

ACTION PLANS TO PROMOTE HEAT PUMPS ON EUROPEAN AND NATIONAL LEVEL

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Abstract: Heat pump action plans on European and national levels should contribute to the acknowledgement of heat pumps as a technology for using renewable energy and to consider the energy programmes of all member states.

Heat pump action plans show the potential of this technology in respect to economic and ecological objectives concerned with the reduction of primary energy needs. CO₂ emissions, the reduction of emissions of other greenhouse gases and pollutants, and the creation of added value and employment. The action plans also recommend detailed measures to execute for realising the achievement of these targets.

Heat pump action plans constitute therefore an important tool which serves to support industry delegates, policy makers and the Heat Pump Association in their daily work of providing information and in their exemplary role. As an official document an action plan should express that the industry, united behind jointly developed target strategies and measures, can encourage Government representatives, politicians and other people affecting a country's energy policy, with one voice.

Key words: *heat pump action plan*

1 INTRODUCTION

The project "heat pump action plan" was indirectly initiated by an announcement by the European Commission of the year 2004 concerning the contingent of renewable energy in the EU. Therein the European Commission commits itself to submit a biomass action plan. This action plan should describe how the utilisation of biomass energy can be promoted. Measures to promote the use of biomass for heat and electricity generation as well as in traffic should be described besides overall measures concerning biomass supply and research. Furthermore financial aspects should be included.

However, there was no commitment to compile an action plan for ambient heat. The idea of an action plan, thus, seemed very interesting. Therefore it was obvious that the European Heat Pump Association (EHPA) would formulate such an action plan and would encourage national associations to do likewise.

Austria was the first country to respond to the request. Thus the first two action plans were commissioned and, in the meantime, completed.

2 INITIAL SITUATION

Sustainable development is a concept that for a long time served as a metaphor for the imprecise and ineffectual feigning of being disposed toward action and goal orientation. Sustainable development, however, implies the necessity to take action to realise sustainability. This action offensive is finally noticeably present in the European energy policy. In its “Energy Package 2007” the European Commission states clear energy and climate goals, the well known 20 % targets. To attain these targets a Directive, now shortly to be decreed, was submitted. The directive “The Promotion of the Utilisation of Energy from Renewable Energy Sources” includes legally binding targets for the total share of renewable energy sources of every member state [KOM/2007]19] and requests greatest commitment and effort of them to attain the ambitious goals. In so doing renewable energy becomes a very main issue in the economic policy of every member state.

The intensified energetic utilisation of ambient heat can play an important role in attaining these political goals and tasks. The heat pump technology¹ contributes to climate, air and resources preservation as well as to a better guarantee of supply and added value to a national economy. Furthermore it guarantees that for tasks to be solved within the framework of European energy policy one can rely on a longstanding technology, albeit it is a young one with regards broad utilisation. This is important in so far as that up until now energy supply has rested on the few fossil fuels whilst renewable energy has been discriminated against in its development, or at least not been taken appropriately seriously. This has led to the present situation we have whereby numerous promising energy technologies are still a long way from being able to play out their true potential and the necessary capacities cannot accordingly be made available for large scale energy supply.

We can take the example of the extremely innovative technology of photovoltaic power generation which, with regards to economic and energetic efficiency, is a long way off from a real breakthrough. We can take the example of the energetic utilisation of biogas, whose mixture with natural gas meant its deployment has so far only been realised in pilot projects because of the high costs of gas cleaning. We can take the example of the thermal utilisation of biomass which, due to the lack of fuel products suitable for large scale use, is utilised widely only in rural agricultural areas (logs, wood chips). Utilised in other areas it is subject to extreme price fluctuations due to scarcity of resources.

For these reasons it is important to be able to rely on technologies that are technically fully-developed and therefore guarantee a reliable basis for energy supply with renewable energy sources. Among these technologies we can count, for instance, power generation through wind and hydropower as well as the thermal utilisation of solar energy through solar panels and heat pumps.

However, it is important to utilise all forms of renewable energy and not to restrict any in their development, because only this diversity can offer a strong alternative to fossil energy sources.

¹ NB: 1855 the heat pump was utilised for the first time by an Austrian – Peter Ritter von Rittingen – in the saline Ebensee in salt production

The following illustration shows the different renewable energy sources and its origins.

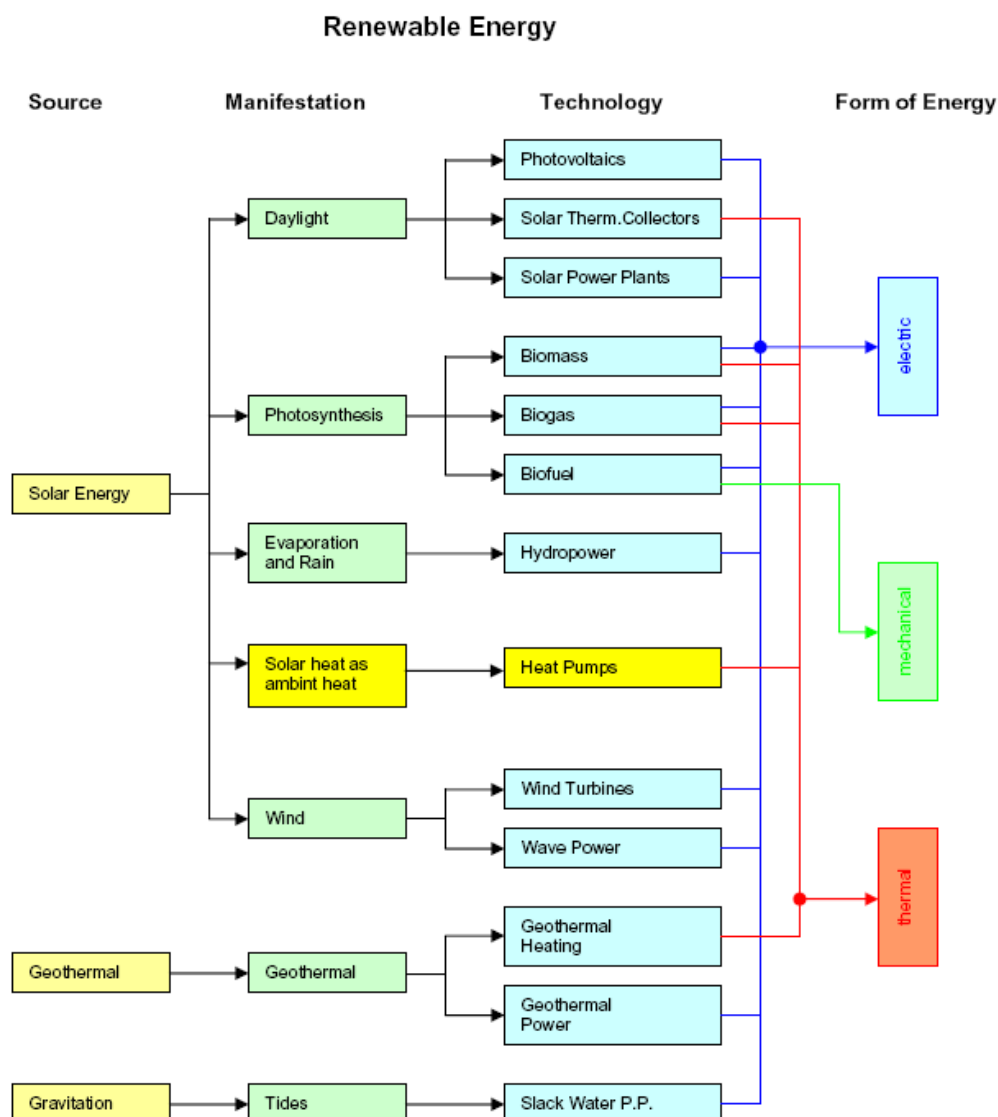


Figure 1: Overview Renewable Energy, According To (Biermayr 2006)

To demonstrate the contribution that the ambient heat can make within renewable energy sources it is necessary to express the potential of the energy producible in figures. Equally, it is necessary to state the connected investments and the energetic preconditions necessary for the development of these energy sources. A picture must be drawn which clearly presents what opportunities the broad utilisation of ambient heat can offer the individual EU member states and at the same time what requirements are connected to its being made available. A possibility of accomplishing these tasks is seen in the compilation of heat pump action plans.

3 GOALS OF HEAT PUMP ACTION PLANS

Definition: A heat pump action plan is a country-specific programme stretching over several years for propagation of the heat pump technology. As national objectives and measures in the energy sector originate from the EU level it is also necessary to support an EU-wide coordinated line of action. That has to be determined on the basis of EU-wide potential of

the heat pump technology. For that reason an aggregated outline of opportunities and potentials of utilisation in all member states is required – and could be realised through a European heat pump action plan.

The main goal of a heat pump action plan is the spreading of ambient heat utilisation based on the heat pump technology. The action plan is then the manifestation of the will and commitment of the heat pump industry to conform with the EU goals in the area of renewable energy. Furthermore, the action plan represents an proposition to the responsible parties to draw on this potential. Not every industry affected by the energy and climate targets is so broad-minded, accessible and active as the heat pump industry with respect of these goals. Often the objectives are considered to be a restriction rather than an opportunity. The question is therefore occasionally asked why politically responsible parties needlessly encumber these goal attainments through criteria that is too strict concerning the utilisation of heat pumps.

The heat pump action plan is also a benchmark instrument that supports the spreading of successful measures and practises among the member states and the players in the heat pump industry.

Heat pump action plans support the requirements, that the parameters that determine the success of the heat pump technology are transparent and thereby comprehensible to other countries. Likewise barriers and constraints, which have so far hampered the breakthrough of the technology in the particular country, can be addressed.

In addition the action plan offers the possibility to formulate the objectives with regards the amount of energy generated by heat pumps. Furthermore the action plan states the proposed mix of measures for the terminated attainment of these goals. In this sense the action plan is also a specific call to action to the industry, politicians and those responsible in energy management. Ideally the action plan also states the offices responsible for putting the measures into practice, the projected costs as well as the time frame necessary for implementation.

In summary the following goals can be pursued through heat pump action plans.

- Recognition of ambient heat (utilised through the heat pump technology) as a renewable form of energy for generation of heat, hot water and cooling of buildings.
- Active informing about opportunities and possibilities of the technology
- Anchoring of energy from ambient heat in national energy plans and integration in relevant policy areas.
- Description of ambitious objectives with regards utilisation of ambient heat
- Realisation of progress in propagation of the technology on national as well as EU level
- Compilation of market development programmes to attain the objectives.
- Further development and concentration of activities in the heat pump industry
- Transfer of know-how and information
- Networking of players within the industry
- Strengthening of international cooperation
- Documentation of the national heat pump industry's commitment
- Improvement of the public perception of the heat pump
- Increase in institutional acceptance and financial support
- Increase in support for research and development

3.1 Motivation for the Preparation of National Action Plans

The national heat pump action plan achieves the said objectives by making the heat pump technology a constant element of future-oriented political programmes for pushing renewable, climate protecting energy sources or for pushing efficient technologies. As such programmes within the EU largely derive from comprehensive EU targets, a goal should be to start an action plan on European level, which estimates the contribution potential of the heat pump within the EU, to develop action plans in the respective countries and thereby be able to describe in detail the country-specific contribution potential to the European climate and energy goals. This is also important because the potential for ambient heat is different in the individual member states and every country has its own history concerning utilisation of ambient heat.

3.2 Why to work out Action Plans?

As stated explicitly in the content, the purpose of developing national action plans is a major project that will need the cooperation of many players. The basic requirement for the success of this project is therefore a directed commitment of the industry delegates from the respective countries. Ideally the National Heat Pump Associations will commission or execute the project. Furthermore it would be advantageous if the players who will implement the measures would be involved in the compilation of the action plan.

To attain the goals expressed in the action plan, and in so doing guarantee the success of the plan, it would be important that the goals and the measures are decided upon and committed to by as many players as possible.

For the simple aggregation of the individual national plans to a plan on European level it would be recommendable that the member states decide on a joint outline for the preparation of action plans. This manual could state several recommendations for the implementation of the project. Since the compilation of an action plan is voluntary, any support that would increase the probability that any EU member state would initiate the project or even have completed it in the following years would be appreciated.

Ideal conditions for initiating the action plan would be the compilation of national action plans within the framework of a joint European project which could be conducted as an EU Research Programme. This possibility would be important since financial and personnel expenses could cause a significant obstruction to the compilation of action plans in many countries.

4 PHASES OF THE COMPILATION PROCESS

Preparation Phases

The first Step towards compiling an action plan is to state the actual situation regarding the spreading of heat pump technology. The national heat pump associations annually publish sales figures from the heat pump producers – this data serves as a basis for the determination of market potential – which is projected in a shared discussion process.

Plan Development

For the compilation of the action plan specific goals, strategies and measures must be determined.

S M A R T goals

S = Specific, specific goals coordinated to local conditions are stated

M = Measurable, the attainment of goals can be observed, measured and determined

A = Acceptable, a consensus among the players concerning the goal is given

R = Realistic, the goals are generally attainable under the given conditions
T = Terminated, a specific time frame is given for the goal attainment

Development of the Measures Catalogue

A core element of the action plan is the catalogue in which possible measures are stated. In the process measures of high efficiency and acceptance should be emphasised. The more specific the measure the more implementable. Therefore actions to be implemented on short notice should be predefined as concretely as possible and even more than is the case with long term measures.

Implementation of the Measures Stated in the Plan

To guarantee that the compilation of the plan is also put into operation it is important to assign responsibility for its implementation to an office. One person must be responsible for, and assure, its translation into practice.

Monitoring

Furthermore the implementation of the action plan should be monitored continuously. Also the establishment of status reports to comment on the status of implementation would be appreciated since the time frame of the action plan mostly expands over several years.

Evaluation

After the execution of the transition period a complete assessment and evaluation of the achievements and the phrasing of a final report would be useful. The monitoring and the evaluation of the achieved results enables those concerned to optimise the relation between the applied resources and the achievements.

Within the scope of the evaluation the decision should be made as to whether to develop a further plan or not.

5 CURRENT SITUATION

The idea to develop national heat pump action plans was born by EHPA in the year 2007 and is therefore rather new. Within the EHPA the compilation of the action plan was delegated to the communication officer. As a subsequent result of this decision the Federal Association of Heat Pumps Austria (BWP) equally initiated a compilation of an Austrian heat pump action plan.

Since this time two plans have been completed. Both action plans will subsequently be introduced and the process of their compilation as well as the experiences gained based on the Austrian action plan will be outlined.

5.1 European Heat Pump Action Plan

The E-HPAP was initiated by the European Heat Pump Association EHPA and was compiled by EHPA Communication Officer Thomas Nowak between January and November 2007.

The E-HPAP describes the potential that can be realised through heat pumps within the EU technology. Approx. 20% of the EU goal to reduce primary energy consumption, to reduce greenhouse gas emissions and to increase the share of renewable energy until 2020 could be covered by heat pumps. To realise this potential different conditions have to be fulfilled, that are stated in detail in the action plan. Below these measures and their effects are shown.

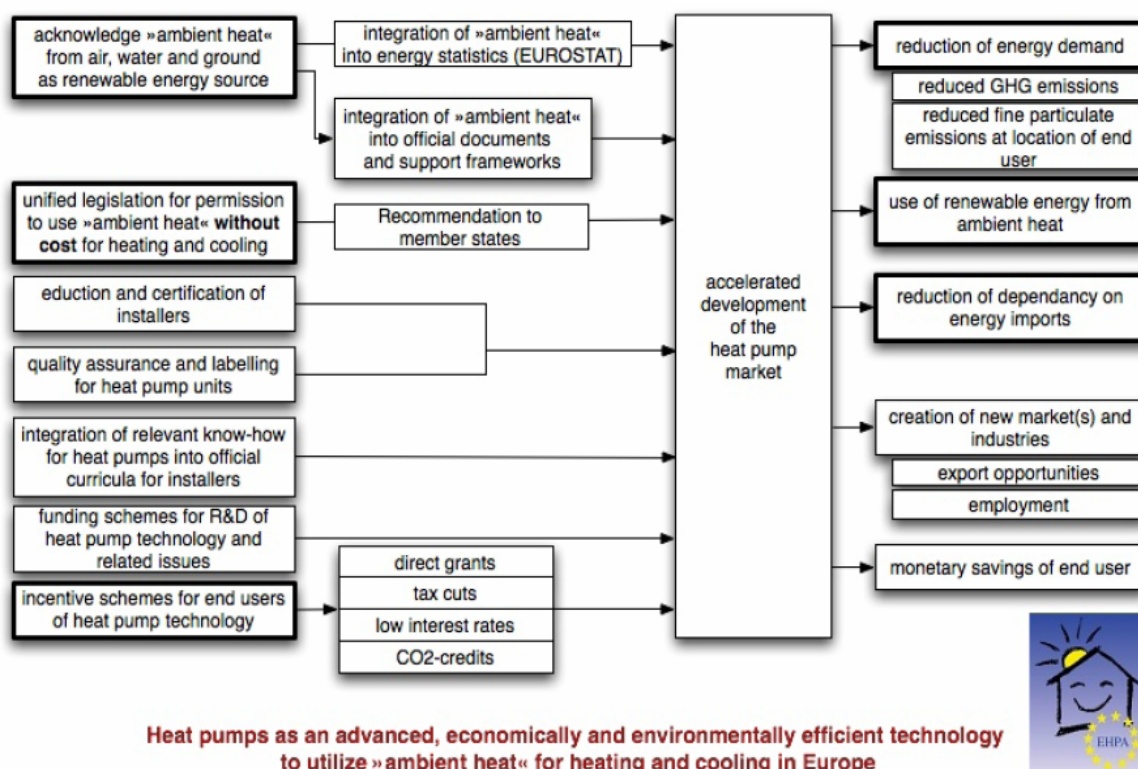


Figure 2: Measures for Realising the Contribution Potential of Heat Pumps (E-WPAP 2007)

With this the action plan can be used as a basis for official offices to develop the potential of ambient heat.

5.2 Heat Pump Action Plan Austria

The compilation of the A-HPAP was commissioned to an external expert. The work began in February 2007 and the A-HPAP was completed in June 2007.

In two scenarios the A-HPAP describes ecological and economical advantages that can be attained through the broad utilisation of the heat pump for warm water supply and room heat generation. These scenarios relate to both new buildings and reconstruction of single-family and multi-family houses. Furthermore the considerable potential in the areas trade/ industry and services is described.

The external expert first compiled an outlined proposal that was presented, discussed and developed further in a general meeting

The following outline was decided upon:

- Utilisation of ambient heat with respect to a sustainable energy supply
- Technology and application field of the heat pump
- Scenario market growth 2007-2020
 - Goal setting
 - Construction scenario new building/ reconstruction
 - Scenario heat generation
 - Scenario energy requirement
 - Scenario greenhouse gases
 - Attainable value added
 - Affects on national workplace

- Potential in the areas services, industry and trade
- Measures for a strained utilisation of renewable energy sources in comparison with
- Measures for a strained utilisation of ambient heat
- Measures that indirectly influence a strained utilisation of ambient heat
- Reduction of CO₂-emissions resulting from power generation
- Increase in power plant efficiency
- Reduction of useful energy demand
- The benefit of ambient heat from the customer's view
- Future development potential

Since the advantages of the heat pump are still not known everywhere the two first chapters of the plan serve as a comparison of ambient heat and other renewable energy sources as well as a description of the technology and the technical advancement.

In the following part the potential of the heat pump from 2007 to 2020 was described. It was shown how many facilities could be installed based on a projected market share. A jointly accepted value for the facility scenario until the year 2020 was determined on a kick-off meeting which was attended by members of BWP

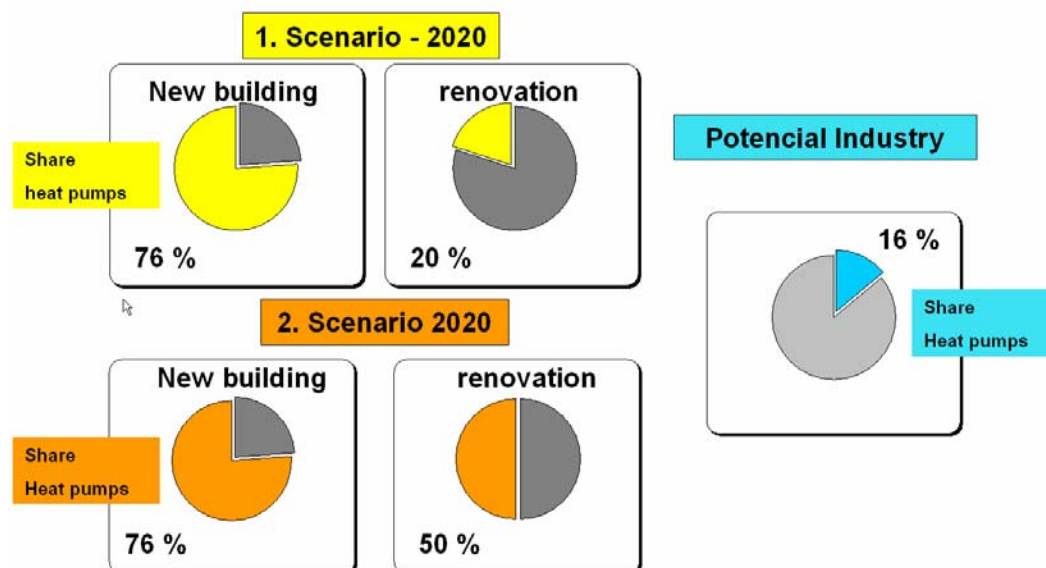


Figure 3: Goal Setting Ambient Heat/ Heat Pump Technology In Austria 2020 (A-WPAP 2007)

Based on this figure the generated amount of energy, the necessary electricity demand as well as CO₂ reductions in comparison to conventional heating systems were described. The market growth, though, also affects the value added and the national workplace positively, which was also numbered.

An area that, according to the workshop participants, will strongly gain importance is the area of application for large capacity heat pumps. For this reason also the potential for this area should be calculated.

Based on the agreed target values, outline and content's direction the action plan was compiled by the external expert.

In another two workshops the necessary measures for the attainment of the objectives were discussed. The following aspects were regarded as crucial to the further intensification of ambient heat (the measures were developed for these areas).

- Legislation
- Financial benefits
- Contracting
- Communication
- Education

The measures should comply with the following criteria and were evaluated and ranked in this respect after a “measures brainstorming”.

- Fast practicability
- Emission reduction potential
- Customer benefit
- Contribution to market growth

With regard to the objectives with which the measures are connected, distinction between their contribution to **reduction of market barriers** as well as their contribution to **acceleration of market development** was made.

21 measures were eventually integrated into the HPAP according to the following figure. At this juncture it was always the area that is addressed by the measure, in short the current situation and the necessity of action respectively, as well as the objective and target group which were mentioned.

Nr.	
Area	Laws
Measure	Austrian-wide standardised technical directive for the installation of heat pumps
Present Situation	Different regulations respectively deadlines (e.g. water legislation), different requirements concerning technical documentation and implementation of facilities (with/ without buffer, with/ without heat meter, etc.) different form of facilities law.
Objective	Reduction of market barriers
Target Group	Legislator in these legal matters (state and province)

Figure 4: Measure Examples (A-HPAP 2007)

In addition to these "direct" measures "indirect" measures that also contribute to the heat pump technology being favoured but cannot be influenced by the action plan were mentioned in the following part. The following "indirect" measures are concerned:

- Political objectives with respect to further reduction of CO₂ emissions in power generation
- Increase of power plant efficiency
- decrease in demand for useful energy through e.g. efficient white goods, efficient recirculation pumps

The Austrian heat pump action plan has already been presented to policy decision makers – which also led to the consideration for the heat pump in the Austrian efficiency plan. Furthermore it was presented to the general assembly of the EHPA and to the members of BWP as well as at a press conference for the specialised press.

6 FURTHER NECESSITIES

The benefit of the action plans is, apart from the one for the particular country, to be seen in the spreading of information across national borders. To spread the information the action plans should not only be compiled in the respective language but also, at the very least, in English.

A further important solution to the improvement of communication would be seen in the introduction of a separate heat pump action plan website. This website could include broad information with respect to country-specific questions and in so doing evolve to a heat pump information centre. At present country-specific information concerning national general conditions are troublesome to research.

On this website the action plans in different languages as well as possible status reports concerning the state of implementation could be accessed.

The first goal must be that every member state possible starts to compile heat pump action plans – this would contribute to a higher level of awareness and with it an increase in the importance of the heat pump technology.

I would therefore encourage all National Heat Pump Associations to formulate their own National Heat Pump Plan in order to spread our ideas and meet our common goals.

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