Case Studies
https://heatpumpingtechnologies.org/annex57/

ANNEX 57 | Flexibility by implementation of heat pumps in multi-vector energy systems and thermal networks

Vattenfall Wärme, Berlin-Köpenick, 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:
11,2 MW_{el}, 48,5 MW_{th}, 1 MW_{th} heat pump

Energy Storage:
heating storage (15 m^3) and heat source storage (7,5 m^3)

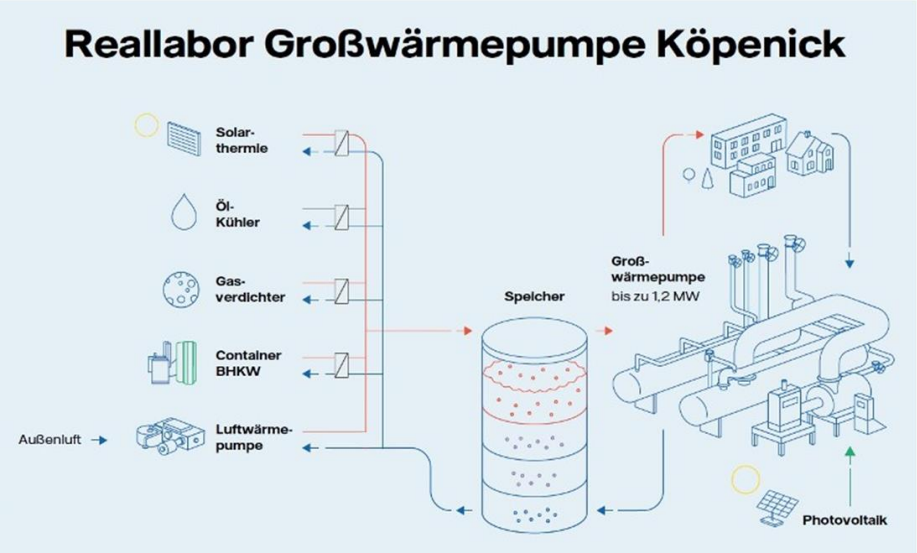
Control for the flexible heat pump operation:
Heuristic control: optimization for minute reserve on the electricity market

General description:
1 MW_{th} heat pump

Heat Source:
natural gas, bio methane, solar heat, outside air, electricity

Project:
Place: Berlin / Germany
Time Frame: 4/2021 - 3/2026
Owner/leader: Vattenfall Wärme Berlin AG
R&D-project partners:
AGFW; Fraunhofer ISE; IER Stuttgart;

Funding
Federal Ministry for Economic Affairs and Climate Protection (BMWK) due to an enactment of the German Bundestag under grant number 03EWR008A.



Summary of the project:

In Berlin-Köpenick heat and electricity are provided by two gas turbines, three boilers, a CHP unit and a thermal solar system. Thus 48,5 MW_{th} and 11,3 MW_{el} is generated. The installation of the large heat pump with a capacity of 1 MW_{th} is planned for 2024. The LHP will be powered partly by a PV plant. Heat sources will be solar heat, waste from oil cooler, gas compressor and the CHP and additionally hot water from an air heat pump. The energy of the different sources is collected and stored in two 7.500 Liter tanks to ensure a continuous supply of the LHP.
The heat is stored in another two 7.500 Liter tank to decouple the LHP from the district heating network.
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.

Contact Information/Links

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