Example 1 | Power Tower | Energie AG, Linz | AT (Photo courtesy of Ochsner Corporation, Austria)
Building type: Passive house office building heated and cooled with two ground coupled heat pumps (vertical borehole and activated concrete foundations), PV façade, intelligent lighting and forced ventilation. 22,652 m² office space.
Commissioning: 2008
Service: Heating & passive cooling
Heat pump: Two high capacity brine/water heat pumps (370kW/337.4kW)
Capacity: 700 kW heating / 800 kW cooling
Energy source: Geothermal energy / Groundwater

Example 2 | Residential home in Finland heated with air/air heat pumps (Photo courtesy of Jussi Hirvonen, Finland)
Building type: 250m² residential building; heat pumps as a replacement for previously installed direct electric heating; final energy savings: 45% (45,000 kWh down to less than 25,000 kWh / year)
Commissioning: 2006
Service: Heating
Heat pump: Three air/air heat pumps
Capacity: /.
Energy source: Ambient air

Example 3 | Commercial building in Berlin | DE (Photo courtesy of Ochsner GmbH, Austria)
Building type: Commercial / Retail with optimized energy supply concept using heat pumps, peak power gas boiler, PV and solar thermal collectors
Commissioning: 2010
Service: Heating (70%) and cooling (100%)
Heat pump: three high capacity brine-water heat pumps
Capacity: 3 x 500 kW
Energy source: Municipal Waste-Water

Example 4 | Mixed use project in Mellingen | CH (Photo courtesy of Stiebel-Eltron GmbH, Germany)
Building type: Mixed commercial (post office, modern furniture store and new treatment center) and residential (28 housing units) built to Minergie standard
Commissioning: 2005
Service: Heating and sanitary hot water
Heat pump: Six brine/water heat pumps for hot water and heating
Capacity: max. 90 kW (cascading application)
Energy source: Geothermal energy (drilling)

Example 5 | Office building in Törökbálint (HU) (Photo courtesy of HGD KFT Corporation, Hungary)
Building type: Office building, headquarter of mobile operator company Telenor, 26,520 m² with about 1,200 work stations
Commissioning: 2009
Service: Heating, sanitary hot water and cooling
Heat pump: Three high capacity brine/water heat pumps
Capacity: 862.2 kW for heating and 965.7 kW for cooling
Energy source: Geothermal energy (180 boreholes), 2nd largest in Hungary and one of the biggest such project in Europe; 168 m² solar panels covering 60-70% of sanitary hot water needs
The European heat pump sector witnessed a challenging market environment in 2010. It was characterized by a multitude of factors some of which were positive and others negatively influencing heat pump sales. Overall, the market showed a slightly negative trend with -1.6% for EU-10 and -2.1% for EU-18 (see figure 1). The overall positive result was mainly caused by adding three new countries, Spain, Poland and Portugal, to the report. Their large share of air source heat pumps overcompensated decline in other markets.

The on-going global economic and financial crisis continues to affect the availability of credit, and negatively influences consumer confidence and sentiment regarding any discretionary new investments. The slowdown and virtual collapse of the construction sector, particularly new build in many countries has halted activity in areas which had seen significant growth in the 2006–2008 period. Budgetary constraints, at European and national level have resulted in a tightening of incentives and support schemes. General uncertainty surrounding future developments has led consumers towards cost orientated, short term decisions or to deferring investment decisions to a future date. Finally the low relative price of oil and gas during much of this period has also provided a challenging environment for promoting the merits of heat pump technology’s lower operating costs.

From a geographic perspective a significant proportion of the decline may be attributed to a small number of (large) markets led by France, followed by the Netherlands, Germany, and Finland. In the past they have accounted for a large proportion of the overall European market (approximately 80%). Their weak performance had a disproportionate affect on the overall picture presented and could not be overcompensated by the growth in markets such as Belgium, Czech Republic, Hungary, Italy and the UK which showed growing sales, albeit from a low base.

In terms of energy source, macro trends show a continued trend towards a shift from ground source to air source heat pumps in most markets, in some cases air alternatives exceeding ground source for the first time in 2010. The trend reflects a more cost conscious decision in favour of air-source units as a maturing technology with lower installation costs.

In total, more than 3.7 mio. heat pumps have been sold since 2005. They save 37 TWh of final energy and 15.7 TWh of primary energy, they produce 29.5 TWh of renewable energy from air, water and ground and avoid 6.9 Mt of Greenhouse gas emissions (GHG).
Heat pump market 2010

HP per 10,000 households

- Larger 1
- 0.5 < x < 1
- 0.1 < x < 0.5
- Smaller 0.1

Numbers include (H) heating-only + exhaust, (R) reversible and (S) sanitary hot water heat pumps. Air-air heat pumps are only included when mainly used for heating (all Scandinavia, Baltics a fraction for rest EU). *Numbers estimated. Number for industrial and thermally driven not included here.
Total 2010: 752 062

Numbers include
(H) heating-only + exhaust,
(R) reversible and
(S) sanitary hot water Heat pumps.

Air-air heat pumps for only included when mainly used for
heating (all Scandinavia, Baltics
a fraction for rest EU).

* numbers estimated

Number for industrial and thermally driven
not included here.
Looking at market developments and trends, the rapid expansion of the European heat pump sector in recent years has brought with it the typical changes and challenges of a growing market. Once a segment characterized by a large number of small manufacturers it is now being integrated into the mainstream European heating, ventilation and air-conditioning market. The large oil and gas boiler manufacturers have gradually established a position in the heat pump sector. Recent developments show both the emergence of new entrants, and continued consolidation within the sector, leading to the emergence of a number of larger European ‘Heating and Cooling Groups’.

Increased competition has brought intense price competition in all markets but in particular in the lower cost and entry level segments.

A notable development in the European heat pump sector is the growing presence and expansion of the air conditioning manufacturers. These companies are deploying refrigeration technology traditionally used in cooling devices in heating applications. By leveraging strong brand awareness and economies of scale they have taken positions in many of the markets which they have entered.

The sector is also witnessing fundamental changes in distribution channels to the end consumer. Whilst traditional three stage distribution remains strong, some markets show clear signs of a growth in two stage distribution (through installers) and some instances of a trend towards sales via DIY chains and online. New new growth opportunities exist in both the commercial and industrial sectors, where heat pumps are being increasingly viewed as viable heating and cooling alternatives. The sanitary hot water segment in both residential and commercial applications also looks set to grow in the coming years assisted by favourable legislation changes. With the relative slowdown in new build activity, a switch towards the renovation sector is noticeable. High temperature heat pumps also provide a cost effective alternative in retrofit environments for existing buildings. Although not an entirely new phenomenon, the emergence and increasing popularity of Energy Supply Companies (ESCOs) is opening up new and innovative business opportunities comprising the deployment of heat pumps by organisations utilising energy contracting models.

In terms of technology development, manufacturers continue the relentless drive for improved overall system performance, achieved through optimized components and more attention to the delivery of completely integrated solutions. This underlines the importance of the heat pump’s interplay with the heat distribution system, and a need to focus on more intelligent and integrated controls. The emergence of hybrid systems (heat pumps deployed in conjunction with other renewable or conventional heating solutions) highlights the acceptance of the technology as part of an integrated energy efficient solution in both the retrofit and new build sectors. It also enhances possible fields of applications to nearly 100% of the market. To meet the requirements of low energy buildings (efficient heating and cooling, air tightness and ventilation), systems integrating heat pumps, heat recovery and ventilation are now becoming increasingly common. In the broader context, heat pumps are seen as an enabling technology in the emerging ‘smart grid’ infrastructure and smart cities initiative. Pilot programs and extensive field tests abound in many European countries, with utilities becoming convinced of the role heat pumps can play in grid balancing, supply and demand side management, and smart energy storage.

The legislative framework put in place to underpin the drive for energy efficiency throughout the continent and achievement of the 2020 targets is now beginning to bear fruit. The key Directives (EPBD, RES Directive, Ecodesign and Energy labelling), are expected to provide a positive market impact on the inclusion and adoption of heat pumps in an emerging more energy efficient landscape.

A look towards the future at this point is encouraging. For 2011 the macroeconomic environment is looking more favourable and first signs of recovery are now becoming visible in the sector. The overall market will remain challenging but an improved economic outlook, increasing awareness of the remarkable and often still untapped potential of heat pump technology, will fuel future recovery and market growth.
EHPA was established in the year 2000 as a European Economic Interest Group to promote awareness and proper deployment of heat pump technology in the European market place for residential, commercial and industrial applications. EHPA aims to provide technical and economic input to European, national and local authorities in legislative, regulatory and energy efficiency matters.

All activities are aimed at overcoming market barriers and dissemination of information in order to speed up market development of heat pumps for heating, cooling and hot water production.

More information can be found at www.ehpa.org