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

Energie Burgenland, Austria

"Use excess wind electricity for heat pumps to enable flexible operation of the district heating system"

KEY FACTS

RD&D Status:
Large-scale demonstration

Type of heat pump:
Centralized HP with district heating-system 1,2MW

Building description:
Residential, Mix of new and existing

Energy distribution System:
District heating, Direct electrical connection to Wind park

Energy Storage:
Centralized battery, Centralized Thermal

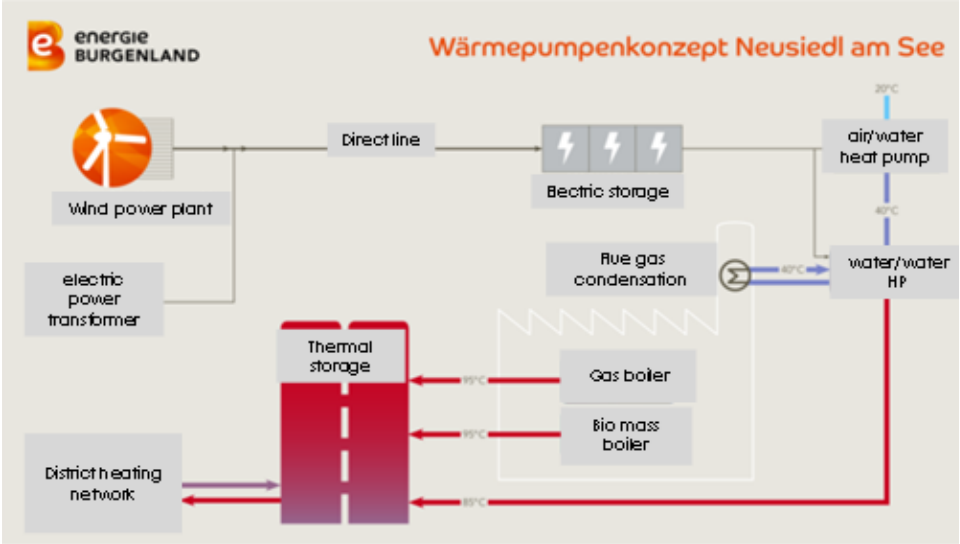
Control for the flexible heat pump operation:
Heat driven control

General description:
Number of heat pumps:

W/W 2x600 kW

A/W 2x600 kW

Heat Source:
Flue gas condensation /air



Summary of the project:

The region Burgenland (where Neusiedl am See is located) is the region with the highest wind energy supply in Austria. Neusiedl am See is a preferred living space with increasing heat demand. The project consisted of installation of a direct electric line from a wind park, a thermal and electric storage, as well as the installation of 4 high performance heat pumps and provides therefore the unique opportunity to source heat from renewable electricity generation.

Expected results:

- Gas-savings of around 1,250 GWh/a
- Reduction of carbon emissions of around 300 t/a
- Reduction of biomass consumption of around 1,200 t/a
- Reduced transport of biomass, reducing carbon emissions in transport by 9 t/a

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

Energy supply scheme:

In winter, the majority of the heat load is covered by biomass. When biomass is on, flue gas condensation delivers water of around 30/35°C. From there, 2 water-water heat pumps lift the heat level of the warm-buffer of around 60/65°C to around 65/70°C. Additionally, 2 air-water heat pumps are supplied by the warm buffer with 74°C/78°C which they lift by 4°C. Heat load in winter is between 1-4MW.

In summer, the biomass plant is not operational and the heat from flue gas condensation is replaced by air-water heat pumps which deliver heat at level of 30/35°C that was done by the flue gas condensation before. From there on, same procedure as in winter. Heat load in summer is around 0.5-1MW.

Around 10% of heat is produced from gas, 40% from biomass and 30% from wind.

2 water/water heat pumps, 600kW each
2 air/water heat pumps, 600kW each

Cold-water storage 17m³
Hot water storage 17m³
Buffer storage 2x150m³

Flexibility – scheme and control strategy of the system:

The gas boiler is used as backup capacity in case of a wind slack. The battery storage ensures, in case of a wind slack, that the heat pumps can be ramped down in a controlled manner and deliver 1 MW for a couple of minutes. The thermal storage of 300 m³ enables further supply of the DH system for 10 hours during summer time.

FACTS ABOUT THE PROJECT

Place: Austria / Neusiedl am See

Time Frame: Start 2021

Project organisation:

Owner/leader:
Energie Burgenland

Project partners:
Energie Burgenland, Ochsner Wärmepumpen, Hybrid DH Demo, 4Ward Energy Research, Heat Water Storage Pooling

Contact Information/Links

Energie Burgenland

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Published articles:

N/A

IEA Technology Collaboration Programme on Heat Pumping Technologies (HPT TCP)

Delivered by:

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