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Gas engine heat pump heats residential complex in Munich

Prototype developed for the research project

The intention was to energy efficiently renovate a residential complex from the post-war period in the Munich district of Haidhausen and provide it with a new, CO₂-neutral energy concept. The core of the heating system comprises a gas engine heat pump that utilises groundwater as the heat source. The new BINE-Projektinfo brochure "Gas engine heat pump supplies renovated residential complex" (09/2017) presents the prototype for the heat pump, the concept for the heating system, a method for providing energy-efficient legionella protection and the renovation project as a whole. A mass-produced gas engine heat pump suitable for the central European market did not exist when the planning was being carried out.

Gas engine heat pumps offer interesting possibilities for additionally using the internal waste heat from engines and exhaust gas. The new heat pump can provide heat at two temperature levels: A temperature circuit at a level between 60 and 70 °C supplies the approximately 150 apartments with hot water, while a second circuit at a temperature of around 50 °C supplies the space heating. Within the heating system, the heat pump operates in conjunction with a solar thermal system and a gas-fired condensing boiler, which is used to meet peak loads. Three series-connected storage tanks buffer the generated heat. It was initially planned that the heat pump would cover around 70 % of the heat production. Problems with the technology and regulation meant that this prototype failed to meet the target value, but the actual energy savings have nevertheless surpassed the calculated values during the operating phases.

During the course of the renovation of the residential complex, the buildings also received very high-quality facade insulation and window systems. On completion, scientists from the Fraunhofer Institute for Building Physics carried out scientific monitoring for a period of two years. The owner of the buildings and therefore the client is the Städtische Wohnungsbaugesellschaft München municipal housing association. BLZ Geotechnik Service GmbH developed the prototype heat pump.

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 additional image material can also be downloaded from this web portal in the press section.

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