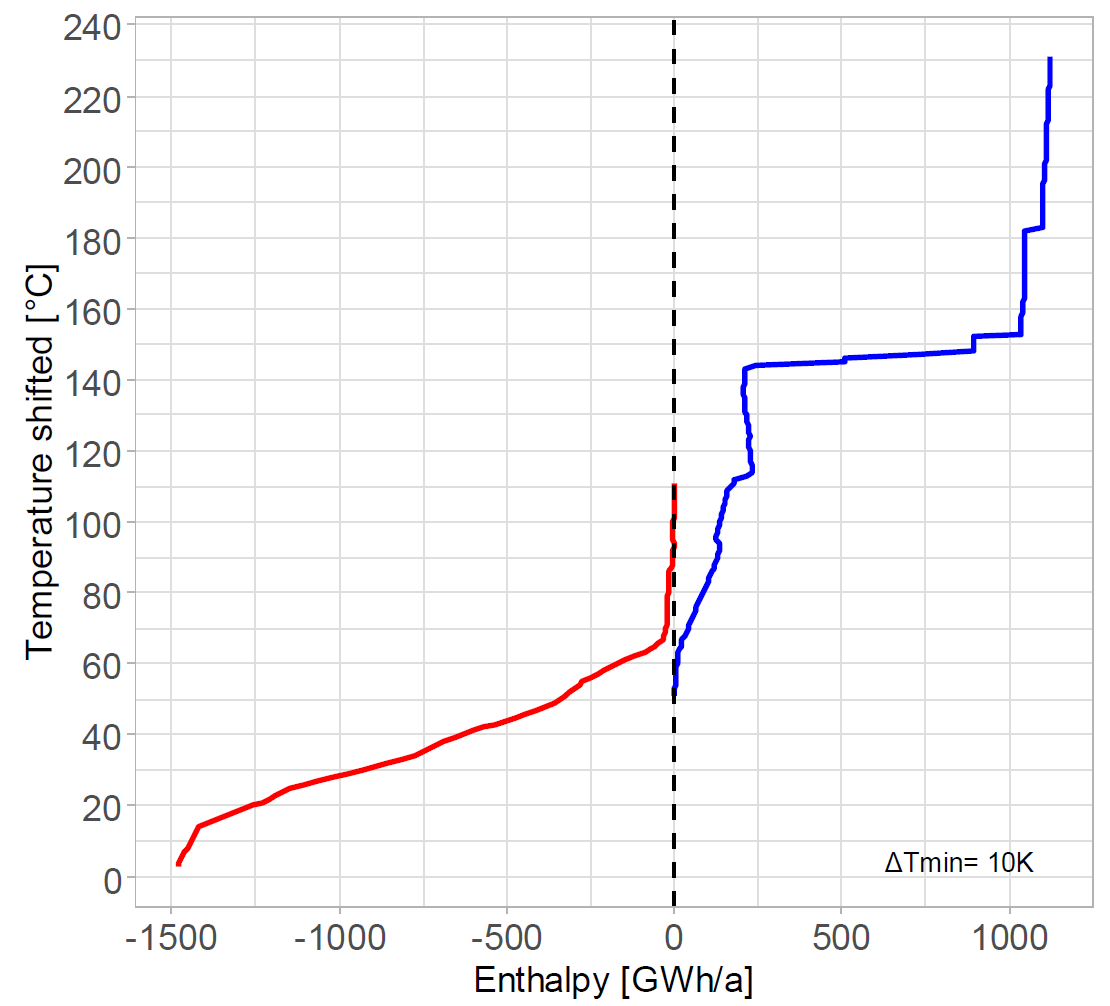
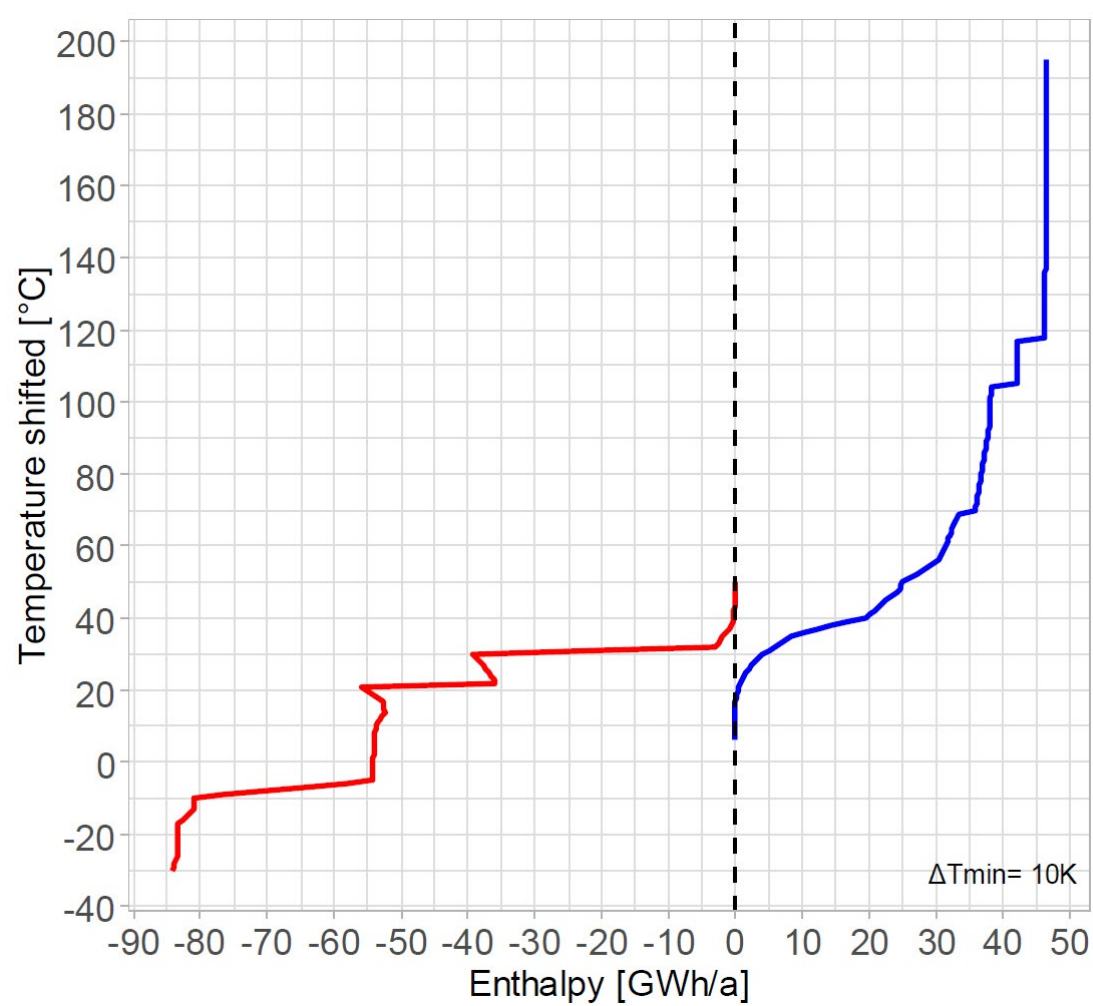
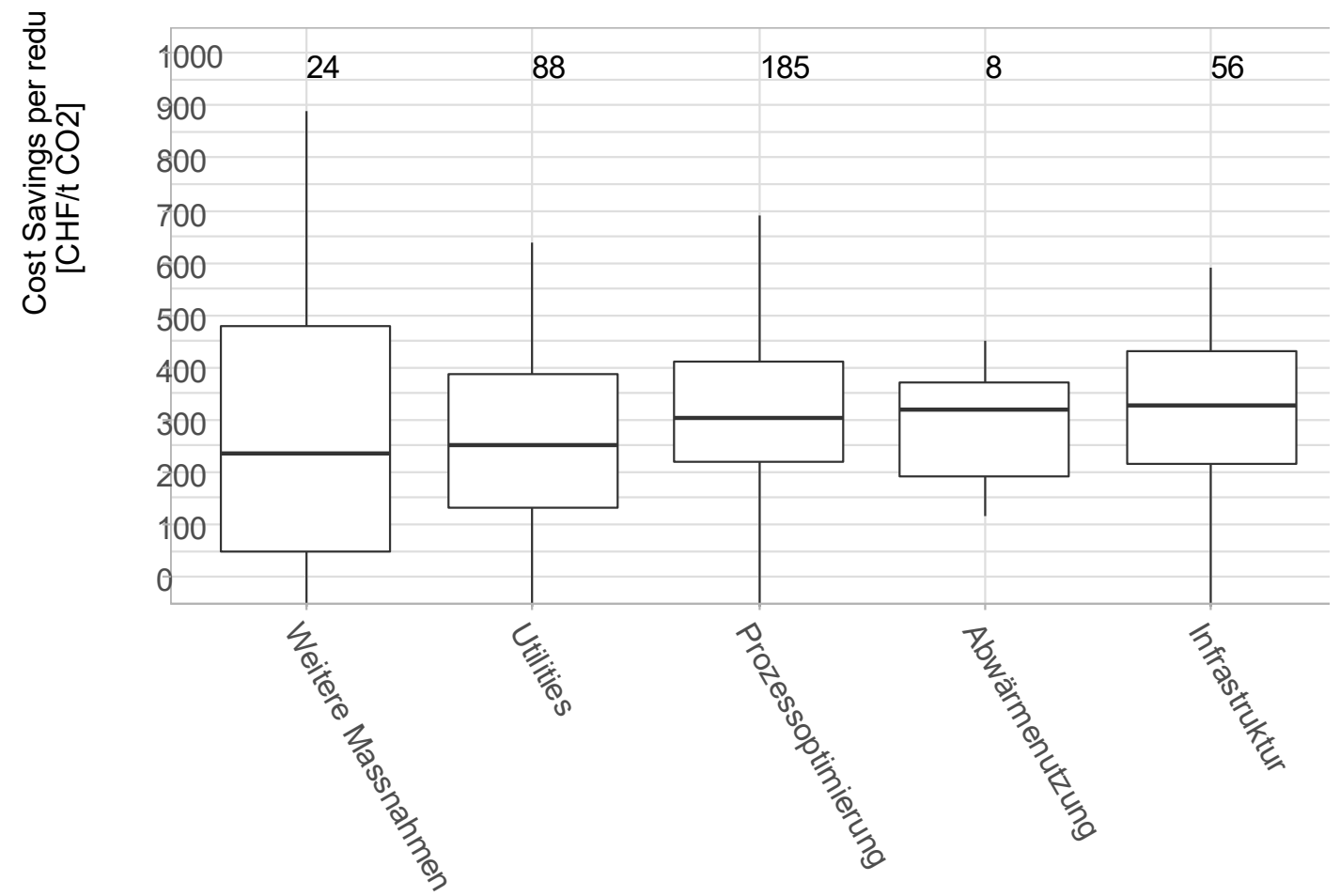
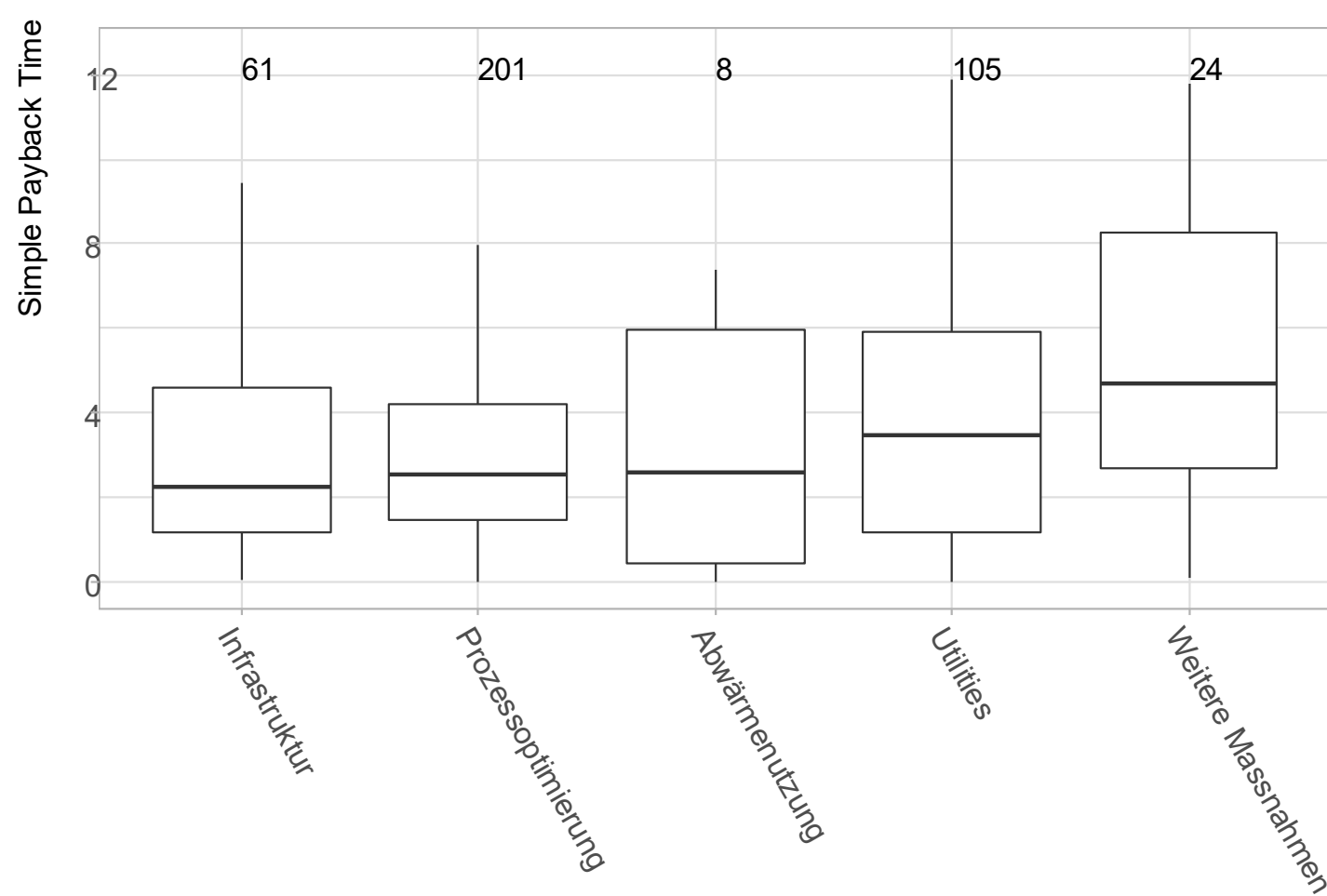


Master-Thesis Engineering, Fachgebiet Energy and Environment

Evaluation of pinch analysis projects in swiss industry



Problem Statement

The industrial sector is responsible for 18.1 % of total energy consumption in Switzerland. Process heating alone accounts for 56 % of this. To achieve the goals of the Swiss energy strategy 2050, the CO2 emissions of the industry sector must be reduced. This will be achieved by increasing energy efficiency and by using renewable energy sources.

A tool to increase energy efficiency in industrial companies is the PinCH software. In the past years, over 170 pinch analyses have been carried out in Switzerland. In the course of a research project at the HSLU, a large part of these analyses were collected and will be evaluated in this thesis.

Solution Concept

From the 170 pinch analyses performed, 71 were selected and examined from two different perspectives. The first perspective deals with the techno-economic evaluation of energy efficiency measures (EEM) proposed by the pinch analyses. The results of the 399 EEMs show an energy saving potential of 415 GWh/a or 9 % of the total final energy demand. In terms of CO2 emissions, approximately 71,000 tCO2/a can be saved annually.

The measures not only show savings in terms of energy and CO2 but also prove to be economically viable: around 75% of the proposed measures have a simple payback time of less than 5 years and can therefore be considered economically viable.

In the second perspective, a method was developed to combine the results (Grand Composite Curves) of the pinch analysis to obtain sectorspecific thermal profiles. The results provide information about the maximum heat recovery potential and the minimum requirements for the utility system in a specific industrial sector. Based on the sector profiles, potentials for renewables were investigated.

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