

session and organised the workshop and the study trip.

The picture shows delegates on the study trip to Austria's well-known producer of heat pumps– Neura Electronics.

The managing director, Mr. Peter Huemer, showed the production line, the company's latest innovation, and gave an overview presentation of the Upper Austrian heat pump market. (Source: Neura: www.neura.at)

The presentations were as follows:

Progress and impact at the European level

Mr. Karl Ochsner, Chair of EHPA Strategy Committee, presented the next measures taken by the EHPA for boosting heat pump technology at the European level, and said that "The aim is to become a voice of the heat pump sector in EU and to be a back-up base for national actions".

Progress and impact driven by the national government

As an example of a national programme on climate protection, Mr.



Andreas Bangheri presented the initiative of Austria's Federal Ministry of Agriculture, Forestry, Environment and Water Management – klima: aktiv. Klima: aktiv offers tailor-made programmes for all those who want to benefit from the advantages offered by modern, climate-friendly technologies. A major target of the "wärmepumpe" klima: aktiv programme is to promote an environmentally-friendly and effective heating system. This has benefits in two ways – it strengthens the domestic heat pump market and boosts the competitiveness of the Austrian heat pump industry, as well as ensuring that Austrian consumers benefit from high-quality products. For more Information: www.waermepumpe.klimaaktiv.at

Ground source heat pumps in different countries

Experts from Norway, Canada and the USA (Jorn Stene, Vasile Minea and Moonis Ally respectively) presented the current market situation in respect of ground source heat pumps. They focused their presentations on grants/subsidies, systems used, sales figures and typical national aspects in the field of heat pump technology. (See the Japanese information campaign)

(Source: Presentation: Katsunori Nagano, Sayaka Takeda, Takao Katsura)

Technical aspects

As far as the technical aspects of ground source heat pumps are concerned, a new design tool was presented by representatives of the Hokkaido University. Mr. Present-



schnik, from the research testing centre, described the current status of development, testing and monitoring of heat pumps. Mr. Widerin, project manager, showed how the building fountains can be used as heat sinks. The picture shows the Norddeutsche Landesbank, Hannover.

Technical data:

Type of Absorber: 122 drilled piles
 Heating Capacity: 150 kW
 Cooling Capacity: 350 kW
 (Source ENERCRET, Nägele)

Mr Bangeri gave the closing remarks for the event:

"For me, it was a pleasure to take part in the workshop. On the one hand, I learned a lot about the utilisation of ground source heat pumps in other countries, and on the other hand about real and potential problems and burdens. The main task is to work together in a strong network to encourage our visions for the heat pump market".

ANNEX30

Annex Meeting in Aachen

At the third Annex meeting on 04.04.2006 in Aachen/Germany, it was reported that Task 1 "State of the Art, Market Analysis" has been finalised, while Task 2 "Matrix of heat pumps", (and in particular, the type and number of case studies) and "RD&D projects" was discussed. Finally, Task 3 "Overcoming economic, environmental and legal barriers" was introduced and a list of problems and barriers for the use of heat pumps in retrofitted buildings was discussed. The operating agent, IZW e.V, has already started preparation of the final report of Task 1.

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ANNEX 32

Multifunctional heat pump systems for low energy dwellings

At present, most heat pumps are installed in newly built dwellings. In the low-energy building sector in particular, multifunctional heat pump systems which cover different building needs such as space

heating, domestic hot water heating and ventilation have advantages. Annex 32 entitled "Economical heating and cooling systems for low-energy houses" was therefore started in January 2006. Its objectives are to extend the functionality range, e.g. to space conditioning incl. cooling and de-/humidification, and to improve both system components and integration with regard to design and control, subject to the limitations of investment costs. The work will include field testing to gather more experience of these systems. The kick-off meeting took place in Muttenz, Switzerland, at the end of April 2006. Participating countries are Canada, Switzerland (Operating Agent), Germany, Japan, the Netherlands, Sweden and the USA.

Further countries interested in the Annex 32 are Norway and Austria. The main subject of the kick-off meeting was the project planning to coordinate the national contributions. Canada's contribution is concerned with NOVOCLIMAT low-energy dwellings for cold climates, complying with the Canadian R-2000 building standard. Both optimisation of the design and control and field testing are planned.

Germany has two comprehensive field testing projects, one for ground-coupled and outside-air heat pumps in low energy buildings, and one for heat pumps replacing boilers in existing buildings. Field test results aim to discover weak points and to enhance the performance of the heat pumps under investigations. A further point is to evaluate if refrigerant loss occurs, and how this affects operation of the system.

Japan has a wide range of different climatic conditions, so customised heat pump solutions have to be developed. Even though many heat pumps are in use in Japan, most of the systems are small split units operating in reverse application for space cooling. Japan's project contribution is therefore entitled "The future heat pump for Japan", referring to the development of more flexible and mul-

tifunctional solutions to cover the different requirements.

Sweden has an extensive heat pump market, both in ground-coupled and exhaust air heat pumps. Due to the Swedish building regulations, an exhaust air heat pump is installed in nearly every new dwelling. However, the systems are not primarily intended for low-energy buildings, and so redesigns are needed at both component and system level, which is the focus of the Swedish contribution.

In the USA, 57 % of residential energy consumption is used for space heating, domestic hot water (DHW) heating and space cooling. The US Department of Energy (DOE) has therefore launched a research program to reduce consumption to half of this value. A particular focus in the USA is dehumidification, needed for comfort in the climatic conditions in the southern states. Multifunctional integrated heat pump systems have been identified as the best suited system in previous feasibility studies. Design options are being tested at present, and a prototype field test is scheduled for the end of 2007.

Switzerland's contribution is dedicated to the investigation of the cooling function. In low-energy dwellings with large glass façades in particular, there is a risk of overheating in

the summer. Even though cooling in energy-efficient single-family dwellings is not very common yet, manufacturers are redesigning their heat pumps to include a comfort cooling option. In fact, a cooling option can increase comfort in the summer, and if the systems are well designed, the additional energy consumption may be marginal. Thus the objective of the contribution is to develop standard layouts and controls for integrated heat pump systems, including space cooling.

Having similar objectives but different scopes, a close information exchange has been established between IEA HPP Annex 2 and Annex 48 in the Energy Conservation in Buildings and Community Systems (ECBCS) program entitled "Heat pumping and reversible air conditioning". The main focus of the ECBCS Annex 48 is (as far as possible) reversible operation of chillers in commercial buildings.

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Figure 1: Participants at the kick-off meeting of Annex 32 in Switzerland