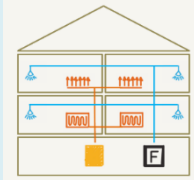


Former Finnish Defence Forces Building, Finland

In Kemi, Finland, an old apartment building built by the Finnish Defence Forces required extensive renovation. Instead of by oil, the building would now be heated by ground source heating.



F1.3

Key facts

Buildings

Location	<i>Kemi, Finland</i>
Construction	-
Project type	<i>retrofit</i>
Heat distribution	<i>underfloor</i>
Heated space	<i>640m²</i>
No. of apartments	<i>14</i>
Level of insulation	-

Heat pump and source

Number of	<i>1</i>
Operation mode	<i>bivalent</i>
Heat source	<i>ground</i>

Heating system

Installed power	<i>60 kW</i>
Heating temperature	<i>35°C</i>

Domestic hot water

Type of system	<i>central - circulation</i>
Heater	<i>3000l superheat tank (10kW)</i>
Max. temperature	<i>110°C working temp.</i>

Other information

Coefficient of Performance	<i>3</i>
Refrigerant	-

Lessons learned

- Savings of over 10,000€ per year



Pictures: Oilon

As part of the overhaul, the building's energy systems were upgraded, and the old oil heating system was replaced by locally sourced ground source heating. At the same time, water-circulating radiator heating was replaced with resident-friendly floor heating. In a 14-apartment building, a 3,000-liter super heat tank and a ground source heat pump from the Oilon pump range were installed instead of two oil boilers. According to Arto Heikkinen, chairman of the board of the housing association, the financing base for the building renovation was covered by switching away from oil.

If we compare the oil bill of approx. 20,000 euros year before the renovation to that, that with ground source heating, for example, 4,000 euros are needed for the electricity bill, the investment is worthwhile, says Heikkinen. Switching from oil to ground source heat requires more electricity because the pumps are powered by electricity. Ground source heating is an investment of about 50,000 euros including VAT in this size of a property.

When the annual savings are well over 10,000 euros, the ground source heat investment will pay for itself in a few years. The ground source heat pump's COP is 3, so one kilowatt hour of electricity produces three kwh of heat, says Mika Poikela, the CEO of Engineering office Wormalämpö Oy, who was responsible for the ground source heat contracting of the site. Ground source heat can be installed in a building with a water circulation heating system.