DE013 Optimization of an HP Cascade, Germany

Reducing Energy Consumption via Cloud Control

This project focuses on the holistic operational optimization of a heat pump cascade via remote control.

A1

Key facts

Buildings

Location	*Eckernförde, DE*
Construction	*1972*
Project type	*retrofit*
Project date	*2023 - ongoing*
Heated space	*1072 m²*
No. of apartments	*16*
Level of insulation	*Good*

Heat pump and source

Number of	*2*
Operation mode	*monoenergetic*
Heat source	air

Domestic hot water

Type of system	*central*

In 2022 and 2023, a block of flats built in 1972 in the far north of Germany was retrofitted. Since then, the 16 apartments have been heated by two *Stiebel Eltron* heat pumps, both for space heating (SH) and domestic hot water (DHW). PV panels were also installed on the roof.

However, the energy consumption of the system was higher than expected. To address this, a project was started 2023 to integrate the system into their cloud platform to enable remote analysis, optimization and control.

Keys to success:

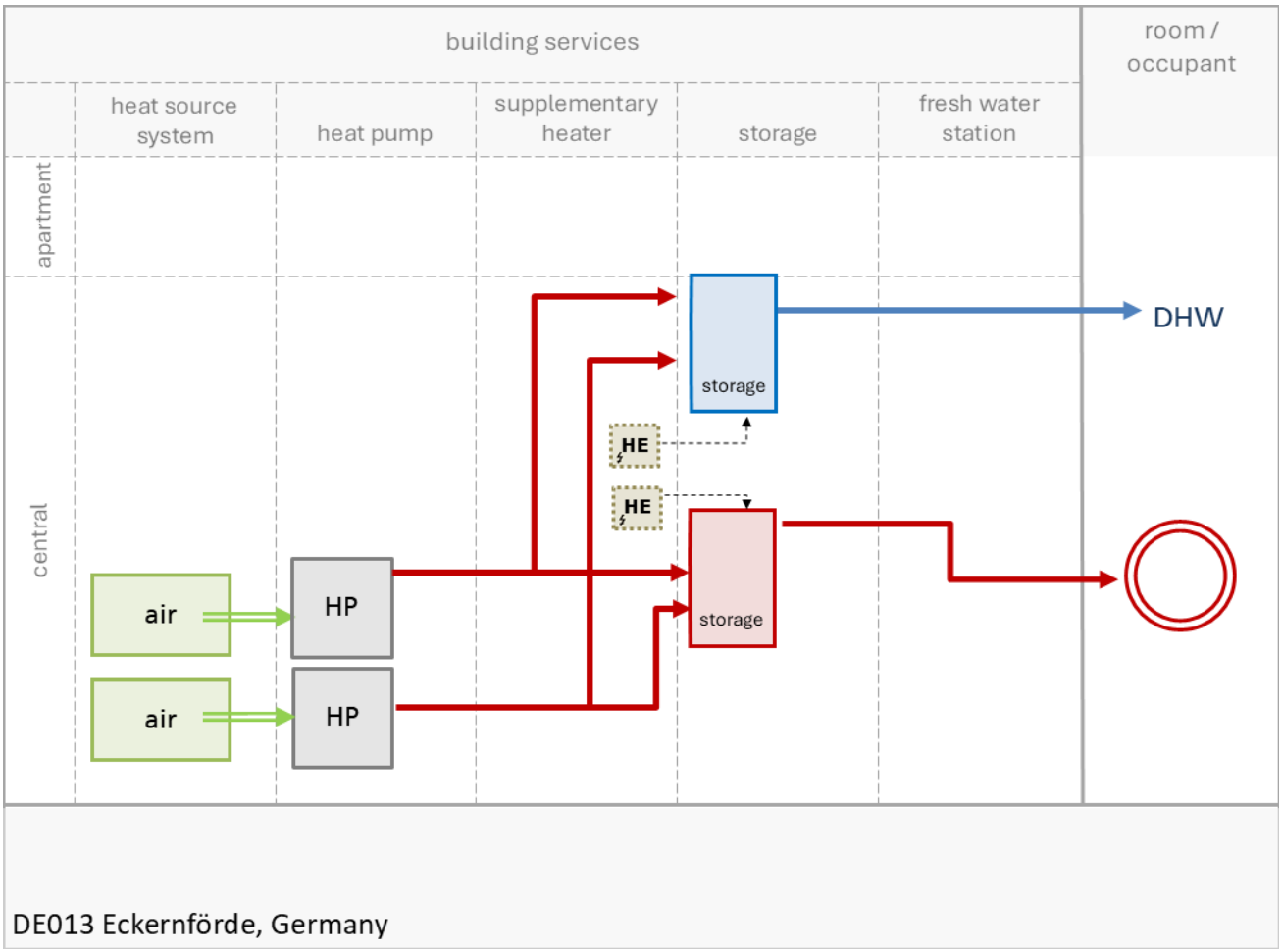
- Comprehensive data collection, evaluations and analysis in the *Green Fusion Cloud*
- Holistic, intelligent optimization of system operations via remote control
- Automated fault and malfunction notification

Lessons learned

- Additional sensors and counters lead to more comprehensive data integration in the cloud. Errors can be identified faster and in more detail.
- Identified savings potentials:
  1. The flow heater was activated too often and for too long.
  2. The flow temperature could be lowered without compromising occupant comfort.
  3. Further savings were achieved with a nigh setback.

Pictures: Green Fusion

DE013 Optimization of a HP Cascade: Technical details



Description of observations and results

Additional sensors and meters were installed. The data was merged with the heat pumps' operating data in the *Green Fusion Cloud* and analysed to give a holistic picture.

It was found that the electric heating rods, which were supposed to support the heat pump in marginal situations, were running much more often than necessary. As a result, the much more efficient heat pumps were used less frequently than possible.

In addition, the flow temperature was lowered without any loss of comfort for the building's residents, the heating curve was further optimized, and a night setback was implemented.

Results:

The project is not yet complete, but the package of measures described has already shown promising results: Energy consumption for DHW has been reduced by nearly 20 percent.

The overall energy consumption of the system is expected to be reduced by around 15 percent.

Provided by:

GreenFusion

Upon the project's completion, an update of this fact sheet is expected.