EUROPEAN HEAT PUMP NEWS

issued by the European Heat Pump Association EHPA

EUROPEAN HEAT PUMP ASSOCIATION

Issue 2/4, December 2001

EHPA NEWS

EHPA activities

Rayner Mayer, Chair, reports

The executive of the EHPA met in Brussels on 25/26 October and was briefed on two recent European Commission initiatives. Marco Loprieno, DG Environment, described the communication from the Council on the first phase of the European Climate Change Programme. Pablo Fernando Ruiz, DG Enterprise, presented the rationale for a new approach directive designated EEE (electrical, energy and environment). This directive aims to reduce the overall environmental impact of an electrical machine or apparatus during its lifetime, by requiring a harmonised level of environmental protection.

Membership applications for Stiebel Eltron International, Alpha Innotec, HEA Trade Association and BSRIA were approved. The formation of the Estonian Heat Pump Association was welcomed and its membership application accepted.

The following definition of a heat pump was agreed following a request from the Commission for the energy performance of buildings directive:

The heat pump is a product that can upgrade low grade renewable energy (from air, water or ground) to provide space and water heating and/or extract heat, thereby providing cooling: a small amount of external energy is used to transfer heat, not create it.

The role of the EHPA web site was discussed and it was agreed that the site should focus on and describe the activities of the Association in developing the European market for heat pump systems. The number of site visits was increasing steadily.

The initiative of the Czech Heat Pump Association in attracting 70 designers, architects and planners to a one-day symposium in Prague on 15 October was welcomed. This type of activity needed to be replicated in countries where the market transformation had only just begun.

Rayner Mayer

The **EHPA Annual general meeting** will be held on 1 March 2002 in Paris and will be hosted by EDF with a guest speaker from the IEA. If you wish to attend please contact Axel Lehmann, EHPA secretary, see back cover.

GENERAL

Swiss promotion campaign 2001

In coordination with the 'Energie Schweiz' (Swiss energy) programme the FWS, the Swiss association for the promotion of heat pumps, is launching another promotion campaign this autumn. The campaign makes use of children's drawings and their thoughts and ideas about future and renewable energy. The best entries from a competition held in spring are now appearing in advertisements throughout the country. An example in French is shown below.

Source: H. Bruderer, FWS

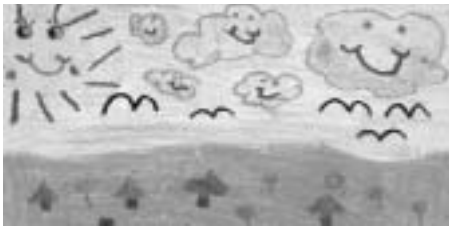

Figure 1: Drawing used in Swiss promotion campaign.

SAVE project to start market transformation is finalised

The SAVE project "Transforming the market for electrical heating of residential dwellings" was finalised on 31 October 2001. The final report contains an overview of the results, and an analysis of the European heat pump market. The excerpt below gives an initial impression. The report can be obtained from Rayner Mayer, Sciotech, UK.

By analysing specific growth/maturity factors we can evaluate the heat pump market in various countries and determine whether it is static or dynamic.

The following factors are considered:

1. *Availability of heat pump technology* refers to the presence of domestic or foreign heat pump manufacturers, agents or sales representatives who offer heat pump systems through organised and trained resellers.
2. *Economic incentives* consider whether it is viable or even profitable to install heat pumps compared to other heating alternatives. Are energy prices advantageous for heat pumps or not? To be competitive the heat pump installation needs to have a payback period for the initial investment of no more than 5-7 years compared to alternative heating systems.
3. *Political decisions* means legislation etc. that promotes heat pumps compared to other heating systems. This can be standards or regulations controlling the maximum amount of CO_2 emissions and the maximum allowable capacity (kW) of energy (kWh) for heating, or standards for sizing the heating system to cover the heat loss of the dwelling and transitions to low-temperature heating systems.
4. *Trained installers and resellers* are essential for a functioning market and continued market growth.
5. *Awareness amongst end-users* creates an autonomous, self-developing and ongoing market where there is a "market pull" from end users demanding a better heating alternative.
6. *General acceptance* among decision makers, engineers, technicians, politicians, architects, builders, housing associations, trustees, landlords, tenants and electrici-

Table 1: Maturity factors of the heat pump market in various European countries.

Factor	AT	CZ	DE	DK	FI	FR	NL	RO	SE	SP	UK
1	3	2	2	2	2	2	2	1	3	2	1
2	2	2	2	2	2	2	1	1	3	1	1
3	2	2	2	2	1	1	3	1	2	1	1
4	3	2	2	2	2	1	2	1	3	2	1
5	3	1	1	2	2	1	2	1	3	1	1
6	2	1	1	1	1	1	1	1	2	1	1
SUM	**15**	**10**	**10**	**11**	**10**	**8**	**11**	**6**	**16**	**8**	**6**

ty supply companies. These people are the ones designing the buildings, consulting the house builders and owners and informing the public. To obtain and retain general acceptance it is also very important that the heat pumps offered on the market are tested and reliable.

Table 1 summarises the growth/maturity factors mentioned above. A factor score of 1 to 3 is given for: Austria (AT), Czech Republic (CZ), Germany (DE), Denmark (DK), Finland (FI), France (FR), Netherlands (NL), Romania (RO), Sweden (SE), Spain (SP) and the UK.

The scores show that Sweden and Austria are best prepared for widespread market penetration owing to a long tradition of heat pump technology and continuous information/advertisement campaigns devoted to heat pumps. Long-term use of the technology has also provided feedback on benefits and time scales. A sustained demand for the technology has encouraged market players to manufacture and market the product with increasing confidence. Various authorities have recognised the technology and shaped legislation and education around the products. Countries like Finland, the Netherlands and Czech Republic have worked conscientiously to promote the product and are now experiencing powerful growth and strong market development. The UK, France, Romania and Spain have underdeveloped markets, although the Spanish market for cooling is well developed.

To achieve a sustainable market penetration for heat pump technology the six factors mentioned previously must be promoted at various stages by the relevant institutions.

Source: SAVE project report, see introduction

Atlas of geothermal potential

Around 10,000 of the 60,000 heat pumps in operation in Germany are installed in the federal state of North Rhine-Westphalia (NRW). NRW is also striving for the leading role in the utilization of geothermal energy in Germany. An essential step towards this goal is a study of the geothermal potential of NRW.

This study focuses on the underground use of heat by ground source heat pumps located at depths of up to 100 metres. The work of the NRW Geological Service will result in digital regional maps showing the geological situation and the geothermal potential at four depth levels. In addition the database comprises detailed information on the structure of the ground, ground water flow, protected areas, etc. This information will assist designers in planning the number and depth of heat exchanger boreholes correctly.

The initiative 'NRW, Energy sources for the future', Düsseldorf, will publish this study on CD-ROM (in German) in spring 2002. For more information e-mail: geothermie@gla.nrw.de

A similar project in the federal state of Baden-Württemberg is being carried out by the German utility EnBW. The first phase of the work concentrates on drawing up a geothermal map of the city of Ettlingen, which was selected due to the favourable geological conditions in the area. First results are expected at the end of this year.

Source: FIZ Karlsruhe

MARKET ISSUES

Substantial progress in the Swiss replacement market

In Switzerland, the 'Energie Schweiz' programme is pushing for a substantial increase in the market share of heat pumps in the replacement market. Following the Swiss Federal Office of Energy (SFOE) competition "Swiss Retrofit Heat Pump" the most promising concept was selected in spring and two prototypes have been built for field testing. A remarkably efficient 10 kW retrofit heat pump was introduced onto the market in September 2001 as a result of another research programme. This high temperature 'turbo heat pump' provides an output temperature of 65°C, even at outdoor temperatures of -12°C. It is designed to replace oil-fired boilers with radiator systems. The heat pump is equipped with an efficient fully hermetic scroll compressor with intermediate vapour injection and works with the reliable R407C.

Source: H. Bruderer, FWS

Figure 2: Turbo heat pump for retrofit applications.

REGULATIONS

Income tax rebate to promote heat pumps

A new income tax rebate has been introduced in France this year for energy-production equipment (electricity or heat) using a renewable energy source (solar, wood, wind, ...). The inclusion of the heat pump on the list is a result of communication of the heat pump commission with ministries. The income tax rebate is 15% of the cost of the equipment (heat pump plus outdoor unit, whether air- or ground-source). This measure relates both to new and existing dwellings (for the latter, the income tax rebate is cumulative with reduced VAT for dwellings more than 2 years old) but only applies to main residences. This measure provides financial support for the implementation of renewable equipment – including heat pumps – and is an initial step towards national recognition of the heat pump as equipment using renewable energy.

Source: Catherine Ducruet, EDF

Confort Eco Nature established

France - The French market for heat pumps has grown considerably over the past three to four years, mainly due to the efforts of suppliers and the electricity supply company, EDF.

A "four seasons" concept of all year round comfort using both heating and cooling has been marketed successfully with the promotion of complete packaged solutions, including both heat pump and heating/cooling emitters for the building interior (floor heating, fan coils, air systems)

Since total customer satisfaction is considered to be a key factor in choosing a "four seasons" system in France, the suppliers of these systems agreed in December 2000 to form an association "Confort Eco Nature" in order to enhance the quality guarantees of these installations and to promote them effectively.

The aim of this association is to establish systems and services for the development and quality control of "four seasons " solutions for residential applications, which provide heating, cooling and energy saving by using heat pumps.

The seven founding members of the association are: CIAT, CTA Confort, DELEAGE, MULTIBETON, RIBO, TECHNIBEL and TRANE, with new members joining shortly.

The essential components of the "four seasons" promotion are:

- heat pump
- control system
- back-up heating system for the heat pump (electrical heaters)
- heat emitters
- heating consumption counter (optional)
- sanitary hot water production with a heat pump (optional)
- plans and sizing of the installation

Compulsory services that must also be offered are:

- indications of forecast energy consumption under normal conditions
- installation plans (supplied by design company / construction company)
- project management by a qualified installation company
- quality control of the installation by an official control organisation
- commissioning of the installation in the presence of the end user
- guarantees from the manufacturer including parts and labour, conditional on the existence of a maintenance contract
- annual maintenance contract for at least 2 years

The French market for residential heat pumps (excluding air conditioners) is estimated at 7000 units in 2000, with continued growth in 2001.

Simon Armstrong, CIAT, France

COUNTRY IN FOCUS: FRANCE

Market

Following initial failure, the French heat pump market has expanded to over 7,000 pumps (including reversible units) installed in new houses in 2000. This represents 2.4% of new dwellings (320,650 houses built in 2000). The following chart shows sales in France (including reversible heat pumps):

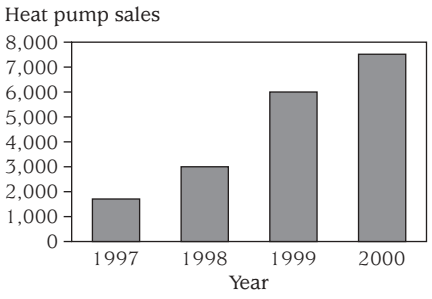

Figure 1: Evolution of the French heat pump market.

The heat pump market share is divided evenly between houses and flats. However, there is a big difference in the type of heat distribution associated with heat pumps. Heating and heating-cooling floors are installed in 94% of houses, but in only 16% of flats. There is also a big difference between the current heat pump market and that of the 70s and 80s. Today, most systems are installed as the main heating system in new dwellings, with complementary electrical energy integrated into the installation at the outset. In the 70s and 80s, heat pumps were mainly installed in existing dwellings in association with fuel boilers.

There were an estimated 30,000 heat pumps at the end of 2000, excluding the 'PERCHE' heat pumps installed before 1985.

Four important factors explain the current favourable development of the heat pump market:

- The cost of fossil fuels that makes the heat pump very competitive in terms of operating costs.
- Increased awareness of environmental problems (greenhouse effect, renewable energy sources and energy efficiency/demand side management).
- A voluntary approach by EDF, which has encouraged the implementation of quality solutions via the VIVRELEC promotion,
- Increased customer awareness and acceptance in a growing market.

Market players

The following players exercise a role in the development of the heat pump market in France: ADEME, EDF, the Heat Pump Commission, and Confort Eco Nature.

Joint actions ADEME and EDF

ADEME, the French Agency for Environment and Energy Management, considers that heat pumps represent a rational use of electricity and help reduce global warming, and that geothermal heat pumps are fundamental for Renewable Energy, Rational Use of Energy and Demand Side Management.

In June 2000, EDF and ADEME signed an agreement to carry out joint, co-financed projects. The DSM part of this agreement includes work on heat pumps for domestic heating for which the following studies have been started:

- assessment studies of the technical, economic and environmental potential of heat pumps. These should confirm that the development and deployment of residential heat pumps leads to energy saving and the reduction of greenhouse gas emissions.
- a market study aimed at dividing the French heat pump market into segments by technology/region/type of dwellings, etc. according to the technical, economic, energy-related and environmental advantages and disadvantages of the different technologies proposed. This will lead to a marketing plan with proposals for promotion initiatives and support measures that could be carried out by EDF and ADEME to assist the development of heat pumps in France.

In parallel with these studies, EDF and ADEME are considering setting up a national accounting system for the heat pump market (number, flows, consumption, heat produced), which could eventually be integrated into the French energy balance. In addition, experiments will be conducted to prove the technical feasibility of heat pump technologies, their economic competitiveness and their potential for energy saving.

EDF's position on heat pumps

In 1999, EDF issued a statement on heat pumps as heating systems. They are regarded as important from an energy and environmental point of view, being an energy-efficient DSM tool on the one hand and a system that exploits free, renewable energy and reduces the greenhouse effect on the other. The purpose of this is increase awareness by French and European authorities, so that heat pumps eventually take their rightful place in national and European policies.

EDF's commercial promotion

In 1997, EDF started offering financial incentives to promote high quality electrical heating in new housing through a promotion called 'Vivrelec'. This promotion fixed requirements for the dwelling insulation, ventilation, electrical installation and the performance of the heating and hot water equipment (including heat pumps). With the new thermal regulations introduced in 2000 in France (RT2000), the requirements in terms of insulation were similar to the standards achieved by the Vivrelec promotion, leading to a redrafting of Vivrelec. EDF's financial incentive has now been reoriented in order to increase its attractiveness and encourage the marketing dynamics of the promotion. These incentives break down into four focal points:

1. A quality incentive of Euro 300 per house to promote high quality systems.
2. An energy performance incentive aimed at encouraging professionals to seek a higher level of performance than required by RT 2000. The incentive ranges from 1.5 - 4 Euro/m^2 depending on the gain in performance achieved.
3. Marketing support for professionals to encourage them to promote new Vivrelec dwellings
4. A loan for private individuals, at a variable reduced rate (between 3 - 4%). For heat pumps, the loan amounts to a maximum of 100 Euro/m^2.

Heat Pump Commission

This Commission, formerly the French heat pump association, is a group of players working on heat pumps in France (ADEME, EDF, manufacturers, technical centres, installers, etc.). Since 1996 it has worked mainly on preparing professional technical guides containing recommendations and requirements for the different heat pump heating systems on the French market. These guides serve as a basis for Promotelec to monitor heat pump installations and to obtain the Promotelec label certifying the quality of units installed as part of EDF's Vivrelec promotion.

Recently, the Commission campaigned for the recognition of heat pumps in France and their incorporation into national policies on energy efficiency, control of the greenhouse effect, etc. These actions have been successful and the tax credit established in 2001 will also benefit heat pumps.

Impact of recent regulations

The thermal regulation for buildings *RT2000* specifies requirements for the energy use of residences. To conform to RT2000, the different products/systems must be covered by certification relating to the energy efficiency of the product/system. However, there is no certification for heat pumps: the EUROVENT certification (verification of performance) is not sufficient. EDF and the manufacturers are currently considering the best certification scheme for evaluating heat pumps in RT2000.

Certain *tax measures* encourage the development of heat pumps in France. For companies, a one-off repayment was created in 1999 for reversible air-conditioning systems with a COP higher than 2.7. For private individuals, an income tax rebate was introduced in 2001.

There are two additional financial measures for private individuals that promote not only heat pumps but also most equipment installed in dwellings:

- Since late 1999 VAT on equipment and labour has been reduced to 5.5% instead of 19.6% for dwellings more than 2 years old. The low VAT rate also applies to other heating systems, for example boilers.
- An income tax rebate introduced in 2000 for large installations in flats more than 2 years old applies to heat pumps and boilers.

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