

H&Vnews

The heat is on

An EU-funded project to test the efficiency of CO₂ in any climate is seeing good results, reports Andrew Gaved

The partners behind the EU-funded project that seeks to develop CO₂ systems for supermarkets say that early results are promising. The LIFE C₄R project, part of the EU's wide-ranging €3.4 billion LIFE climate project, seeks to support the transition away from HFCs and to help work towards the targets of the recently released European Green Deal, aimed at making the Europe the world's first climate-neutral continent by 2050.

LIFE C₄R (Carbon 4 Retail Refrigeration) aims to completely replace HCFCs and HFCs in commercial refrigerators with CO₂ and to demonstrate the feasibility and efficiency of innovative technological solutions for the commercial refrigeration sector.

The project's key policy objective is to create an industrial standard that supports policy makers to push the use of energy-efficient natural refrigeration systems.

The project sees the testing of two technologies from Italian refrigeration specialist Epta: Full Transcritical Efficiency System (FTE2.0) and ETE (Extreme Temperature Efficiency). Both innovations make CO₂ usable at higher temperatures, meaning the system can work efficiently in warm climates. They also use 10 per cent less energy than traditional solutions, while installation and maintenance costs are down by 20 per cent, the project partners say.

Epta and its project partners Epta Iberia and Romanian subsidiary DAAS have outlined two main targets:

- To develop a technology that allows a minimum of 10 per cent energy savings in commercial refrigerating plant in any country, with any external temperature;
 - To prove the possibility to completely substitute HCFC and HFC with CO₂ in any climate or market condition;
- Since beginning the project in late



The project is based on the latest generation of Epta's FTE System, which won a 2017 Cooling Award

2018, the partners have set out to prove;

- Industrial development of C₄R technologies based on tests and results performed by Epta in the laboratory;
- Two pilot prototypes installed and tested at end users' premises in Italy;
- Replication prototypes (at least four in Romania, Spain, and elsewhere) to validate performance under other climate conditions;
- Full Life Cycle Analysis according to the standards of LCCP to evaluate the project's carbon footprint and environmental performances.

Technical objectives

The partners say the key objective is "high efficiency at all temperatures with no limits, not only at [ambient] temperatures lower than 30 deg C" along with improved efficiency and a minimum of 10 per cent energy savings in commercial refrigeration systems "in any country, with any external temperature".

Other objectives include looking

The objective is to create a standard that supports use of energy-efficient natural refrigeration

to provide cost savings of up to 30 per cent on both equipment and controls, compared to the current solution.

The project's environmental credentials are naturally headed by the ability to reduce refrigerant GWP to 1. LIFE C₄R also seeks to "reduce carbon footprint over the entire value chain", based on a LCCP approach and to reduce EU greenhouse gas emissions by at least 1.5 per cent using the technology.

In February, the partners inaugurated the Consum store at Benecassim in Spain, a store designed by Epta Iberia.

Consum, the largest co-operative in the Spanish Mediterranean region, is particularly attentive to reducing the environmental impact, LIFE C₄R says – all its stores are eco-friendly and, thanks to a policy of continuous investments, it boasts a 21.6 per cent reduction in the carbon footprint compared to

2015 figures. The key factors that allow it to achieve such standards of excellence include the use of natural refrigerant gases like transcritical CO₂, already used by Epta in 25 stores using the FTE Full Transcritical Efficiency system, the project partners say.

"When we suggested to Consum to participate in the Life C₄R initiative and implement the first Spanish project together, they immediately decided to join the programme," says Diego Ortega, Trade Marketing Manager of Epta Iberia. "Life C₄R was born to raise awareness in the scientific community and among the players of the retail world, showing how it is possible to fully replace HCFC and HFC refrigerants with transcritical CO₂ in any climatic condition."

The store was identified due to its Mediterranean climate as suitable for assessing the performances and obtain objective data of the environmental impact of FTE and of the other systems adopted in regions with high temperatures. Compared to a system developed with HFCs, the Benecassim store will ensure a saving of 21,548 kWh per year, the partners say. 