

HEUSDEN-ZOLDER ADULT SCHOOL

Heusden-Zolder is a new school building replacing an existing one on another site. The new school is built as an extension of an old mine building. The extension was built in 2013-2014 and is in use since February 2015. The main energy related targets were valuable energy savings and a healthy indoor climate with high comfort.





RENEW SCHOOL

GENERAL INFORMATION

Location:	Heusden-Zolder, Belgium
Project type:	New building (extension)
Net cost:	17,1 million EURO
Main contractor:	Houben nv + Vanderstraeten nv
Architect:	Q-BUS Architectenbureau
Building owner:	Municipality of Heusden-Zolder
Gross floor area:	5 637 m ²
Number of storeys:	4
Construction time:	2013-2014

FINANCING

EFRO (Europees fonds voor regionale ontwikkeling): ~20,8%
 LSM (Limburg Sterk Merk): ~18,1%
 AGION: ~37,1%
 Province of Limburg: ~5,7%
 Onroerend Erfgoed: ~16,5%
 Tourisme Vlaanderen: ~1,8%

TECHNICAL SOLUTIONS AT A GLANCE

- Passive house standard
- Heating with heat pump
- Prefabricated, insulated facade elements
- Focus on indoor air quality and thermal comfort
- PV system on the roof

VENTILATION AND INDOOR ENVIRONMENT QUALITY

The mechanical ventilation system is arranged as followed:
 Every floor has 2 ventilation systems, the first serves the east side, the other serves the west side. The systems use high efficiency rotary heat exchangers which also recuperate moisture during cold winter days.

All classrooms are equipped with a VAV-box (Variable Air Volume) which is controlled by a CO₂-sensor. When the CO₂-level is below 600 ppm the flow will be limited to 20 % of it's maximum flow.

Pressure sensors in the ventilation ducts are controlling the frequency driven ventilators.

Some technical details:

- daylight-controlled lighting with absence-detection
- shading at eastern and western windows by automatically movable blinds
- all windows have a textile roll-up for glare reduction on the inside





Co-funded by the Intelligent Energy Europe
Programme of the European Union

DESCRIPTION OF CONSTRUCTION

The facade elements consist of plasterboard, an insulated installation cavity, OSB, insulated timber beam structure, fibreboard, air cavity and a cladding of corten steel on the outside.

A new concrete structure was built. During the construction time of the new concrete structure the pre-fabricated elements were prepared off-site.

ENERGY DATA / SUPPLY

The building achieved a passive house school certification in May 2015, and monitoring data will be gathered during the first 2 years of operation.

Calculated primary energy demand (heating, cooling, lighting + auxiliary power (pumps, ventilators,...):
71,1 kWh/m²GFAa

Calculated final energy demand: 28,5 kWh/m²GFAa
Heating demand: 13 kWh/m²GFAa.

Every classroom has its own (small) heat pump which heats or cools the room. These small heat pumps are emitting their heat to a ring duct system. This way energy can be transported between different classrooms: for example from warm cooking classrooms to colder north oriented classrooms. An additional central heat pump system controls the need for heating and cooling on a global building level. Heat can easily be distributed from warm zones to cold zones if requested.

A PV system is mounted on the roof.

So, 25 % of the final energy demand is covered by renewable energy.

LESSONS LEARNED

A more detailed design is an absolute must before starting the construction phase.

A "passive" airtightness-level of 0,6 h⁻¹ is a reachable goal.

Good communication between the main contractor, the producer of prefabricated elements, the producer of the cladding-system (corten-steel) and the window producer resulted in a zero-error project.



Picture 1

Showing the prefabricated timber elements which are covered with a black protective cloth/foil. You also see the metal brackets which are the fixing points of the "corten steel" cladding

Picture 2

The facade completed

THE RENEW SCHOOL PROJECT WILL DISPLAY 18 RENOVATED OR NEW SCHOOL BUILDINGS ALL OVER EUROPE

The RENEW SCHOOL project aims at retrofitting a large number of school buildings to Nearly Zero Energy Building (nZEB) standard. The project will promote and increase high-energy performance and prefabricated timber-based renovation of school buildings in Europe.

The project assists municipalities, school owners/-financiers and companies with appropriate tools and solutions and offers renovation possibilities for them.

Integrated and multifunctional solutions are based on:

- Timber prefabrication (with integrated components)
- Ventilation (indoor air quality)
- Intelligent daylight / shading (control)
- Renewables (on-site or nearby)

The project has chosen 18 frontrunner buildings, to present to municipalities, school owners, companies and users as good examples and solutions for the renovation of existing school buildings to nZEB standard.



1. Søreide Primary School
2. Risør Technical College
3. Baksippans Preschool
4. Kalmthout
5. School CVO Heusden-Zolder
6. Detmold Vocational College
7. Gymnasium Reutershagen
8. Schwanenstadt
9. Rainbach
10. Neumarkt
11. St. Leonard
12. Tišina kindergarten
13. Lavrica kindergarten
14. Kekec kindergarten
15. Storžek kindergarten
16. Siemianowice
17. Vibeengen
18. Capriva del Friuli kindergarten

CONTACT INFORMATION:

Stefan Vanloon, Passiefhuis-Platform vzw
(stefan.vanloon@passiefhuisplatform.be, +32 (0)3 235 02 81)

Armin Knotzer, AEE INTEC (a.knotzer@aee.at, +43-3112-5886-369)
- Coordination Renew School

Follow us on www.renew-school.eu

The sole responsibility for the content of this folder lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the EASME nor the European Commission are responsible for any use that may be made of the information contained therein.

