

## Refrigerants, Naturally!

for LIFE



### Belgian Chain Successfully Converts 12 Organic Stores to Natural Refrigerants

Bio-Planet aims to equip all of its current 31 small stores with propane-based refrigeration systems by 2029 as part of the group's ambitious CO<sub>2</sub> emission reduction targets.

#### About the store

Bio-Planet, part of the Colruyt Group, is a store chain that offers a wide range of organic and ecological products. Its strong points are the fresh food area and the catering counter, which offer a unique range of meat, cheese, preparations and vegetarian products.

"Bio-Planet intends to encourage its customers to live responsibly," explains Collin Bootsvelde, Project Engineer, Colruyt Group. "As a supermarket, Bio-Planet wants more than ever to make a difference on the Belgian market, thanks to a true and good assortment, which excels in health, ecology and respect. It offers an in-store experience that simplifies the life of customers while inspiring them. In addition, Bio-Planet continues to focus on sustainable innovation."

As of July 2020, there are 31 Bio-Planet organic stores throughout Belgium, each at around 600m<sup>2</sup> in size and employing a total of 500 staff members.



Bio-Planet store compact propane chiller

## A climate-friendly choice for cooling

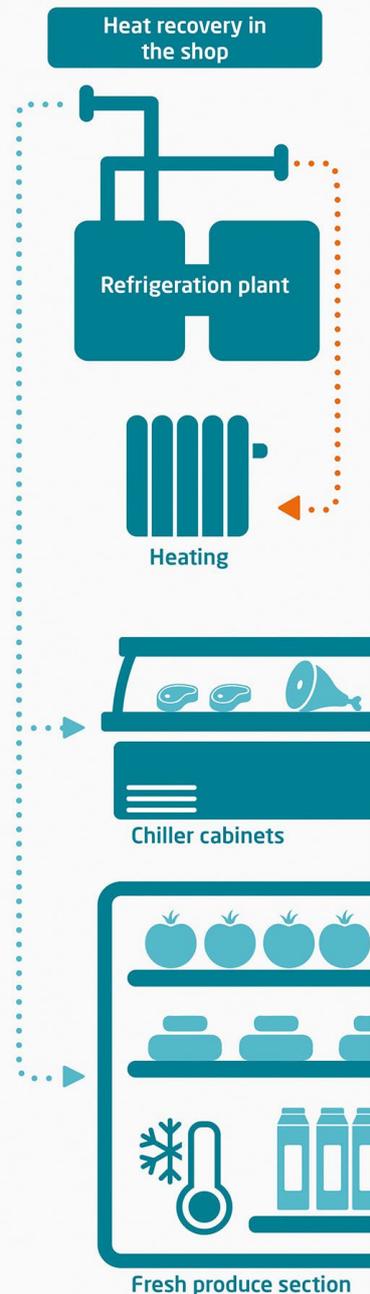
In 2012, the Colruyt Group set itself an ambitious objective: to reduce its CO<sub>2</sub> emissions by 20% by 2020 compared to the 2008 baseline year and in proportion to sales. They aim to increase this reduction to 40% by 2030, confirmed Bootsvelde. This aligns with the company's mission to have the lowest possible environmental impact. "By 2029, all Bio-Planet stores will be equipped with natural refrigeration systems using propane," he said.

As such, they have been opting for natural-refrigerant based propane compact-chillers wherever possible for new stores and older ones in need of refurbishment. Waste heat from the refrigeration system is recovered for heating purposes too. This means the shop needs little or no fossil fuels for heating.

To educate customers, Bio-Planet displays the major sustainability measures taken in the specific shop at the entrance for everyone to see.



Bio-Planet propane cooling heat recovery explained





## A natural choice

A variety of natural-refrigerant based equipment is used in the Bio-Planet stores. This includes propane compact chillers, chest freezers with isobutane, and CO<sub>2</sub> heat pumps for domestic hot water.

The most important considerations when purchasing equipment for these stores are reliability, sustainability, efficiency, maintenance practicality, and life cycle cost. Regulations were also considered but the team experienced no issues or legal barriers. The flammability of the propane cooling solution and the resulting safety measures were discussed with the regional authorities.

The adopted technology features a compact chiller based on the principle of a ventilated enclosure. It produces both hot and cold glycol. The chiller can be easily exchanged in case of a technical defect. One reserve chiller is placed as well for redundancy. The cold glycol is pumped towards the refrigerated cabinets, air handling units and coolers. The warm glycol is pumped towards the heating system or a dry cooler on the roof.

The electricity used for the store is generated from sustainable energy sources such as solar PV, cogeneration, and wind power – making these installations even more environmentally friendly.

## Positive results

Thanks to switching over from HFC-R507 to a hydrocarbon-based cooling solution, Bio-Planet has reduced its direct CO<sub>2</sub> emissions (CO<sub>2</sub>e) by more than 99% in these stores. Since indirect evaporation (with a glycol circuit) is used in the propane installation, the refrigerant charge is smaller than that of a classic R507 installation. The annual leakage loss at a propane installation is also smaller compared to that of an R507 installation because the piping is much more limited and because the propane chillers are built and tested in a factory, explains Bootsvelde.

When it comes to indirect emissions, the Group's internal production of sustainable electricity makes a significant positive impact. Because of the introduction of heat recovery measures, when compared to the 2015 store, the 2019 upgrade's CO<sub>2</sub>e was reduced from 80 ton/year to only 0.16 tonnes/year – and the new stores no longer use any fossil fuel for heating. Also, it is important to note that the energy efficiency of this natural refrigerant-based cooling system is comparable to that of the an HFC installation.



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