

Economical heating and cooling systems for low energy houses



Austria

Austria is represented by the **Institute of Thermal Engineering** of the **Graz University of Technology** and by **Arsenal Research**

National team leader



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Informal co-operation with the Austrian Heat Pump Associations



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Austria national project

In Austria with current building codes (2006) and subsidy schemes space heating demands of 50-60 kWh/(m²a) for newly built single (and two) dwelling buildings and 40-50 kWh/(m²a) for multi dwelling buildings are achieved. Furthermore, also more than 1600 passive houses (heating energy demand < 15 kWh/(m².a)) are already built and a further strong growth is expected for the next years. Heat pump markets are increasing in Austria as well (Fig. 1).

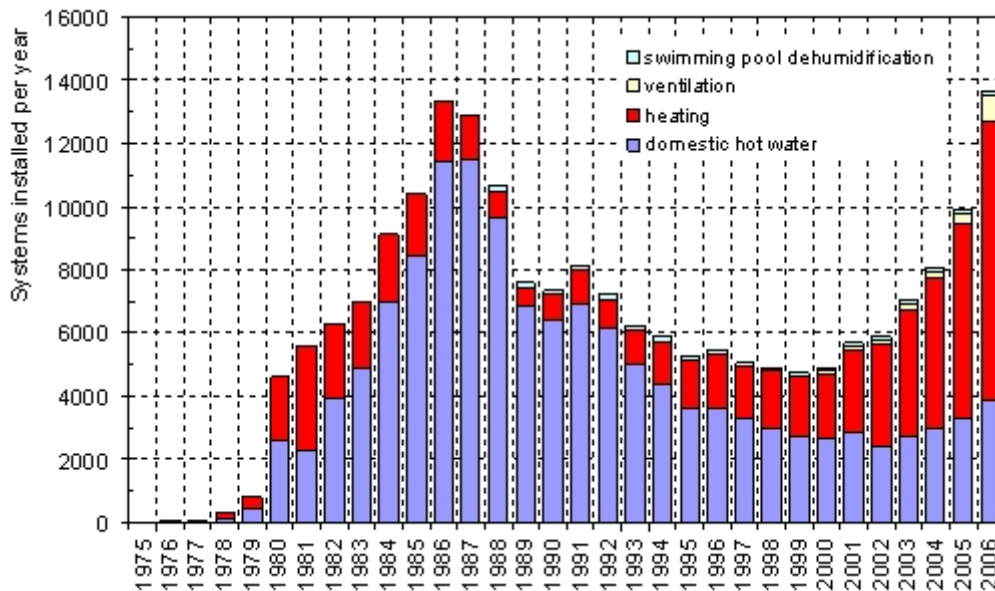


Fig. 1 Heat pump market in Austria: 1975-2006, systems installed per year (source: Faninger, 2007)

The national project at the Institute of Thermal Engineering of the Graz University of Technology is dedicated to the development of an integrated heat pump for the low-capacity range of 3-5 kW, adapted to the heating needs of low energy houses. The development comprises an evaluation of the refrigerant cycle with different refrigerants, among others CO₂, which will deliver the best refrigerant choice for the low capacity application. Another

boundary condition for the choice of the system is the availability of components on the market.

Moreover, different system configurations will be analysed by system simulations with TRNSYS, yielding an optimal system configuration for a multifunctional unit incorporating the space heating, domestic hot water and the space cooling operation.

Afterwards, a prototype of the most favourable layout will be constructed and tested in the laboratory. A field test in real application is not intended within this project.

In the beginning of 2008, arsenal research joined the national team of Austria. The activities will be focused on a field monitoring including 10 combined operating heat pump systems (space heating and DHW preparation). Additionally one compact ventilation unit for heating, cooling and DHW preparation will be monitored.

Activities are supported by the Austrian heat pump associations LGWA and BWP concerning the market survey and the heat pump statistics

Austrian links



Austrian Ministry of transport, innovation and technology

The Austrian ministry of transport, innovation and technology supports the research projects in the field of energy technologies and sustainable buildings.

Information at

 <http://www.bmvit.gv.at/>



Klimaaktiv

Klimaaktiv is a program to reduce the CO₂-emission.

Among other technologies, research and implementation of energy efficient buildings and heat pump systems are supported by the program.

Information on the heat pump activities within the program at

 <http://www.klimaaktiv.at/article/archive/14283/>

Information on the building activities within the program at

 <http://www.klimaaktiv.at/article/archive/15115/>



Haus der Zukunft

"Haus der Zukunft" (engl. "Building of Tomorrow") is a subprogram of the Austrian R&D Program on Technologies for Sustainable market diffusion of components and construction methods for dwellings and office buildings which correspond to the principles of a sustainable technology development.

Information at

 <http://www.hausderzukunft.at>



Energiesysteme der Zukunft

"Energiesysteme der Zukunft" (engl. "Energy Systems of Tomorrow") is a subprogram of the Austrian R&D Program on Technologies for Sustainable Development and focuses on the development of new technologies and concepts for a flexible and efficient energy system based on renewable energy sources.

Information at

 <http://www.energiesystemederzukunft.at>



Austrian Energy Agency

The Austrian Energy Agency is the Austrian energy research and policy institution in which the federal and the provincial administration and some fifty important institutions and corporations from a variety of economic sectors co-operate.

Information on

 <http://www.energyagency.at>



IG Passivhaus Austria

The IG Passivhaus Austria is an information network on passive houses in Austria by regions and as a central organisation. Objectives are information dissemination, know-how exchange and networking as well as quality management.

Information on

Information on the building activities within the program at



<http://www.igpassivhaus.at/>



Arsenal Research

Arsenal Research runs a development and test centre for heat pumps. Activities include among others the quality testing of heat pumps, education and certification of installers and monitoring of heat pump systems.

Information at



<http://www.arsenal.ac.at/>

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 Program (HPP) of the International Energy Agency (IEA).

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

