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Using renewable energy in heating networks more efficiently

Lowering return temperatures and optimising customer systems

Thanks to the year-round, continuous heating requirement placed on them, heating networks provide favourable prerequisites for utilising renewable energies. However, until now excessively high return temperatures and flow rates in the networks have prevented them from making a greater contribution. The BINE-Projektinfo brochure “Efficiently using district heating” (14/2015) presents various technical approaches for improving the conditions for geothermal and solar heat sources in heating networks. To this end, low-temperature systems have been further developed and optimised.

More efficient domestic hot water heating is a central starting point. In heating networks, domestic hot water (DHW) heating is in itself insufficient to adequately reduce the return temperature during the summer months. Measurements in eight apartment buildings and a terraced house complex showed that the bulk of the heat consumed is used for reheating the circulating drinking water. The primary heating of the cold water plays a minor role. In order to obtain lower return temperatures when heating the domestic hot water, storage tanks have to be integrated into the system to temporarily store the residual heat from the circulation pipes. This enables a gradual heating process. Seven district heating transfer stations have been developed with different DHW systems for different building types and for both summer and winter requirements, and evaluated on a test rig. Three systems enabled return temperatures lower than 35 °C to be achieved.

This LowEx Systems research project is a collaboration between the Stadtwerke München municipal utility company, Munich University of Applied Sciences and the Ebert-Ingenieure building services engineering company. The investigations were carried with a view to Munich’s plans to use only renewable energy for district heating provision by the year 2040.

The BINE Projektinfo brochure, which can be obtained free of charge from the BINE Information Service at FIZ Karlsruhe, is available online at www.bine.info or by calling +49 (0)228 92379-0. The brochure cover and an additional image can also be downloaded from the press section in this web portal.

Contact
Uwe Milles
presse@bine.info

BINE information service
Kaiserstraße 185-197
53113 Bonn
www.bine.info

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