

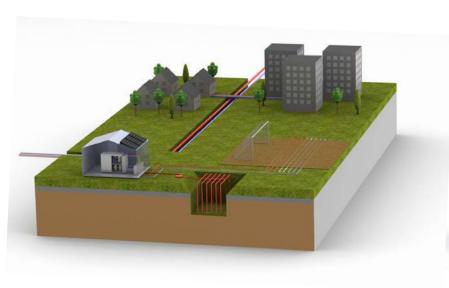


DISTRICT HEATING NETWORK - REAL ESTATES
WASTE WATER TREATMENT PLANTS - WASTE TREATMENT PLANTS
INDUSTRY, MILK PROCESSING AND MEAT PROCESSING PLANTS



Heat pumps produce heating and cooling energy efficiently in modern district heating networks

In hybrid systems heat pumps produce the required cooling energy and most of the heating energy. For peak times for example a natural gas boiler can be used, and in the summer some of the energy can be produced using solar panels. The system components are sized and optimized based on an annual consumption profile. This means cost efficient, greener energy throughout the year.



Fortum, Nokia, Finland

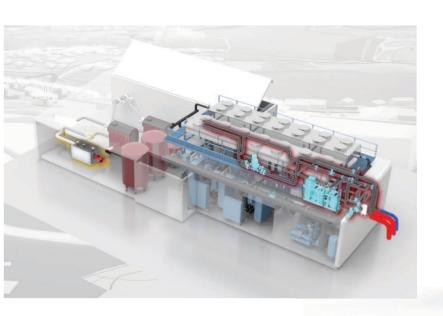
Pitkäniemi district heating network Heat source | **Ground** Heat load | **280 kW**



Hot water

74 °C

1 pcs S-series heat pump



Jevnaker Commune, Jevnaker, Norway

Heat source I **Waste heat from refrigeration**/air and ground

Heat load | 500 kW



Hot water

1 pcs P-series heat pump

Heat pumps for real estates

Heat pumps are very suitable for many kinds of real estates. In addition to low energy sites, a heat pump can be integrated into heating systems of demanding restoration sites that require higher temperature levels. By combining heating and cooling systems with a heat pump, it is possible to significantly reduce costs — and increase the value of the real estate.

Helsingin Energia, Sipoo, Finland

Heat source | **Ground** Heat load | **275 kW**

Hot water

63 °C



1 pcs P-series heat pump

Orimattilan lämpö, Artjärvi, Finland

Heat source | **Ground** Heat load | **150 kW**

Hot water



1 pcs P-series heat pump





Tate Modern, London, UK

Heat source I **Process cooling**

Heat load | 1 600 kW

Hot water



1 pcs S-series heat pump



Heat source I **Process cooling**Heat load I **3.6 MW**



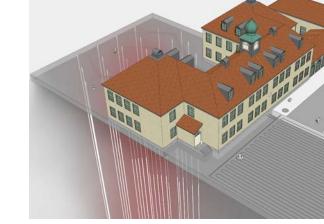
5 pcs P-series heat pump

2 pcs S-series heat pump









Ljan skole, Oslo, Norway

Heat source | **Ground** Heat load | **215 kW**



Hot water **75 °C**

1 pcs P-series heat pump

Sannäs Manor, Sannäs, Finland

Heat source | **Ground** Heat load | **230 kW**



Hot water **70 °C**

1 pcs P-series heat pump



Energy from waste waters

Purified communal wastewaters contain a lot of energy that is not otherwise utilized. Heat pumps can be used to produce energy for the treatment plant's use, reducing the need to buy energy. Treated wastewaters can be used to produce heating also in district solutions. Then large borehole fields can be replaced with a couple of heat exchangers with auxiliary systems.

Joensuun Vesi, Joensuu, Finland

Heat source I **Purified communal waste water** Heat load I **800 kW**



Hot water

2 pcs S-series heat pump



Oulun Vesi, Oulu, Finland

Heat source | **Purified communal waste water** Heat load | **260 kW**

Hot water

55 °C



1 pcs RE-series heat pump

Vaasan Vesi, Vaasa, Finland

Heat source | **Purified communal waste water** Heat load | **600 kW**



Hot water **65 °C**

2 pcs S-series heat pump

WASTE TREATMENT PLANTS



Cost efficient waste treatment

Heat pumps reduce energy consumption of waste treatment processes, thus making it kinder to the environment. Waste energy produced during the waste treatment process can be recycled in e.g. anaerobic digestion processes using a heat pump, which increases the amount of energy produced from waste significantly – ecological energy from waste.

Kujalan komposti, Lahti, Finland

Heat source | Biogas process Heat load | 760 kW



Hot water

75 °C

1 pcs P-series heat pump

Jeppo Biogas, Jepua, Finland

Heat source | Waste treatment process Heat load | 750 kW



Hot water

80°C

2 pcs P-series heat pump





Fortum, Ruokasaarioinen, Sahalahti, Finland

Heat source | **Condensing ammonia** Heat load | **1.4 MW**



Hot water

63 °C

3 pcs S-series heat pump



Snellman, Pietarsaari, Finland

Heat source | **Condensing ammonia** Heat load | **1.4 MW**



3 pcs S-series heat pump



Heat pumps in industrial use – a natural choice

Heat pumps offer an environmentally friendly solution for combining energy intensive industry's energy flows and improving profitability. With a heat pump a specific cooling utility can be produced, or a heat pump can collect waste heat produced in cooling. A heat pump can then produce heating energy to be used in several processes — with full capacity all the way up to 80 °C.

Arla Ingman, Sipoo, Finland

Heat source | **Condensing ammonia** Heat load | **750 kW**



Hot water

1 pcs P-series heat pump





Satamaito, Pori, Finland

Heat source | **Condensing ammonia** Heat load | **450 kW**



Hot water **80°C**

1 pc. P-series heat pump

Valio, Seinäjoki, Finland

Heat source | Process cooling 6/2°C and 48/25°C Heat load | | 3.2 MW



5 pcs S-series heat pump

Valio, Riihimäki, Finland

Heat source | **Condensing ammonia** Heat load | **1.1 MW**



Hot water **63 °C**

2 pcs S-series heat pump



Heat source I Process cooling 6/2°C and 48/25°C Heat load I 3.2 MW Hot water 70 °C, 5 pcs S-series heat pump

Vaasan vesi, Vaasa

Heat source I Purified communal waste Heat load I 600 kW Hot water 65 °C, 2 pcs S-series heat pu

Jevnaker Commune, Jevnaker, Norway

Jevnaker district heating network
Heat source I Waste heat from refrigeration air and ground
Heat load I 500 kW
Hot water 70 °C, 1 pcs P-series heat pump

Satamaito, Pori

Heat source I Condensing ammo Heat load I 450 kW Hot water 80 °C, 1 pcs P-series heat pump

Valio, Riihimäki

Heat source I Condensing amm Heat load I 1.1 MW Hot water 63 °C, 2 pcs S-series heat pump

Kujalan komposti, Lahti

Heat source I Biogas process Heat load I 760 kW Hot water 75 °C, 1 pcs P-seri

Kraftringen, Lund, Sweden

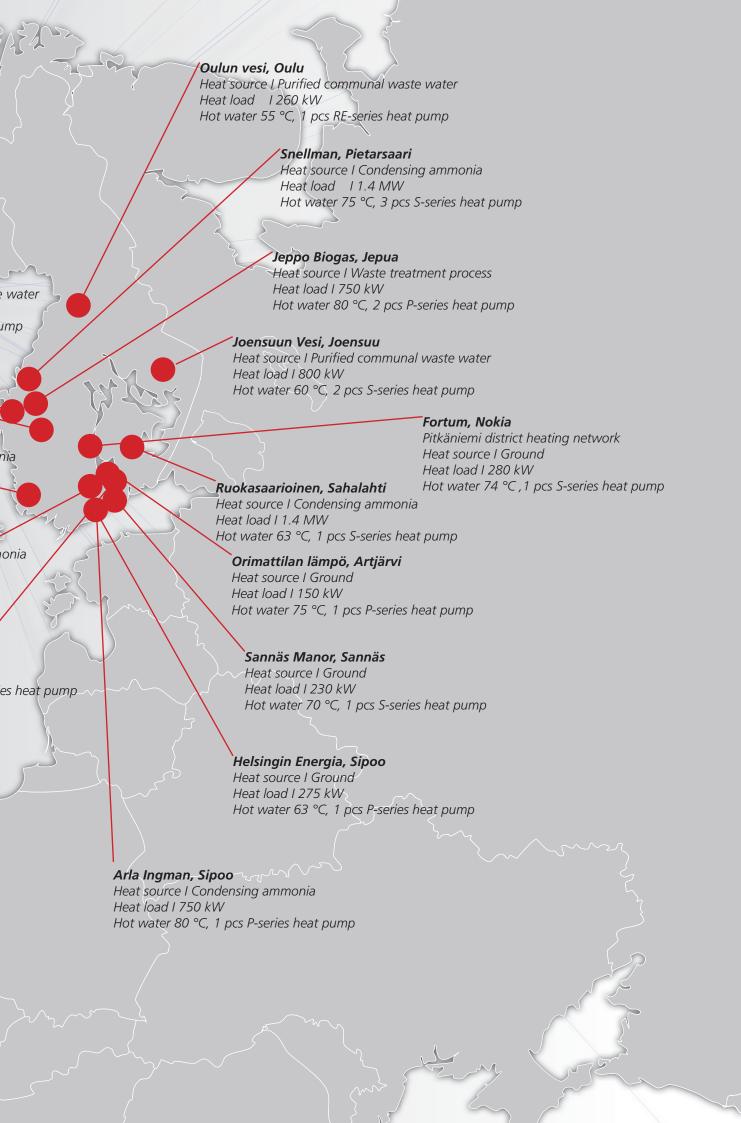
Heat source I Process cooling Heat load I 3.6 MW Hot water 80 °C 5 pcs P-series heat pump 2 pcs S-series heat pump

Ljan skole, Oslo, Norway Heat source I Ground Heat load I 215 kW

Heat load I 215 kW Hot water 75 °C 1 pcs S-series heat pump

Tate Modern, London, UK

Heat source I Process cooling Heat load I 600 kW Hot water 53 °C, 1 pcs S-series heat pump



CERTIFICATES AND STANDARDS

Quality management systems acc. to ISO 9001

Environmental management systems acc. to **ISO 14001**

Quality requirements for fusion welding of metallic materials both in workshops and at field installation sites acc. to **ISO 3834-2**

Welders qualifications acc. to **EN ISO 13585:2012**

Calculation and manufacturing acc. to **EN 378**

Work's Certificate, Certificate of Conformity acc. to **Machine Directive 2006/42/EC**

Certificate of Conformity acc. to **Pressure Equipment Directive (PED) 97/23/EC**

