

DETMOLD VOCATIONAL COLLEGE

The buildings are situated on the campus of the vocational colleges “Felix-Fechenbach-Berufskolleg” and “Dietrich-Bonhoeffer-Berufskolleg” at Detmold (Germany) and will undergo exemplary renovation in 2014/2015; after their renovation, these buildings will produce more energy than is actually needed for their operation. The external walls will be insulated using pre-fabricated timber elements that are to be mounted on the outside of the facade.



GENERAL INFORMATION

Location:	Detmold, Germany
Project type:	Renovation
Net cost:	6,5 million EURO
Main contractors:	Brüggemann Holzbau GmbH & Co. KG and Krebbers GmbH & Co. KG
Architect:	pape oder semke Architekturbüro
Building owner:	Kreis Lippe (the district)
Gross floor area:	14 300 m ² (total floor space of all three buildings)
Number of storeys:	3-4
Construction time:	2014-2015

FINANCING

The administrative district (Landkreis Lippe) will pay for the renovation, subsidies were granted by the German Federal Ministry for Economic Affairs and Energy.

The two main contractors were awarded the Europe-wide tender.

TECHNICAL SOLUTIONS AT A GLANCE

- Plus energy building
- District heating (biomass, residual wood, CHP)
- Roof-integrated PV system on top of all three buildings
- Central ventilating system with 85 % heat recovery (administration, the training restaurant and the hotel classes)
- Decentralized facade-integrated ventilation in all other classrooms with 85% heat recovery.

DESCRIPTION OF CONSTRUCTION

Construction before renovation (U=1,2 W/m²K):

- 386 mm masonry, plastered on both sides

Construction after renovation (U=0,11 W/m²K):

- 386 mm masonry
- 360 mm web girders/ I-joists filled with 360 mm cellulose insulation
- 35 mm fibre cement board
- 35 mm light-weight plaster



ENERGY DATA / SUPPLY

- Final energy consumption before renovation: 260 kWh/m²GFAa
- Final energy demand after renovation: 57 kWh/m²GFAa (space heating, ventilation, domestic hot water, auxiliary energy for the technical building installations, lighting).
- ->78 % reduction
- Primary energy demand after renovation: 92 kWh/m²GFAa (space heating, ventilation, domestic hot water, lighting)

The electricity consumption demand will be covered by the PV system (346 kWp). The generated electricity will be consumed on-site; any surplus electricity will be fed into the public grid.

The district heat breaks down as follows:

- 60 % regenerative heat from an industrial biomass-cogeneration plant (combined heat and power generation, CHP)
- 15 % heat from peak-load gas boilers
- 25 % from large-scale district heating using cogeneration plants (CHP)

VENTILATION AND INDOOR ENVIRONMENT QUALITY

- The centralized ventilation plant will be regulated by a demand-responsive control system. Each functional part can be controlled separately, because every room will be provided with a presence detector and a CO₂ sensor. As the air is supplied through textile air hoses, the flow noise will be reduced and the supply air will be introduced free of draught.
- The decentralized ventilation systems in the classrooms will be controlled by presence-detecting and CO₂-dependent control systems.
- The heat will be emitted by radiators.
- Summer heat protection will be ensured by means of an external shading system and via night ventilation.

Picture 1

The existing facades of the school buildings

Picture 2

Mounting of the prefabricated facade elements

Picture 3

Sketch of how the college will look like when 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. Bacsippans 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

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