Heat Pump News in Hungary

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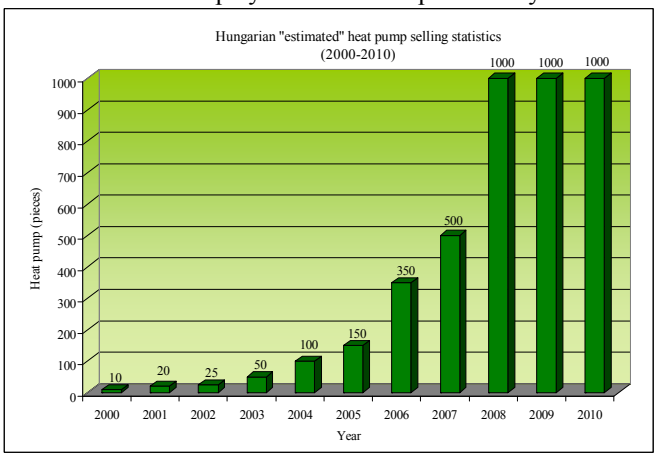
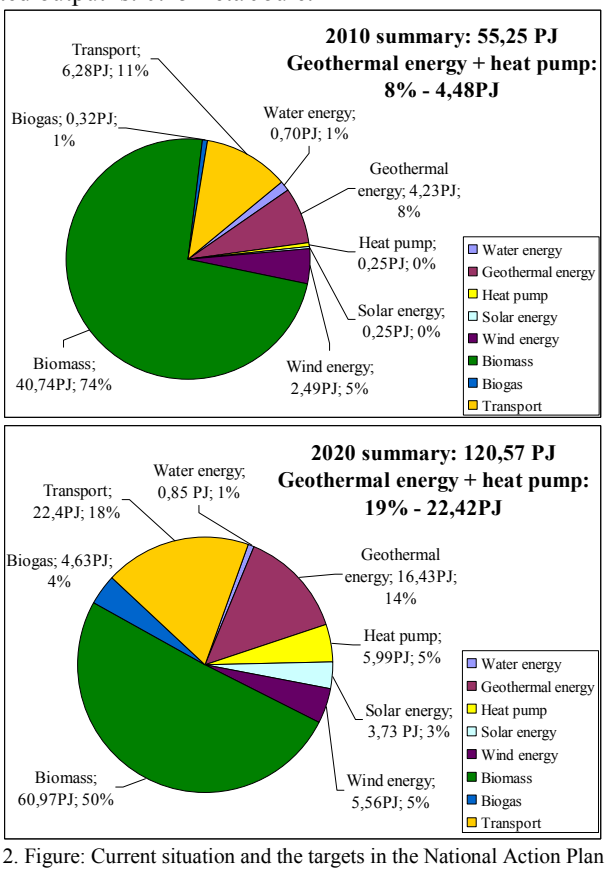
I. INTRODUCTION

In Hungary, the heat pump market was not able to exceed the amount of 1.000pc/year sold in the past three years.



1. Figure: Hungarian estimated heat pump selling statistics

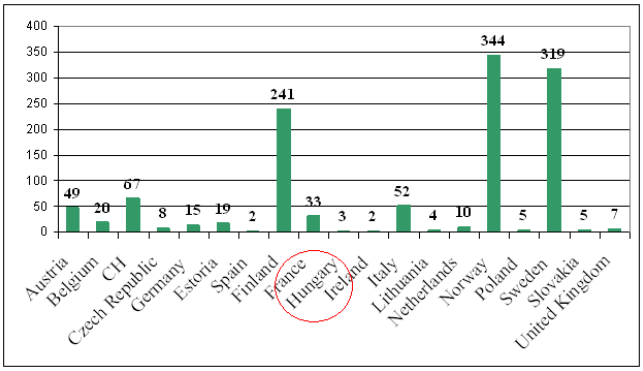
The total number of installed heat pumps is 5.000pc, and the rated output is: 0.25 Peta Joule.



2. Figure: Current situation and the targets in the National Action Plan

II. INTERNATIONAL AND HUNGARIAN INFLUENTIAL FACTORS

If you consider that around the world 69.7% of the use of geothermal energy is utilized by heat pump technology, compared to here in Hungary where we use less than 1% of geothermal energy by heat pump. As we can see in *figure 3*, 3pc heat pumps are sold per 10,000 household in the 2010 EHPA statistics.



3. Figure: Sales of Heat Pumps per 10.000 households 2010 (EHPA)

If the market situation is compared to the leading EU countries, our fulfilment is 1%. We can ask: what is the reason? The answer is a negatively combination of impact factors:

- The lobby of the fossil energy sector is quite strong, since 90% of Hungary is supplied by natural gas.
- Natural gas prices have been aided by the state depending on the degree of consumption.
- Electricity production efficiency is low (36%), the power loss is 10%, so compared to primary energy, the heat pump technology can not provide a significant primary energy savings even with high COP value.
- In Hungary renewable energy (solar and wind) does not provide a sufficient amount of power to support heat pump technology.
- The heat pump technology can not compensate the share of natural gas and electricity prices. Gas: 0,43€/m^3 → 0,046€/kWh, electrical energy power: 0,16 €/ kWh → in case of COP 4,0: 0,04 €/ kWh. With GEO tariff: 0,11€/kWh → in case of COP 4,0: 0,03 €/ kWh.
- The heat pump manufacturing has not been started in Hungary, and the imported systems and heat pumps are expensive.
    - low-power heat pump system under 20kW: gross approx. 1.333€/kW
    - high-power heat pump system with 20-500kW: gross approx. 733€/kW

- A tender is missing. Occasionally in the last few years small tender amounts were received; because of this the effects were low.
- There is high level of tax: 25%.
- There is high cost of licensing for borehole heat exchangers and water-well systems.

Beside a negative market impact the only positive result from this is that the awareness and acceptance of the heat pumps technology has increased. This activity was helped by the Hungarian Heat Pump Association on the Chamber of Engineers and university training courses. In the last three years, at least 200 engineers learned the basics of heat pump technology design and gained practical experience.

Despite this market situation, we can be proud of some excellent high-performance projects on the high level with the rest of Europe.

1. Table: Several large project in Europe

Europe	Country	City/Project name	No. BHE	Depth BHE	Total BHE length
1.	UK	London Shopping Center	400	150 m	60 000 m
2.	NO	Loerensko, SIA hospital*	ca. 300	150 m	ca. 45 000 m
3.	NO	Oslo, Nydalen district	180	200 m	36 000 m
4.	SE	Lund, IKDC	153	230 m	35 190 m
5.	SE	Stockholm, Vällingby Centr. *	133	200 m	26 600 m
6.	SE	Kista, Kista Galleria*	125	200 m	25 000 m
7.	HU	Budapest Pillangó street, Tesco	150	150 m	22 500 m
8.	HU	Törökbálint, Telenor House	180	100 m	18 000 m
9.	TR	Istanbul, Metro market	168	107 m	18 000 m
10.	HU	Törökbálint, School and Sport Centr.*	180	100 m	18 000 m
11.	DE	Golm near Potsdam, MPI	160	100 m	16 000 m
12.	SE	Stockholm, Blackeberg area	90	150 m	13 500 m
13.	HU	Budapest Pesti street, Tesco	130	100 m	13 000 m
14.	HU	Páty, Monicomp Ltd., logistics centr.	120	100 m	12 000 m
15.	SE	Örebo, Musikhögskolan	60	200 m	12 000 m
16.	DE	Langen, DFS	154	70 m	10 780 m
17.	CH	Zürich, Grand Hotel Dolder	70	150 m	10 500 m

BHE: Borehole Heat Exchanger * under construction

We proved with these examples that there is no lack in the heat pump expertise. Characteristics of these projects is that the investors are foreign multinational companies (Tesco, Telenor), which can show examples of the environmental approach, also using its marketing advantages. Then we can ask what is expected in late 2011 and subsequent years?

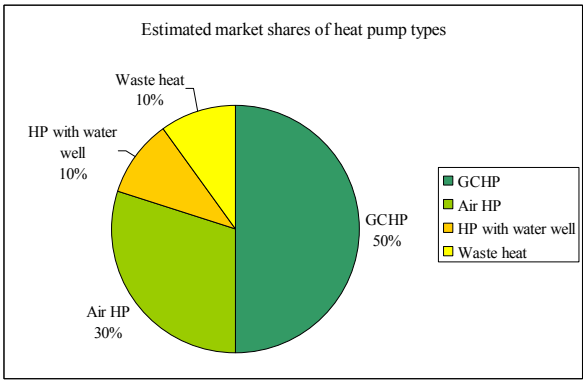
Hungary has taken upon itself to achieve 14.64% renewable energy by 2020. In this the heat pump capacity is 5.99 PJ, thus 24-fold growth would be achieved in 9 years. The Hungarian Heat Pump Association prepared the development plans for this purpose. We calculated the opportunity of natural gas substitution, which results 5% reduction and the CO_2 emission mitigation is also significant. What should be implemented?

III. HUNGARIAN MARKET DEVELOPMENT OPPORTUNITIES

Governmental (state) economic and renewable energy development is necessary by development programs and aids from the state. Currently the investments have stopped because of the economic crisis. They must be restarted by EU Structural Funds support, especially the energetically modernization of public institutions and included in this the heat pump technology. The overall energy systems of about 20.000 institutions must be renewed and for a part of this the heat pumps can be used.

Currently, only the solar thermal production is supported in an amount €10 million in case of family and apartment houses. A tender is expected to open in early 2012 for a larger, €133,3 million amount to be used for solar energy, heat pumps, biomass and geothermal energy systems. In this case we can see a possible way out for the development in our sector.

Within the heat pump technology the ground heat source is still the leading primary heat source, but the air heat pumps have had a significant growth in recent years. The sustainability and licensing practice of water-well systems is restricted their development. The following chart shows the distribution.



4. Figure: Estimated market shares of heat pump types

In recent years remarkable projects were made according to the EHPA "Future Cities = Cities Heat Pump" program. These include heat pump projects which connected to urban water supply systems, sewage pipeline systems, or thermal wasted water with up to 400-1.200kW power. Some of them are used for industrial or commercial heating and cooling. In one of the pilot projects a heat pump system solves the heating and cooling of 4 objects (schools, social housing, the mayor's office and the sports centre) with the utilization of the water supply system heat.

There are further works in connection with the heat pump licensing. At the end of 2011 the administrative service fee has been significantly increased by 50%, and there is no differentiation between small or large power projects. This is detrimental to the family house projects in the heat pump market. Therefore, we have initiated a legislative amendment.

Professional point of view development is that we participate in the GeoPower heat pump project in cooperation with eight countries. We would like to use this international experience in the Hungarian heat pump market.

IV. CONCLUSION

To sum up the possibilities for 2012, significant advances can be achieved only with increased state aid. With this we can achieve the plan of 2020, but not without it.