



Low energy buildings - Case Study: Covestro Zukunftshaus Bottrop



Category / year

Renovation - Commercial (supermarket, shopping centre, offices) / Built in 1964, latest renovation in 2014



Address

Hansastr. 15, 46236 Bottrop (Germany)



Contact details

Developer:
Oliver Helmke GmbH
Gerichtstr. 18, 46236 Bottrop (Germany)

For further questions:
Oliver Helmke GmbH
Gerichtstr. 18, 46236 Bottrop (Germany)



Pictures





Description of the building

Detailed description:

Mixed-use commercial building located in the city centre of Bottrop; five use units: public shops on ground level and offices in the levels above.

First commercial building renovation worldwide to reach a calculated plus-energy standard.

Building envelope:

- PU insulation (Linzmaier and Puren products) was used in the flat roof, wall and basement ceiling to achieve highest insulation values at low thickness:
Roof: U value = 0.10 W/m²·K
Walls: front side (cladded façade) and back side (ETICS), U value = 0.13 W/m²·K
Cellar ceiling: U value = 0.32 W/m²·K
- Triple-glazed windows (U value = 0.89 W/m²·K, g = 0.49). Optimised use of daylight thanks to an in-window lamella

Energy efficient technologies:

- LED lighting incl. presence control and daylight control systems per office
- Glass fibre lighting technology using sunlight without additional energy supply
- Ceiling heating system (heating and cooling using activation of concrete ceiling core)
- District heating pumps and heating control devices
- Decentralised ventilation with min. 90 % heat recovery
- Energy efficient lifts with 75 % energy recovery

Renewables:

- Geothermal heat pump
- Photovoltaics (108 elements installed on roof and wall) incl. energy storage devices
- Wind plant of 300 W



Energy consumption

Energy values:

Values before renovation are unknown.
Final energy demand after renovation (excluding on-site production of renewables):

- *Heating demand:* 13.3 kWh/m²a
- *Cooling demand:* 0.8 kWh/m²a
- *Total final energy demand:* 34.1 kWh/m²a (excluding RES, incl. hot water, ventilation and lighting)

- *Total energy demand:* 29 kWh/m²a (primary energy)
- *Total demand:* 21 233 kWh/a
- *Total production:* 28 865 kWh/a
- **Energy fed into grid: 7 632 kWh/a**

Use of renewables:

- RES fraction 100 % (excl. district heating energy peaks)



Awards won

- Zukunftshaus Bottrop (part of Innovation City Bottrop programme)
KlimaEXPO.NRW - 1000 Schritte in die Zukunft (further info: <http://www.klimaexpo.nrw/en/join-in/projects-pioneers/vorreitergefunden/covestro/>)



Links

Websites illustrating the building:

- <http://www.covestro.de/en/Projects-and-Cooperations/InnovationCity/Zukunftshaus.aspx>