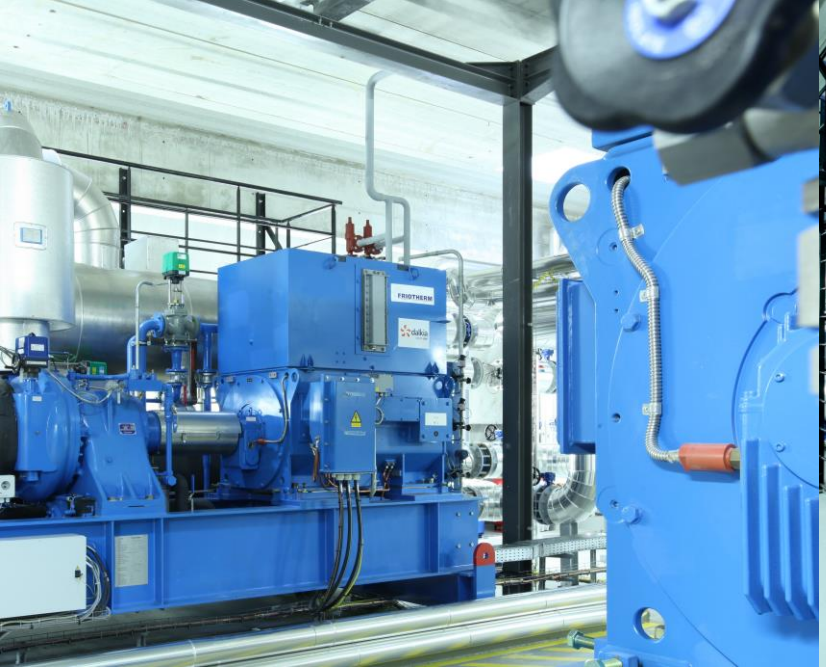


Créteil - over 50% renewable energy with geothermal heat pumps

Client

Société de Chaufage Urbain de Créteil (SCUC)
FR-94000 Créteil / France

Plant location

Dalkia
FR-94000 Créteil / France

Waste heat is being utilised

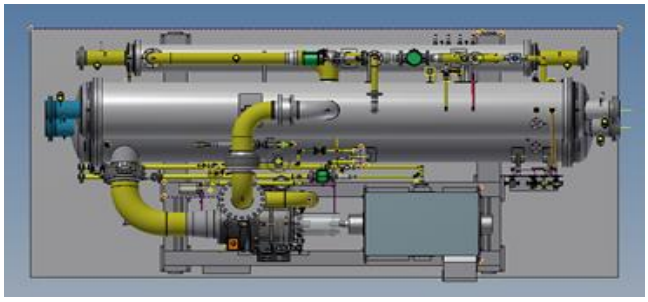
With the installation and incorporation of two high temperature heat pumps in the Créteil geothermal heating system, the renewable energy part of the city's district heating network now exceeds 50%. At Créteil, for the first time in France, heat pumps are operating in combination with a geothermal installation that draws its energy from the 1800 m deep Dogger aquifer.

The district heating network of the city of Creteil heats 33'264 housing equivalents. It is fed by several renewable heat sources like waste incineration and geothermal energy since 1985.

To increase the share of renewable energy in the mix of the network, Dalkia's engineers incorporated two high temperature heat pumps into the already existing installation. With this innovative technology and its environmental and economic benefits, the annual production of geothermal heat rose by 50% from 54,000 MWh to 81,000 MWh, thus avoiding 6022 tons of CO^2 annually.

2 Unitop 33 C heat pumps from Friotherm

The two Unitop 33 C heat pumps consist of heavy duty industrial centrifugal compressors at their heart. Together with the heat exchangers and the control system they are especially adapted to comply to 100% with the client special requirements regarding flexibility of operation modes, high efficiency and operational reliability. The service friendly design allows limiting service and maintenance work to a minimum while the units are operational for decades. The heat pumps are connected in series and further exploit the geothermal



water already used to heat the district heating network. This configuration increases the amount of heat recovered from the geothermal water and maximizes heat pump performance. The district heating water leaving the geothermal heat exchangers with up to 72°C flows through the condensers of the heat pumps and is leaving them at up to 88°C. Thus, the innovative system feeds 27,000 MWh of renewable energy in the district heating network.

Main technical data

Operating Seasons:	Autmn - Winter - Spring
Heating capacity:	8'660 kW
Cooling Capacity:	7'100 kW
Hot water in/out:	67,2 °C / 89 °C
Cold water in/out:	55 °C / 37,3 °C
COP:	4,65

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