The French (hi)story of Heat Pumps

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The heating markets in Europe, especially for products using fossil fuels, like boilers, have been stable for decades. Some technological improvements have been made, such as the condensing technology, gas-adaptive devices, or connectivity, but this never impacted the market volumes dramatically. Of course, this stability also applies to the French boiler market. But one segment that has not followed this trend, however, is the French heat pump market, as described in this article.

Pre-history

The French Heat Pump market emerged in the eighties. Back then, it was very much of a niche market: very few manufacturers, limited product ranges, high prices, low general knowledge of the product from installers, etc. The price of fossil energy did not favour heat pumps. Gas became the new source of energy, being affordable, convenient, and available.

Things started to change in the beginning of the 2000's. Energy prices were rising (and perhaps more importantly, were seen as unstable and volatile!) and led consumers to seek alternative technologies for heating. At that time, solar thermal systems became popular, but they had limitations for heating. People started to consider heat pumps again. Geothermal products appeared, with local specialists leading the market. Water-to-water and direct expansion products were developed, mainly in new build, where it was easier to install a network outdoors.

But heat pumps still remained a niche: in some regions with milder climates, in a specific type of home (more high-end), attracting customers with a different approach to heating and energy. And heat pumps, in the early 2000's, were still sold only at a few thousand units a year.

And then ...

It was not until 2008 that the situation changed drastically. That year made history for the French heat pump market. Particularly, the air-to-water heat pumps boomed in an unexpected way. The market for those units jumped from 51 000 in 2007 to 131 000 units in 2008 (Figure 1)! Volumes could have been even higher if the manufacturers had been able to deliver products, and installers to fit them.

This success was linked to a combination of factors. The most important one was the energy crisis, with the price of oil reaching unprecedented levels. This caused panic in the market, especially with home owners using oil as a main heating source (more than 3 million homes in France, back then). French electricity, already the cheapest in Europe, was suddenly becoming even more attractive, particularly with COPs of 3 or 4.

The Grenelle de l'Environnement, the new national program to tackle environmental issues, was being implemented. One of the measures was a tax credit (Credit d'Impôrts), which enabled home owners to claim 50 % of the price of the heat pump (excluding installation costs) as a tax reduction.

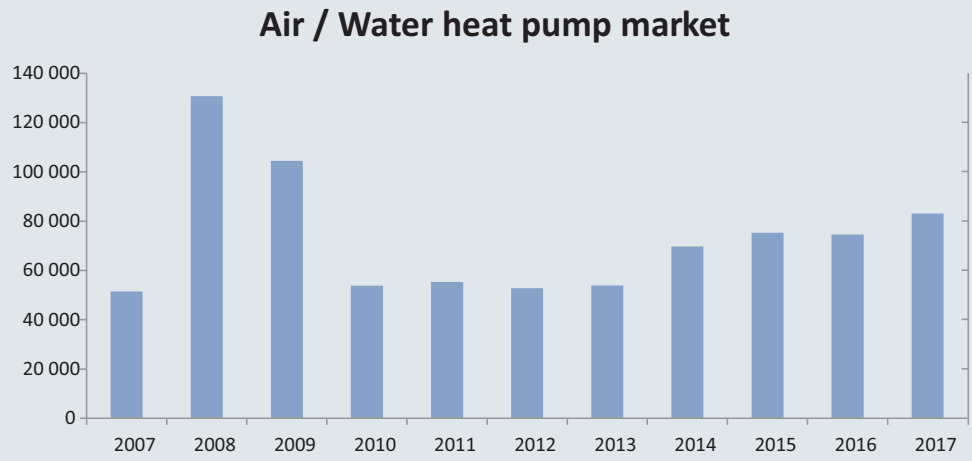

Fig. 1: Air/Water heat pump market

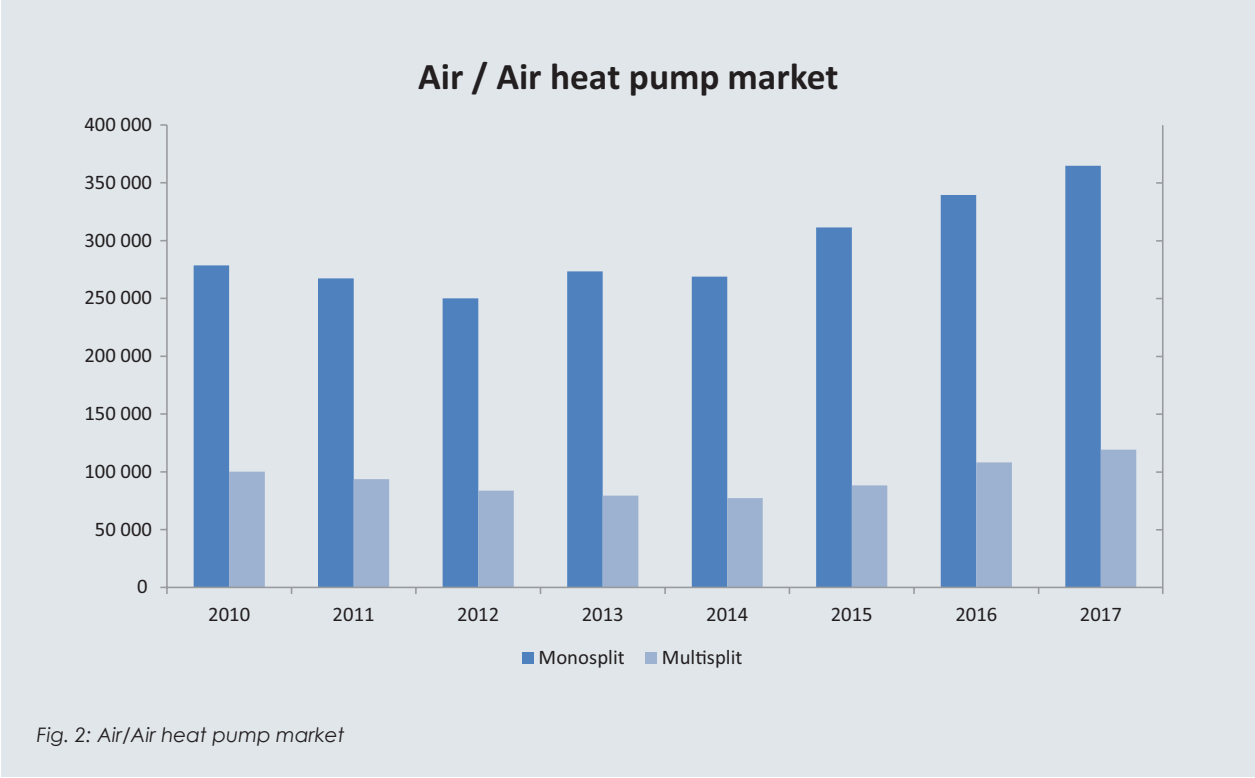

Fig. 2: Air/Air heat pump market

In addition to this, air conditioning actors entered the market *en masse,* with affordable, reliable, good quality split systems. Boiler manufacturers started to launch their own ranges, taking advantage of their installer network, good levels of service, and good brand awareness with professionals. Installers saw the opportunity and started to fit heat pumps. Some specialists appeared in the market, some without much knowledge of what a heating system was. Education of installers was developed and Quali'PAC certification implementation ensured good quality of heat pump installations. The media also played the game and helped the success of the product. Geothermal applications also benefitted from this new fashion, but in a more modest way (around 20 000 pieces sold in 2008).

At the same time, Thermodynamic Water Heaters also developed. Those dedicated applications fit well as a complement of heat-only fossil fuel boilers, which could then be turned off during the summer season.

But some issues occurred...

Products at that time were fitted mostly as a back-up of oil boilers, to reduce the household global energy bill. But some mistakes were made, both on geothermal or on air-source installations. Sometimes sizing was wrong, leading to loss of comfort. Sometimes the oil boiler was removed, leading to high electrical costs the following winter.

In 2009, oil prices dropped again. The most passionate end-users had bought their equipment. Subsidies were eventually reduced. Therefore the market became realistic and returned to more "normal" levels for 2010, around 54 000 air-water heat pumps.

A new market emerged ...

The heat pumps market was then stable for a couple of years. It was until the application of the RT 2012 (new thermal legislation for the new build in France, transposition of the European EPBD), that Heat Pumps found a second (or actually, third) youth. This time, the new build market would represent fantastic opportunities.

For many years, the new build market in France was dominated by electric systems (dry) such as convectors and underfloor electric heating. The new legislation would not favour those any longer, applying a penalty factor for the electricity production and distribution losses. Back then, the RT 2012 was one of the most stringent legislations in Europe for buildings. In particular, it set a strict limitation for the energy consumption of the building for heating and domestic hot water. It made usage of renewable energy compulsory in individual houses. The road was paved for heat pumps to be the perfect solution (Figures 2, 3, and 4).

Heat pumps also offered other advantages in the new build. It meant that a second energy source (like gas), with an additional subscription, could be eliminated. What's more, connection to the gas network is sometimes complex to achieve. And gas is not always available in rural areas, as the network is not expanding today as it was some years ago.

Heat pumps are also seen by the market as a clean solution, without local emissions, and using, in France, mostly nuclear-based electricity (although not always the case during the winter season).

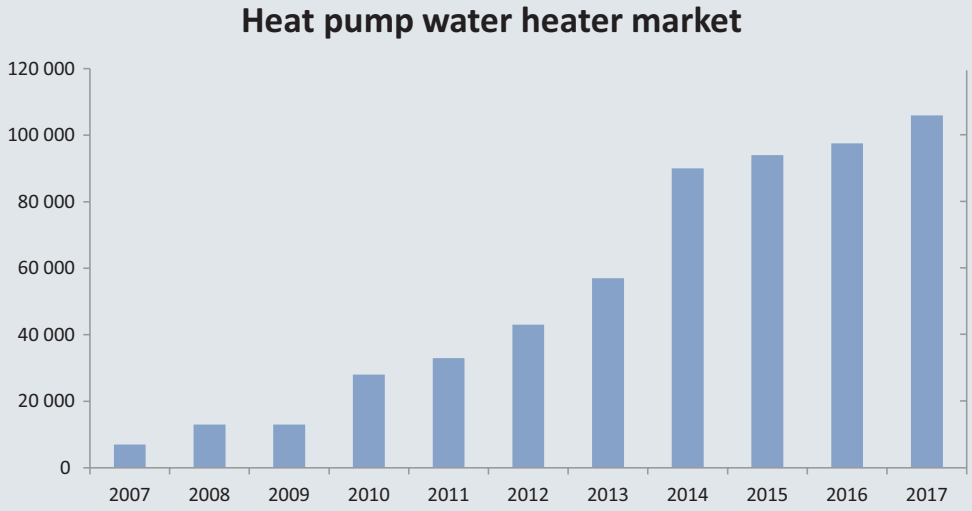

Fig. 3: Heat pump water heater market.

Heat pump models even offered integrated hot water production (with a hot water tank, generally around 100 litres). This solution was very easy to fit, and brought sufficient comfort, both on heating and on hot water needs. Compact versions are perfectly adapted to the new build, and can even be fitted in a standard cupboard.

All manufacturers offer heat pumps in their portfolio today, namely dedicated versions for the new build, ranging from 4 to 8 kW. Most installers have learned to install them by now, and therefore heat pumps can be seen as a mainstream solution in the new build. As a result, more than 40 % of new houses are equipped with a heat pump today. Air-water products are highly competitive (with attractive prices to house builders) and the level of insulation of the house enables those to warm up the house without problems. The market for air-water heat pumps has therefore reached satisfying levels in the 70 000 - 80 000 units range, and keeps increasing at a steady rate. Another significant point in favour of heat pumps, especially in the new build, is their capacity to "refresh" the house in the summer, often with underfloor cool water circulation, a common issue in air-tight new build, especially in the southern regions.

In the meantime...

Unfortunately, all heat pump types did not follow the same trend. Particularly geothermal products dropped down to very low volumes, a couple of thousands of units per year (Figure 5). This can be explained by the pop-

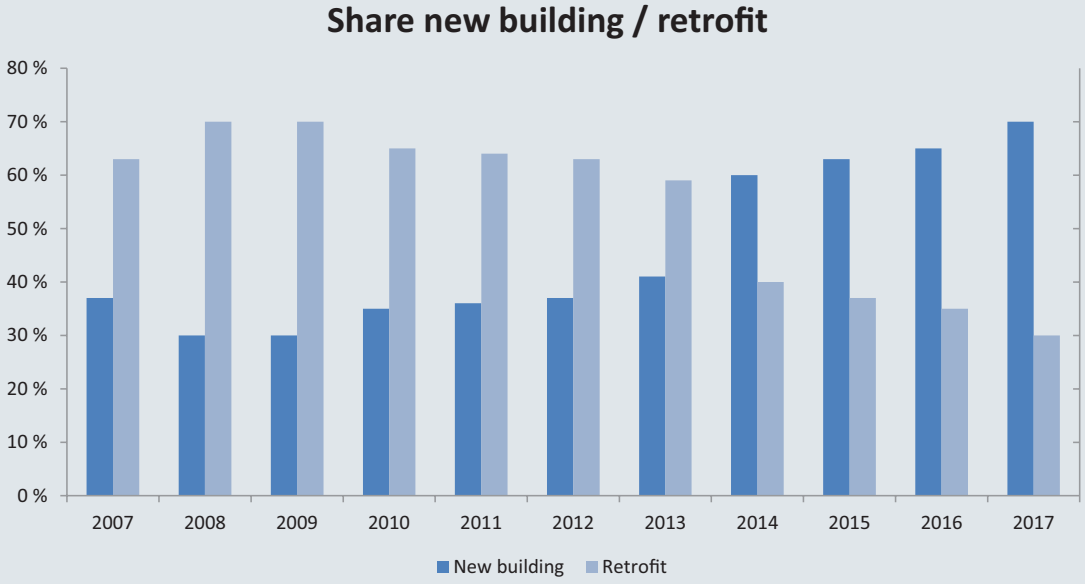

Fig. 4: Share new building/retrofit