

Fighting climate change is a rocky road - but it's the right one

Heat pumps is one of the few technologies that has the potential of providing 100 % emission-free heating. However, heat pumps need refrigerants to function and currently this usually means HFCs – the most common type of F-gas.

For the last decade, the possibilities of reducing CO₂ emissions and limiting the impact of climate-damaging gases have been the focus of attention. Since the Montreal Protocol in 1989 and the Kigali Amendment and the Paris Climate Change Agreement two years ago, the combat against global climate change has spread throughout the world. The EU F-gas Regulation is one of the most important drivers to combat climate change in Europe. The main objective is to push the industry towards low GWP and natural refrigerants, as well as to encourage the recycling and reuse of existing HFCs through a phase-down and quota system that gradually and significantly reduce HFCs – to end up at no more than 21 % of 2015 sales by 2030. But with this comes certain challenges.

The industry is now facing a comprehensive transition that calls for competences to deal with the many challenges. Some of the refrigerants most currently used by heat pump manufacturers are R410A, R407 and R32, as well as R134a in larger heat pumps. As some of these have high or medium-high GWP, they are affected by the phase-down.

Marketing quotas are introduced to limit the volume and the circulation of HFCs, and, due to this, prices are rising rapidly at all levels of the supply chain. Some refrigerants have increased by several hundred percent in recent months. Thus, refrigerant suppliers are producing less to respond to the limits of the quota system creating yet another challenge: immediate shortage or even unavailability of certain high-GWP HFCs. In the coming years, we will experience further massive cuts in the available quantities of HFCs in the EU. Some analyses even indicate that it might be difficult to get sufficient amounts of refrigerant for servicing existing systems.

The phase-down and the GWP limit of 2,500 do not leave much choice other than to stop using HFCs and instead turn to the low-GWP and natural alternatives, such as pure HFOs, CO₂, ammonia, and hydrocarbons, including reclaimed or recycled HFCs, which are not affected by the phase-down. Initiatives to extend the use of HFCs until solutions with alternatives are found have been made, but such extensions have not been granted. Therefore, an increase in the use of natural and low GWP refrigerants is expected, and opportunities have increased as new products come to fruition. The uptake of heat pumps on the European market will in part depend on the industry's ability to make the switch to low GWP and natural refrigerants.

The Ecodesign Directive not only sets the framework for common requirements for environmentally friendly products, it also contributes to the protection of the environment. The two Ecodesign regulations that apply to heat pumps are currently under review. The new requirements will be approved in 2019, and it is expected that they will more or less continue in their current form – maybe with more strict requirements on energy efficiency.

Denmark has introduced special provisions for artificial refrigerants, stating that the maximum charge of HFCs in a heat pump must not exceed 10 kg. HFOs with a GWP below 5 can now be used in charges larger than 10 kilos. The 10 kg-limit is currently up for debate and it is expected to be raised to 50 kilos for heat pumps.

For the heat pump industry, the combat for global climate change means a rocky road full of challenges to ensure the move towards low GWP and natural refrigerants, as well as recycling and reusing existing HFCs.

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