



Oilon ChillHeat Industrial Heat Pumps and Chillers

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Oilon Oy



OILON Briefly

- Founded in 1961, private-owned company
- Chairperson of the Board : Päivi Leiwo
- CEO: Tero Tulokas
- Turnover: 70 million euros
- Employees 350
- We manufacture and sell
 - Burners and combustion systems for liquid and gaseous fuels in the capacity range of 10 kW – 90 MW
 - Industrial heat pumps and chillers 30 kW – 5000 kW
 - Ground source heat pumps for heating houses 4 kW – 96 kW
- Our products are used in
 - power plants, waste incineration, marine boilers, district heating plants, for heating or cooling large buildings and facilities, and for heating private houses.

Oilon Dealers and Companies



Oilon Factories



LAHTI, FINLAND



KOKKOLA, FINLAND



WUXI, CHINA

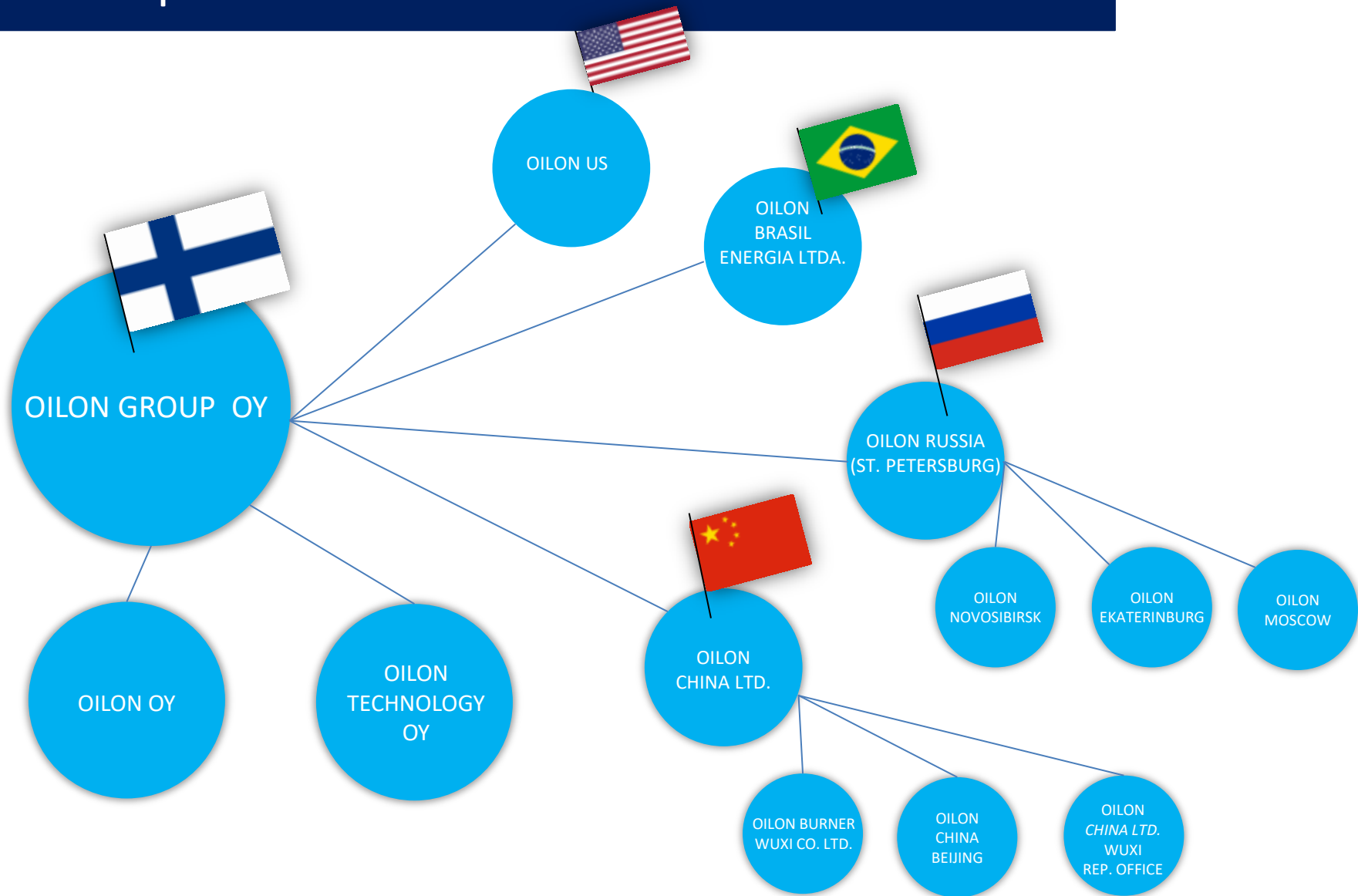


THOMASVILLE, USA



St. PETERSBURG, RUSSIA

Oilon Group



OILON Products



Ground source heat pumps 4 kW – 96kW

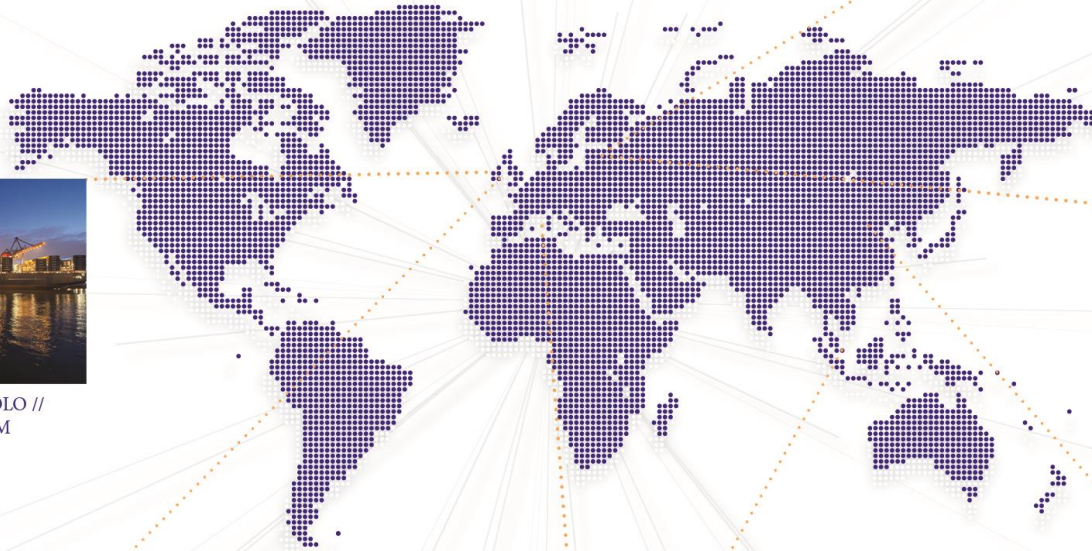


Industrial heat pumps and chillers 30 kW - 5000 kW



Burners 10 kW – 90 MW

OILON AROUND THE GLOBE



CMA CGM MARCO POLO //
UNITED KINGDOM



TATE MODERN //
UNITED KINGDOM



DA VINCI'S BIRTHPLACE // ITALY



GARDEN BY THE BAY // SINGAPORE



EREMITAGE// RUSSIA



MOSCOW CIRCUS// RUSSIA



BEIJING AEROSPACE CONTROL
CENTRE // CHINA

OILON ChillHeat Industrial heat pumps and chillers

Product family

Applications

References

Models

	P-series	S-series	RE-series
Model	P30, P60, P100, P150, P220, P300, P380, P450	S180, S280, S380, S490, S600, S800, S1000, S1200, S1500, S2000	RE210, RE330, RE420
Compressor type	Piston	Screw	Scroll
Refrigerant	R134a, R450A, R1234ze	R134a, R450A, R1234ze	R410A



Standard factory made units

- ✓ 3 standard sizes with acoustic enclosure
 - ✓ P-, RE-series and S-series up to S490



- ✓ Two screw units S600-S2000



Options for standard units

- ✓ **Optimal efficiency**
 - Subcooler or economiser (S-series) for highest efficiency
 - Desuperheater for high temperatures
- ✓ **Variable frequency drives (S and P-series)**
 - Higher capacity
 - Precise control
- ✓ **Energy measurement system**
 - Energy metering
 - COP
 - Cost and CO2 reductions



Oilon Selection Tool

Product selection and system design for

- Heat pumps
- GSHP
- Burners

License requests:

selection.tool@oilon.com

Download:

<https://oilon.com/oilon-selection-tool/>

The screenshot displays the Oilon Selection Tool interface. On the left, there are input fields for Condenser inlet (45.0 °C), Condenser outlet (90.0 °C), Evaporator inlet (22.0 °C), and Evaporator outlet (18.0 °C). Below these are options for connection type, fluid (water), and power supply (400 V - 3 - 50 Hz). A list of heat pump models is shown, including P60, P100, P150, P220, P300, P380, P450, RE210, RE330, RE420, S180, S280, S380, S490, S600, S800, S1000, S1200, S1500, and S2000. The central part of the interface shows a schematic diagram of two heat pumps: a 500 kW unit and a 417 kW unit. The 500 kW unit has a condenser inlet of 45.0 °C and an evaporator inlet of 18.0 °C. The 417 kW unit has a condenser inlet of 85.3 °C and an evaporator inlet of 18.0 °C. Both units have a condenser outlet of 100.0 °C and an evaporator outlet of 22.0 °C. The 500 kW unit has a subcooler of 152 kW and a total power of 346 kW. The 417 kW unit has a subcooler of 172 kW and a total power of 273 kW. On the right, there is a table of performance metrics:

Heating capacity	936	kW
Cooling capacity	639	kW
Electrical power	302	kW
COPh	3,04	
COPc	2,65	
DS Power	0,0	kW
Condenser liquid flow	4,0	kg/s
Condenser Δp	26	kPa
Evaporator liquid flow	37,0	kg/s
Evaporator Δp	29	kPa

At the bottom left, there is a graph titled 'Operation envelope (R1234ze)' showing the condensing temperature (y-axis, 0 to 125 °C) versus the evaporating temperature (x-axis, -30 to 40 °C). The graph shows a green line for condensing temperature and a red line for evaporating temperature, forming a loop. A blue dot is marked on the condensing temperature line at approximately 100 °C and 15 °C.

At the bottom right, there is a table titled 'Part load check' with columns for Partload [%] and Errors:

Partload [%]	Errors
100	NO
88	NO
81	NO
73	NO
61	NO
53	NO
45	NO
35	NO
29	NO
23	NO
12	NO
6	NO

Oilon Global Monitor



- Remote monitoring of one or several ChillHeat heat pumps or the whole system .
- The client must organize an internet connection with a cable or mobile connection.
- Versatile and visual reporting and comprehensive trend monitoring.
- Operations support and optimization as a remote service to destinations around the world.
- High usability, minimizing maintenance costs and downtime

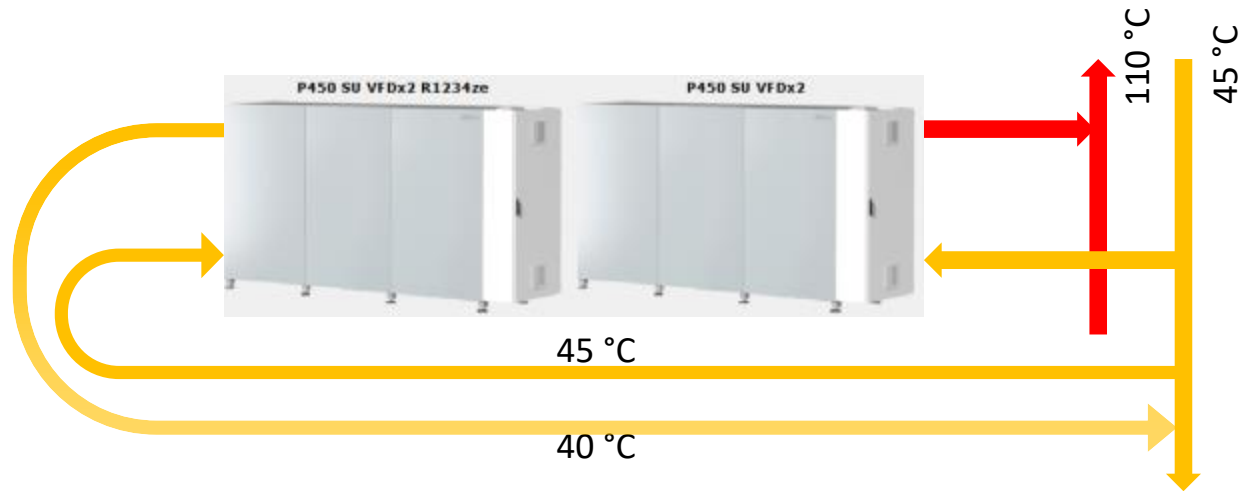
120 °C Heat pump technology

New technology now available for ChillHeat P-series

- Maximum temperature of heated water 120 °C
- Future proof refrigerant GWP 1
- Safety class A1

Example connection for booster heat pump system utilizing DH return water for new or existing customers

- Heat load 1.7 MW (From 45 to 110 °C)
- Electricity for HP 424 kW
- COPh 4.0
- 2 x ChillHeat P450 heat pumps



Applications

➤ Large real estates

- Ground source heat pump
- Air-conditioning

➤ District heating and cooling

- Combined cooling and district heating
- District heating

➤ Industry

- Waste heat recovery
- Process cooling and heating
- High temperature process heating

Temperature range
-20°C / 120°C
for produced cold / hot
liquid

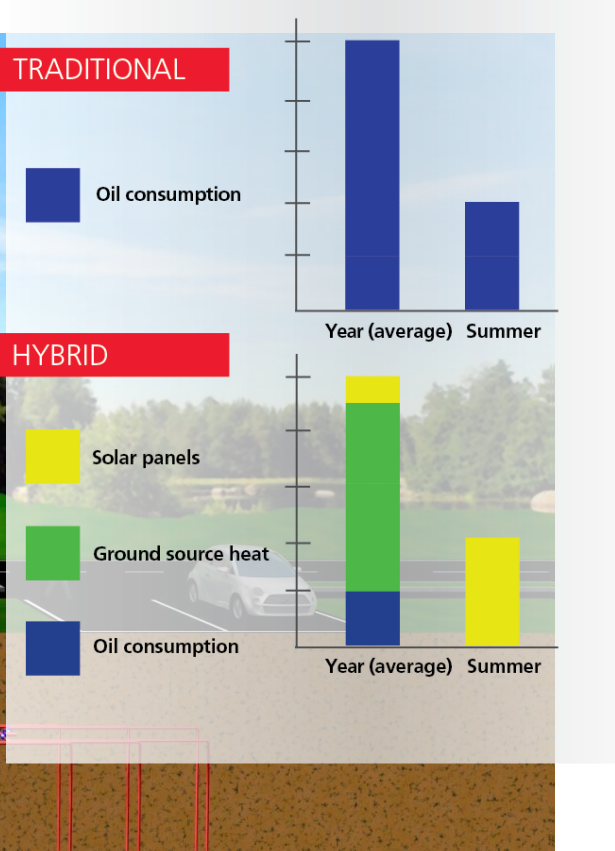
Practical range of
application from
30 kW up to 10 000 kW
in terms of cooling and/or
heating power

References

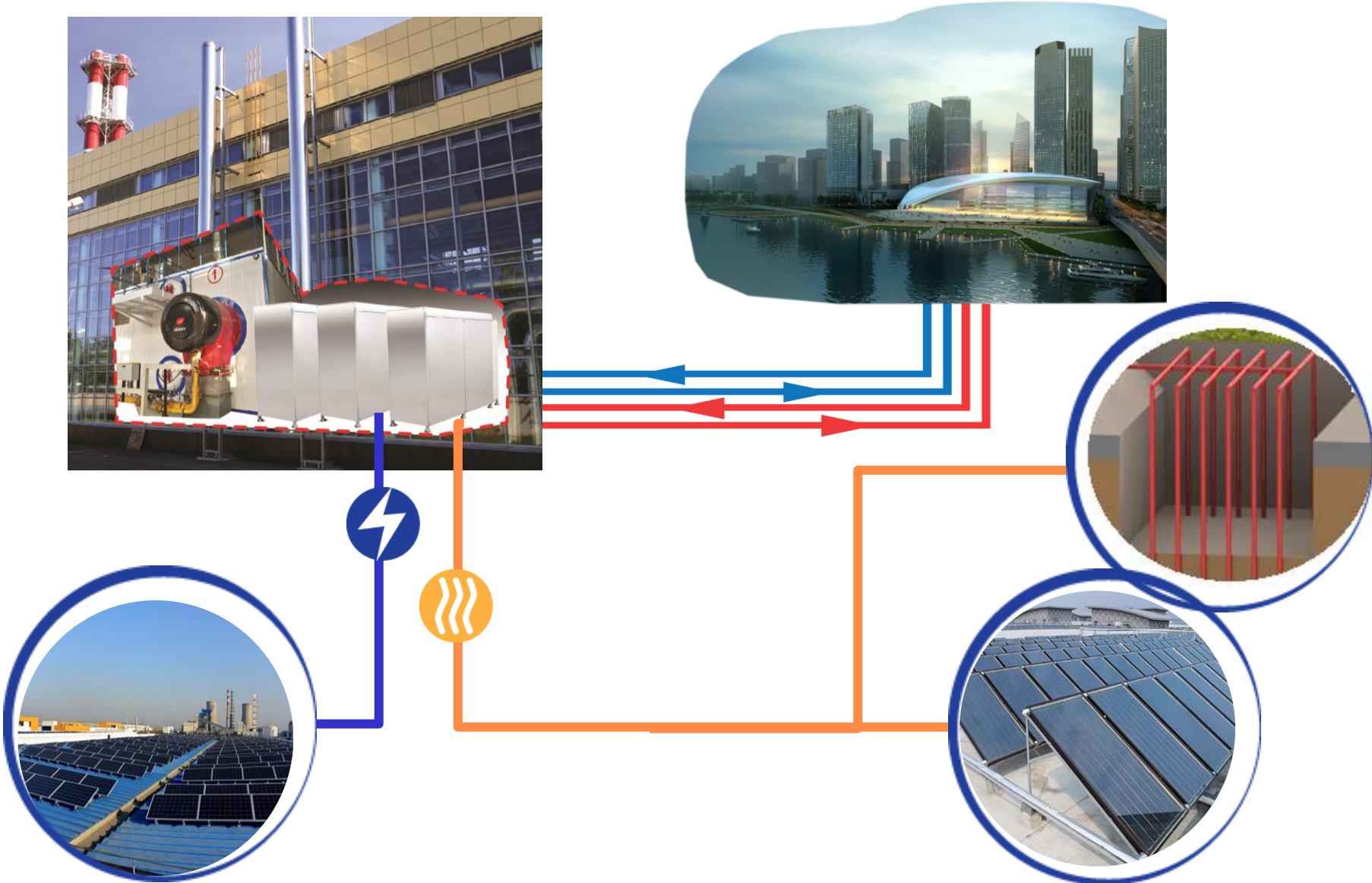
Ground source heating and hybrid solutions

Real Estate, Hybrid Solution

HYBRID SOLUTION

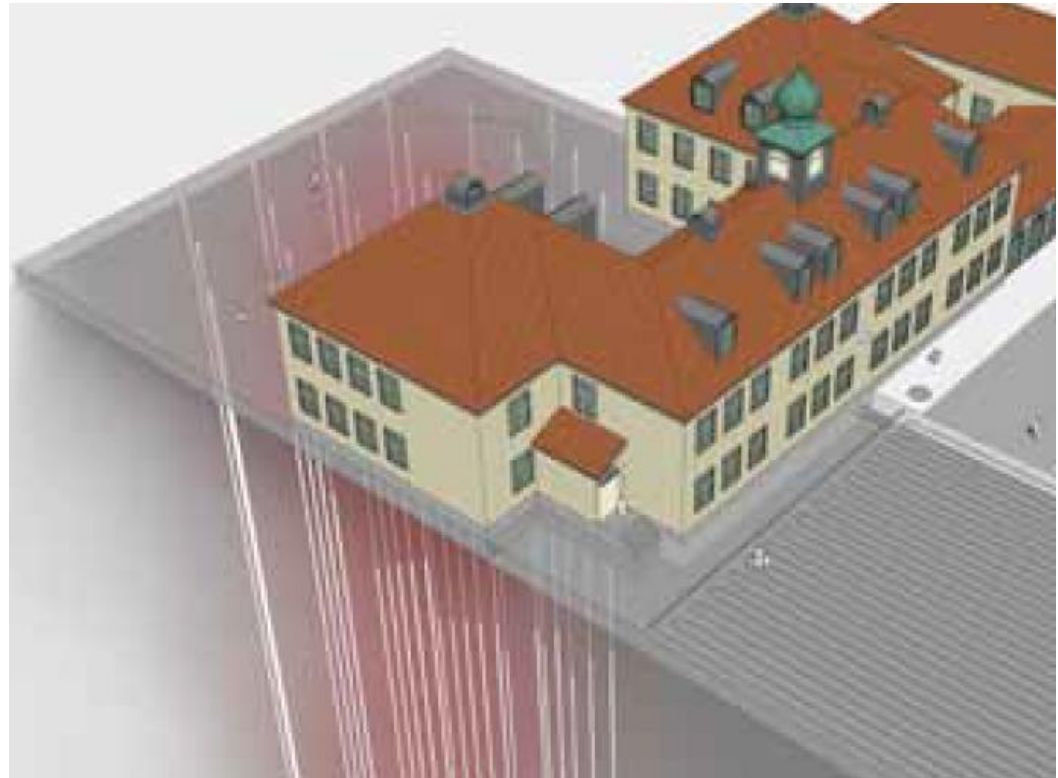


Hybrid Solutions



Ground source: School, Norway

- Heat source: Ground
- Heating power: 215 kW
 - Building heating
- Water temp.: 75 °C
- Heat pump
 - 1pc. P-series



Ground source: Manor, Finland

- Heat source: Ground
- Heating power: 230 kW
 - Building heating
- Water temp.: 70 °C
- Heat pump
 - 1 pc. P380 SU VFDx2
- Replaced oil in heating



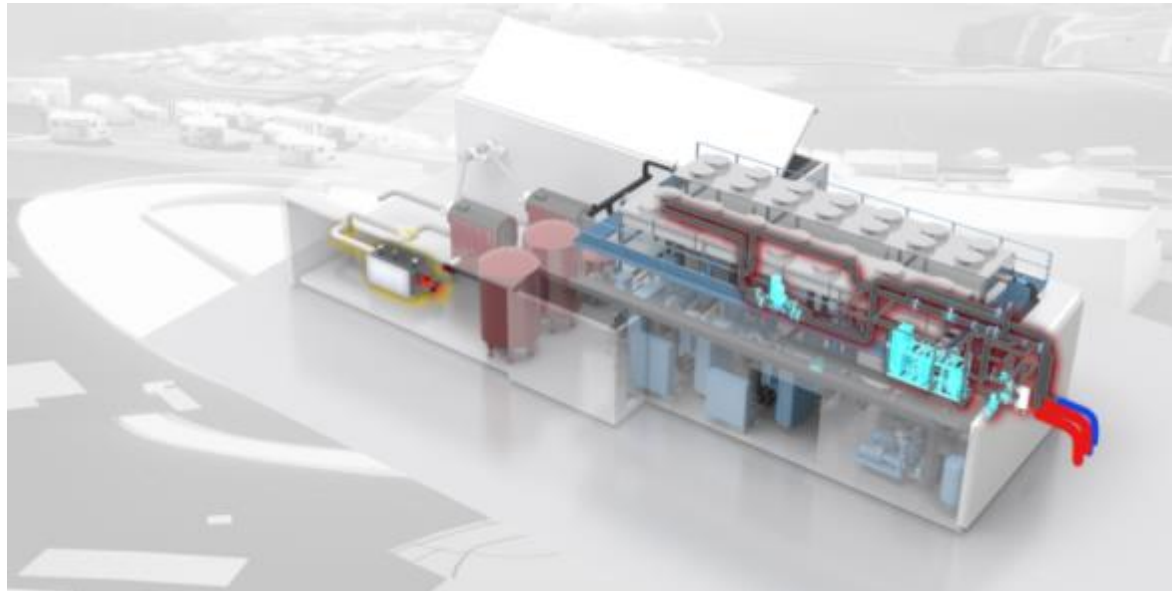
Ground source/hybrid: School, Finland

- Heat source: Ground heat (bore holes)
 - 21 pcs. bore holes → Total depth 6300 m
- Heating capacity: **270 kW**
 - Heating of building
- Water temperature: **68 °C**
- ChillHeat heat pump
 - **1 pc. P300 SU**
- Solar collectors
 - Heating capacity 150 kW
 - Heat to the system or heat to the bore hole liquid cycle
- Oil boilers
 - Heating capacity 1 500 kW
 - For peak loads and reserve capacity



Hybrid Solution: Sports arena, Norway

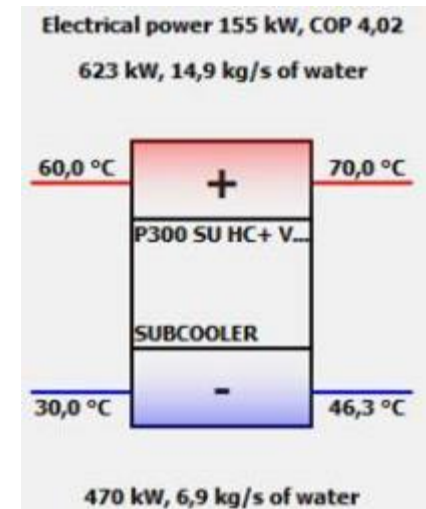
- Heating of schools, hospital, sport hall, football field and residential building
- Refrigeration plant
 - Cooling capacity 2000 kW
 - Cooling to speed skating rink
- ChillHeat heat pump
 - 1 pcs. P300 SU
 - Heat source: Heat recovery at a refrigeration plant, geo thermal heat and a condenser of the refrigeration plant (air source heating)
 - Heating capacity: 500 kW
- Wood chip boilers
 - Heating capacity 2x750 kW
- Oil boilers
 - Heating capacity 3 500 kW
 - For peak loads and reserve capacity



Heat recovery from flue gas

Copenhagen Airport (CPH), Denmark

- Heat source: Exhaust gas from natural gas boiler (intermediate water circuit)
- Heat sink: Local heating network
- Water temperatures (cooling/heating): 30/70
- COP: 4,0
- 1 pc. Oilon ChillHeat P300 SU HC+ VFDx2 R1234ze



**Cooling and Heating &
Heat extraction from outdoor air**

Montevideo Airport (MVD), Uruguay

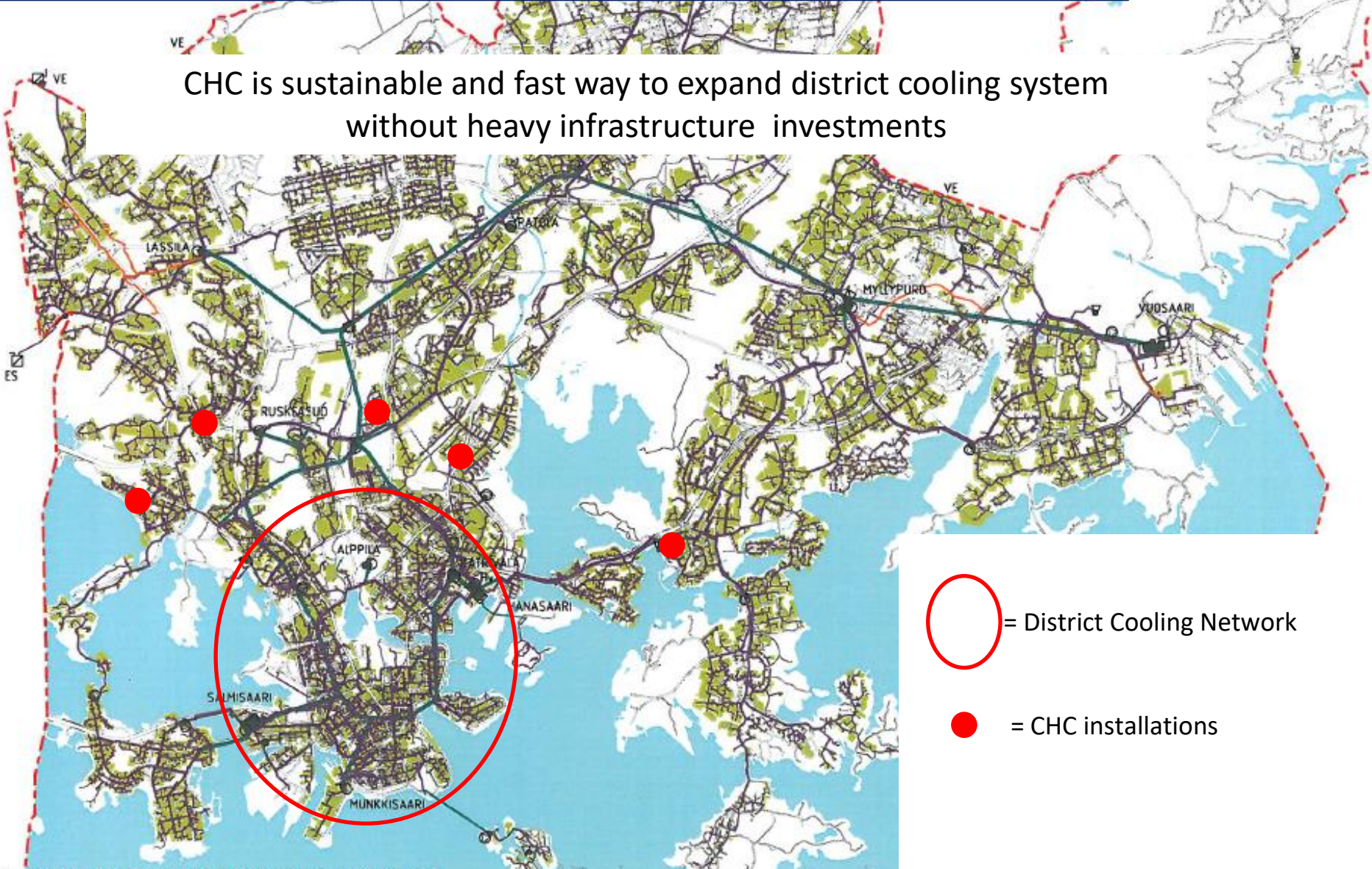
- Heat source: Airport water cooling network and outside air
- Cooling capacity: 625 kW
- Heating capacity: 915 kW
 - Heat sink: Airport heating network
- Water temperatures (cooling/heating): 7/65 °C
- ChillHeat heat pumps
 - 2 pcs. P380 SU



Combined cooling and district heating

CHC to grow cooling business, case Helsinki, Finland

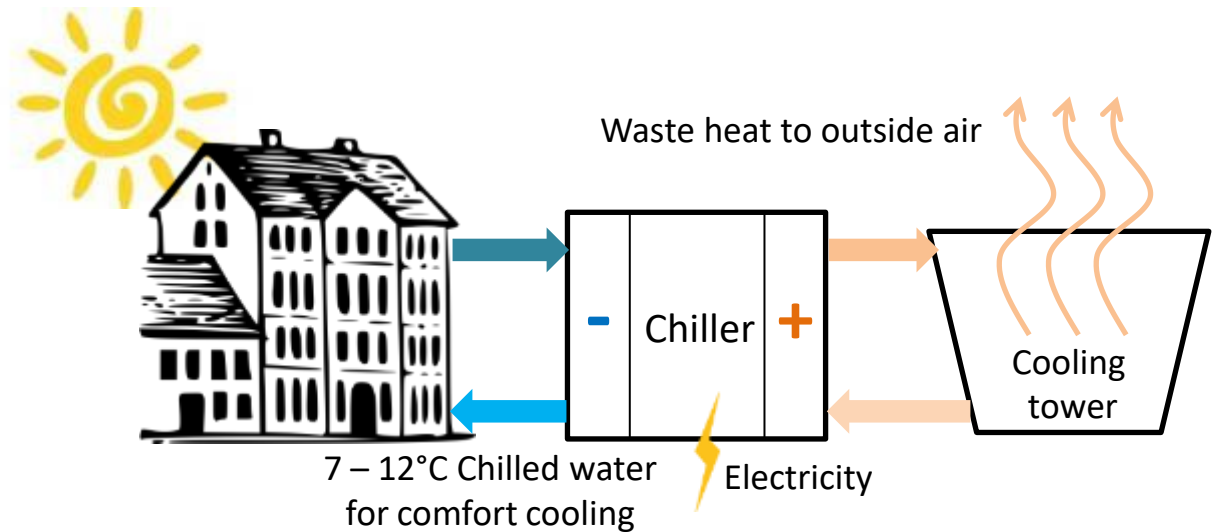
CHC is sustainable and fast way to expand district cooling system without heavy infrastructure investments



CHC – Concept description

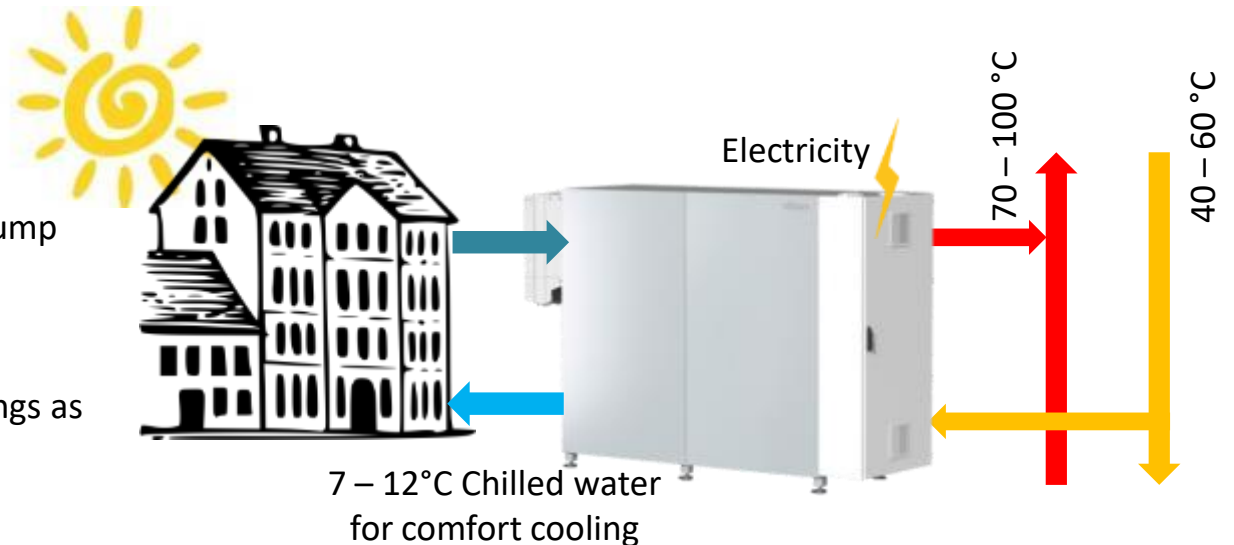
Traditional cooling process

- The low grade heat from the cooling process is wasted
- Expected COP 3.5 - 5



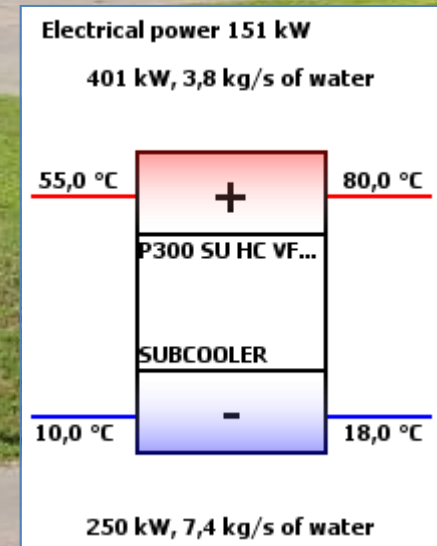
CHC concept

- Heat from cooling process is recovered to DHN with heat pump
- COP_{combined} 4 – 7
- Scale:
 - 20 kW (block of flat) to
 - several MW large buildings as commercial centers and hospitals.



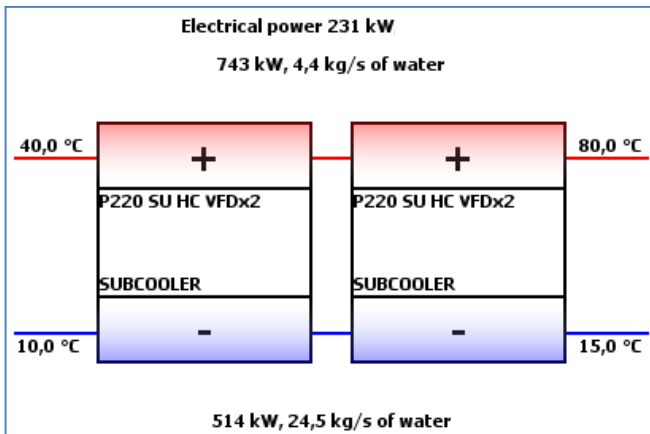
CHC: Fire station, Finland

- Heat source: Fire station cooling
- Cooling capacity: 250 kW
- Heating capacity: 400 kW
 - Heat sink: District heating network
- Water temperatures (cooling/heating): 10 °C / 80 °C
- ChillHeat heat pumps
 - P300 SU MC VFDx2
- COPcombined 4.3



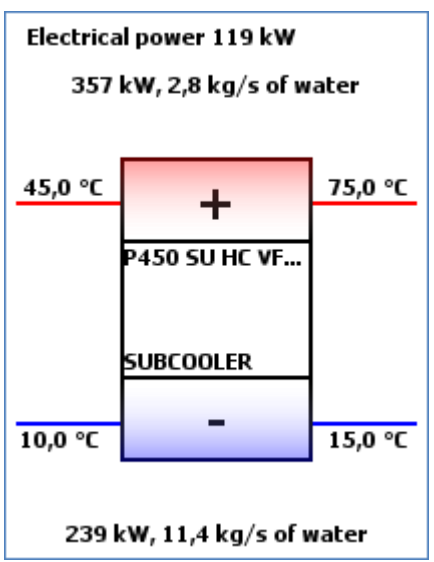
CHC: Supermarket, Finland

- Heat source: Space cooling and condensing of refrigerant system
- Cooling capacity: **514 kW**
- Heating capacity: **743 kW**
 - Heat sink: District heating network
- Water temperatures (cooling/heating): **10 °C / 80 °C**
- ChillHeat heat pumps
 - **2 pcs. P220 SU HC VFDx2**
- COP_{combined} 5.4

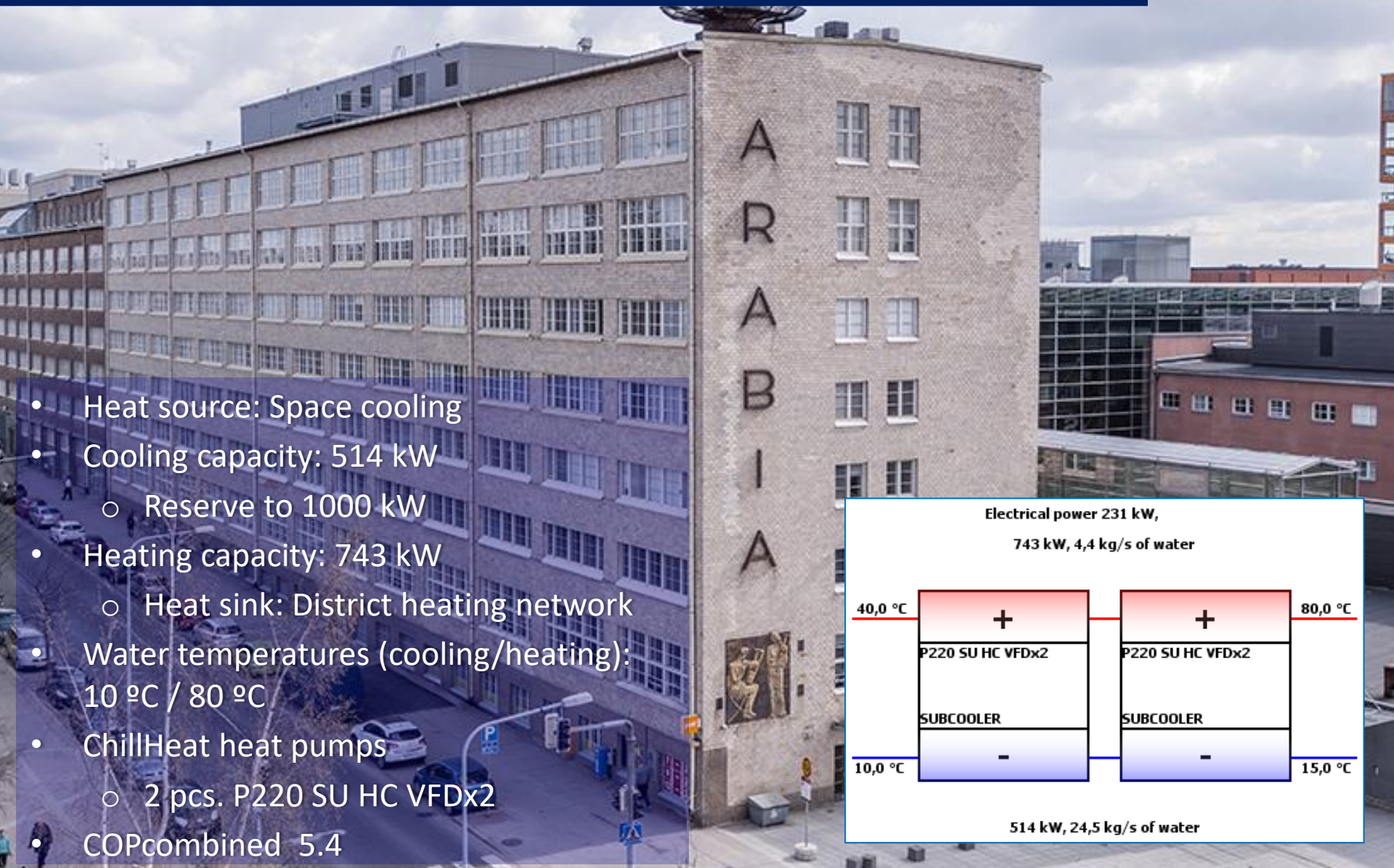


CHC: Office building, Finland

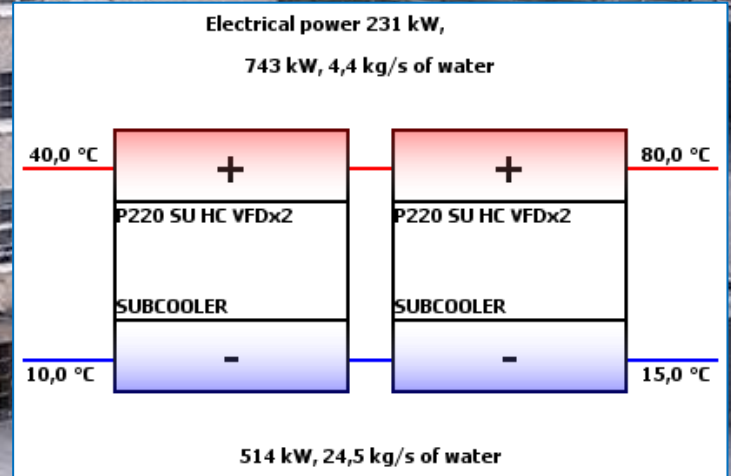
- Heat source: Space cooling
- Cooling capacity: **239 kW**
 - Reserve to 640 kW (with same heat pump)
- Heating capacity: **357 kW**
 - Heat sink: District heating network
- Water temperatures (cooling/heating): **10 °C / 75 °C**
- ChillHeat heat pumps
 - **P450 SU HC VFDx2**
- COP_{combined} **5.0**



CHC: University, Finland

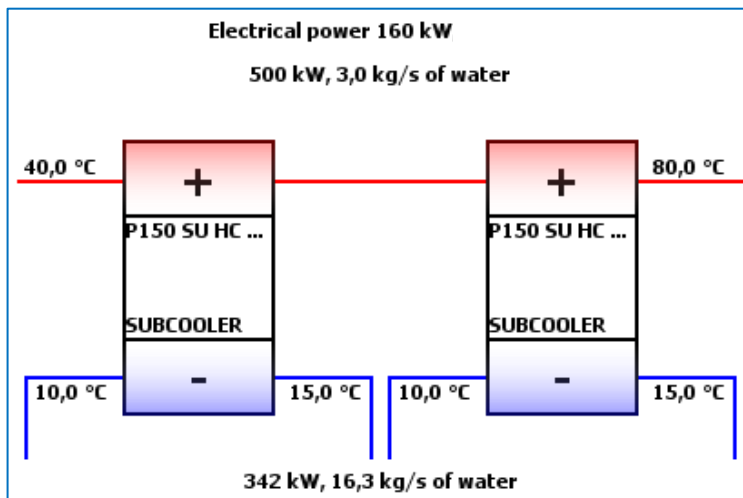


- Heat source: Space cooling
- Cooling capacity: 514 kW
 - Reserve to 1000 kW
- Heating capacity: 743 kW
 - Heat sink: District heating network
- Water temperatures (cooling/heating): 10 °C / 80 °C
- ChillHeat heat pumps
 - 2 pcs. P220 SU HC VFDx2
- COPcombined 5.4



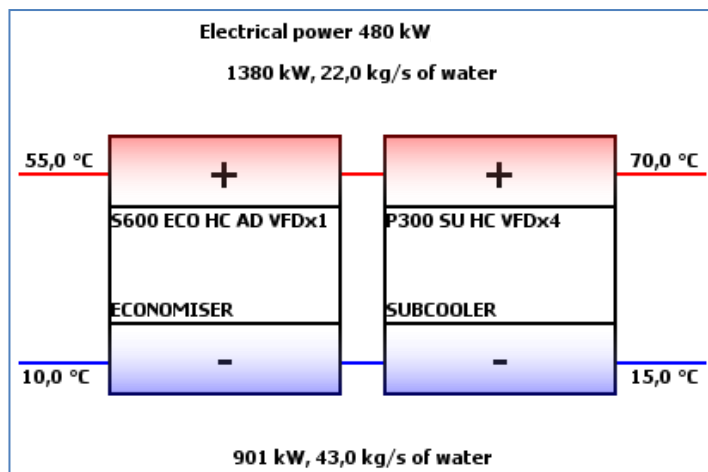
CHC: Office building, Finland

- Heat source: Space cooling
- Cooling capacity: **342 kW**
- Heating capacity: **500 kW**
 - Heat sink: District heating network
- Water temperatures (cooling/heating): **10 °C / 80 °C**
- ChillHeat heat pumps
 - **2 pcs. P150 SU HC VFDx2**
- $COP_{combined}$ **5.3**



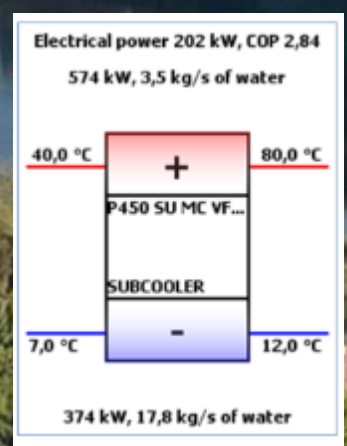
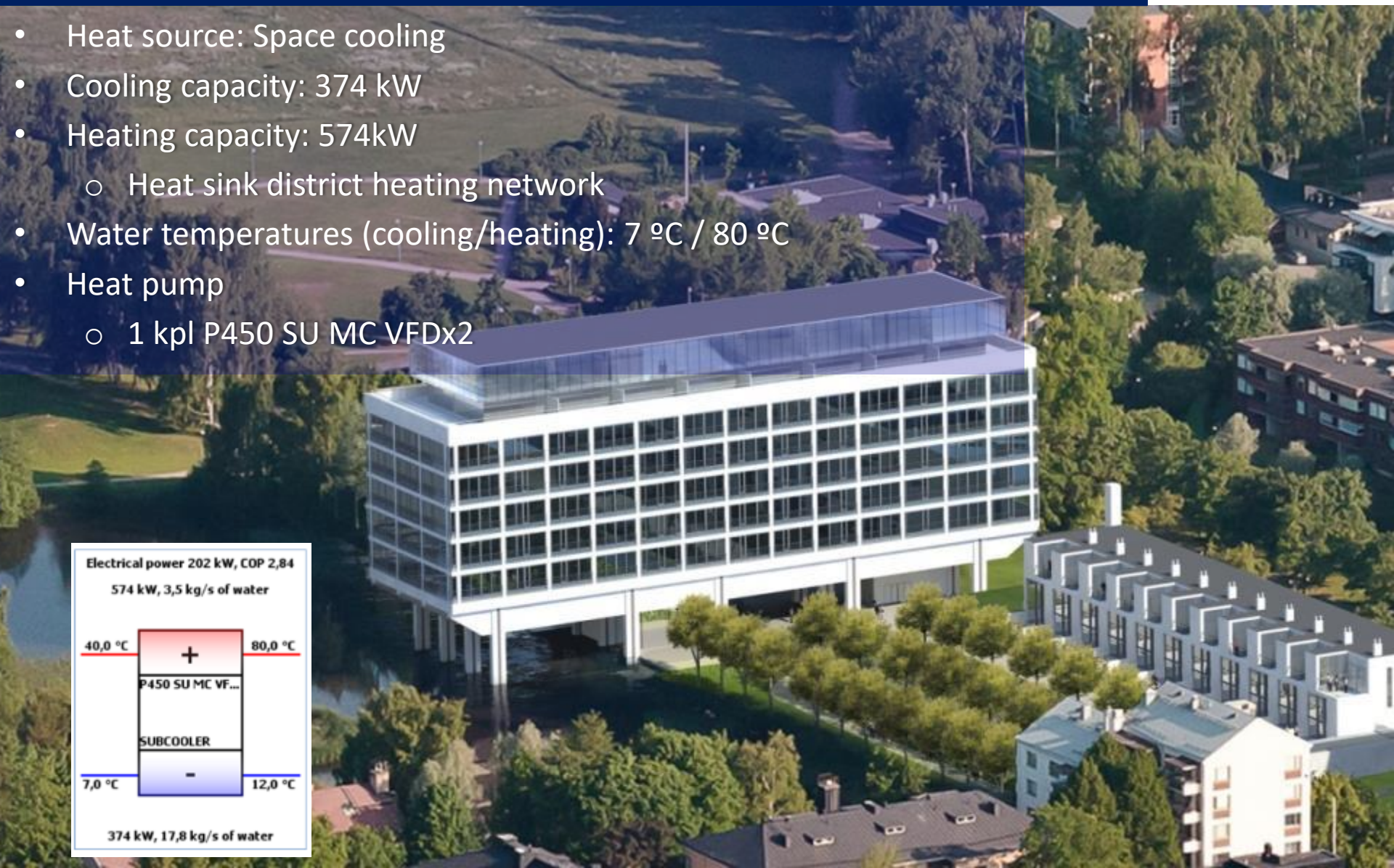
CHC: Hospital, Finland

- Heat source: Hospital water cooling network
- Cooling capacity: **900 kW**
- Heating capacity: **1380 kW**
 - Heat sink: District heating network
- Water temperatures (cooling/heating): **10 °C / 70 °C**
- ChillHeat heat pumps
 - **S600 ECO VFDx1**
 - **P300 SU HC VFDx4**
- COP_{combined} **4.8**



CHC: Apartment building, Finland

- Heat source: Space cooling
- Cooling capacity: 374 kW
- Heating capacity: 574kW
 - Heat sink district heating network
- Water temperatures (cooling/heating): 7 °C / 80 °C
- Heat pump
 - 1 kpl P450 SU MC VFDx2



CHC: Data center, Sweden

- Heat source: Data center
- Cooling capacity: 590 kW
- Heating capacity: 860 kW
 - Heat sink: District heating network
- Water temperatures (cooling/heating): 20 °C / 85 °C
- ChillHeat heat pumps
 - 2 x Oilon ChillHeat P300 SU HC VFDx1
- COP_{combined} 4.8



Oilon ChillHeat P300 SU VFDx2

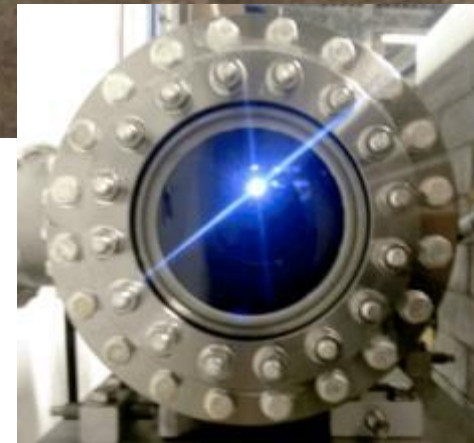


CHC: Synchrotron radiation laboratory, Sweden



- 8 P-series heat pumps
- 3 S-series heat pumps

Heat source | **Process cooling 3.90 MW**
Cold water | **23 °C & 10 °C**
Heat load | **5.57 MW district heating**
COPcombined | **5.9**
Hot water | **80 °C**



CHP Plant, Germany

- Heat source: CHP engine cooling
- Cooling capacity: **925 kW**
- Heating capacity: **1 265 kW**
 - Heat sink: District heating network
- Water temperatures (cooling/heating): **+35 °C / 78 °C**
- ChillHeat heat pumps
 - **2 pcs. P220 SU HC VFDx2**

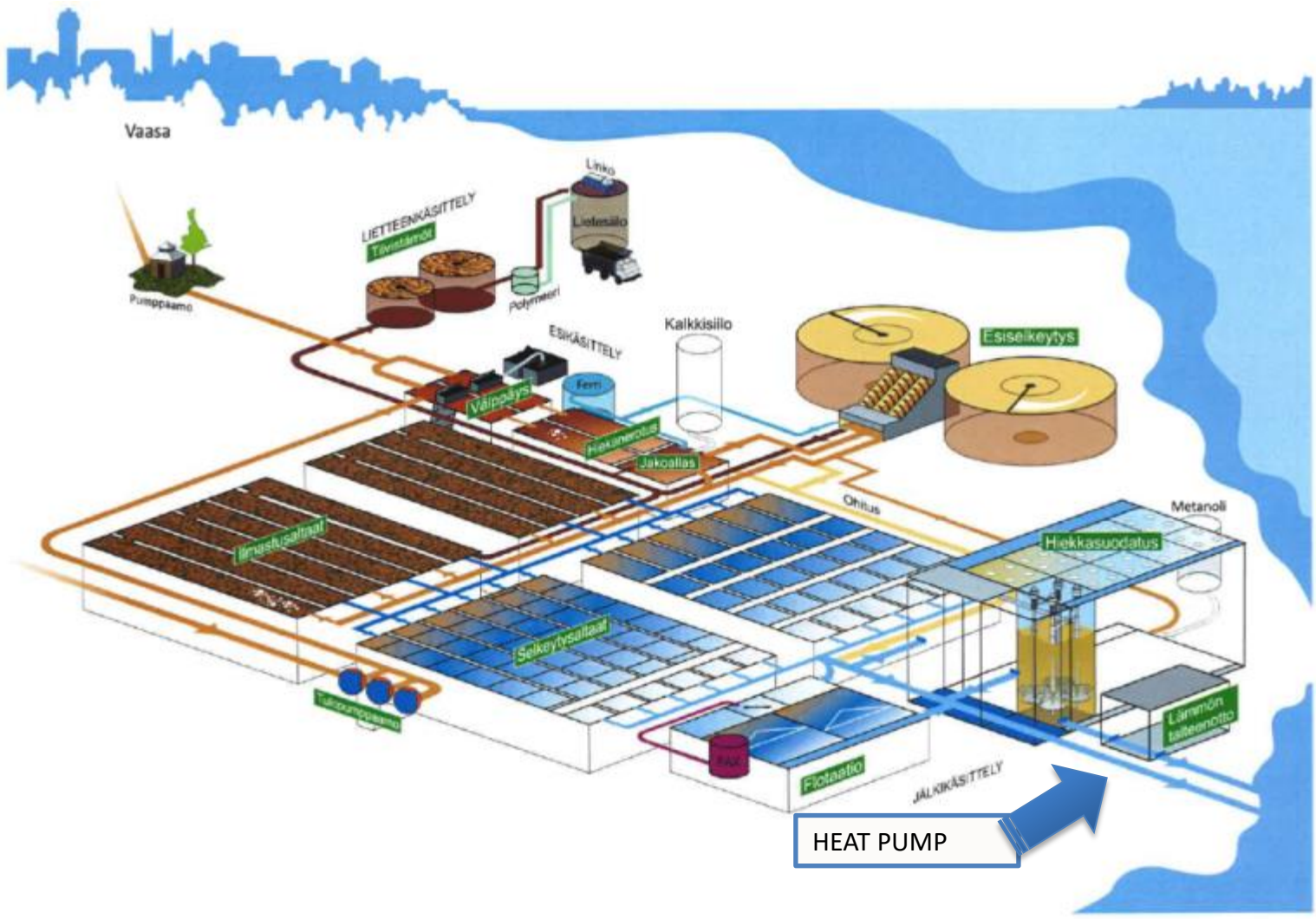


Oilon ChillHeat P220 SU HC VFDx2



Heat recovery from wastewater

Municipal wastewater treatment plant



Water treatments plants, Finland

- Communal waste water treatment plants:

- Vaasa (2 pcs S-series)
- Joensuu (2 pcs S-series)
- Oulu (1 pc. RE-series)
- Suonenjoki (1 pc. S-series)
- Huittinen (1 pc. P-series)
- Rauma (1 pc. P-series)
- Iisalmi (2 pcs. S-series)

- Fresh water treatment plants

- HSY Helsinki (2 pcs. S-series)

- Process waste water heat recovery

- Valio Joensuu (1 pc. S-series)
- Koff Kerava (2 pcs. S-series)



Heat recovery from biogas process

Heat recovery from biogas process: Biogas plant, Finland

- Heat source: Biowaste
- Cooling capacity: 545 kW
- Heating capacity: 845 kW
 - Biogas process
- Water temperatures (cooling/heating): +10 °C / 80 °C
- ChillHeat heat pumps
 - 2 pcs. P300 SU HC VFDx1



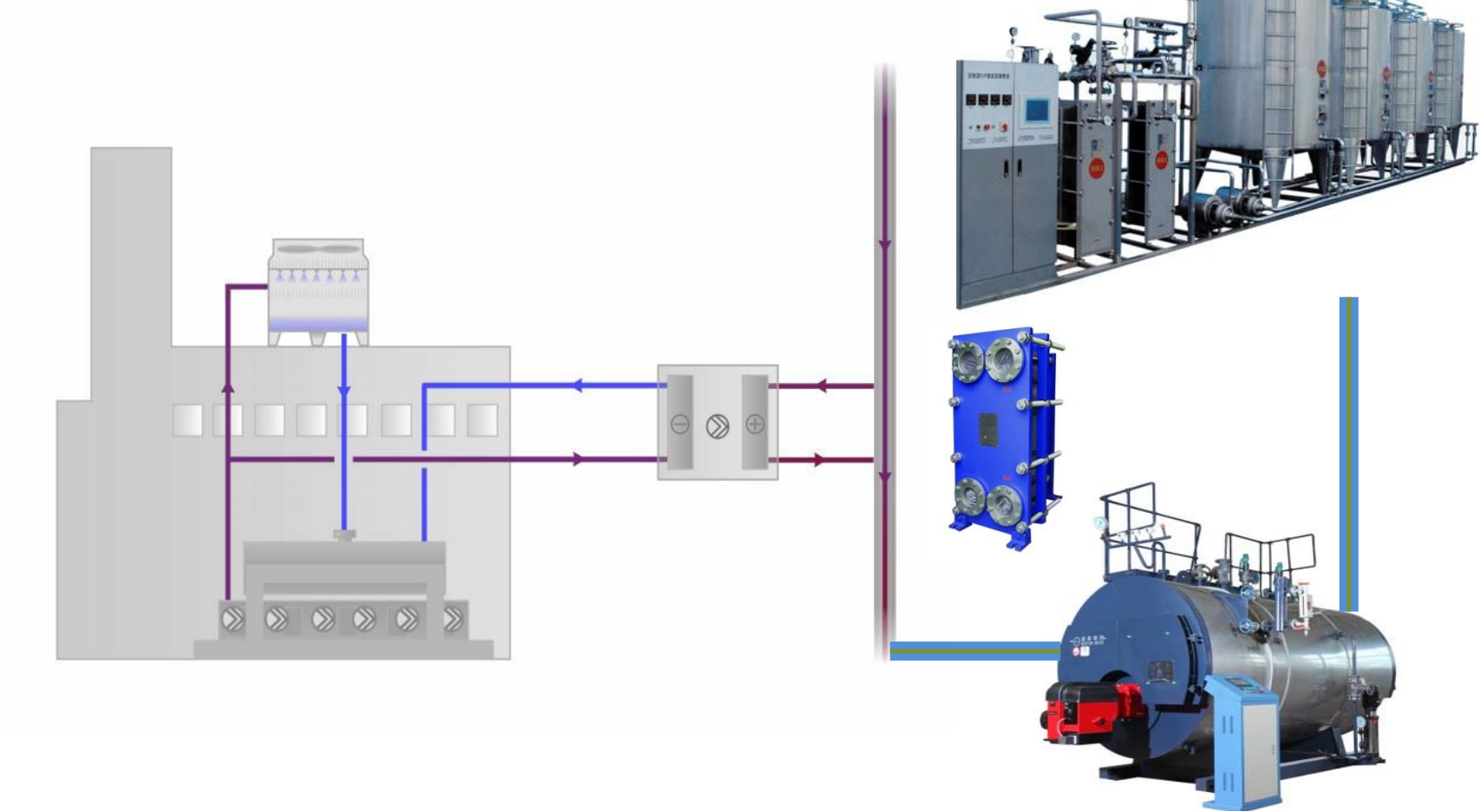
Heat recovery from biogas process: Biogas plant, Norway

- Heat source: Biowaste
- Cooling capacity: 420 kW
- Heating capacity: 623 kW
 - Biogas process
- Water temperatures (cooling/heating): +14 °C / 76 °C
- ChillHeat heat pumps
 - 2 pcs. P220 SU HC VFDx2



**Cooling and Heating &
Heat recovery from industrial processes**

Heat recovery from refrigeration plant



recovery at refrigeration plants
(ammonia, HFC, CO₂)



Heat recovery from refrigeration plant

2013

Waste heat from refrigeration process efficiently utilized Arla Ingman, Sipoo, Finland

Heat source: Ammonia condensate
Heating capacity: 750 kW
Water temperature: 80°C

- One Series P heat pump

The heat pump system at the Sipoo Dairy recovers waste heat from the refrigeration process and uses it to heat water, the facility, and the feedwater of a steam boiler. The waste heat is recovered directly from the refrigeration facility. This cost-efficient solution also has an excellent coefficient of efficiency. "The delivery is also important for us, as we strive to reach the energy and environmental goals laid down in our environmental strategy. We will carefully monitor the efficiency of the system to make further plans," says Vesa Hostikka, PTD Manager at Arla Ingman.

2006-
2013

Heat recovery, cooling, and heating generate savings in the food industry Snellman, Pietarsaari, Finland

Heat source: Ammonia condensate
Heating capacity: 1.4 MW
Water temperature: 75°C

- Three Series S heat pumps

Oilon has delivered Snellman equipment and automation solutions in several stages, for various applications, and for different process stages. Snellman's meat processing unit uses only renewable energy in heating and steam generation. "In the past seven years, Snellman has reduced its energy consumption by 29%, while the floor area of the production facilities has increased by 240%. This is mostly due to the heat pumps," explains Markus Snellman. The industrial ChillHeat pumps handle both the cooling and the heating of Snellman's production facilities.

2010
2012

Industrial heat pumps save energy and the environment at all production facilities of a food industry conglomerate Valio production plants: Riihimäki, Joensuu, Vantaa, Seinäjäki, and Lapinlahti, Finland

Heat source: Ammonia condensate, process cooling
Heating capacity: 1,1–3.2 MW
Water temperature: 63–70°C

- Series S heat pumps

The Finnish food industry giant Valio is committed to Finland's national goal of reducing the energy consumption of industrial production by 9% between 2005 and 2016. Oilon's energy efficient heat pump solutions assist Valio in reaching this goal. The applications recover heat from the production processes and generate cooling to be used by the production plants.

2014

Industrial heat pump saves energy in dairy production plant Satamaito, Pori, Finland

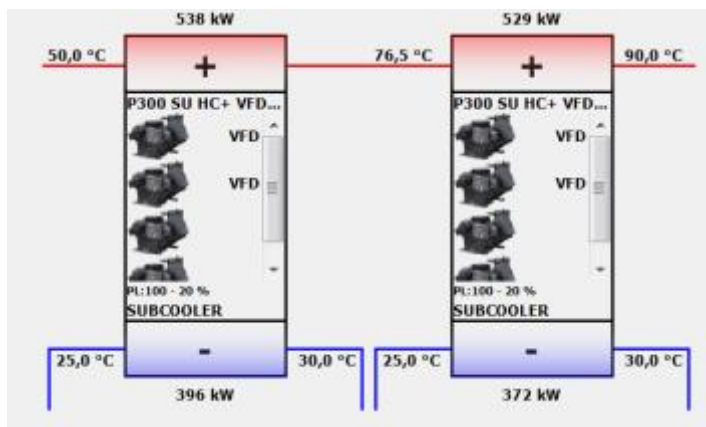
Heat source: Ammonia condensate
Heating capacity: 450 kW
Water temperature: 80°C

- One Series P heat pump

The condensate heat from the dairy process heating system is recovered with a ChillHeat pump.

Waste heat recovery: Meat processing plant, Finland

- Heat source: Refrigeration waste heat
- Cooling capacity: **768 kW**
- Heating capacity: **1067 kW**
 - Heat sink: sterilization water and kathabar dehumidification system
- Water temperatures (cooling/heating): **25°C / 90 °C**
- ChillHeat heat pumps
 - **2 pcs. P300 SU HC+ VFDx2 R1234ze**
- COPh **3.5**



Cooling and heating: Process plant, Finland

- Heat source
 - HP1: Low temperature water/propylene glycol (30 %)
 - HP2: Cooling water
- Cooling capacity
 - HP1: **1166 kW**
 - HP2: **2566 kW**
- Heating capacity
 - HP1: **1 870 kW**
 - HP2: **3328 kW**
 - Heat sink: Air heating coils of granulation air pre-heating
- Water temperatures (cooling/heating): **0 °C (HP1) +20 °C (HP2) / 68 °C**
- Heat pumps:
 - HP1 system: **S1000 ECO AD & S1000 SU AD**
 - HP2 system: **S1000 SU HC & S800 SU HC**



Process cooling: Factory, Finland

- Heat source: Process cooling
- Cooling capacity: **595 kW**
- Cooling water temperature: **+5°C**
- Heat to out side air
- ChillHeat heat pump
 - **S600 ECO HC VFDx1**



Thank you!