

ST. LEONHARD PRIMARY SCHOOL AND KINDERGARTEN

The school was built in in 1964 and was renovated in 2010. The main energy related targets were the attainment of the passive house standard after the renovation, the use of prefabricated timber facade elements as well as the use of renewable energy sources for heating, domestic hot water and electricity.





RENEW SCHOOL

GENERAL INFORMATION

| | |
|--------------------|---|
| Location: | St.Leonhard, Austria |
| Project type: | Renovation |
| Net cost: | 2,0 million EURO |
| Main contractor: | ARCH+MORE ZT |
| Architect: | Gerhard Kopeinig, ARCH + MORE ZT |
| Building owner: | Municipality Arnoldstein |
| Gross floor area: | 1 831 m ² |
| Number of storeys: | 2 building parts: 1st part 2 floors, 2nd part gym (no retrofit) |
| Construction time: | 2010 |

COOPERATION MODEL

Carinthian school building funds financed 75 % of the retrofit and the Austrian Research Promotion Agency financed 25 %.

AWARDS / CERTIFICATES

The project received the ISOVER Energy Efficiency Award in 2011

TECHNICAL SOLUTIONS AT A GLANCE

- Passive house standard
- Biomass (pellets) and PV
- Centralized mechanical ventilation system with heat recovery
- Focus on the improvement of indoor air quality

DESCRIPTION OF CONSTRUCTION

Prefabricated timber facade elements were used, which were produced off-site about 2 weeks before the mounting on-site. No temporary moving to e.g. containers were necessary due to a lot of preparation before the start of production.

The roof of the building was also insulated, and both roof and outside wall achieve a u-value lower than 0,10 W/m²K after the renovation. New triple glazed windows with total u-value of lower than 0,8 W/m²K were integrated in the prefabricated facade elements.





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



ENERGY DATA / SUPPLY

The heating demand before retrofit was 121 kWh/m²GFAa, and after the renovation the heating demand was reduced to 8 kWh/m²GFAa, which means a reduction of 94 %.

The measured final energy demand before retrofit was 116 kWh/m²GFAa, compared to 35 kWh/m²GFAa after retrofit.

The energy supply is based on wood pellet complemented by PV. This gives 85 % renewable energy coverage of the final energy demand and a calculated CO₂ reduction in operation of about 39 kg/m²GFAa.



VENTILATION AND INDOOR ENVIRONMENT QUALITY

A central mechanical ventilation system with 80 % heat and moisture recovery was installed.

The ventilation system is controlled based on the CO₂ concentration in the classrooms.

The ambient air is preheated by a separate brine-system before entering the heat exchanger. Before the preheated air gets to the classrooms the wood pellet furnace heats the supply air to at least 24°C (if necessary) to guarantee high thermal comfort in the classrooms.

LESSONS LEARNED

In general the feedback to the renovation of the school building was very positive from all involved, especially from the school owner and the users (teachers and pupils).

The only potential for optimization is the introduction of the mechanical ventilation system in the school's daily life. Although an instruction has been conducted and a documentation has been handed over, the school users had difficulties with the use of the mechanical ventilation at the beginning.



Picture 1
St. Leonard before retrofit

Picture 2
Mounting of the facades

Picture 3
St. Leonard after retrofit

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 exchange possibilities for them.

Integrated and multifunctional solutions are based on:

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

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



1. Romsdal Secondary School
2. Søreide Primary School
3. Risør Technical College
4. Bacsippans Preschool
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:

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.

