

Economical heating and cooling systems for low energy houses



Germany

Germany is represented by the **Fraunhofer Institute of Solar Energy systems (ISE)** of the Fraunhofer Gesellschaft and the German manufacturer of building technology **Viessmann Werke GmbH & Co. KG**

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German national project

The national project of Germany is dedicated to field monitoring of heat pumps for low energy houses.

A large field test of about 100 heat pumps is conducted in co-operation with 7 heat pump manufacturers and 2 utilities.

The heat pump types in field testing are mainly ground-coupled brine-to-water as well as some outdoor-air-to-water and water-to-water heat pumps. The first part of the field test has been started in 2006 and will continue until 2008. Some systems will continue to be measured until 2010. In summer 2008 further 30 systems will be installed and measured until 2010.

Results shall serve

- to evaluate the actual seasonal performance of the latest generation of heat pump systems incl. the domestic hot water operation
- to derive technical expertise for the further development of heat pumps for well-insulated houses
- to investigate the impact of eventual refrigerant losses of heat pump on the seasonal performance

An example of the measurement points for a brine-to-water heat pump is given in Fig. 1.

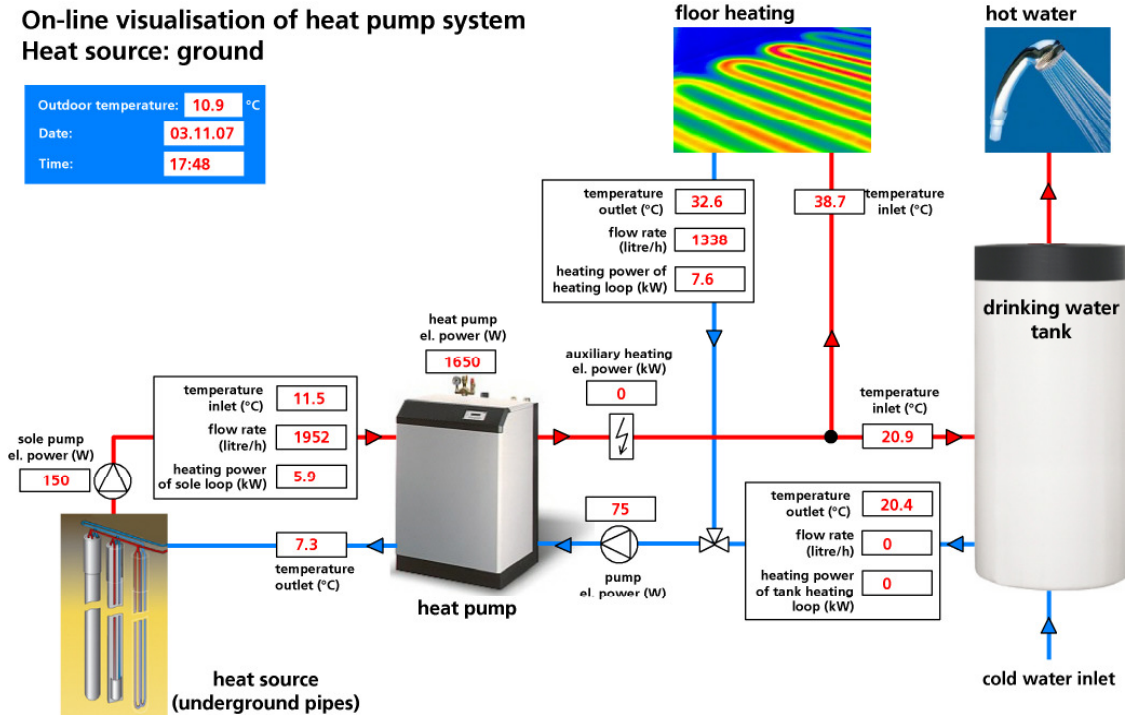


Fig. 1 Example of online visualisation with measurement points for heat flows, electricity inputs and temperatures

Moreover, another field test of heat pumps in the application of retrofitting of boilers will be accomplished in charge of the German utility E.ON in the years 2006-2009. Heat sources for the retrofit application are brine-to-water and air-to-water heat pumps. The selected houses comprise annual energy needs for space heating in the range of 150-250 kWh/m²/a and requirements for high supply temperatures. Results shall deliver the feasibility of this retrofit option in terms of energy savings, CO₂-emission reduction and the economy of the system.

The results of the German contribution are documented in five Best Practice Sheets and the field monitoring report.

German links



WP-Effizienz

Homepage of the German field test project called "WP:Monitor". As continuation of the field test HP-Efficiency in Germany the project HP:Monitor has started in 2009 and will be continued until 2013. About 100 further heat pumps of the involved 12 manufacturers and 1 utility are monitored for at least 30 month to include at least two full heating and summer periods.

Website in German :

<http://wp-monitor.ise.fraunhofer.de/>



WP-Effizienz

Homepage of the German field test project called "HP-Efficiency". The project is the national German contribution to IEA HPP Annex 32.

The Website contains information on the project, links to the involved manufacturers a password protected members area, where field test results can be inspected online.

Website in German:

 <http://wp-effizienz.ise.fraunhofer.de>



WP im Gebäudebestand

Homepage of the German field test project called "HP in the building stock", which investigates heat pumps as retrofit for boilers in existing buildings with high flow temperature requirements for the space heating emission system. The project is accomplished in co-operation with the German utility E.ON. Results will be reported to the IEA HPP Annex 32.

The Website contains information on the project, links to the involved branch companies of E.ON and the possibility to visualise measurement data of three systems online.

Website in German:

 <http://wp-im-gebaeudebestand.de>



Bundesverband WärmePumpe

The website has contact information to members, information about heat pumps.

Information in German at:

 <http://www.waermepumper.de/>



FIZ Karlsruhe

The FIZ provides information on heat pumping technology since over 20 years.

Presently the information transfer of the German energy market and European market players is in focus.

Topics of energy efficiency, renewable sources and reduction of CO₂ emissions with emphasis on heat pumps are main issues.

Information is given in German and English

  <http://www.fiz-karlsruhe.de>



Passive House Institute

The Passive House Institute (PHI) is an independent research institute under the auspices of Dr. Wolfgang Feist with an interdisciplinary team of presently 23 employees.

Main tasks are in research, development in the field on highly-efficient energy use in buildings.

The German Passive house standards and construction concepts for Passive Houses originate of the PHI.

The website gives information on the activities of the PHI and on German Passive houses at

  <http://www.passiv.de>



IG Passivhaus Deutschland

The IG Passivhaus Deutschland is an information network on passive houses in Germany.

Moreover, a data bank with information on realised passive house project in different countries is incorporated in the website.

Objectives are information dissemination, know-how exchange and networking as well as quality management.

Information in German at:

 <http://www.ig-passivhaus.de>



Research initiative EnOB

The objectives are ambitious: in the key research area "Energy-Optimised Construction" (EnOB), there is a resolve to reduce the primary energy requirement of new buildings to half of that entailed by current technology. At the same time, "zero energy buildings" are already being worked towards within these projects. And due to the fact that the greatest potential for energy savings resides in buildings' structural quality, there is a research focus on refurbishment. Alongside building concepts and energy concepts for new buildings and refurbishments, new materials, technologies and systems for construction engineering and for buildings' technical equipment are also being developed and tested in real operating conditions. Learn more about the projects, the methods, about who can participate, and about the makers and doers behind this research initiative.

Information is given in German and English

 <http://www.enob.info>



BINE Information Service

BINE Information Service putting energy research into practice. The BINE Information Service reports on energy research topics, such as new materials, systems and components, as well as innovative concepts and methods. The knowledge gained is incorporated into the implementation of new technologies in practice, because first-rate information provides a basis for pioneering decisions, whether in the planning of energy-optimised buildings, increasing the efficiency of industrial processes, or integrating renewable energy sources into existing systems.

Information is given in German and English

 <http://www.bine.info>



German Green Building council (DGNB)

The task of the German Sustainable Building Council is to point out and advance paths and solutions for sustainable building. This includes the planning of buildings, but also their construction and operation. The DGNB considers itself to be the central German organization for exchange of knowledge, professional training, and for a raising public awareness for this future-oriented part of the building sector.

The focus of the DGNB is on awarding the certification for sustainable building. The first time the Sustainable Building Certification was awarded was at the BAU 2009 in Munich. Initially, it was awarded for the system variation New Construction Office and Administration, Version 2008.

Information is given in German and English

 <http://www.dgnb.de>

IEA HPP Annex 32

IEA HPP Annex 32 is a corporate research project on technical building systems with heat pumps for the application in low energy houses.

The project is accomplished in the Heat Pump Programme (HPP) of the International Energy Agency (IEA).

Internet: <http://www.annex32.net>