

Apartment house in listed school

Between 1881 and 1966 children were taught inside this old school building, which is now listed. In the meantime, the building served as a church, community administration and youth hostel. In 2008, the house was finally rebuilt by its new owner into a multi-family house with five residential units. After the existing building had been heated over the years with an oil heating and district heating, the decision was made to use a heat pump as an environmentally friendly solution.

Key facts

Building

Location	<i>Kempen, Germany</i>
Construction	<i>1881 (2008)</i>
Heat distribution	<i>floor heating</i>
Heated area	<i>470 m²</i>
Level of insulation	<i>interior insulation</i>

Heat pump and source

Number of	<i>1</i>
Installed power	<i>33 kW</i>
Operation mode	<i>monovalent</i>
Heat source	<i>outside air</i>

Heating system

Heat demand	<i>19700 kW/year</i>
Heating temperature	<i>Between 8 and 12°C</i>

Domestic hot water

Type of system	<i>unknown</i>
Max. temperature	<i>unknown</i>
Circulation system	<i>unknown</i>

Lessons learned

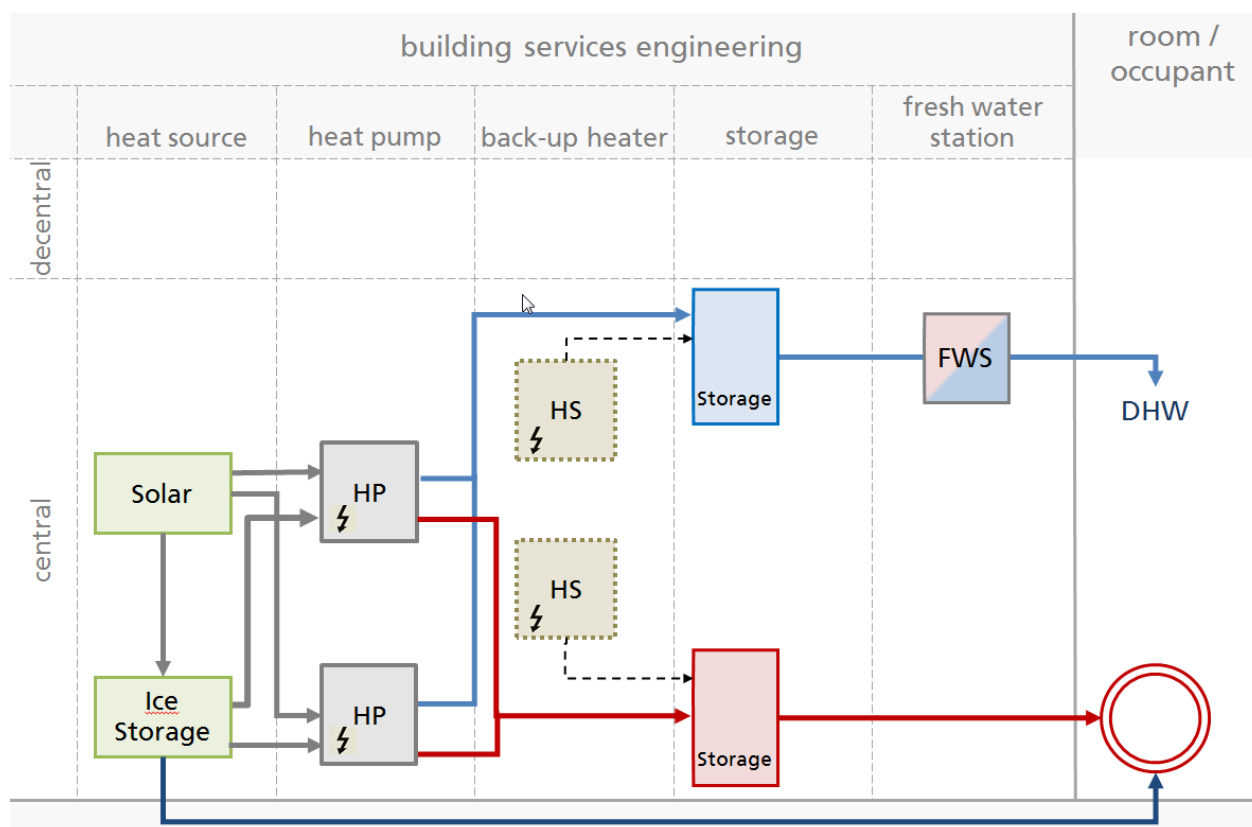
- Quality of the system's control is crucial.
- Compared to design data increased heat demand due to increased room temperature & DHW consumption.



The heat distribution in the house takes on a special floor heating. With their very low height and therefore low weight, the original wooden beamed ceilings of the listed building can easily carry the underfloor heating. At the same time a higher heat radiation performance is achieved, as previous calculations by the heating engineer showed that the building heat load with a low-temperature heating system can only be achieved by the additional internal insulation of some components. The air heat pump runs with a seasonal performance factor of 3.9.



Apartment house in listed school Technical details



Description of the technical concept

The challenge was to reconcile monument protection and modernization measures. The historic façade was therefore made with interior insulation. After the existing building had been heated with oil heating over the years and later with district heating, the new owner opted for an environmentally friendly variant and installed an energy-efficient air heat pump.

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