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CO_2 COOLING MARKETPLACE

European Retailers Report Energy Savings in Life-C4R/Epta Transcritical CO_2 Project

Food retailers who participated in the Life-C4R (Carbon 4 Retail Refrigeration) project reported energy savings and other benefits associated with installations of transcritical CO_2 (R744) equipment in warm ambient climates during a July 1 webinar.

The webinar – hosted by Italian OEM Epta, which coordinated Life-C4R project – marked the conclusion of the three-year initiative.

Life-C4R, co-funded by the EU, was created to accelerate the implementation of very-high-efficiency CO_2 refrigeration systems as a way of reducing GHG emissions and cutting energy.

In the webinar, representatives of three European retailers – Conad Centro Nord, Consum and Mega Image – discussed the installations of Epta's transcritical CO_2 equipment, notably systems using the FTE (Full Transcritical Efficiency) 2.0 and/or ETE (Extreme Temperature Efficiency) technologies.

Also, at the webinar, Epta announced the availability of a new version of its Eco_2Large transcritical CO_2 rack that includes integration of the FTE 2.0 and ETE technologies.

"The two technologies at the heart of the Life-C4R project are FTE and ETE," said David Wirth, Product Manager for Epta during the webinar. The technologies have already been used individually and together over the past three years in "hundreds of installations," he added.

Saving 60,000 washing machine cycles.

The first pilot project for the Life-C4R project, launched in October 2019, took place at a store operated by Conad Centro Nord in Carpenedolo, Italy, where summer temperatures frequently reach 35°C (95°F). The store installed Epta's Eco_2Small rack, including FTE 2.0, which saved 54,514kWh/year compared to standard solutions, according to Epta; that's equivalent to about 60,000 washing machine cycles.

"We appreciate the energy savings; it's really impressive," said Stefano Elli, Planning and Controlling Director for Conad Centro Nord. "With CO_2 and FTE, we feel we have found the efficient solution we were looking for."

Conad Centro Nord also installed an Epta system with ETE technology, as part of the Life-C4R project, at a store in Bologna, Italy, where it saved 55,868 kWh/year, said Epta.

The second Life-C4R Epta project took place at a new 1,400m² (15,069ft²) Consum store in Benicasim, Spain – another high-ambient-temperature location – starting in January 2020. The store is using an Epta transcritical CO_2 system that incorporates both FTE 2.0 and ETE technologies. In 2020, Consum installed transcritical CO_2 systems in 17 new supermarkets, reaching 113 stores with CO2 refrigeration out of a total of more than 700 outlets.

"Compared to an installation without FTE or ETE, there was a reduction of 15% [in energy consumption] measured last summer" at the Benicasim store, said Javier Martínez, Organization and Control Executive for Consum, during the webinar. Over a year, the energy savings was 21,548kWh, Epta said.

The store's CO_2 system experienced "a considerable reduction" in compressor discharge temperatures, and an increase in evaporation temperature at medium-temperature cabinets, said Martínez. In addition, the system reduced condensation temperature, "practically eliminating the flash gas that causes inefficiency in high temperatures," he noted.

Overall, the Benicasim store showed that, "with currently available technology, CO_2 is efficient in hot climates such as ours," Martínez said. "We will maintain our commitment to CO_2 in systems that incorporate optimization solutions such as FTE 2.0 and ETE because of the ease of maintenance and the continuous energy savings 365 days per year."

Another Life-C4R pilot project was carried out at a Mega Image chain store in Sibiu, Romania, beginning in April 2021. The store installed an Epta Eco_2Small pack with an FTE 2.0 system.

The installation is designed to reduce consumption by 10%, compared to an equivalent system with HFC, said Epta. That would save 38,573kWh/year which is equal to 41,787 fewer washing machine cycles in a year or 1,052 fewer small cars in 10 years.

"The system has been very reliable and functions in tough conditions," including high ambient temperatures, said Vasile Casian, Technical Manager for Mega Image, a division of Ahold Delhaize, who also participated in the webinar. Mega Image plans to install more such systems, he added.

In addition to the two Conad Centro Nord stores, the Consum store and the Mega Image store, the Life-C4R project has conducted FTE 2.0/ETE pilots at supermarkets in Perugia, Italy (operated by Oasi), Timisoara, Romania (Auchan) and Madrid, Spain (ALDI).

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Javier Martínez, Consum