Waste-to-energy CHP plant, Stuttgart-Münster, Germany

“Large-scale heat pumps in district heating networks – installation, operation, monitoring and system integration”

**KEY FACTS**

**Type of heat pump:**
river heat pump

**Energy distribution System:**
184 MWel, 447 MWth, 20,5 MWth heat pump

**Energy Storage:**
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**Control for the flexible heat pump operation:**
Heuristic control: optimization for minute reserve on the electricity market

**General description:**
20,5 MWth heat pump

**Heat Source:**
river water, electricity, waste, hard coal

**Project:**
Place: Stuttgart / Germany
Time Frame: 4/2021 - 3/2026
Owner/leader: EnBW Energie Baden-Württemberg AG
R&D-project partners:
AGFW; Fraunhofer ISE; IER Stuttgart

**Summary of the project:**
The waste-to-energy CHP plant generates electricity and heat in 3 coal-fired and 3 waste-fired boilers. The heat is distributed through a nearly 275 km long network around the city. The network reaches supply temperatures up to 130°C and provides for about 17% of Stuttgart's households.

The newly installed heat pump is a first step towards climate neutrality. The river heat pump uses the cooling water of the waste-to-heat CHP and thus the waste heat to provide district heating water up to a temperature of 90°C. The LHP has a nominal thermal power of 20,5 MWth, uses a four-stage turbo compressor with an intercooler and operates with the refrigerant R-1234ze(E).

In the Real-World Laboratory the integration of the LHP in den district heating network and the optimal application regarding grid friendliness and economic efficiency is being investigated.

**funding**
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https://www.ise.fraunhofer.de/de/forschungsprojekte/reallabor-grosswaermepumpen.html

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