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

**Delivered by:** Team Austria
**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.