Intelligent Energy Europe

coolregion

WP 3 - D19 (Gertec, Germany) - Best practice example No. 1

General data

Name of the building	Energon
Building type	Office building
Country	Germany
Address	Lise Meitner Str. 14, 89081 Ulm
Google Earth coordinates	48°25 North, 9°46 East
Building owner/user	Software AG - Stiftung

Building information

Picture of the building	
Highlights	- Passive house with 420 workplaces; (A/V: 0,22 m^{-1}) - Basic shape of the building: three equal, curved facades - Reinforced concrete frame construction; thermal insulation up to 50 cm in the roof - Triple glazed windows - Glass roofed atrium of approx. 430 m² - Concrete core activation with 40 geothermal probes each 100 m deep - Mechanical ventilation with heat recovery: The supply air flows through a subsurface concrete pipe, 28 m long and 1,8 m bore - 15 kWp PV + 135 kWp PV on the garage close-by
Year of construction	2002
Total net area (m²)	6.911 (main useable surface: 5.412 m²)
Volume (m³)	32.223
No. of floors	5
Glazed surface level	43 %

Cooling concept

Cooled area (m^2)	6.911 m²
Cooling approach	- The concrete core activation (CCA) and the 40 geothermal probes with each 100 m deep achieve a cooling load up to 120 kW without an additional cooling machine. - Water flows directly from the CCA (350 plastic tube registers on 5.000 m² ceiling area) through the geothermal probes. The registers are at distance of 10 cm from the rear side of the ceilings, which are 28 cm thick. - In case of cooling the design temperature lies at 18°C at a temperature spread of 1,2 K. - By an additional heat exchanger with antifreeze safety the water circulation in the geothermal probes is also used to cool the supply air. - Minimum air moisture of 30 % is assured by central air moistening (spray nozzles) and plants in the atrium and in the offices. - Most of the cooled supply air flows into the atrium and then into the offices. - A free cross or shaft ventilation as well as a mechanical ventilation with surplus supply air could be operated alternatively in the atrium. - Free ventilation at night by supply and exhaust air in the atrium, open windows in the offices and storing construction materials ensure night cooling. - In the garden floor 830 m² floor cooling have been realized to cover high cooling loads in case of special use. - Seminar rooms are additionally equipped with cooling canvas. - The waste heat from the cooling units in the central computing rooms (compression) and from the kitchen is emitted into the CCA and into recoolers, if there is no demand.
Annual electricity consumption (kWh_{el}/m^2)	n.s.
Installed capacity (kW)	108 (all geothermal probes), decentralised cooling: 34 kW (15 kW_{el})

Building concept

Comfort	Excellent; ratio of overheating 0%, room temperatures to 100 % between 20 und 27°C
Solar protection	- Transparent blinds with spectral selective foils in the pane interspace are installed in the glass roof to further provide daylight. - The foil-blinds reduce the degree of light transmission of the glass roof from 71 % to about 13 %, the degree of light transmission is reduced from 50 to 17 %. - Offices at atrium side: Benefit of the transparent blinds. A glare protection is installed on demand. - Offices at the facades: External sunscreen with a two-tier option (activated as glare protection the supply of daylight is still given).
Lighting performance	- Most lights are equipped with flurorescent lamps and electronic ballasts. - Offices at the facades: Lights with daylight dependent regulation and motion detectors. - The energy saving potential is to low to install motion detectors and special regulation in the offices at the atrium side. - The internal corridors are supplied with daylight by glass elements next to the office doors.
Office equipment	- Energy efficient office equipment, selective choice of electricity saving kitchen technology
Regulation	n.s.

Figures

Figures from http://www.solarbau.de/monitor/doku/index_0.htm Portrait No. 17

Bauwerkskosten Brutto, Stand Kostenberechnung

	Bezug	Baukonstruktion DIN 276: KG 300	Technische Anlagen DIN 276: KG 400	Bauwerkskosten KG 300+KG 400
	BruttoRaumInhalt DIN 277	226 €/m³	74 €/m³	300 €/m³
	NettoGrundFläche DIN 277	1.054 €/m²	345 €/m²	1.399 €/m²

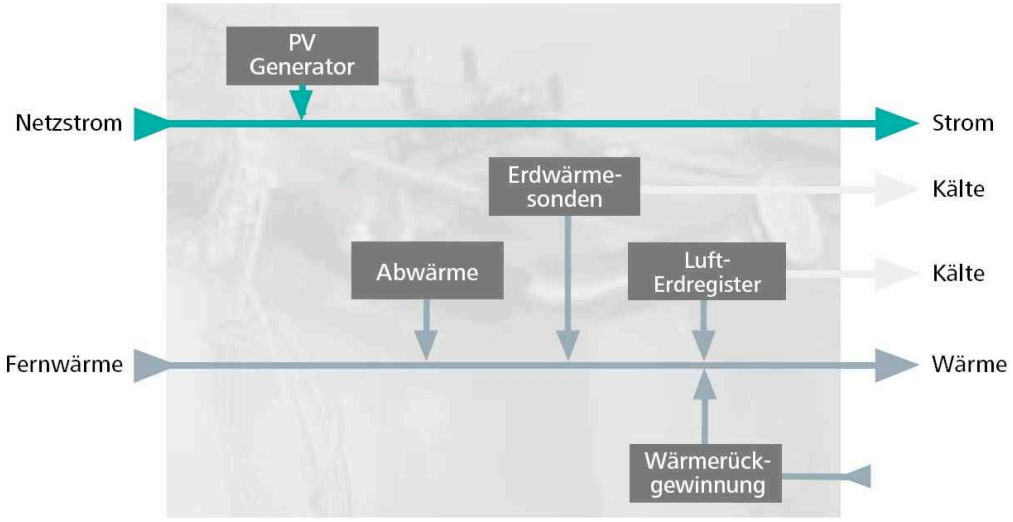

Figure 1: Energy supply

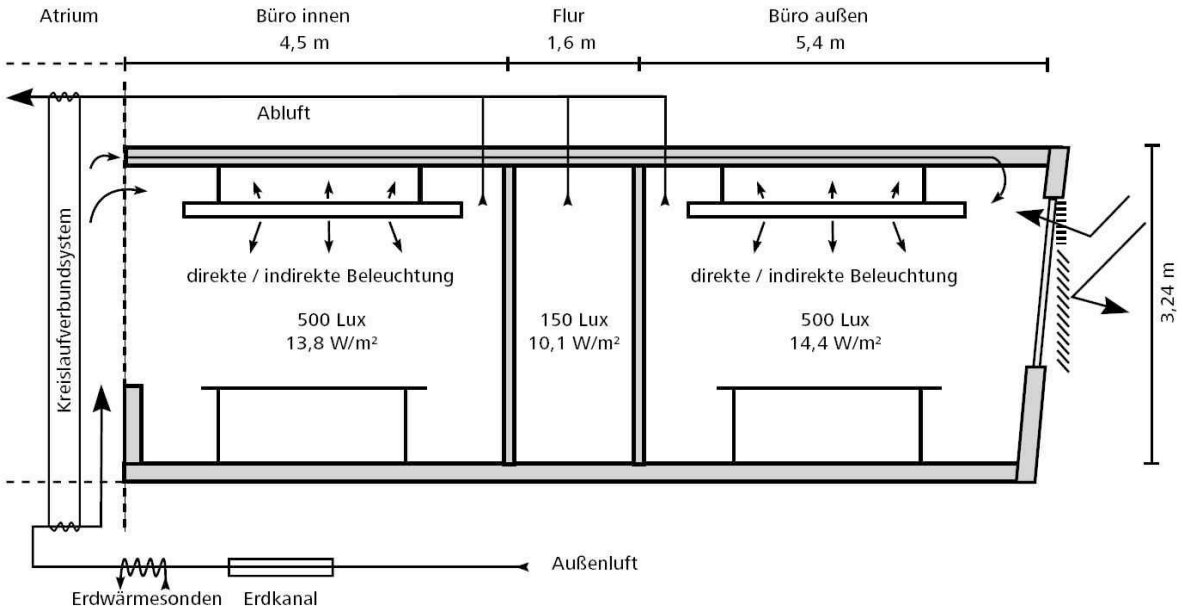

Figure 2: Air-conditioning and lighting concept

Contact & Links

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