

European Heat Pump NEWS



Heat Pump Efficiency? Measured!

New IEE project on seasonal performance factor and monitoring for heat pump systems in the building sector (SEPEMO-Build) started



The background

Heat pump technology can be used to efficiently heat and cool buildings as well as to provide domestic hot water. It does so by using renewable energy from air, water or ground with an additional need for electric or thermal energy to operate the unit. Heat pumps can be employed in all kinds of buildings - from the individual residential home to office buildings and even factories.

The use of heat pumps offers a tremendous potential for energy savings and emission reduction. On average, heat

pumps can cut CO₂ emissions by 50%. The technologies benefits are a perfect match for the EU targets on a more widespread use of renewable energy, on emission reduction, on energy efficiency and on supply security. The technology is proven, existing and reliable. The only limit to leveraging the potential immediately is stronger support for the development of its market.

In order to use the maximum impact of heat pumps, it is of key importance that the unit itself has a high efficiency and that it is designed and installed by trained expert installers.

Current European market is around 600 000 sold units in 2008, the market increasing with an average 30% per year since 2003. It is of utmost importance that the HP's installed are performing optimally, since bad installations could ruin much of the energy saving potential.

Measurements of independent testing institutes according to European Standard EN 14511 show that HP units in themselves are very efficient (high COP). However efficiency of the system inside the building will only be as good as the design. Influencing factors are the energy demand of the building, the type of heat distribution system used, climate conditions and user behaviour, as well as the quality of the installation.

The project

As little is known on the direct relation of measured COP values and systems efficiency in different regions of Europe, one part of SEPEMO focuses on the development of a harmonised approach to execute field measurements in Europe. This method will be developed in cooperation with several partners from industry that are currently involved in executing such measurements. If successful, this method would greatly contribute towards comparable measurements. Methodology development is followed by a 1 year field measurement. This experiment will measure about 44 heat pump installations using geothermal, hydrothermal and aérothermal energy sources. As measurement of air-source units has rarely been





performed in the past, its results will be particularly important. Installations are in located in all participating countries, thus covering all European climate zones. Evaluation of results will be used to improve both - the measurement approach and the installed systems. Lessons learned from this task will be used to contribute towards overall systems optimization and installer education.

Strongly related to measurements is a second main goal of SEPEMO: the **development of a calculation method for the seasonal efficiency of the heat pump system (often referred to as SPF)** that can be used towards counting the RES contribution of heat pumps in European energy statistics. This part of the project is planned to finish early enough to provide some input to the implementation of the RES Directive in the Member States of the EU.

This method should also be usable to support the installer in his daily work by enabling him to predict the efficiency of a heat pump installation before it is installed. It could also prove beneficial in supporting manufacturers and legislators to develop and execute labelling and public support schemes. As such, there is a link to current developments in the finalisation of the implementing measure on Ecodesign of energy using products (Lot 1: boilers including heat pumps).

Overall, the project is designed to provide a better understanding of the relation between heat pump units and heat pump system efficiency with a particular focus on factors influencing the latter. The European field test of heat pumps installations will be performed based on a joint measuring approach. Results will most likely have an impact on current policy making.

Indirectly its results are expected to positively influence the quality of heat pump systems leading to a more widespread use of this technology.

The project team

The SEPEMO project is coordinated by SP - technical research institute of Sweden. It has 10 partners from 7 countries, a budget of 1,5 mio. Euro and a duration of 36 months (starting 1.6.2009). It is supported by the Intelligent Energy Europe program.

Partners are

- SP technical research institute of Sweden | www.sp.se
- SenterNovem | www.senternovem.nl
- Armines | www.armines.net
- Fachinformationszentrum Karlsruhe | www.fiz-karlsruhe.de
- Electricité de France R&D | www.edf.com
- European Heat Pump Association | www.ehpa.org
- Centre for Renewable Energy Sources & Saving | www.cres.gr
- Centre Scientifique et Technique du Bâtiment | www.cstb.fr
- AIT Austrian Institute of Technology | www.aic.ac.at
- GtV Service | www.geothermie.de

Input to the project is gathered through the participants and their professional networks. These networks will also be used to disseminate the results. Special care is given to those professional groups crucial for the market development, as they represent a grey area between supply and demand: installers, heating engineers, architects. New players in the market are Energy Service Companies. These groups are targeted in individual events.

More information can be found at www.sepemo.eu

