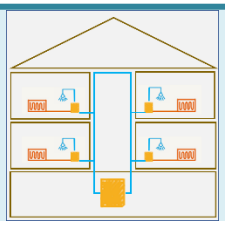
Project HAPPENING Heating Only, Austria

High replicability potential in Austria

The EU-funded project HAPPENING's concept is based on cascade heat pumps in refurbished multi-family buildings in order to allow for 'tailor-made solutions'.



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Key facts

Buildings

Location	*Liezen, AT*
Construction	*1940*
Project type	*thermal retrofit 2022*
Heat distribution	*radiators*
Heated space	*980 m²*
No. of apartments	*20*
Level of insulation*	*good (highest possible)*

**according to Annex 62 classification*

Heat pump and source

Number of	*2 + 18**
Operation mode	*monoenergetic*
Heat source	*air, internal loop*
Cooling	*no*

**two apartments not included*

Heating system

Heat demand	*77 kWh/m2 (a)**
installed power	*126 kW*
Heating temperature	*up to 50°C*

**based on measurements over a year*

Domestic hot water

Type of system	*individual HP fed by internal loop fed by central HPs*
DHW demand	*35.7 kWh/m2**
Max. temperature	*55°C*

**based on measurements over a year*

Other information

$COP_{decentral}$ (R32)	*5.93 (W10W35 & 7.33 kW_{th})*
$COP_{central}$ (R410A)	*4.06 (A7W35 & 31.07kW_{th})*
SPF	*2.62*
Back-up heater	in all HPs
Climate zone	*Dfb*

Lessons learned

- Interface coordination was challenging, possibly simplified by processing via a general contractor.
- Effort and costs for maintenance, system op. & heating bill is rather high.

In the town of Liezen in the very center of the Alpine Republic Austria, the HAPPENING project took part in the renovation of a multifamily building (MFB) with 20 medium sized dwellings. Its insulation envelope had been retrofitted shortly before.

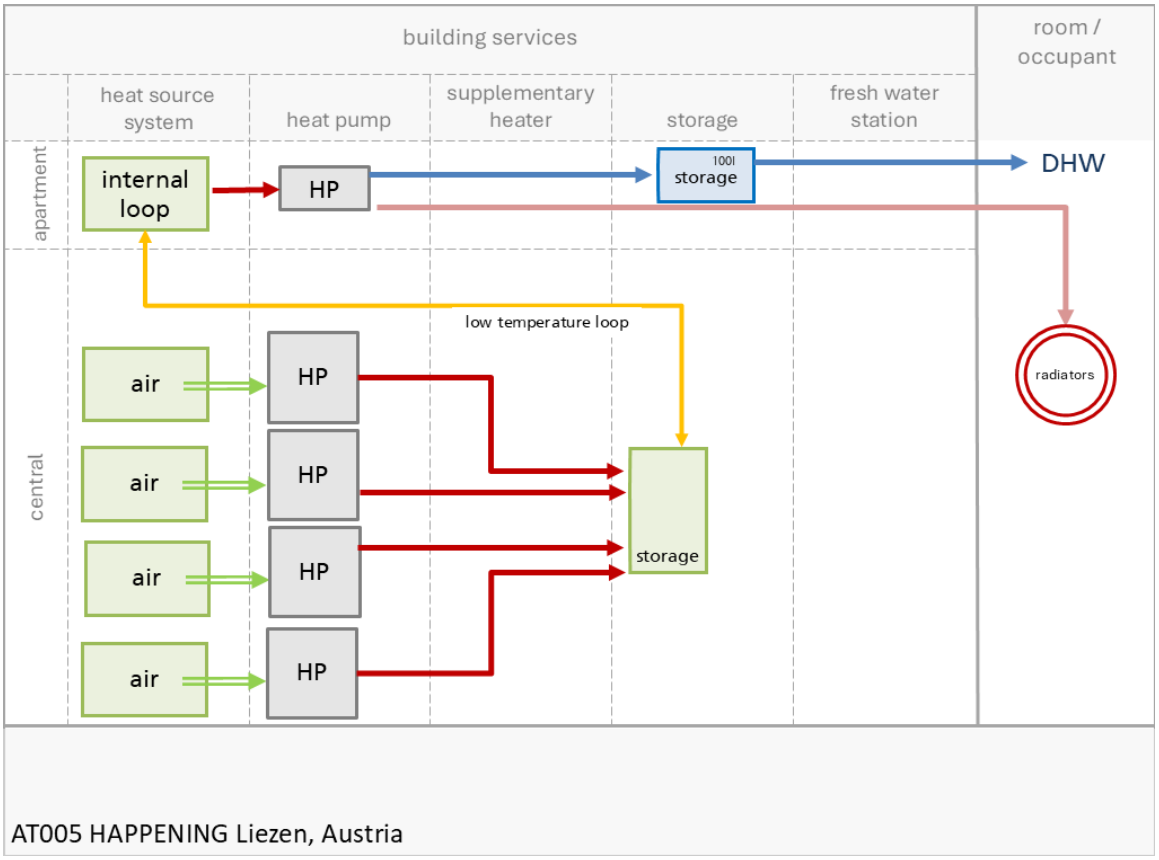
Before the renovation, the individual apartments were heated by various solutions for both Space Heating (SH) and Domestic Hot Water (DHW): from individual gas boilers and radiators to old stoves and electric boilers.

Ownership of the building lies with the non-profit social housing entity GWS.

The apartments required no cooling function in their system but due to the cold winters in the region, reliable heating was all the more a priority.

Because of the 'typicalness' of the MFB, meaning its common kind among building types, there is a high replicability potential.

Project HAPPENING Heating Only, Austria



Description of the technical concept

As part of the HAPPENING project the refurbishment of the building involved installing a new heating system that relied on a central-decentral heat pump (HP) mix.

Centrally, two air-to-water HPs were installed. By means of a Thermal Energy Storage (TES), they feed a low-temperature water-loop (internal loop) inside the building. On the dwelling level, individual HPs use this internal loop as their heat source for both DHW (incl. DHW tank) and SH (partially using the previously existing radiators).

Pictures: HAPPENING Project