

OPTIMISATION OF THE VENTILATION SYSTEMS IN THE BG KLINIK LUDWIGSHAFEN

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The Steinbeis-Transferzentrum Energie-, Gebäude und Solartechnik Stuttgart (STZ) is improving the energy performance of the emergency hospital *BG Klinik Ludwigshafen* in the course of the Re-Co project. The clinic has an annual energy consumption of about 25 GWh which corresponds to energy costs of about 2,7 million Euro.

Basic data of the pilot project	
Net floor area	68.000 m ²
Number of beds	418
Energy consumption	ca. 25 GWh/a
Energy costs	ca. 2,7 mio. €/a

Since the start of the Re-Co project about 8% heat and electricity have been saved through optimisation of the ventilation systems.

First, a rough analysis was carried out, to find out where the consumed energy (from the energy bills) went. This resulted in an energy flow chart (*Figure 1*), which points out the main energy consumer.

From the energy flow chart, it is clearly visible that the ventilation systems need approximately 45% of the total energy used. This corresponds to about 54% of the clinic’s total energy costs.

For a detailed analysis the operation of the selected ventilation systems was simulated under current operating conditions and the yearly energy consumption could be calculated. Afterwards the energy saving potential was calculated through adapting the mode of operation to its actual use in cooperation with the technical staff, the users and involved companies. The calculated savings of an exemplary ventilation system are shown in the *Figure 2*.

The calculation for the individual ventilation systems showed the energy saving potential in the range from 4% to even 58% with average savings of more than 35% of the originally used energy.

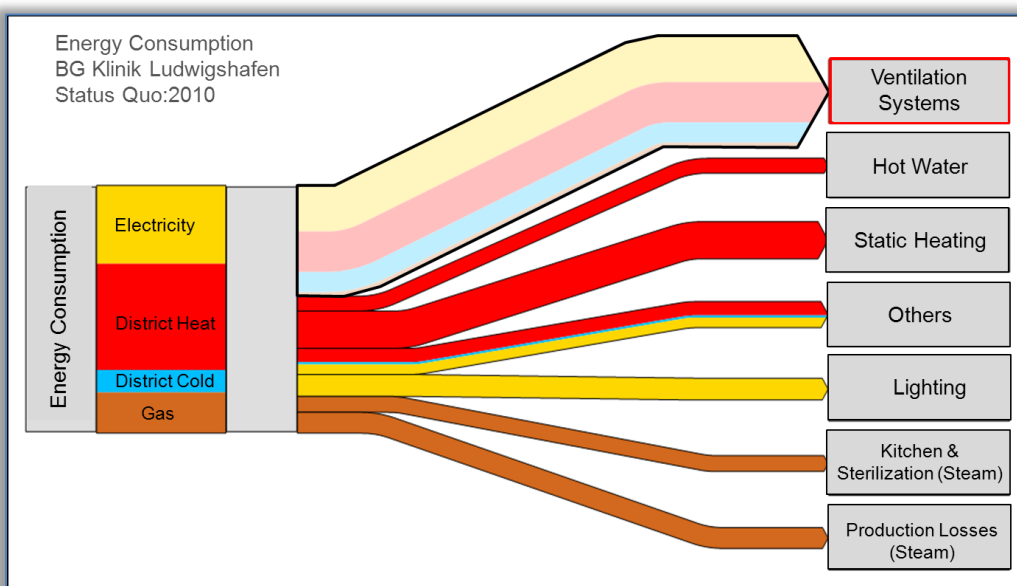


Figure 1: Energy flow chart of the BG Klinik Ludwigshafen

These savings were reached by implementing low- or no-cost measures. The highest potential was found in measures adjusting the supply to the demand side such as shutting down the system overnight, reducing the volume flow, adapting the actual time profiles in the building management system to its actual use or adapting the conditions to new utilisation of the supplied rooms. Other measures increasing the energy efficiency were: reducing of set values of the supply air pressure, exchanging damaged regulating flaps and checking several controls of the volume flow.

The result in the BG Klinik Ludwigshafen shows that large energy savings can be reached only by adapting set values and time profiles of the ventilation systems in the building management system.

Energy costs of about € 170.000 per year could be saved in the clinic by investing about € 110.000. **The identified measures pay themselves off after less than one year.**

Optimisation of ventilation systems	
Investment	ca. 110.000 €
Energy savings	ca. 1,8 GWh/a
Cost savings	ca. 170.000 €/a
CO ₂ savings	700 tCO ₂ /a
Payback period	ca. 8 months

More information on the optimisation of the ventilations systems in the BG Klinik Ludwigshafen can be found on the Re-Co web page under <http://www.re-co.eu/node/57>.

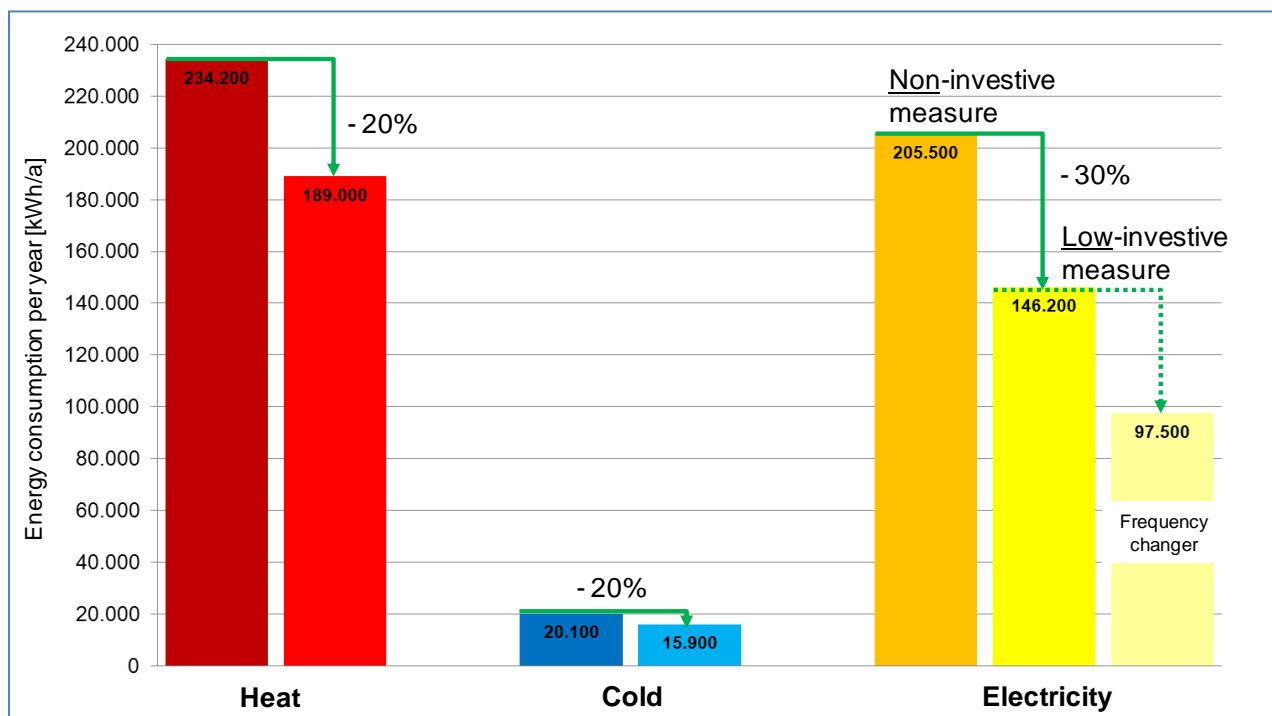


Figure 2: Example of the calculated potential energy savings for one of the ventilation systems

