Bellona Building, Oslo, Norway

Photo: Finn Staale Feldberg

Architectural integration of solar thermal energy systems
The Bellona Building, Oslo, Norway
Commercial building - offices and stores - with solar collectors integrated in the façade

**PROJECT**

The Bellona building is an office building with floor space of 3,120 m² over five storeys. The first floor is housing commercial activities, while the remaining four floors contain offices where the Bellona Foundation (a multi-disciplinary international environmental NGO) occupy two and a half floors. The building is constructed of in situ concrete with facades in plaster and glass. Solar collectors cover large parts of the south-facing facade and contribute towards reducing energy requirements. The solar collectors heat the water used in the offices and in other buildings nearby.

The south-facing facade is divided between inward-facing windows and outward-facing dividers. The outward-facing dividers are perfect for installing solar collectors, 240 in all.

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**Key figures**

Heated area:
- Offices: approx. 2600 m²
- Stores: approx. 800 m²

Energy demand:
- Offices: 82.7 kWh/m²/year
- Stores: 137.5 kWh/m²/year

Collector area: 291 m²

Supplied energy:
- Solar collectors, heat pumps, district heating and electricity

**Heating system**

Heating demand in the building is very low because of good insulation (roof 400mm, 270mm walls), excellent windows (U-value 0.8), minimized thermal bridges and low air leakage factor (0.5-1.0). The solar collectors heat the water used in the offices and in other buildings nearby. Heat is acquitted from the site's energy central whose main source is 14 geo-wells that go 300 meters into the ground.

The energy consumption of the building is calculated to be just 68 kWh/m²/year, which is far below the requirement towards class A buildings.

Estimated additional costs: 2500/m² (+10% compared to average costs)
• Built/Completion: 2010
• Architect: LPO arkitekter
• Engineers /advisors: Ing. Petter Nome AS (RIV), ÅF-consulting AS (RIE), Hambra (RI Miljø), Kjell Ludvigsen (RIB), Brekke&Strand Akustikk AS (RIA)
• Client: Vulkan Utvikling AS/Aspelin Ramm
• Entrepreneur: Veidekke ASA
• Address: Maridalsveien 13
• Location: Oslo, Norway
• Type of project: Commercial building

Read more: http://en.veidekke.com/reports/2010/communityreport/environment/energy-efficient-buildings/article45010.ece