



EXERGY ANALYSIS OF THE HEAT PUMP IN THE SCHULHAUS LIMMAT

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SUMMARY

The school building Limmat was built in 1906. Its heating system with a gas burner was complemented with a heat pump in 2005. Since January 2006, the heat pump is covering 90 % of the building's heat demand for room heating and domestic hot water. The heat pump is a demonstration installation, since it has several special features:

- The heat pump uses Propane as working fluid.
- The heat source is a waste water channel delivering ambient heat at a temperature of 14 °C. In comparison to other heat sources, this is a relatively high temperature leading to conditions favorable to heat pumps.
- The hot water produced by the heat pump has a temperature of 65 °C, which is high for a heat pump.

It is the goal of this project, to analyse the heat pump from an exergetic point of view and to show possibilities for improvements in the current installation as well as in future installations.

The measurements of various physical properties have been verified. An error in the acquisition system of the electrical power was identified and corrected. The visualisation on the internet www.schulhauslimmat.ch now shows correct powers as well as correct COPs. The COP of 2.7 is too low for an economic operation of the heat pump. However this is 37 % of the maximum COP, which can be reached at the given operating conditions.

The future project will focus on establishing a theoretical model, where exergies and exergy losses are analysed. This leads to recommendations for improvements in the current installation and in future project of similar kind.