Heat pump production by Stiebel Eltron group in its Holzminden utility, Germany.

HEAT PUMPS BAROMETER

A study carried out by EurObserv'ER.

Heat pumps have moved up the ranks of renewable energy-producing heating technologies since the mid-2000s. The EU Member States' individual market trends are characterised by the technologies used and their heating and cooling needs. More than 1.7 million systems were sold in the European Union in 2014. According to EurObserv'ER, several market factors were responsible for sales dipping slightly below their 2013 level of just under 2 million.

8 Mtoe

the estimate renewable energy provided by heat pumps in the European Union in 2014

1.7 million HPs

sold in the European Union in 2014

+10%

the increase of the aerothermal air/air heat pump market in the EU between 2013 and 2014

If we are to grasp how the market is developing, we must identify the various types of heat pumps (HPs). They are differentiated both by the energy source used (ground, water, air), by the types of heating unit used (fan-coil unit, underfloor heating, low-or high-temperature radiators), as well as their application. Heat pumps may be used solely for heating purposes, but if they are reversible, they can expel the dwelling's heat to cool it down. Moreover, certain HPs are also designed to produce hot sanitary water, yet some of them do not meet the European Directive's energy performance requirements (see below).

Heat pumps are generally grouped into three main categories, namely ground source (GSHPs), which extract heat from the ground (via horizontal or vertical heat exchange piping), hydrothermal HPs, that draw heat from water (the ground water table, rivers or lakes), and air source (ASHPs), whose heat source is air (outside, exhaust or indoor air). We have amalgamated the hydrothermal and ground source HP statistics.

Underfloor piping or radiators are favoured for heat distribution with GSHPs. Fan-coil units can also be used, but are seldom found. ASHPs use several distribution methods – heat conveyed by water tends to be piped under the floor or through radiators (air-to-water HPs) while fan-coil units convey heat by air (air-to-air HPs). Each of these technologies has its own market trends.

THE EUROPEAN UNION HP MARKETS

The individual European Union HP markets differ considerably and with it HP technology's penetration rate, for while it is popular in Northern Europe, it still has major growth potential in many European countries – particularly in major economies such as the UK where the penetration rate is low.

Climate largely dictates the use made of HPs. In the north of Europe, HPs are basically used for heating. In areas where the climate is more temperate or warm, namely the Western and Southern regions of Europe (Italy, Spain and France), the reversible HP market is bigger, as is the use of the cooling function. In some Southern European regions, the demand for cooling in summer easily outstrips the demand for winter heating. Therefore, the technologies and nominal ratings of the reversible HPs sold in those regions are geared to cooling rather than to heating needs. This issue raises problems when making statistical comparisons between the various European Union markets, especially as reversible air-to-air HPs are also in high demand in heating mode in Northern Europe, Sweden, Denmark and Finland.

The European Heat Pump Association (EHPA), which defends the HP industry's interests, publishes the annual European Heat Pump Market and Statistics Report, in which it incorporates only part of the reversible air-to-air HP market statistics for the climate zones where they are installed. This choice is justified by the desire to monitor the market of HPs essentially used for heating and thus distinguish it from the market of HPs essentially used for cooling.

The EurObserv'ER approach is to monitor the Member States' methodological choices for each unit base. Warm countries such as France and Italy have opted to factor in a large proportion of their reversible air-to-air HPs, including those systems that are mainly used for cooling. This disparity is offset by registering lower energy output from these units as per the EC-issued guidelines **(see insert).**

Methodology

The technologies included in this study extend to all ground source and air source HPs provided that they are solely used for home heating. Reversible HPs that additionally offer a cooling function are included while reversible HPs primarily used for cooling are also included if the systems meet EU Directive requirements. This principle also applies to exhaust air HP technology that harvests heat from exhaust air as it is expelled from dwellings.

It should be pointed out that the various types of HP at the same rating produce different amounts of renewable energy. The governing factors are the energy source harnessed, the heat-carrying fluid, their operating mode and the surrounding climate conditions. The European Commission published a methodology guide in March 2013 to help the countries measure the renewable energy output of their HP bases. It sets out guidelines for calculating the renewable energy share produced from heat pumps for the various technologies as stated in article 5 of the 2009/28/EC directive. In particular, the guide cautions that heat pumps installed on air source hot water heaters only exceptionally achieve seasonal performance factors above the minimum threshold that make them eligible for inclusion as renewable energy producers. Therefore, EurObserv'ER has excluded from this study the specific thermodynamic hot water heater technology that uses air as its heat source.

HEAT PUMPS BAROMETER – **EUROBSERV'ER** – SEPTEMBER 2015

FEWER AIR SOURCE HP UNITS, BUT…

According to EurObserv'ER, the heat pump market, all uses and technologies taken together, contracted in 2014, with recorded sales of about 1.7 million units compared to almost 2 million in 2013. Because the slowdown essentially stems from a sharp slump in the Italian market, and, to a lesser extent from the French market on the specific reversible air-to-air HP segment, it is not quite as dramatic as the figures suggest. The two markets stand out from the other European Union markets that generally count the systems geared to heating exclusively. So we should point out that if France and Italy are left out of the equation, the 2014 HP market would have registered a slight growth, of about 2%.

When we analyse the water source HP market segment, i.e. the HPs that convey heat through water (underfloor heating or radiators), there is less ambiguity, because this type of technology is designed to meet heating needs. Segment growth remained positive, with practically 270 000 systems sold in 2014 (3.6% more than in 2013). Yet for several years the segment has displayed a curious trend… – the air-to-water ASHP market has enjoyed continous growth (10% up on 2013, or 188 428 units sold in 2014), while the GSHP market has slowed down (8.8% down on 2013, i.e. 81 340 units sold).

If we take a closer look at the ASHP segment, it appears that just the air-to-air market is marking time. Momentum is positive for air-to-water HPs, along with exhaust air HPs. Nonetheless air-to-air HP technology dominates the air source segment, with about 88% of all units sold.

Tabl. n° 1

Market of aerothermal heat pumps ***in 2013 and 2014 (number of units sold)****

Country	2013			2014		
	Total Aerothermal HP	of which air-water HP	of which exhaust air HP	Total Aerothermal HP	of which air-water HP	of which exhaust air HP
Italy*	1 042 900	16 900	0	863 000	18 000	0
France*	485 394	53 925	0	415 708	69 671	0
Sweden	71 650	6 635	10 015	61 355	6 355	10 850
Finland	48 870	1 278	1 874	56 069	1 480	1 767
Germany	40 200	40 200	0	41 000	41 000	0
Spain	51 738	2 464	0	54 001	0	0
Netherlands	37 486	4 633	0	44 028	4 499	0
Bulgaria	14 300	716	357	20 727	1 036	518
Denmark	18 537	2 581	198	19 666	2 822	101
United Kingdom	15 656	15 656	0	16 360	16 360	0
Estonia	13 260	800	60	14 340	1 000	40
Austria	8 234	7 994	240	9 141	8 953	188
Portugal	9 197	437	0	7 521	461	0
Czech Republic	5 747	5 747	0	6 247	6 247	0
Slovenia	6 151	2 842	0	5 226	3 108	0
Belgium	4 167	4 167	0	4 552	2 732	0
Poland	2 119	2 119	0	2 308	2 308	0
Ireland	1 190	1 169	21	1 816	1 804	12
Lithuania	230	110	120	340	95	245
Slovakia	576	516	19	319	271	0
Hungary	273	226	47	273	226	47
European Union	1 877 875	171 115	12 951	1 643 997	188 428	13 768

** Datas from italian and french aerothermal heat pump markets are not directly comparable to others, because they include the heat pumps whose principal function is refresh.* ***Source: EurObserv'ER 2015.***

NEWS FROM AROUND THE MAIN COUNTRIES

FRANCE THE NEW EL DORADO FOR AIR-TO-WATER HPS

In France, the air-to-water ASHP market data is very positive. Uniclima, the union for the heating, cooling and ventilation industries, claims that the number of units sold increased by 29% to 69 671 in 2014 (53 925 in 2013). Hence the market recorded a sharp rise after several years of stagnation at around 50 000–55 000 units. This increase largely made up for the 19% slump in the 2014 GSHP market when 3 249 units were sold, relegating it to niche market status. Note that direct expansion HPs are now excluded from Uniclima's data because of the dearth of respondents.

Uniclima explains that air-to-water HPs are performing well because they have found their place in new construction. They are taking particular advantage of the new thermal regulations (RT 2012) that for the first time impose the installation of renewable energy technology in the construction of individual housing units.

Uniclima states that air-to-air heat pump sales have contracted slightly. If only reversible "multi split" systems are factored in (an outdoor unit supplying several indoor units), the market slipped by 3% to 77 290 units sold in 2014 (79 459 in 2013). If "mono split" air-to-air HPs (an outdoor unit supplying a single indoor unit) are added, then the air-to-air HP market registered 346 037 units sold… a 2% drop (352 769 units sold in 2013). Uniclima considers that the French market for "multi split" air-to-air HPs mainly caters for heating needs, which is not necessarily the case for "mono split" HPs…

The French RT 2012 sets the principle that thermodynamic hot water heaters HWHS) use renewable energy-producing technology. The result is that sales of thermodynamic HWHs have soared (by 58%, i.e. 72 530 units sold in 2014 as opposed to 45 950 in 2013), aided by the fact that their installation costs are lower as they are easier to install than the other renewable solutions eligible for RT 2012, primarily solar thermal. Thermodynamic HWHs are now in demand on the French new build market with 180 054 units sold over the last 4 years.

Ground source- and air source-to-water HPs and also thermodynamic HWHs are eligible for tax credit, which only applies to renovation (air-to-air HPs are excluded from the mechanism). The tax credit system changed in 2014. The rate dropped significantly on 1 January 2014, from 32% in 2013 (40% when several energy-saving measures were carried out the same tax year), to 15% (25% for multiple energy-saving measures). On 1 September 2014, the Tax Credit for Sustainable Development (CIDD) was renamed Tax Credit for Energy Transition (CITE). The new formula changed the credit rate to 30% for all eligible technologies and dispensed with the increased rate for multiple energy-saving measures.

GERMANY'S NEW LAW IS ENCOURAGING

Available HP market statistics only cover systems that convey heat by water. According to ZSW, which takes part in producing renewable energy statistics

Tabl. n° 2

Market of geothermal heat pumps ***in 2013 and 2014 (number of units sold)****

Country	2013	2014
Sweden	24 897	23 356
Germany	21 100	18 500
Finland	12 341	11 125
Poland	5 142	5 275
Austria	6 073	5 127
France*	4 003	3 249
Netherlands	3 052	2 510
Denmark	2 503	2 242
United Kingdom	1 976	2 190
Czech Republic	1 743	1 578
Estonia	1 400	1 520
Belgium	1 336	988
Italy	1 036	780
Lithuania	470	735
Bulgaria	366	532
Hungary	510	510
Ireland	305	508
Slovenia	441	390
Slovakia	253	225
Spain	246	n.a.
Portugal	24	n.a.
European Union	89 217	81 340

** Ground/ground heat pumps not included for France.* ***Source: EurObserv'ER 2015.***

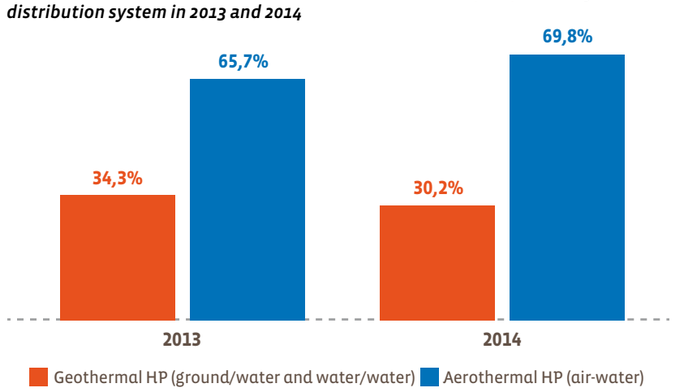
Brine/water (groud source) large-scale heat pump WPF 20-66 from Stiebel Eltron. In this case, two units are connected in series.

for the Ministry of Economic Affairs and Energy, the air-to-water ASHP market grew slightly between 2013 and 2014, rising from 40 200 to about 41 000 units sold (including 38 453 units dedicated to heating alone, and only 1 047 reversible HPs). Heat-driven HPs (that run on gas, not electricity) are also factored in. Their sales were put at 1 500 units in 2014. As in many countries, the GSHP market is sliding. The ZSW claims the number of units sold dropped from 21 100 in 2013 to 18 500 in 2014. Now GSHPs amount to less than a third of the German market (31.1% in 2014 as against 34.4% in 2013).

In Germany, BAFA (Federal Office for Economic Affairs and Export Control) encourages HP market expansion via the Market Incentive Programme, "Marktanreizprogramm" (MAP), which only targets high performance HPs. In the renovation segment (existing buildings), air-to-water HPs are only eligible for installation grants if the systems' seasonal performance factor (SPF) is >3.5. In the case of GSHPs (ground-to-water) or hydraulic (water-to-water) HPs, the required SPF must exceed 3.8 (and >4 for non-residential buildings). The minimum funding amount is € 1 500 for <37.5 kW air-to-water systems, and € 4 500 for <45 kW ground source (ground-to-water) and hydraulic (water-to-water) heat pumps. Very high performance heat pumps (with an SPF in excess of 4.5) are eligible for "Innovationsförderung" – innovation support– is offering of a higher sum, with minimum funding of € 2 250 for air-to-water HPs and € 6 750 for water-to-water or ground-to-water HPs. New dwellings can also claim aid for innovation, but the allocated amount is lower... € 1 500 for <37.5 kW air-to-water HPs, and € 4 500 for <45 kW water-to-water or ground-to-water HPs. Lastly, an additional premium of € 500 is granted for combined systems, such as an HP coupled to a biomass boiler, solar thermal collectors or hybrid solar panels (photovoltaic and solar thermal). In May 2014, Germany adopted a new energy-saving law (EnEV 2014), which is another major growth lever. Since 1 January 2015, the law enforces the replacement of all gas- and oil-fired boilers over 30 years old (pre-1985), with a few exceptions, such as low-temperature boilers. The government suggests that the measure should apply to 500 000–600 000 boilers.

Graph. n° 1

Market share between geothermal and aerothermal heat pumps ***with hydraulic distribution system in 2013 and 2014***



Source: EurObserv'ER 2015.

While solar thermal systems should be the main beneficiaries of the measure, in the light of their "natural association" with condensing boilers, it could also boost the HP market. In the new build segment, the new legislation should particularly promote HPs, because all heating systems are compared by their primary energy consumption.

According to BDH (Federal Association of German Heating Industry) calculations, a new house that meets energy performance standards and is equipped with an HP is likely to get the A+ label whereas the same house equipped with a condensing boiler coupled to a solar thermal system would only be eligible for the A label. Now a house heated by a pellet boiler would only achieve the C label. Thus HP technology indirectly profits from the German government's policy to significantly increase its national renewable electricity output and reduce its dependence on fossil fuel... primarily Russian gas.

THE SWEDISH MARKET IS STABLE AND MATURE

The Swedish heat pump market is mature, since HP technology has long been in demand from households. The market has grown from just over 20 000 units sold in 1999 (20 296 to be precise) to 130 000 units per annum to the end of the decade (133 367 units in 2008

Tabl. n° 3

Total number of heat pumps in operation ***in 2013 and 2014****

Country	2013			2014		
	Aerothermal HP	Geothermal HP	Total heat pumps	Aerothermal HP	Geothermal HP	Total heat pumps
Italy*	16 900 000	12 400	16 912 400	17 718 000	13 200	17 731 200
France*	3 879 383	140 820	4 020 203	4 295 091	144 069	4 439 160
Sweden	892 916	453 486	1 346 402	954 271	476 842	1 431 113
Germany	265 181	297 191	562 372	305 137	314 502	619 639
Finland	472 207	74 182	546 389	528 276	85 307	613 583
Spain	246 246	1 144	247 390	300 247	1 144	301 391
Denmark	211 077	49 747	260 824	225 209	51 638	276 847
Austria	150 891	89 161	240 052	160 032	94 288	254 320
Netherlands	155 594	43 882	199 476	199 148	45 986	245 134
Bulgaria	194 244	3 740	197 984	214 971	4 272	219 243
United kingdom	81 491	20 560	102 051	97 851	22 750	120 601
Estonia	72 357	7 355	79 712	86 697	8 875	95 572
Portugal	83 755	3 020	86 775	91 276	3 020	94 296
Czech Republic	30 572	18 330	48 902	36 819	19 908	56 727
Poland	6 699	25 763	32 462	9 007	31 038	40 045
Belgium	22 993	6 008	29 001	27 545	6 996	34 541
Slovenia	17 004	5 110	22 114	22 231	5 500	27 731
Ireland	3 862	2 693	6 555	5 678	3 201	8 879
Slovakia	5 238	2 527	7 765	5 886	2 839	8 725
Hungary	1 955	2 087	4 042	2 228	2 597	4 825
Lituania	920	2 093	3 013	1 260	2 828	4 088
Luxembourg	742	106	848	742	106	848
European Union	23 695 327	1 261 405	24 956 732	25 287 602	1 340 906	26 628 508

** Datas from italian and french aerothermal heat pump markets are not directly comparable to others, because they include the heat pumps whose principal function is refresh.* ***Source: EurObserv'ER 2015.***

HEAT PUMPS BAROMETER – EUROBSERV'ER – SEPTEMBER 2015

Heat pumps prodution line at the Danfoss utility in Gråsten, Denmark.

and 127 574 in 2010). Now the heat pump is the most popular heating system in Sweden for family home construction, and also for replacing heating systems. It is assumed that more than one in two Swedish homes is equipped with a HP. This very high equipment rate explains why the sales figures have stabilized in recent years, just under 100 000 units sold every year (95 107 in 2012, 96 550 in 2013 and 95 561 in 2014). The development of heating networks connected to most of the multi-occupancy homes also limits the HP market's growth potential. We should point out that the air-to-air segment of the HP market has not been accurately monitored since 2012. Nonetheless, EHPA estimates that at least 55 000 units have been sold every year since 2011. The Swedish Energy Agency (ASE) installation data was unavailable for 2014 at the time of our survey so we took up EHPA's data which registered 95 561 units for the Swedish market, i.e. 55 000 air-to-air HPs, 23 356 GSHPs (24 897 in 2013 according to the ASE), 10 850 exhaust air HPs (10 015 in 2013) and 6 355 air-to-water HPs (6 635 in 2013). As for incentives, HPs have attracted a tax reduction that applies to renovation or home extension work since 8 December 2008. The system offers individual homeowners <50% of the labour costs for this type of work, capped at 50 000 SEK (about € 5 000).

The thermal regulations encourage installation of this type of technology in new build. For electrically-heated individual homes, maximum energy consumption levels apply expressed in kWh/m² per annum. They depend on the climate zones, which vary from 55 kWh/m² for the warmest zone to 95 kWh/m² for the coldest.

THE ITALIAN MARKET STUMBLES

According to data by the Ministry of Economic Development, the heat pump market contracted sharply (17.3%) between 2013 and 2014, dropping from 1 043 936 units to 863 780 units sold in 2014. This underscores the decline which started between 2012 and 2013 (2.7%, i.e. 1 072 650 units sold in 2012). As previously mentioned, the Italian figures differ in that the HP market is dominated by reversible air-to-air technology, which in 2014, accounted for 97.8% of all HPs sold on the Italian market. However the decline has not affected all the technologies to the same extent, as the ASHP water-borne segment increased by 6.5% between 2013 and 2014 from about 16 900 to 18 000 units sold. As for the GSHP market, it has dwindled to a niche segment, as in 2014 sales dropped below the 1 000 unit mark (namely 780 units sold in 2014 compared to 1 036 in 2013). In a similar vein to the Swedish market, the main reason for the Italian market's decline is the country's very high equipment level, compounded by the construction market slowdown. Ministry for Economic Development puts the HP fleet in service at around 17.7 million units. As indicated in the foreword, many of the reversible ASHPs are used for cooling, and are generally installed alongside an existing heating system (a pellet burner for example), which further limits their use in heating mode.

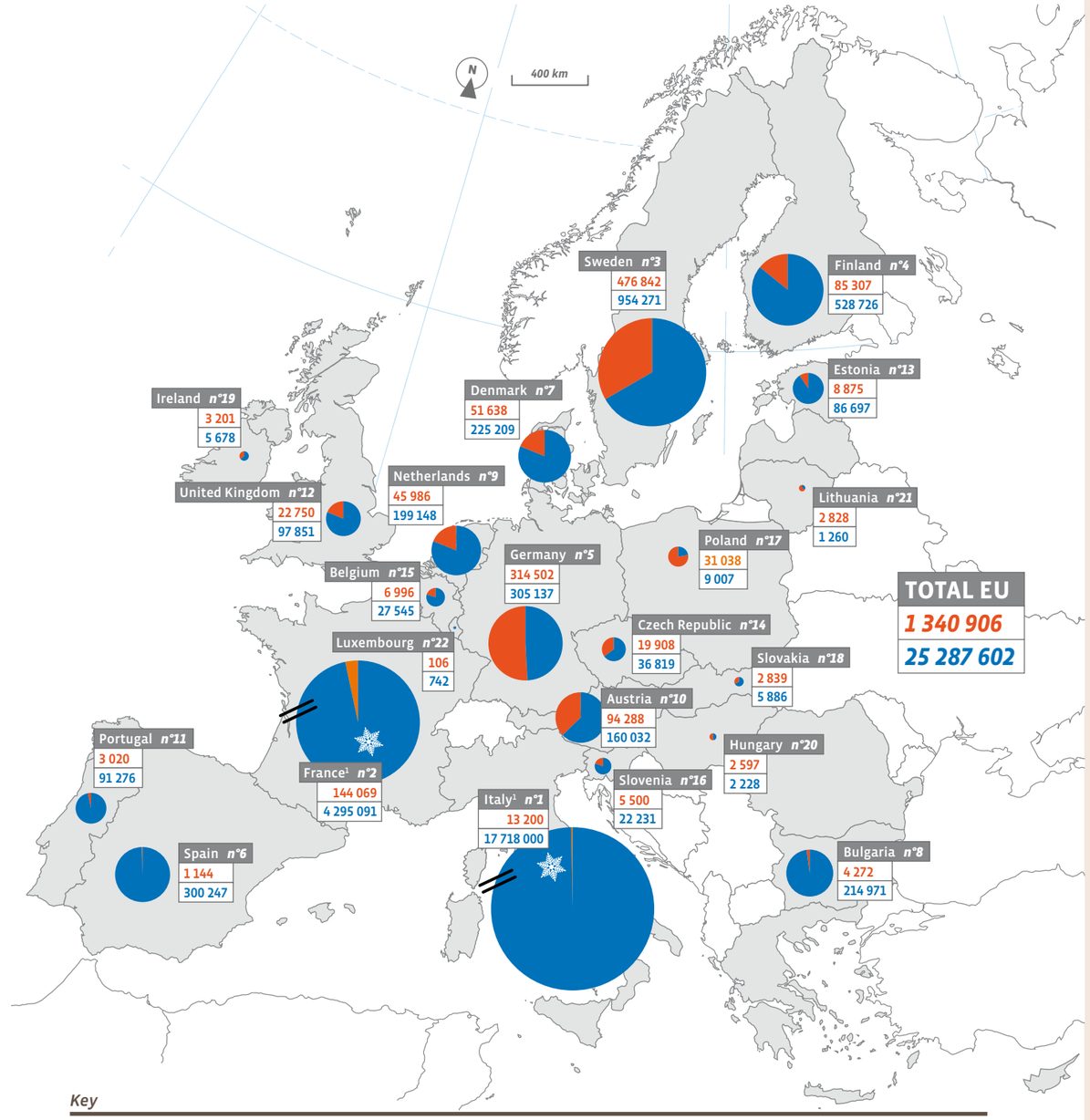
HPs qualify for Conto Termico incentives that can cover up to 40% of the eligible expenses. The incentive is calculated on the basis of specific parameters such as the HP's presumed deliverability, the technology used and the installation's climate zone. The incentive is payable for two years. For example, a 16 kW air-to-water HP costing € 8 292 with a COP of 4.1 for temperature levels ranging from +7 to +35 °C will qualify for two annual payments of € 399 (total of € 798) in climate zone A (the hottest), i.e. about 10% of the price of the HP. In climate zone F (the coldest), the same HP will qualify for two annual payments of € 1 198 (total of € 2 396) or 29% of the HP price.

Italy offers two other funding possibilities for HPs (that cannot be combined with the Conto Termico) – a 65% tax deduction for building energy efficiency investments, and a 50% tax deduction for building renovation and installation grants, both usable over a ten-year period. These two mechanisms have been extended to the end of 2015.

THE ENTIRE HEATING INDUSTRY IS POSITIONED ON THE HP MARKET

The European heat pump and HP component manufacturers lead the world in this technology. All the major heating appliance manufacturers have HPs in their catalogues. As to be expected they include the main European specialist electric heating groups such as Nibe, Stiebel Eltron and Danfoss, and also the boiler manufacturers (Viessmann, Bosch Thermotechnik, Vaillant, BDR Thermea etc.), who have diversified into HP technologies for several years.

Aerothermal and geothermal heat pump park ***in function in European Union in 2014 (installed units).***



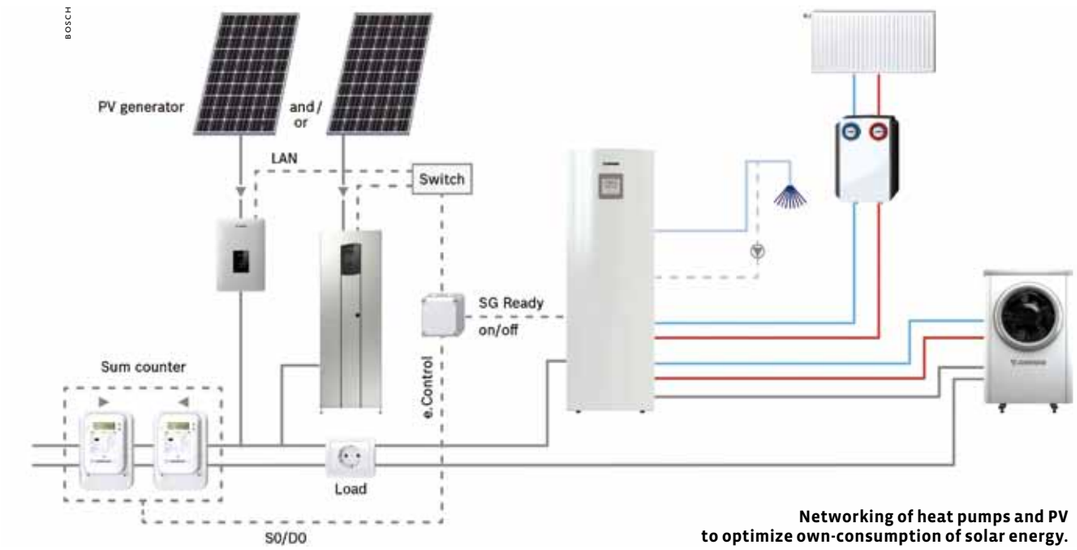
Key

Aerothermal heat pumps
Geothermal heat pumps

6 996 *Total number of geothermal heat pumps in function in the country*
27 545 *Total number of aerothermal heat pumps in function in the country*

* *Datas from italian and french aerothermal heat pump markets are not directly comparable to others, because they include the heat pumps whose principal function is refresh.*

Note : The pie charts are proportioned to the total number of units installed and not to the total capacity installed. ***Source : EurObserv'ER 2015.***



Networking of heat pumps and PV to optimize own-consumption of solar energy.

This vast market has also attracted air-conditioning specialists from Asia, for example Japan's Daikin, Mitsubushi, Panasonic and Hitachi, and Korea's LG and Samsung. They have naturally taken up position on the air-to-air HP segment, where the dividing line with air-conditioning systems is finest, but also offer air-to-water HPs.

Many of these international players have used their financial clout to buy up specialist firms, firstly to gain market shares locally, but also to take advantage of their targets' specific segment skills. The expansion drive of these major firms continues. Sweden's Nibe, the leading domestic heating product manufacturer in the Nordic countries, announced that it was counting on making new acquisitions for its organic growth. Last year for example, the group bought up two North American heat pump manufacturers – Waterfurnace and Enertech Global – to gain a solid commercial foothold on the American continent. In Europe, Nibe has turned a number of players' weaknesses to its advantage. It made a new acquisition in February 2014 – Technibel of France that specializes in heating and air-conditioning HP systems. Nibe's declared aim is to create a key expansion platform to pick up shares of one of Europe's major markets. There are still a few independent HP specialists, such as Ochsner of Austria and Waterkotte of Germany. **Table 4** lists the main manufacturers in the market, and the brands and firms that belong to these major groups (non-exhaustive list).

The HP market's major growth potential can also be shown through hybrid heating systems, which are often carried by manufacturers that did not originally specialize in HP technologies and are now tapping new growth outlets by launching new products. The demonstrated advantage of these hybrid systems is the disposal of two energy sources in a single installation, which enables both energies to be harnessed to the full in line with the outdoor temperature, heating or hot water requirements.

Primarily, we find hybrid HP systems on the market with integrated top-up gas condensing boilers (also known hybrid boilers) that boiler manufacturers are keen to sell. New hybrid systems combining a heat pump with photovoltaic panels are also appearing. Bosch, for instance, has presented a new intelligent energy management system (called e.Control) capable of identifying when the heat pump (air source or ground source) needs electricity, and covering this need with solar energy if the sunlight level is sufficient. This energy system can also incorporate a hybrid storage solution (Bosch Power Tec's BPT-S 5) that enables the system to use even more solar power thanks to lithium ion batteries. Other technical solutions are in the offing. At last June's Intersolar show, Helioterm presented a new ASHP that had photovoltaic panels integrated directly on the heat pump's external unit. At the beginning of the year, the manufacturer Bartl launched a hybrid system whose heat pump has two differently dimensioned compressors so that they can run optimally with a minimum of solar power. The manufacturer claims that 7 kWp of photovoltaic capacity can achieve a 30–40% self-sufficiency rate. Other manufacturers, such as Sonnenkraft, propose a system (Sol+) that combines solar thermal energy with an air-to-water heat pump and thus eliminates the need for any top-up heating.

Another interesting development is the stated determination of HP manufacturers to limit the curbs to expansion and innovation on the European market. EHPA is thus working in conjunction with the certification laboratories SP CERT (Sweden), DIN CERTCO (Germany) and BRE (UK) to set up "Heat pump Keymark" certification, following the example of "Solarkeymark" certification, which was set up by the solar thermal sector. The

Tabl. n° 4

Companies[1] representative of the heat pump market ***in the European Union in 2015***

Company	Brand	Country	Type and capacity range
BDR Thermea	De Dietrich	France	Ground/water – Air/water – Water/water: 5,7 – 27,9kW
	Baxi	United-Kingdom	Ground/water: 4 – 25kW
	Sofath	France	Ground/ground: 2,8 – 14,2kW
	Brötje	Germany	Ground/water: 5,8 – 28,5kW
Bosch Thermotechnology	IVT Industrier (Bosch Thermotechnik)	Sweden	Air/water – Air/Air : 6 – 70kW
	Bosch Thermotechnology	Germany	Air/water : 5-17kW Ground/water : 6-17kW Water/water : 6-17kW
Daikin Europe	Rotex	Germany	Air/water : 4 – 16kW Ground/water : 10,2kW
Danfoss	Thermia Värme AB (Danfoss)	Sweden	Geothermal/water/ground source HP: 4 – 84kW
	KH Nordtherm (Klimadan)	Denmark	Ground/water: up to 42kW Water/water: up to 42kW
Nibe	Alpha Innotec	Germany	Air/water: 5 – 31kW Ground/water: 4 – 160kW Water/water: 11 – 430kW
	Nibe Energy Systems Division	Sweden	GSHP : 5 – 160kW (single unit) up to 540kW in cascade Air/water: 5 – 22kW
	Tecchnibel	France	Air/water: 5 – 250KW Ground/water: 5 – 58kW.
	KNV	Austria	Water/water: 6,1 – 22,1kW Air/water: 5,8 – 32,9kW
Vaillant Group	Saunier Duval	France	Air/water: 5 – 15kW
	Vaillant	Germany	Ground/water: 22 – 46kW Water/water: 3 – 64kW Air/water: 5 – 15kW
	Bulex	Belgium	Air/water: 5 – 15kW
Viessmann Group (KWT, SATAG)		Germany	One and two-family houses: Ground/water: 7,3 – 37,4kW Water/water: 10,3 – 51,4kW Split Air/water: 3 – 9kW Air/water: 7 – 47,6kW Multi-family house: Ground/water: 18,7 – 37,4kW Water/water: 25,7 – 51,4kW Large heat pumps: Ground/water: 93 – 240kW Water/water: 122 – 290kW
Buderus		Germany	Ground/water: 6 – 17kW Air/water: 6 – 31kW
Ochsner Wärmepumpen		Austria	Ground/water: 5 – 13kW Water/water: 11 – 23kW Air/water (split): 1 – 13kW Large HP (ground and water): 80 – 1 000kW
Stiebel Eltron		Germany	Water/water: 5 – 22kW Ground/water: 4,7 – 56kW Air/water (split) : 4,6 – 168kW
Waterkotte		Germany	Air and ground source HP: 4 – 491kW
Wolf Heiztechnik		Germany	Air/water: 8 – 14kW Ground/water: 6 – 16kW Water/water: 7 – 21kW

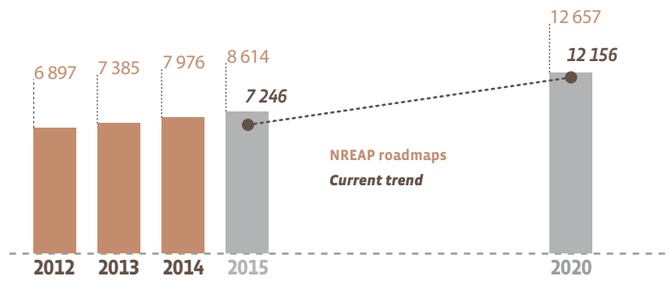
1. Non exhaustive list. ***Source: EurObserv'ER 2015 .***

Check of heat leaks from a heat pump installed in a domestic house.

aim of this certification is to limit the costs of market access by unifying and simplifying heat pump certification in Europe and thus to circumvent the hurdles of each country's specific certification tests.

Graph. n° 2

Actual trend of renewable energy from heat pumps compaired with the National renewable energy action plans NREAP (en ktoe)



Source: EurObserv'ER 2015.

ENCOURAGING GROWTH PROSPECTS

After ten years of strong growth in the first decade of the millennium, the European HP market seems to have lost pace over the last three to four years. EurObserv'ER deems that this lack of growth is cyclical in essence, and makes the recession responsible for reducing European householders' investment capacities. Given that home building is one of the main HP market growth vectors; HPs have taken the toll of several years of insignificant family housing unit construction levels. Recent gas and heating oil price cuts, also due to the lack of economic growth, have likewise curbed HP technology developments and reinjected a little vivacity into condensing boiler type heating solutions.

Current growth prospects are better as the construction sector indicators now give more grounds for hope. Euroconstruct claims that after seven years of crisis and stagnation, the European construction market has been on an upturn since 2014. Growth should be about 1.8% in 2015, 2% in 2016 and 1.7% in 2017. European directives are also contributing, by implementing more stringent energy performance regulations in the building sector. Our reading of these regulations makes it plain that HP type heating solutions are patently encouraged. Examples are France's 2012 thermal regulations and the new German Energy Saving Ordinance (EnEV 2014). In Scandinavia, using electricity as the main building energy is openly promoted, both by the reduction of taxes on electricity, and the introduction of carbon taxes. Since 2013, Denmark has prohibited the installation of gas- and oil-fired heating systems in new build, and this ban will extend to areas covered by district heating networks from 2016. Implementation of the RHI (Renewable Heat incentives) that have recently been extended to private individuals have improved market growth prospects in the UK, where the HP market share is low.

Mapping out the 2020 trends for the renewable energy output from HPs is a hard task, because measuring renewable energy output from machine bases is problematic without specific studies made by each Member State. Hence our projections are based on questionnaires filled out by the national experts who took part in our survey as well as the statistical work carried out by each Member State as part of the Eurostat SHARES (Short Assessment of Renewable Energy Sources) project. EurObserv'ER thus assesses the renewable energy output produced by HPs at approximately 8 Mtoe in 2014, and estimates that it could be as much as 12.7 Mtoe for 2020 adopting a conservative scenario. EurObserv'ER feels that the current market trend is still in line with the NREAP (National Renewable Energy Action Plan) aims **(graph 2).**

In the longer term, by 2030, projections will no longer be the issue, but rather coming up with a vision of what HP technology could be like. An EHPA policy note, entitled "Winter is coming", has committed itself. The association gives what it feels is a realistic estimate of 60.7 million HPs installed by 2030, compared to about 6.8 million at the end of 2013, which leaves a further 54 million or so HPs to be installed. As pointed out at the beginning of this study, EHPA's HP base statistics cannot be compared directly with those of this barometer, because they only take into account HPs used essentially for heating purposes, applying the association's specific methodology. EHPA claims that this HP base of 61 million units is capable of producing 60 Mtoe of renewable energy and reducing GHG emissions by 181 million tonnes. Its 2030 scenario would call for mean annual market growth of 17%.

Above all this vision will depend on the political will of Europe's governments, because environmental heating solutions of the HP type are costlier than traditional more energy-hungry technologies. Taxing fossil energies, already practised in Northern Europe is one of the advanced solutions for freeing the market to grow naturally, without grants. Another solution, which could be gradual, is by using legislation. The renewable energies obligation, already implemented in a number of countries in new build should gradually extend to the renovation segment, where the growth prospects for HPs are much greater. Awareness of climate warming, which is increasingly in the public eye, and current negotiations under the framework of COP21 to be held at the end of the year in Paris, should logically help shift the lines. □

Sources : Ministry of Economic Development (Italy), Uniclima, Observ'ER (France), ZSW-AGEE Stat (Germany), CBS (Netherlands), Swedish Energy Agency, EHPA (Sweden) APEE (Bulgaria), Vienna University of technology (Austria), ENS (Denmark), Ministry of Industry and Trade (Czech Republic), Jozef Stefan Institute (Slovenia), Port PC (Poland), ECB (Slovakia), EHPA (others).

Translated from the French by Parlance.

The topic of the next barometer will be solid biomass

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