

The background of the slide is a photograph of a dense green forest reflected in a calm body of water. The sky is a clear, light blue. The text is overlaid on the lower portion of the image.

Oilon – heat pumps for medium and large buildings

**// Oilon heat pumps promote
the energy transition**

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OILON GROUP

We create sustainable energy technology.

Oilon is a family-owned, global energy and environmental technology company, founded in 1961. Oilon specializes in environmental technology with a special emphasis on research and development. The focus areas of the research and development are on improving energy efficiency, decreasing emission levels, and developing new solutions using renewable energy sources.

The focus technologies are:

- industrial heat pumps and chillers
- Heat pumps for medium and large buildings
- burners and combustion systems for liquid and gaseous fuels in the capacity range of 10–90 MW

The service activities are in an important role throughout the product life cycle.

Oilon solutions and systems are used for heating and cooling large buildings and facilities, and for heating private houses. Key industrial customers include power plants, pulp and paper mills, process industry, waste incineration plants, marine operators, and districts heating plants.

Oilon with its turnover of 85 million euros has 400 employees. Oilon has operations in Finland, USA, and China, and we have sales offices in Brazil and Germany. Additionally, we have an international network of resellers, with 70 partners in total.





Ground source heat pumps

Heat pumps are an excellent choice

Oilon is the oldest ground source heat pump manufacturer in Finland. A family-owned business, Oilon has more than 60 years of experience in heating solutions. Based on this history, we have built a strong standing as one of the leading heating technology companies in the Nordic countries.

With 40 years of experience in heat pump production, we are the oldest heat pump manufacturer in Finland. Our heat pump production started already in the early 1980s. Our current ground source heat pump selection includes energy-efficient solutions for buildings ranging from single-family homes to large properties.

A ground source heat pump is an excellent choice for heating buildings and producing domestic hot water. By using renewable electricity, a ground source heating system can achieve total carbon neutrality.

Switching over to a ground source heating system will typically reduce a property's heating costs by 65–75 per cent, which means that the investment will pay itself back in only a few years. A more accurate property-specific savings assessment will be prepared once the system has been sized.

Compared to most heating methods, ground source heating has extremely low CO₂ emissions. As the system utilizes heat energy stored in the soil, bedrock, or a body of water, the bulk of the energy required comes from renewable sources. In a borehole, for example, water temperature remains at a few degrees Celsius throughout the year. This keeps the heat pump's coefficient of performance at a steady, high level even at the harshest winter conditions.

Installing a ground source heating system is an excellent way to increase the value of your property. Besides ground source heating, the system can be utilized to recover heat from a building's exhaust air. This energy can be used to cover approximately 1/3 of the heating required by the building. Additionally, the cool brine that circulates in the ground loop can be used for energy-efficient apartment cooling, making your building more comfortable to live in and more attractive to prospective buyers. A ground-based cooling solution's operating costs are only 1/15th of those of an air-source pump

used for cooling.



Read more about Oilon ground source heat pumps: [oilon.com](https://www.oilon.com)

Emergency services station utilizes reliable ground source heating from Oilon



In spring 2022, Hollola's decision-makers had to face some cold facts. It was only five years since the Finnish municipality's new emergency services station had been completed, and now, the compressors in both of the station's ground source heat pumps had broken down. To make things worse, the warranty period had just expired.



“When we started investigating the problem, it was revealed that the compressors in the heat pumps represented new, experimental technology that promised much but delivered little in practice. We weren't alone with this problem, and there weren't any spare parts available for the equipment any longer. As the manufacturer couldn't come up with a satisfactory solution for the problem, we were forced to start tendering for new ground source heat pumps,” says **Arto Nuuttila**, the property manager for Hollolan Tilapalvelut Oy.

Oilon's ground source heat pumps came out as the winner of the tendering process. The heat pumps stood out not only due to their competitive pricing but also their reliable and well-established technology as well as the excellent reputation of HC-Systems

Oy, the company responsible for system installation. What finally decided the matter was that the products were already at hand, as at the time, the heat pump was plagued by component shortages due to high demand and the COVID-19 pandemic.

“We could thank our lucky stars with this delivery. We had a couple of Oilon RE84 heat pumps in stock, and they fit the project perfectly. As the project involved an important public utility, we were prepared to stretch our resources and reserve the products for Hollola, even when the municipal decision-making process did take some time,” says Oilon's Sales Manager **Simo Ruusunen**.

“The installation project comprised removing the old equipment and installing new heat

pumps. When we started investigating the site, we noticed that there were problems with the original installation. These were fixed when we installed the new products. We optimized the system by adjusting flow rates and through similar means. This project is a good example of our operating philosophy: instead of adopting a narrow-minded approach and doing just what was ordered from us, we focus on ensuring the reliability and energy-efficiency of the entire system,” says Henri Rämänen, the CEO of HC-Systems.

The end result is a system that provides the emergency services station with heating and cooling exactly as it was originally intended to. There is plenty of hot water available, and the feedback from end users has been positive.

“I'm more than happy with how the project was handled. We were in a tough spot, and both Oilon and HC-Systems were prepared to be flexible and, at the same time, provide excellent customer service. Another thing we like about the new units is that they could be integrated into our building management system. For us, it is important that we can monitor system operation remotely,” Nuuttila says. “HC-Systems installed two 84-kW Oilon RE 84 ground source heat pumps. This is a reliable and popular solution for energy-efficient heating and cooling in medium-sized and large buildings. Up to 16 Oilon RE units can be joined together for a maximum total capacity of 768 kW. An RE 84 heat pump

has two compressors, providing an excellent capacity range and fault tolerance. The advanced Economizer EVI function provides outstanding performance for our RE ground source heat pumps. This means more heating and hot water for the end user with top-rated COP,” Ruusunen says.





Project: Emergency services station, Hollola, Finland

Oilon's customer: HC Systems Oy

Heat pump: 2 x RE 84

Total capacity: 168 kW

Heat source: boreholes

Number of heat pumps: 2

Location: Hollola, Finland



Project: Posti logistics center

Oilon's customer: JP-Yhtiöt

Heat pump: RE 96, RE 33

Total capacity: 129 kW

Heat source: boreholes

Number of heat pumps: 2

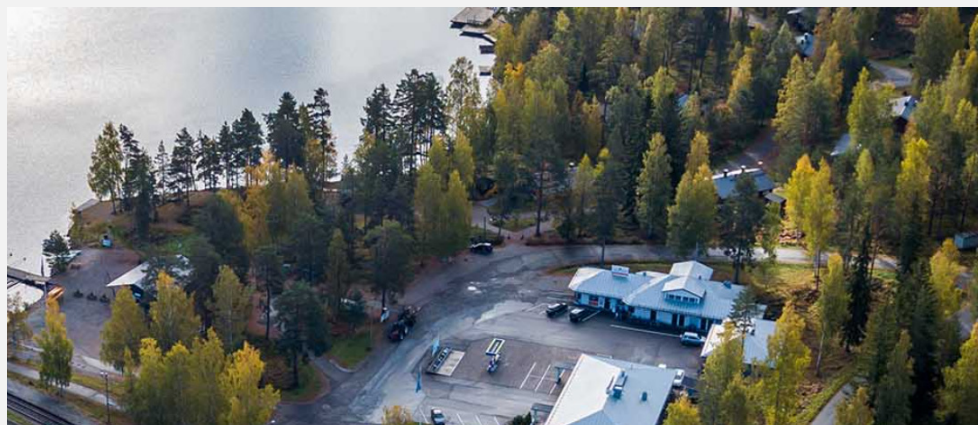
Location: Mikkeli, Finland



Project: AS Oy Relanderinaukio 4
 Oilon's customer: Suomen Kiinteistölämpö Oy
 Heat pump: RE 96, ECO 21
 Total capacity: 213 kW
 Heat source: boreholes
 Number of heat pumps: 3
 Location: Helsinki, Finland



Project: Kuhankoski hydroelectric plant
 Oilon's customer: Lämpöpalvelu Sami Päijänen
 Heat pump: RE 96
 Total capacity: 96 kW
 Heat source: power plant cooling pond
 Number of heat pumps: 1
 Location: Laukaa, Finland



Project: Matkailukeskus Harjunportti
 Oilon's customer: SSP LVI
 Heat pump: RE 48
 Total capacity: 48 kW
 Heat source: boreholes
 Number of heat pumps: 1
 Location: Punkaharju, Finland



Project: Halton Marine
Oilon's customer: Leasegreen
Heat pump: RE 96, RE 56
Total capacity: 344 kW
Heat source: boreholes
Number of heat pumps: 4
Location: Lahti, Finland



Project: Countryside hotel
Oilon's customer: Kemin Vesi-Piste
Heat pump: RE 84
Total capacity: 84 kW
Heat source: boreholes
Number of heat pumps: 1
Location: Kemi, Finland



Project: As Oy Myyrinkoivu
Oilon's customer: Suomen Kiinteistölämpö Oy
Heat pump: RE 96
Total capacity: 288 kW
Heat source: Boreholes and recovered waste heat from exhaust air
Number of heat pumps: 3
Location: Vantaa, Finland

Project: AS Oy Keskustie
Oilon's customer: LVI Apu Kilpinen
Heat pump: RE 96
Total capacity: 96 kW
Heat source: boreholes
Number of heat pumps: 1
Location: Kouvola, Finland

Project: AS Oy Paaskunnanmäki
Oilon's customer: Suomen Kiinteistölämpö Oy
Heat pump: RE 96, RE 48
Total capacity: 240 kW
Heat source: boreholes
Number of heat pumps: 3
Location: Turku, Finland

Project: AS Oy Luhtikulma
Oilon's customer: HC Systems Oy
Heat pump: RE 38
Total capacity: 38 kW
Heat source: boreholes
Number of heat pumps: 1
Location: Koivukuja 5, Orimattila, Finland

Project: AS Oy Paaskunnanlehto
Oilon's customer: Suomen Kiinteistölämpö Oy
Heat pump: RE 96
Total capacity: 192 kW
Heat source: boreholes
Number of heat pumps: 2
Location: Turku, Finland

Project: AS Oy Paaskunnanharju
Oilon's customer: Suomen Kiinteistölämpö Oy
Heat pump: RE 96, RE 48
Total capacity: 240 kW
Heat source: boreholes
Number of heat pumps: 3
Location: Turku, Finland

Project: AS Oy Rannikkolaivurinkuja
Oilon's customer: Helen Oyj
Heat pump: RE 56
Total capacity: 56 kW
Heat source: boreholes
Number of heat pumps: 1
Location: Helsinki, Finland

A unique solution based on an Oilon ground source heat pump provides heating for a historical hydroelectric plant



For a hundred years, the Kuhankoski hydroelectric plant utilized waste heat from its own generators for heating. In Easter of 2023, the old plant was left in reserve as its replacement became operational. The plant no longer provided the necessary waste heat, requiring another solution that would keep the plant in good working order.

“Kuhankoski is a valuable heritage site. We needed to find a heating solution for the plant, since from that point onwards, it would serve only as a backup, and for the most part, remain unused,” says Hannu Ruotsalainen, who serves as the CEO of Koskienergia Oy.

At the planning phase, Hannu’s team came up with the idea of using waste heat from the new plant for heating the old plant. The biggest challenge was the new plant’s nature as a peaking power plant; sometimes it would stay unused, then run at full capacity, or at any capacity in between, generating a highly variable amount of waste heat.

At the tendering phase, the company investigated if equipment suppliers could offer a heating solution that could adapt

quickly to changing conditions.

“For example, not a single hydroelectric set manufacturer we asked for a quotation had experience in anything like this. Finally, we found a simple and insightful solution, which is based on ground source heat pump technology,” Ruotsalainen says.

AN OILON GROUND SOURCE HEAT PUMP RUNS THE SHOW

The solution uses the side streams from the new plant’s energy production as the system’s “ground loop”. The heat pump recovers waste heat from generator cooling water, which would otherwise simply be pumped back into the river with the excess heat. The heat is extracted from the cooling system’s secondary side by a heat exchanger. A heat pump transfers the

energy to the old hydroelectric plant, which is right next to the new one.

The primary component of the heating system is an Oilon RE 96 ground source heat pump with a 96-kW heating capacity. If the new hydroelectric plant runs at partial capacity or additional heating is required due to, for example, extremely low temperatures, the heat pump is supplemented by four 23-kilowatt air-to-water heat pumps. Additionally, the system has a 107-kW electric boiler as a backup.

“We built the solution offered to Koskienergia around an Oilon ground source heat pump, since the units have proven themselves as high-quality products with extreme reliability. Another thing we appreciate is Oilon’s life cycle services. The unit will serve well for a couple of decades, and the end customer won’t ever have to deal with potential problems alone,” says Sami Päijänen from Lämpöpalvelu Oy, the overall heating system supplier in the project.

“If there is an issue, we have quick access to local support and service – in Finnish, of course.”

The plant was in normal service during installation, which was a major challenge. To ensure safety, careful advance planning was required. As the site itself had a unique heritage, Lämpöpalvelu Oy paid special attention to the appearance and placement of recirculating fans and other visible

equipment.

Ruotsalainen praises the end result in every respect.

“Now we can sell all the electricity we produce in the marketplace instead of wasting it on heating. I’d estimate that we’ll save tens of thousands of euros every year. Additionally, this is a great boon for the climate, as the hydroelectric power we produce will hopefully replace energy produced by fossil fuels.”



Posti's new logistics center utilizes Oilon ground source heat pumps



In October 2023, Posti opened a new regional terminal that serves as a hub for mail and parcel delivery. The terminal serves each of the about 150,000 postal customers in and around the city of Mikkeli.



The terminal building utilizes ground source heating installed by JP-Yhtiöt Oy.

JP-Yhtiöt Oy is part of the Quattro Mikenti group, one of the largest building system specialists in Finland. The heat pumps used in the project came from Oilon.

“We have always been extremely happy with Oilon products. Additionally, we knew that a standard solution wouldn’t do here, and it turned out that we did need Oilon’s expertise and support in system design. This has been a very significant project for us,” says Joonas Halinen from JP-Yhtiöt.

The terminal heating system is powered by two heat pumps, RE96 and RE33, with a combined capacity of 129 kilowatts. The heat pumps are used to heat a 1,500-liter buffer tank that serves radiator circuits and fan convectors.

“Additionally, the heat pumps are used for heating a 500-liter domestic hot water tank that provides hot water for the personnel,” Halinen says.

ENGINEERING SUPPORT AND HANDS-ON HELP FOR SITE PERSONNEL

Each day, a large number of freight trucks bring mail and parcels to the terminal and leave with a new load. The terminal features around 15 loading bridges with huge roll-up doors.


“Naturally, we equipped the loading bridges with deicing equipment to prevent them from becoming life-threateningly slippery. Additionally, we installed fan convectors, or, air curtains at the roll-up doors. In cold weather, when a door opens, they’ll start blowing hot air. This prevents cold air from creeping into the bay. This is the kind of thing that needs to be considered when designing a heating system,” Halinen says.

Unlike a typical building, the terminal has a complex heating system with several different adjustable circuits: radiator circuits, ventilation, loading bridge de-icing equipment, fan convectors for roll-up doors, and ground source cooling. To ensure energy efficiency and smooth operation, each circuit must be integrated into the overall system in a smart way.

“When you have different heating circuits, ground source cooling and so on, you need a partner that can help with connection diagrams and connection work when need be. In these kinds of big projects, it is a definite plus to have support and safety only a phone call away and, if need be, even hands-on help at the site,” Halinen says.

The Oilon team is also extremely happy with the long-standing co-operation with the company. This project was no exception. Oilon’s Sales Manager Mikko Laaksonen can only praise JP-Company’s expertise both in this project and overall.

“We really appreciate the kind of long a customer relationship we have with JP-Yhtiöt. They are a reliable contractor, and over the years, co-operation has always been smooth and professional, just like in this project. It was a pleasure to be part of it,” Laaksonen says.



Project: Harjulan Maito Oy, a dairy
Oilon's customer: MHW Force Oy
Heat pump: EMI 28
Total capacity: 28 kW
Heat source: Slurry and milk
Number of heat pumps: 1
Location: Kauhava, Finland

Project: Pig farm heat recovery
Oilon's customer: Putkivoima Oy
Heat pump: EMI 43T
Total capacity: 43 kW
Heat source: Slurry
Number of heat pumps: 1
Location: Yppäri, Finland

Project: Farmhouse
Oilon's customer: LVI-Kurunsaari Oy
Heat pump: ELI 60 T
Total capacity: 60 kW
Heat source: boreholes
Number of heat pumps: 1
Location: Lapua, Finland

Project: Savon Taimen – fish farm
Oilon's customer: Pohjois-Karjalan kalanviljely Oy
Heat pump: RE 76
Total capacity: 152 kW
Heat source: boreholes
Number of heat pumps: 2
Location: Keskijärvi, Finland



Project: Padelhalli Lapua, a sports hall
Oilon's customer: Are Oy
Heat pump: ELi 60T
Total capacity: 60 kW
Heat source: boreholes
Number of heat pumps: 1
Location: Lapua, Finland

Project: Anjalankosken metallinen Oy
Oilon's customer: Nascotec Oy
Heat pump: RE42
Total capacity: 42 kW
Heat source: boreholes
Number of heat pumps: 1
Location: Anjalankoski, Finland

Project: Multirent hall
Oilon's customer: Kemin Vesi Piste Oy
Heat pump: RE 66
Total capacity: 66 kW
Heat source: boreholes
Number of heat pumps: 1
Location: Kemi, Finland

Project: Clewer Aquaculture Oy
Oilon's customer: Clewer Aquaculture Oy
Heat pump: EMi 43T
Total capacity: 43 kW
Heat source: boreholes
Number of heat pumps: 1
Location: Viitasaari, Finland

Project: Uusikumpu, Espoo
Oilon's customer: HC Systems Oy
Heat pump: 3 x RE 56
Total capacity: 168 kW
Heat source: boreholes
Number of heat pumps: 3
Location: Espoo, Finland

Project: Industrial building
Oilon's customer: Kosken LVI-Palvelu Oy
Heat pump: RE 42 04
Total capacity: 2 x 42=84 kW
Heat source: boreholes
Number of heat pumps: 2
Location: Jyväskylä, Finland

Project: Talotekniikka Koivuluoma Oy
Oilon's customer: Kototaloo Jalasjärvi
Heat pump: ELi 90T
Total capacity: 90 kW
Heat source: boreholes
Number of heat pumps: 1
Location: Jalasjärvi, Finland

Project: The Rautio hall project
Oilon's customer: Vesi ja Lämpö Niemelä Oy
Heat pump: RE 48
Total capacity: 48 kW
Heat source: boreholes
Number of heat pumps: 1
Location: Kalajoki, Finland

Project: Industrial building
Oilon's customer: RPK Rakennus Kempainen Oy
Heat pump: ELi 60 T
Total capacity: 60 kW
Heat source: boreholes
Number of heat pumps: 1
Location: Kajaani, Finland

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