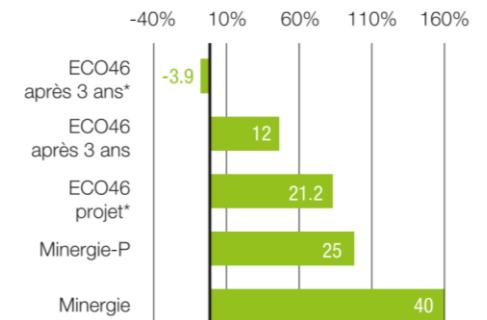


**Heating and ventilation** For ECO46, the heating system consists of a 5.9 kW auxiliary pellet stove installed on the ground floor. The heat is distributed directly into the ambient air by means of the heat recovery ventilation system required by the Minergie standard. The building also benefits from natural ventilation, which allows summer overheating to be removed through the roof lantern. Adjustable slat blinds act as sunshades. The electric current produced by the 19.6 m<sup>2</sup> of photovoltaic panels on the roof is fed back into the power grid.

The graph represents an assessment of greenhouse gas emissions, which contribute to global warming, as produced by each building over a 60-year period, in kilograms of CO<sub>2</sub> equivalent.



To illustrate the importance of the choice of materials, ECO46 (Minergie-ECO standard, with an envelope equivalent to Minergie-P) was compared with two simulations of buildings of the same size, but made with conventional materials (e.g. reinforced concrete structure and polystyrene insulation), one complying with Minergie-P requirements, the other with the SIA 380/1 standard. This analysis shows that, in order to reduce the environmental impact of buildings, the choice of construction materials remains essential.



\* avec production photovoltaïque (PV)

Comparison of the primary energy consumption (kWh/m<sup>2</sup>) for heating systems, ventilation and domestic hot water