



Low energy buildings - Case Study: **Kuopas Apartment Building**



Category / year

New construction: nearly zero energy building or better - Large residential (multi-family house) / 2010



Address

Finland, Kuopio, Suokatu 14



Contact details

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Pictures





Description of the building

Detailed description:

5 story apartment building with 47 accessible apartments for students.

Building gross volume: 6 900 m³, heated gross area 2 125 m² without garage.

Building envelope:

- *Walls:* polyurethane insulation (300 mm), concrete sandwich elements (U-value 0.08 W/(m²·K))
- *Roof:* hollow slab, polyurethane insulation (270 mm) + 90-160 mm light gravel and 100 mm concrete
- *Total energy consumption of the building:* 107 100 kWh/a

Renewables:

- *Total renewable energy production* (solarheated water and solar electricity, geothermal heating and thermal energy created by use of the building): 85 600 kWh/a
- *Heating energy purchased from district heating grid:* 17 335 kWh/a
- *Electricity purchased from grid:* 4 230 kWh/a
- *Heating energy and electricity sold to district heating system and electricity grid:* 19 273 kWh/a

The example shows that zero energy buildings are feasible even in regions with harsh climatic conditions and low solar radiation.



Energy consumption

Energy values:

- *Heating demand:* 10.6 kWh/(m²·a)
- *Cooling demand:* 12.9 kWh/a, cooling is completely produced by geocool i.e. the only energy consumed is the electricity for pumps
- *Final energy demand including onsite solar energy production:* 1.4 kWh/(m²·a)
- *Total energy balance = -2 292 kWh/a* (electricity purchased from external sources)

Use of renewables:

- 100 % RES fraction of the energy used for heating
- 100 % RES fraction of the energy used for cooling
- Renewables – total energy demand 98 % total annual balance (building feeds energy to district heating grid as well as electricity grid)



Links

Website illustrating the building:

- <http://www.nollaenergia.fi/mediapankki.html>

Promotional material online:

- www.nollaenergia.fi