

# REFRIGERATION

COMMITMENTS & ACHIEVEMENTS OF CGF MEMBERS



The Consumer Goods  
**FORUM**

# INTRODUCTION NOTE

AN INDUSTRY COMMITTED TO PHASING OUT

HARMFUL HFC REFRIGERANTS

Back in 2010, the CGF's members made a commitment to tackle the growing impact of refrigeration systems and, in a move to sustain momentum, the CGF's Board announced a second Refrigeration Resolution in October 2016 to continue the phase out of HFCs and call for the inclusion of HFCs in the Montreal Protocol. This proposed amendment was included in 2016: a huge step towards the global phase-out of harmful HFCs.

The resolution focuses on four key areas; the installation of new refrigeration equipment in markets where viable, the engagement with key stakeholders to overcome barriers in markets where installation is not currently viable, the reduction of the environmental impact of existing refrigeration systems and the development of individual targets and action plans to measure the first three points.

However, for all the industry's achievements, there is scope for companies to be more ambitious in phasing out harmful chemical refrigerants and moving to natural alternatives. The benefits of doing so are not just environmental but economic too. When implemented at scale, a HFC phase-down will have huge impact and could prevent warming of up to 0.1 °C by 2050 and 0.5 °C by 2100, offering one of the most cost effective climate mitigation strategies available in the world today.

To support faster uptake, and as the only organisation bringing consumer goods retailers and manufacturers together globally, we have been able to bring our members together to discuss the barriers and solutions to a faster and geographically wider uptake of natural refrigeration systems; help those that haven't yet explored or invested in natural refrigeration systems to realise the benefits of doing so; and give suppliers confidence that the sector is interested in this technology.

This is why I am happy to introduce the CGF Refrigeration Booklet, which details some of these success stories.

However, while much has been achieved since the initial commitment was made in 2010, there is still more that we can do. We want to see further implementation of natural refrigeration systems beyond 2017. We will continue to mobilise the efforts of our members and work with civil society and international organisations, with a view to promote the development, commercialisation and adoption of climate-friendly alternatives to HFCs for all relevant industry sectors and overcome barriers that limit the widespread introduction of these climate-friendly technologies and practices.

In short, no matter what industry you are in, the case for switching to natural refrigerants has never been stronger, and the time to move is now!

Thanks for reading, and don't hesitate to connect with us should you have any questions about our work to phase out harmful HFC refrigerants.



**IGNACIO GAVILAN,**  
Director, Environmental Sustainability  
The Consumer Goods Forum





“ AEON AIMS TO REALISE A SUSTAINABLE SOCIETY WITH STAKEHOLDERS. AND, WITH THE REALISATION OF A LOW-CARBON SOCIETY AS OUR CORE FOCUS, WE WILL CONTINUE TO THINK GLOBALLY AND ADVANCE ACTIVITIES LOCALLY.



MOTOYA OKADA  
GROUP CEO,  
PRESIDENT  
OF AEON  
CO., LTD.

## ” OUR POSITION

Here at Aeon, we remain committed to phasing out hydrofluorocarbons carbons (HFCs) due to their extremely high global warming potential (GWP) and their high contribution to greenhouse gas emissions (GHGs).

As part of our plans to switch to natural alternatives, new stores are now being fitted with non-HFC systems to help prevent global warming and to help play our role in keeping global temperature increases to below 2°C.

## OUR ACTION

In 2011, Aeon introduced its Natural Refrigeration Declaration, which publicly acknowledges our commitment to phase out HFCs and switch to natural refrigerants at our new stores. This commitment is also supported through our work at The Consumer Goods Forum and their corresponding Refrigeration Resolution.

In 2009, Aeon became the first Japanese retailer to introduce natural refrigeration (CO<sub>2</sub>) freezers and

refrigerators. As of the end of FY 2015, we have introduced natural refrigeration (CO<sub>2</sub>) based equipment at 45 new stores.

However, it hasn't been an easy journey. We have faced many challenges along the way, including the lack of supplier choice, high costs, specific regulations on natural refrigerants and trying to overcome these issues by creating awareness with our stakeholders.

Thankfully, however, progress has been made. Our results have been positive and we look forward to building on these as we continue to increase the number of natural refrigeration systems we have in operation.

## OUR RESULTS

We firmly believe that we are taking the right path by switching to natural refrigerants and we've seen the benefits through a reduction in GHG emissions and energy savings across the stores currently using the natural refrigerants.

And, in Japan, the rigorous regulation to control the leakage of fluorocarbons was executed in April 2015. The natural refrigerants are not covered by the regulation so there are no extra costs or burdens required.

However, we haven't overcome all the challenges yet, and we are still working on finding solutions to the issues of high cost and over regulation of natural refrigeration systems. We hope a wider uptake across the industry in Japan will help address these issues.

## KEY FIGURES

### Results from our Aeon Mall in Makuhari New city:

- Introduction of natural refrigeration systems in the Aeon Mall:
  - Direct operation area: about 21,500 sqm
  - Food section area: about 5,200 sqm

### Results from the natural refrigeration systems:

- # installed: 20 systems
- # of refrigeration systems with CO<sub>2</sub>: 44 cases /Total 182 cases
- Estimated Energy saving effect: about 20% compared to HFC refrigerants
- Estimated GHG emissions reduction: 813 CO<sub>2</sub>-t
- Indirect CO<sub>2</sub> reduction: 60 CO<sub>2</sub>-t / Direct GHG reduction: 753 CO<sub>2</sub>-t





“ REDUCING OUR DIRECT IMPACT ON CLIMATE EMISSIONS THROUGH INNOVATING HOW WE REFRIGERATE PRODUCTS IS PART OF HOW WE OPERATE SMARTER AND GET BETTER EVERY DAY. IT’S AN ESSENTIAL PART OF OUR AMBITIONS TO BE A SUSTAINABLE RETAILER. FOR EXAMPLE, ALBERT HEIJN IN THE NETHERLANDS IS MAKING GREAT PROGRESS WITH STATE OF THE ART XL STORES THAT ARE 100% CO2 NEUTRAL. ”



## OUR POSITION

When Royal Ahold and Delhaize Group merged in mid-2016, we committed to specific actions to continue to drive toward being a more sustainable retailer. Among those are three targets related to reducing the climate impact of our refrigeration systems, to achieve by 2020:

1. Reduce our CO2 emissions per m2 sales area by 30% compared to our 2008 baseline.
2. Reduce our global warming potential (GWP) from 2.430 to 2.230.
3. Increase the percentage of ozone friendly refrigerants from 73% to 85%.

Leakages from our refrigeration systems in stores and warehouses contributed 30% of our global CO2 emissions in 2017. Therefore reducing this is an important driver in making progress on our climate targets and to limit our environmental footprint.



DICK BOER,  
CEO, AHOLD  
DELHAIZE



## OUR ACTION

Natural refrigeration systems are the new standard when we remodel or build a store in our Belgium, Luxemburg and Dutch markets. Our brands in the United States and Central & Southern Europe continue to test natural refrigeration systems to find the best options for their markets. We share the knowledge we learn between our family of great local brands, enabling them to learn faster and drive uptake of natural refrigeration across our businesses.

In addition to switching the refrigerants we use, we have a strong focus on reducing refrigerant leakage. Our brands achieve this through installing leak detectors and ensuring solid maintenance programs are in place so our systems perform at their expected level.

## OUR RESULTS

As of 2017, we had reduced our CO<sub>2</sub> emissions from refrigerants by 20% compared to our 2008 baseline. We also continued to increase the number of stores operating with natural refrigerant systems (over 650 stores as of the end of 2017).

Ozone-friendly refrigerants are used in nearly all of our European facilities, and are on the rise in our U.S. and Indonesian markets.

Our brands continue to improve their performance year over year. For example, the Maxi brand in Serbia reduced refrigerant leakage by 63% in four years, and Albert Heijn in the Netherlands maintains a leak rate of 5%.

## KEY FIGURES

- End of 2017 661 stores are using natural refrigeration
- 20% reduction in relative equivalent CO<sub>2</sub> emissions from refrigerants from 2008-2017.

# Kuhinja

• SVEŽE • KUVANO • PEČENO • GRILOVANO •







**“ SUSTAINABILITY WAS ALWAYS THE FOUNDATION OF WHAT WE DO: MORE THAN 15 YEARS’ EXPERIENCE WITH NATURAL REFRIGERANTS MADE US THE WORLDWIDE LEADING “GREEN” SUPPLIER OF ECO-ORIENTED PLUG-IN REFRIGERATION SYSTEMS. WE TAKE CARE OF THE FUTURE!**



**HANS AAGE JØRGENSEN,  
CEO, AHT  
COOLING  
SYSTEMS**

**OUR POSITION**

It has always been important to us to consistently operate sustainably and with an eye to the future in research and development. Hence, the path initiated by successive prohibitions on hazardous synthetic refrigerants soon became very clear: AHT would commit itself to the development and production of environment-friendly and energy-efficient refrigeration systems. The bar for this process was already high to begin with – for our goal from the very outset was to completely forgo the use of climate- and ozone-disruptive refrigerants in the medium term.

Thus we began our “green” offensive more than 15 years ago – in particular, we were the first manufacturer ever to use natural refrigerants like R290 (propane) or R600a (isobutene) in commercial refrigeration and freezing equipment.

With this orientation towards sustainability and the necessary innovation dynamics, we succeeded in setting new technical standards in the segment of commercial refrigeration and freezing which have contributed significantly to the substantial ecological improvement of the food retail sector.

## OUR ACTION

Concentration on transitioning to greener types of refrigerants was made a focus of the AHT development strategy early on in order to stay abreast of the developing market situation. The beginning of the project consisted primarily of tests on existing appliances to determine their refrigeration performance and general behaviour when filled with alternative refrigerants. In close cooperation with our customers, the AHT R&D department then began developing new model generations whose technology was entirely designed around the requirements of “greener” refrigerants; our first large-scale field tests under realistic conditions were conducted as early as the year 2000 (among others at the Olympic Games in Sydney). These tests were very successful and allowed comprehensive roll-out to our customers starting in 2004; many of our partners soon exchanged their existing refrigeration and freezing equipment for the new, sustainable model generations. To this day, more than 1.5 million AHT units with “green” refrigerants have been manufactured – and production levels continue to rise.

As with every successful project, a number of technical hurdles had to be faced and manufacturing processes adapted, but the experienced team at AHT mastered these challenges with aplomb, enabling us to offer our customers technically advanced and safe products of the highest quality. In fact, certain legal impediments and marketing restrictions posed the greater problems, making it difficult to introduce units with alternative refrigerants to some markets. Thankfully, however, the legislations of many countries have since reacted, creating the legal frameworks necessary to support the transition towards sustainable refrigeration and freezing technology for food retailers as well as for technology providers.

## KEY FIGURES

- **3 production sites (Austria, Brazil and P.R. China)**
- **16 Sales offices**
- **More than 1,500 employees worldwide**
- **A global service network for best customer satisfaction**



## OUR RESULTS

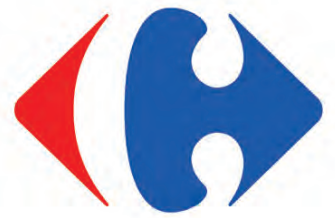
The new “green” unit series have seen excellent market acceptance, meaning that our investments into research and development have definitely paid off. AHT has also been able to extend its reach to new clienteles and develop many new market potentials with its environment-friendly refrigeration and freezing appliances.

The most important thing, however, is that the large number of new appliances has helped to reduce energy consumption and associated CO2 emissions in the food retail sector around the world. In the past 20 years – thanks in large parts to the use of natural refrigerants – the average energy consumption of the AHT appliance fleet has been reduced by 50%. This extraordinary operating efficiency creates sustainability in the best sense of the word, and represents the optimal solution for contemporary, “green” food refrigeration – in particular considering the fact that refrigeration and freezing are massive cost drivers in the food retail sector.

AHT builds on these insights and applies its experience to all of its development processes in order to stay ahead and remain optimally prepared for the future!







“ GIVEN ITS CENTRAL ROLE IN THE DAILY LIFE OF THE MAJORITY OF PEOPLE ON THE PLANET, THE CONSUMER GOODS SECTOR MUST CONTRIBUTE TO THE EMERGENCE OF COLLECTIVE SOLUTIONS IN THE FIGHT AGAINST CLIMATE CHANGE. CARREFOUR IS PROUD TO CONTRIBUTE TO THIS MOVEMENT” ”



**ALEXANDRE BOMPARD,  
CEO,  
CARREFOUR**

## OUR POSITION

Producing refrigeration is essential for the fresh and frozen food sections in our stores – it’s needed to preserve the products’ high quality. However, fluorinated refrigerants have a very high impact on the environment (they contribute to the greenhouse gas effect and have a considerably large carbon footprint). And they are the second biggest source of greenhouse gas emissions in the retail sector.

In order to ensure that the cold chain is not broken while at the same time maintaining customers’ comfort levels and using a refrigerant that is environmentally friendly, Carrefour has worked closely alongside its partners in all of the countries in which it operates, even in very warm regions like southern Spain and Brazil where it is a major challenge.

Carrefour supports the CGF’s drive to phase out HFCs so as to speed up development of other solutions for more effective cooling systems.



## OUR ACTION

- The first step involved studying the countries which are early-adopters in the use of CO<sub>2</sub> technology, like Switzerland. In this country the technology has been tested in a varied range of representative store formats: different sizes, and in different locations and environments. And the methodology used together with the approved rigour were a genuine source of inspiration for Carrefour. One interesting revelation of the study was the good energy efficiency of the alternative technologies that strengthened Carrefour's choice to begin phasing out HFCs.
- Joint initiatives were entered into with a number of preferred partners and CO<sub>2</sub> technology experts. This step was crucial – the preferred working method for close supervision during preparations, particularly just as the pilot projects were being launched.
- We identified technical support for the stores, by creating partnerships with the best local installers able to up competence on CO<sub>2</sub> technology.

- We then set up clusters of stores using CO<sub>2</sub> and other natural refrigerant installations in different regions to get prepared for an easier deployment.
- Then, Carrefour started to tackle warmer regions, such as Spain and Brazil, in order to ensure the performance of CO<sub>2</sub> transcritical installations. These pilots require specific technical adaptations to be energy efficient.
- Finally, negotiations based on detailed breakdown of costs helped to reduce pay-back, and allowed additional investment. At Carrefour, we believe that this technological breakthrough is an investment for the future. It's one of the levers that will help us reach our goal of reducing our CO<sub>2</sub> emissions by 40% between now and 2025.

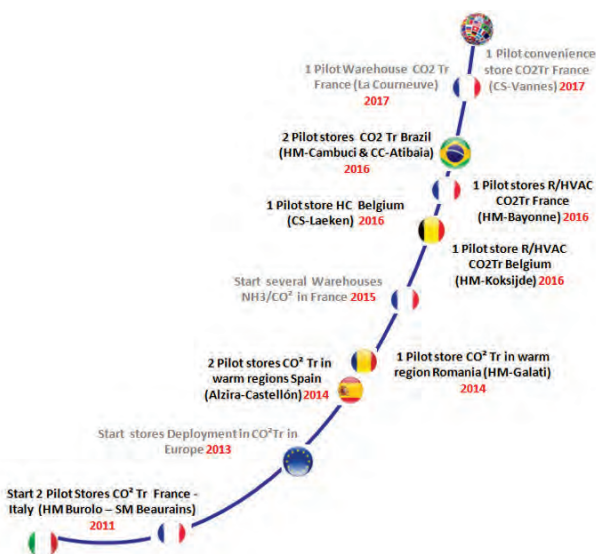
All these key points are the ingredients of success.

Significant preparations were necessary to tackle the issue and overcome the natural gas refrigeration reluctance:

- Enable all stakeholders to start using this new technology, persuade and bring pedagogy.
- Play a part in developing the market for HFC alternatives. The challenge was to get the various stakeholders involved in these new technologies (manufacturers, installers, maintenance companies, etc) around a table so that they could work together and tackle the various technical and financial difficulties.
- Renew the initiative in each region so as to find the right partners for each local installation until a pilot project becomes a general way of doing things.

## KEY FIGURES

- **In Europe and Brazil, more than 400 stores are running with natural refrigerants in January 2018.**



## OUR RESULTS

This approach has served as a means of identifying the real benefits:

- A very low carbon footprint (CO<sub>2</sub> has a warming potential that is 450 to 9,000 times lower than gases in the HFC family over 20 years).
- It is more energy-efficient and so less electricity is required (generating savings of between 10% and 20%).
- Systems are more airtight and so less gas is released into the atmosphere.
- Guarantees in terms of safety: it is non-flammable, non-corrosive, chemically inert, non-toxic and so non-hazardous for store personnel.



“ IN GRUPO BIMBO, WE WORK EVERY DAY TO PRESERVE THE ENVIRONMENT AND REDUCE OUR CARBON FOOTPRINT. AS A MEMBER OF THE CGF, WE ARE COMMITTED TO MITIGATE GLOBAL WARMING THROUGH A ROBUST STRATEGY FOR THE UTILIZATION OF NATURAL & LOW GWP REFRIGERANTS AND THE PHASE OUT OF HFCS. ”



## OUR POSITION

In Grupo Bimbo, our “what for”, is to build a Sustainable, Highly Productive and Deeply Humane company.

Our Sustainability Strategy guides us in the implementation of environmental practices throughout the value chain, and Grupo Bimbo is convinced that sustainable refrigerants (natural, low GWP and new generation alternatives) will help us to reach our goals of Carbon Footprint reduction.

We are aware of the importance of refrigeration in our processes (from ingredient storage to product freezing, storage and distribution), and how critical it is to choose wisely and better regarding our refrigerant options. With the release of our Global Refrigerant Policy, in 2019, we are able to track our phase-out progress, focus our attention on asset care, share best practices and ultimately, phase-out HFCs refrigerants from our operations.

Being a company present in 32 countries, our sustainable refrigerant strategy considers Natural, Low GWP and New Generation Refrigerants, so it can be adopted globally in Grupo Bimbo.



**DANIEL**  
**SERVITJE,**  
**CHAIRMAN,CEO,**  
**GRUPO BIMBO**

As part of our actions, we have released our Global Refrigeration Policy, currently under implementation. This effort has been made with the synergy of three global functions: Environmental Sustainability, Asset Management and Engineering. The policy main goal is to phase-out, from our operations, HCFCs refrigerants by 2025 and HFCs refrigerants by 2030. Additionally, it prioritizes the use of sustainable refrigerants, such as Ammonia or CO<sub>2</sub>, on the installation of new manufacturing lines and facilities.

Every year, we conduct a survey that helps us to track progress as we move towards 2030 and allows us to understand where the main challenges are to assess the required Capital Investment.

We began discussions with OEM's to explore Natural Refrigerant options and we have participated in our first ATMOsphere conference, organized by Shecco, where we learned massively and got insights from companies that have travelled a long way using Natural Refrigerants.

We work with our bakeries in which we have Natural Refrigerants Systems, such as the ones in Mexico, Canada, United States, Argentina, Russia, United Kingdom, France and Turkey to identify best practices and share these with the bakeries so they can also adopt these solutions.

We will continue working in order to comply with our commitments, and believe that by adopting sustainable refrigerants, there will not only be benefits for our planet, but for our society and business as well.

## OUR RESULTS

One of the best examples on our journey, is our bakery in Ontario, where Grupo Bimbo installed a Low Charge Ammonia/CO<sub>2</sub> packaged system, which is a proven Natural, Safe and Efficient alternative, the first of its kind in Canada.

Some of the benefits we have found with the system are:

- Significant reduction of the Environmental Impact, as both refrigerants are environmental friendly.
- Power consumption is half of the one in the synthetic option (197 kW vs 298 kW), this translates in over 600,000 kWhr saved annually and represents not only savings for our company, but reduction of CO<sub>2</sub> emissions.
- Regarding safety, the system has less than 200 lbs. which are centralized in a machine room, it significantly reduces risks, limits regulatory compliance and makes it a safe option for our people and our product.
- Maintenance costs are lower, when comparing to the synthetic option in the long-term, and led, among with the energy savings, to a less-than-5 years payback investment, which is very attractive for us.

Today, in the Ontario area, our bread is stored with a lower environmental impact. Our work on refrigeration has been a vital part of our sustainability journey towards nourishing a better world.

## KEY FIGURES

- **Grupo Bimbo joins RE100 and commits to use 100% renewable electric energy by 2025.**
- **Gradual replacement of refrigerants to phase-out HCFCs by 2025 and HFCs by 2030.**
- **10% reduction of carbon footprint by 2020.**

“ SUSTAINABLE REFRIGERATION AND PHASING OUT HFCs IS ONE OF THE BEST INVESTMENTS COMPANIES CAN MAKE IN THE FUTURE OF OUR PLANET. HEINEKEN STARTED THIS JOURNEY IN 2010 AND THE AVERAGE CO<sub>2</sub> EMISSIONS FROM OUR FRIDGES ARE NOW 50% LESS THAN IN 2010. AS MEMBER OF THE CGF WE REMAIN COMMITTED TO SHOW LEADERSHIP IN THIS SPACE. ”



JEAN-FRANÇOIS VAN BOXMEER, CEO, HEINEKEN



## OUR POSITION

Our consumers love our beers when served cold. In the majority of cases, we own the fridges and draught beer equipment. We place it with our customers to help them serve the perfect Heineken® or one of our other brands. But we are also aware of the impacts of chilling our drinks.

Our journey started in 2010, as part of our sustainability strategy 'Brewing a Better World'. One of the targets we formulated that year was to reduce CO<sub>2</sub> emissions of our fridges by 50%, by 2020. We discovered that phasing out HFCs and replacing them by natural alternatives would support this target in two ways: it helps to deliver energy efficiency and it has a significantly lower Global Warming Potential compared to the existing refrigerants we used in our fridges.

Due to the lifecycle of fridges, which stands at around eight years, we anticipated that in order to reach our target in 2020, we needed to start immediately. And that's exactly what we did in 2010.





## OUR ACTION

We consider our fridges to be 'green' if they have one or more of the following features: the use of hydrocarbon refrigerant, LED illumination, an energy management system, and energy efficient fans. Whenever a fridge needs to be replaced, we provide a 'green' fridge.

We work with a number of cooling partners and an independent cooling advisory group, which helps us with the technology side of things. We first introduced the equipment in Europe, followed by the Americas and later in Asia and Africa. It took time to develop a servicing infrastructure. The equipment suppliers provide HEINEKEN's customers with training on how to work with hydrocarbons.

To meet our targets, we invested in a specific suite of technology. By reducing the energy requirements, we have seen less strain on the components, which has shown to increase the useful lifetime of the fridge.

The use of natural refrigerants is not restricted to fridges. Since 2012, all HEINEKEN's new draught beer dispensers in Europe have used hydrocarbons (and in Mexico since 2014). The Blade – our latest draught beer dispense innovation – uses isobutane (R600a) as the refrigerant.

It is a win-win for the environment and for any company. We reduce the refrigerant Global Warming Potential, we save on electricity, there are no extra costs to achieve this and the fridges last longer.

## OUR RESULTS

Today, HEINEKEN uses hydrocarbon equipment all over the world. 'Green' fridges are now the norm for our global businesses, and we are ahead of our 2020 commitment.

We continue to use technology to further improve the energy efficiency of our fridges. For example, we now have over 10,000 connected fridges, which enable us to understand how much energy they are consuming, how many times doors are being opened and other useful information related to their performance.

As we continue to decrease CO<sub>2</sub> emissions in cooling, we will be setting new 2030 targets and specifications for our fridges, ensuring that each asset is best-in-class for energy consumption and length of life.



## KEY FIGURES

- We reduced CO<sub>2</sub> emissions of our fridges by 50% compared to 2010.
- In 2018, we bought over 190,000 new fridges, all using hydrocarbon refrigerant.



“ AT ICA SWEDEN, WE ARE COMMITTED TO DISPLAY STRONG LEADERSHIP WHEN IT COMES TO REDUCING CLIMATE IMPACT FROM OUR OPERATIONS. INCREASED ENERGY EFFICIENCY, RENEWABLE ENERGY AND PHASING OUT HFCS IN FAVOUR OF NATURAL REFRIGERANTS ARE IMPORTANT MEASURES TO US.

”

## OUR POSITION

To provide fresh, high quality food to our customers, refrigeration is an essential part of our business. However, some refrigerants are powerful greenhouse gases with a high global warming effect. Therefore, as an important part of our climate work, we are working hard to reduce the contribution from these refrigerants.

ICA Sweden is in the forefront when it comes to developing, testing and using natural refrigeration systems. As natural refrigeration systems are the right long-term solution, we have committed to phasing out HFC refrigerants in line with The Consumer Goods Forum.

Our work within this area started already in the 1990s when ICA wanted to convert the use of CFC/HCFC to natural refrigeration systems. In 1995, ICA built the first store in Sweden with 100% natural refrigerants with ammonia and CO<sub>2</sub>. In 2010, it was verified that the technology had reached a level that matched the best available HFC-technology and since then ICA has adopted this technology as standard.



ANDERS SVENSSON,  
CEO,  
ICA SWEDEN



## OUR ACTION

ICA's ambition to find long-term solutions of natural refrigerants in new installations started more than 20 years ago with the result of a standard with pumped CO<sub>2</sub> for freezing installations in larger stores. In the beginning of 2000, ICA installed propane/propylene and CO<sub>2</sub> systems in a number of stores, with the aim to have natural refrigerants as standard in a few years' time. In 2003, ICA built the first store in Sweden with transcritical CO<sub>2</sub> and the years to come a number of ICA stores followed. In 2010, it was verified that the technology had reached a technical and energy level that matched the best available HFC-technology. Since then ICA has adopted this technology as standard.

Our ambition to excel in corporate responsibility is hard work and collaboration with others e.g. authorities, academic institutions and other commercial actors, is an important key factor. As an example ICA has a long tradition to address the awareness of the climate impact from refrigerants and energy consumption in stores by participating in national research programmes to evaluate new technology (e.g. Klimat 21, EffSys). Many Swedish ICA stores have been involved in these programmes' important field studies. Also, the open forums, often supported by the Swedish Energy Agency to independently show the performance for CO<sub>2</sub> systems compared to HFC systems, have been very important. As an example, in our work ICA has been transparent and contributed with evaluations from pilot stores to our competitors. This openness led to a strong consensus regarding the applicability of transcritical CO<sub>2</sub> systems in refrigeration systems in 2010, which resulted in a fast growing market demand.

Another important driver for this work is that Sweden has, since the early 90s, had a good implementation of regulations and effective regulatory demands within the area of refrigerants. ICA has been a strong supporter of this.

A challenge, however, was that the first generation of transcritical solutions didn't meet ICA's demand. In close cooperation with Swedish Energy Agency and academic institutions, ICA addressed the need for more efficient solutions with CO<sub>2</sub>.

Another challenge has been the situation in the market regarding the number of suppliers and the importance of trained staff. ICA has, through participation in forums with the Swedish refrigeration trade organisation, emphasised the need of good training sites and also supported the initiative for a voluntary authorisation and diploma system for staff.

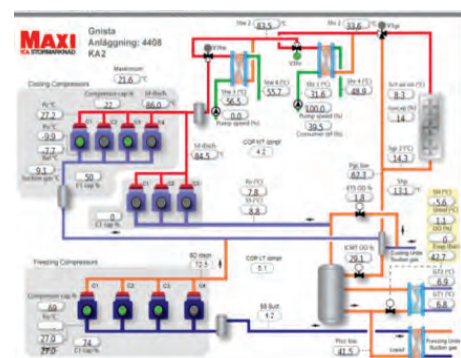
## OUR RESULTS

The Swedish market has, since 2010, reached consensus on the positive results from the transcritical CO<sub>2</sub> systems and created a standard on a market that earlier was very divided in different brine solutions. Contractors in Sweden can base the installations on components that are standard on the European continent instead of having separate Swedish constructions and suppliers. Also, coming from high cost solutions and also often high energy levels with brine solutions, the CO<sub>2</sub> solutions offered a cut in investments, space requirements in machine room and energy consumption.

Combined with ICA's standard with doors and lids on cabinets in new and refurbished stores, a major cut in energy consumption and TEWI was established in 2010. The combination with effective natural refrigerant solutions with lids and doors has been the strongest factor for reduced TEWI in new and refurbished ICA stores. Reduction exceeds 40% in all ICA store profiles, for refrigeration systems the reduction is 50-60%.

## KEY FIGURES

- Almost 10% of the approximately 1,300 ICA stores in Sweden are using 100% natural refrigerants. Since 2010, the growth rate is strong and is getting stronger each year.
- The TEWI reduction exceeds 40% on all new ICA store profiles in total since 2009. For refrigeration systems the reduction is 50-60%.



*Monitoring system showing a transcritical solution with integrated AC*

“ NATURAL REFRIGERANTS PLAY A CENTRAL ROLE IN DELIVERING OUR SUSTAINABILITY TARGETS. THE PHASE OUT IS A CHALLENGE, BUT EVERYTHING WE ARE DOING HELPS US MOVING TOWARDS THE GOAL OF USING 100% NATURAL REFRIGERANTS BY 2030. ”



PEDRO SOARES DOS SANTOS, CHAIRMAN OF THE BOARD OF DIRECTORS AND CHIEF EXECUTIVE OFFICER OF THE JERÓNIMO MARTINS GROUP

## OUR POSITION

Refrigeration is an essential part of our business, whether in the fresh and frozen food sections in our stores or in the industrial refrigeration needed in our Distribution Centres. In fact, refrigeration plays an important role in preserving many of our food products.

Considering that most refrigerants are made of a mixture of synthetic substances containing environmentally harmful fluorinated gases and have a considerably large carbon footprint, the development and production of environment-friendly and energy-efficient refrigeration systems for our commercial refrigeration and freezing equipment sounded not only logical but necessary.

## OUR ACTION

Our work has been focusing on controlling leaks, using more efficient technology and co-operating with service providers specialised in refrigeration, with the intent to minimize greenhouse gas emissions.

Finding the best technology solutions, both for the environment and for our business, has been leading our path: from lighting to refrigeration racks, the transition to a sustainable energy system affects every decision we make.

We have been testing solutions in our stores and Distribution Centres (DC) to comply with our voluntary commitments to greenhouse gases emissions reduction as well as to ensure compliance with future legislation. Whenever possible, new stores or major remodeling projects use equipment with fluids with lower GWP potential - in the case of heating, ventilation and air conditioning installations - and 100% natural refrigeration gases in the case of industrial refrigeration installations.

Investments in environmentally friendly, natural alternatives to synthetic refrigerants have been made where innovation also plays an important role. Solutions like propane or carbon dioxide are being considered in refrigeration systems, not only because of their economic advantage, but also because of their low impact on climate change and on the ozone layer.

We are indeed decoupling our economic growth from our environmental impacts.

## OUR RESULTS

In 2018, 17 of our DCs had cooling systems installed with thermal roll-containers with CO<sub>2</sub> snow; 54 stores in Portugal, 591 stores and three DCs in Poland had cooling technologies running exclusively on CO<sub>2</sub>; four DCs in Portugal and one in Colombia had refrigerated warehouses (positive and/or negative cold) with systems running on ammonia combined with glycol.

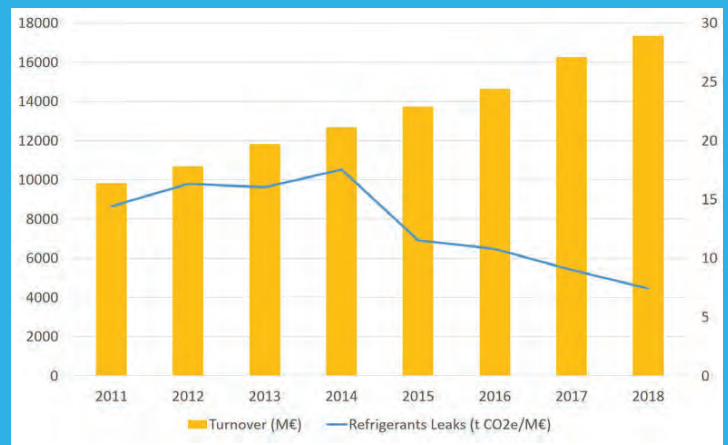
In Northern Portugal, the most recent DC - in Alfena - has a cooling and refrigeration system running on CO<sub>2</sub> (ice machines, freezers and fridges in the canteen).

There are 307 stores in Portugal and 956 stores in Poland with freezers that only use

propane.

Despite the challenges of technology, costs and services availability we have some 120 Ara stores in Colombia working with propane (R290) and the Gachancipá DC has refrigerated warehouses with systems running on ammonia combined with glycol.

Leakages from our refrigeration systems in stores and DCs contributed 12% to our global CO<sub>2</sub> emissions in 2018 and the intensity indicator (measured in t CO<sub>2</sub>e/M€ of turnover) has been decreasing since 2014, even though our business has grown.



## KEY FIGURES

- Since September 2016, all new stores and big refurbishments must use 100% natural refrigeration systems. For those facilities that are still using high GWP refrigerants, the retrofit is analysed case by case.
- In 2016, Recheio set the ground for an environmentally sustainable course, having opened its first CO<sub>2</sub> transcritical store, in Sines. The rack is used for refrigeration, space heating, and space cooling - using water. It also serves the store's heating needs.
- One of our commitments to 2020 is to reduce the Group's carbon footprint by 5% (per €1,000 of sales).



“ THE LAWSON GROUP ESTABLISHED ITS ENVIRONMENTAL POLICY TO ENSURE THAT WE HAND OVER THE BLESSING OF THE EARTH TO THE NEXT GENERATION. WE PROMOTE CO2 REFRIGERATION AS THE KEY TO REDUCING OUR CARBON FOOTPRINT AS PART OF OUR WORK ON ENVIRONMENTAL PROTECTION. ”

SADANOBU TAKEMASU,  
PRESIDENT & CEO,  
LAWSON



## OUR POSITION

Initially, in order to comply with the Montreal Protocol, which put pressure on developed countries to take urgent action to phase out HCFCs by 2020, the Lawson Group started replacing its HCFC (R-22) equipment with HFC refrigerant equipment in 2009.

We soon realized that we needed to install non-freon equipment as HFCs seriously contributed to global warming. We saw the initiatives that European companies were starting to take under the F-gas Regulation and at the same time, we came across Panasonic's CO2 refrigeration system.

Following the approval of our plan to explore the possibility of CO2 refrigeration system by the METI's technology verification programs in 2011, we, alongside industrial associations and other manufacturers, researched natural refrigeration in Europe. We visited and met with users, installers, manufacturers, training providers, and research institute. The information that we collected helped us to create standard procedures for installing CO2 refrigeration equipment.



## OUR ACTION

In an effort to promote the wider use of CO2 refrigeration equipment, we have addressed and successfully dealt with numerous challenges in partnership with government agencies, trade associations, manufacturers, and installers.

We worked to ensure reliability and safety during installation, developed standards and manuals, organized regular training sessions for installation engineers to improve their skills. We also developed a maintenance system, verifying energy efficiency performance, and identifying factors impeding cost reduction.

Supported by the technology verification programs of the METI and the equipment subsidy programs of the MOE, we prepared to open a number of stores while dealing with various issues.

From August 2014, new stores had CO2 refrigeration equipment as a standard store specification. This accelerated the process of installing CO2 refrigeration equipment in over 700 stores per year (70% of the new stores). The number of stores with CO2 refrigeration equipment reached over 2,000 (14% of all stores) at the end of February 2017.

To promote wider use in the retail industry, it is essential to increase energy efficiency as well as reduce costs. We should work with manufacturers in making a road map for achieving this goal and pursue our plan while monitoring progress.

Although the installation of CO2 refrigeration equipment in over 10,000 stores is an important step in the Lawson Group's efforts to address this issue, regrettably it is not actively undertaken due to higher cost involved in the installation and lower profit resulting from the need to close the stores for a long period of time. We will draw up a Refrigerant Conversion Road Map and continue our fight against global warming while ensuring the speedy installation of CO2 refrigeration equipment.

## OUR RESULTS

Since CO2 refrigeration equipment was first installed in 2010, more than 2,000 Lawson stores are now equipped as of 2017. CO2 refrigeration equipment has little impact on global warming as its GWP is 1. We did however reduce CO2 emissions from all stores with CO2 refrigeration equipment, both direct (from refrigerant leakage) and indirect emissions (from the electricity used). Combined, this amounts to 73,000t-co2 per year (32.5t-co2 per store).

Other achievements include:

- 1) Improved energy efficiency
- 2) The establishment of installation systems
- 3) A remotely monitored and controlled maintenance system
- 4) Cost savings

We will continue our non-freon initiatives, promoting the wider use of natural refrigerant equipment in the retail industry as well as other industries. We consider it a priority to build collaborative relationships between users and manufacturers to share information, technical alliance and supplying materials.

We also carry out public relations campaigns, in the hope that our initiatives will help others. There is a limit to what a company can do, but by teaming up with the government and trade associations, the Lawson Group is committed to fulfilling its mission as a leading global company to help solve the problem.

## KEY FIGURES

- **Electricity consumption reduction:**
- **27.4% of the total energy**
- **22.920 kWh/store/year**
- **CO2 emission reduction through usage of refrigeration CO2 system.**
- **Emissions reduction: 19.4 tons- CO2/ store/year**
- **(In comparison with HFC, 1/4000 at maximum.)**
- **CO2 emissions reduced using CO2 coolant -(minus) 32.5 tons, CO2 (-48.5%)**



**“ OUR FAMILY BUSINESS WAS BUILT ON ALWAYS DOING THE RIGHT THING — ESPECIALLY WHEN NO ONE WAS LOOKING. WHEN WE SAW AN OPPORTUNITY TO SWITCH TO NATURAL REFRIGERANTS — A MOVE THAT WOULD REDUCE GREENHOUSE GAS EMISSIONS AND ACHIEVE CLEAN AND EFFICIENT ENERGY CONSUMPTION — WE TOOK IT AND HAVEN’T LOOKED BACK. ”**

**ANTHONY LONGO,  
PRESIDENT & CEO,  
LONGO’S**



## **OUR POSITION**

Longo's has long been focused on building and running more efficient stores that reduce GHG emissions and operating costs. Supermarkets are the most intensive energy user of all commercial buildings and around 50% of energy use comes from the central refrigeration system and account for a significant portion of GHG emissions. Refrigeration is a critical part of our business, and allows us to achieve our vision of being the most trusted and relied upon food partner. In 2006 we were presented with the opportunity to start using natural refrigerants that held a promise of decreasing the environmental footprint of our industry. Since then Longo's has been dedicated to exploring initiatives that help us reduce our emissions. Natural refrigerants allow us to reduce our carbon footprint and achieve clean and efficient energy consumption. We believe that we owe it to our team members, guests, partners, and the communities we serve to reduce the environmental impact of our business.

## OUR ACTION

In 2006, Neelands Group Limited, our refrigeration & HVAC partner, approached Longo's about the possibility of using glycol in our refrigeration systems. The decision was made to use the propylene glycol for medium temperature and keep using HFC for low temperature applications. During this time, other North American manufacturers were experimenting with CO<sub>2</sub> to reduce HFC usage. Around 2009, as CO<sub>2</sub> gained traction in Europe, and the technology started to make its way to North America, we began to look at it as a viable refrigeration evolution. In 2012, Neelands approached us about trying out a CO<sub>2</sub> and glycol design in a new store opening in Oakville. This would be the first CO<sub>2</sub> trans-critical system in Ontario and it was a success. We continued to use the same refrigeration design in two additional stores, using CO<sub>2</sub> refrigeration for low temperature and glycol for medium-temperature applications. Our next store, in Mississauga, was the first time we were able to explore a 100% trans-critical CO<sub>2</sub> model.

Since the concept was relatively new, capital costs were higher. The investment in technology delivers payback much sooner. While the CO<sub>2</sub> systems are more expensive, this is partially mitigated by the cost of the refrigerant itself. HFC chemicals are expensive, but CO<sub>2</sub> is an inexpensive natural refrigerant. Servicing a trans-critical CO<sub>2</sub> refrigeration system has its own unique challenges. When we piloted the first installation, part of the job was getting the service technicians comfortable with servicing on a regular basis. The main challenge is that pressures are much higher than with the HFCs. Finding leaks can also be challenging.

Longo's commitment to environmental stewardship and running sustainable buildings continues to be critical in overcoming these barriers. The trust we have been able to put in our partner, Neelands, to give us the best design, equipment, installation and service in the industry has been critical to our success thus far.

## OUR RESULTS

By the end of 2019, 36 percent of our stores will have CO<sub>2</sub> refrigeration systems in place. Electricity consumption at our CO<sub>2</sub> refrigeration stores was on average 25 percent lower than our HFC stores. Emissions from conventional stores are 1783 times higher than stores with 100% CO<sub>2</sub> systems. In 2018 alone our refrigeration systems allowed us to avoid an estimated 5,256 tonnes of CO<sub>2</sub>e emissions

from leaks.

Refrigerant leakage is inevitable, especially with supermarket equipment which has very long piping lines and a high number of system components. The need to reduce emissions from HFCs from the supermarket sector in Ontario is urgent and technological solutions are ready for the market. Our story demonstrates how a clean technology solution that is widely used outside of Canada can deliver emissions reductions for Ontario.



## KEY FIGURES

- **36% of our stores use CO<sub>2</sub> refrigeration.**
- **CO<sub>2</sub> refrigeration stores use 25% less electricity than conventional stores.**
- **In 2018 alone, we were able to avoid approximately 5256 tonnes of CO<sub>2</sub>e emissions from refrigerant leaks.**





“ CLIMATE CHANGE IS A MASSIVE CHALLENGE AND THE CONSUMER GOODS SECTOR HAS A KEY ROLE TO PLAY IN REDUCING CARBON EMISSIONS FROM REFRIGERATION, DEFORESTATION AND FOOD WASTE. ”



**MARC BOLLAND,  
CEO OF  
MARKS AND  
SPENCER**

## OUR POSITION

In 2007 we launched Plan A (because there is no Plan B for the one planet we have) our 100 point social and environmental plan. Plan A has been updated subsequently in 2010 and 2014 with new commitments added. In total we have completed successfully over 170 commitments in the last 8 years covering everything from fish, wood and cotton sourcing; to packaging reduction; payments to milk farmers; leaner manufacturing; and ensuring all our coffee and tea is Fairtrade.

Like many CGF members we have also been working hard to reduce the environmental impact of our refrigeration systems. In particular we have set goals to:

1. Reduce the carbon emissions from our UK and Ireland store refrigeration by 80% by 2020
2. From 2014 use carbon dioxide in all new UK and Ireland refrigeration system installations and replace HFCs by 2030.

We are making good progress on these two commitments, the results of which are summarised below. We have also improved energy efficiency in our

stores by 35% per square foot and with refrigeration accounting for over 25% of the energy used in our retail estate this has required significant improvement to the efficiency of fridge operation too.

## OUR ACTION

We have been using CO<sub>2</sub> as our main refrigerant of choice for new stores for a number of years now predominantly in hybrid systems. We use a HFC to cool a vessel of CO<sub>2</sub> down to approx. -3°C and then pump the CO<sub>2</sub> around the store to act as the cooling medium for our chilled cases and cold rooms.

However, as per our Plan A commitment to be HFC free by 2030, we have been working hard to develop a totally HFC free solution. We started by carrying out a series of desktop studies on DX Transcritical CO<sub>2</sub> systems including mock store designs and detailed engineering calculations. We also trialled hydrocarbons and pumped glycol.

We then built an engineering test centre to bring all our learning together before we deployed the technology in store. It gave us the opportunity to fully optimise the system and push it to its limits in a safe environment. We installed our first DX CO<sub>2</sub> system in our test centre in April 2014. The system worked well right from day one, but we knew we could make it better. Over the course of the next year we:

- Made sure the control system gave us all the reporting data we needed
- Fully understood the energy signature of the system
- Pushed it to its Transcritical phase to understand the energy penalty
- Tested how much waste heat we had available
- Simulated plant failures
- Got our incumbent service providers in to ensure they fully understood the system

These trials in our test centre were fully crucial in giving us the confidence to deploy the technology in stores. In mid-2015 we launched our first three HFC free DX CO<sub>2</sub> stores in the UK making sure we implemented all the learnings from our test centre. We fully sub-metered all three stores and after carrying out energy analysis on the stores we found them to be a lot more efficient than the pumped systems we had been installing. In some cases up to 60% more efficient.

## OUR RESULTS

Since 2007 we've reduced greenhouse gas emissions from refrigeration equipment in UK and Ireland stores by 73%, well on our way towards our 80% 2020 target. We've done this by using less impactful gases and reducing leakage.

We now have 94 stores using hybrid CO<sub>2</sub> systems and 5 stores using only CO<sub>2</sub>. Thanks to the learning from our Engineering Centre from April 2016 all of our new refrigeration systems will be delivered using HFC Free DX CO<sub>2</sub> Transcritical plant.

We are also running a trial to replace HFCs with nitrogen in 14 food delivery trailers.

## KEY FIGURES

- **We've improved energy efficiency in our stores by 35% per square foot.**
- **We've reduced greenhouse gas emissions from refrigeration equipment in UK and Ireland stores by 73%.**
- **We now have 94 stores using hybrid CO<sub>2</sub> systems and 5 stores using only CO<sub>2</sub>.**





# MARS



“ IT’S TIME FOR TRANSFORMATIONAL CHANGE TO TACKLE THE THREAT OF GLOBAL WARMING. AT MARS, WE’VE SET A SCIENCE-BASED TARGET TO REDUCE OUR GREENHOUSE GAS EMISSIONS ACROSS OUR VALUE CHAIN BY 67 PERCENT BY 2050. ONE WAY WE’RE MAKING MEANINGFUL PROGRESS IS BY TRANSITIONING TO NATURAL REFRIGERANTS. ”



**GRANT F. REID,  
CEO, MARS**

## OUR POSITION

At Mars, we believe it’s time to take a new approach to addressing the world’s most significant challenges – one that takes what we’ve learned during the last decade by focusing on the impacts of our direct operations and expands our ambitions to our entire value chain to make a significant impact. That’s why in 2017 we launched our Sustainable in a Generation Plan – a plan to grow in ways that are good for people, good for the planet and good for our business.

As part of this plan and our commitment to addressing climate change, Mars has developed a science-based goal to reduce our total global greenhouse gas (GHG) emissions from our full value chain by 27 percent by 2025 and 67 percent by 2050, from 2015 levels. While refrigeration is not one of the larger elements of our footprint, we recognize we have a responsibility and opportunity to take action in phasing out HFCs given their increasing contribution to total GHG emissions.

## OUR ACTION

Our shift toward natural refrigeration underpins our ability to accomplish goals set out in our Sustainable in a Generation Plan. We have been taking action for more than a decade on phasing out HFCs and phasing in natural alternatives. To drive our ambition, Mars adopted a Corporate Refrigeration Commitment in 2017. This commitment was informed by the Consumer Goods Forum's (CGF) Refrigeration Resolution, which provided a template around which we framed our policy for commercial and industrial refrigeration equipment under Mars' control within our value chain. Mars uses refrigeration equipment in the manufacturing of products from building air conditioning, factory production process cooling and in point of sale units like ice cream freezers and vending machines.

With the implementation of this policy, Mars is working to reduce the environmental impact of our existing and new refrigeration systems, including improving energy efficiency, optimizing refrigerant charge sizes and minimizing leaks. Additionally, we are committed to purchasing new equipment that utilizes natural refrigerants unless local circumstances means this is not viable.

This is a natural extension of the approach taken by our chocolate factories for more than a decade. These factories, which represent approximately 70 percent of our refrigerant use, have implemented ammonia as their refrigerant of choice for the last 12 years. This has resulted in natural refrigerants now representing more than 30 percent of our total factory fridge gas inventory – demonstrating ammonia as a viable, scalable and effective natural cooling solution.

## OUR RESULTS

A cornerstone of our approach is engaging with our stakeholders to overcome barriers and advance progress. Around the world, Mars engages with our associates to leverage their skills, expertise and ingenuity to innovate solutions.

- A dedicated team works to develop a roadmap for each facility to ensure systems are fulfilling requirements set out in our policy.
- Our King Abdullah Economic City Team piloted technology for a new heat pump based on natural refrigerants in 2012 that eliminates or significantly reduces the need for steam boilers, delivering reductions in water and fuel usage for

Mars chocolate factories worldwide. This technology has been implemented in five sites across Saudi Arabia, Germany, France, Netherlands and China, with a sixth site in Egypt to be completed in 2018.

- Dedicated employees at our ice cream refrigeration plant in France achieved a site-wide shift to natural refrigerants in 2010. This not only reduced electricity consumption by 26 percent, but also delivered a “sweet result” for consumers in the form of creamier ice cream benefitting from smaller ice crystals.

These efforts prove that careful examination of existing practices can spark innovative solutions that bring Mars closer to achieving our Sustainable in a Generation ambitions.

## KEY FIGURES

- **At the end of 2016, Mars converted more than one-third of its total factory refrigeration gas inventory to natural refrigerants.**
- **More than 15 factories within Mars Wrigley Confectionery Segment have implemented natural refrigerant systems.**
- **100 percent of Mars' ice cream factories are using natural refrigerants, including ammonia and CO<sub>2</sub>.**





“ WE STARTED THE SHIFT TOWARDS MODERN AND SUSTAINABLE COOLING TECHNOLOGY BACK IN 2013. THROUGHOUT THE YEARS WE HAVE RUN INTO A LOT OF CHALLENGES. BUT WE HAVE MASTERED THEM AND TODAY ALREADY HAVE CLOSE TO 30% OF OUR STORES FULFILLING THE 2030 OBJECTIVE. ”

OLAF KOCH,  
CHAIRMAN OF THE MANAGEMENT  
BOARD,  
METRO AG



## OUR POSITION

The refrigeration equipment is the technical backbone of our wholesale business, responsible for approximately 40% of our total electricity demand. HFC leakages have an impact of 20% on METRO's carbon footprint. Therefore, in mid-2013 we decided to start METRO's F-Gas-Exit Program (FEP): before 2030, we want to reduce 90% of carbon emissions from leakage, and 35% of our electricity demand – by using only natural refrigerants in refurbishments and new store openings (baseline: 2011). We are on track, with approximately 27% of our stores now equipped with transcritical, subcritical or other natural refrigerant equipment, mostly with closed cooling furniture. With well operating equipment and maintenance and repair, we could reduce the leakage rate by 8.25%, including all accidents. And we want to execute the FEP throughout all METRO stores and depots worldwide, including retrofitting stores. Here we often implemented a refrigerant with a GWP <2.500.

## OUR ACTION

In 2008, METRO's first transcritical system was installed in Hamburg. For us, this was the starting point to install more subcritical cooling systems. In 2013, we decided to roll out natural refrigerants in METRO stores worldwide in which it was technically impossible to use refrigerants with a GWP < 2.500. This was the birth of METRO's F-Gas-Exit-Program (FEP). We could learn from previous experiences with the installation of transcritical systems in Germany and France and started to completely shift to transcritical systems. In 2014, we additionally tested our first subcritical system in our Weifang store in China, and rolled out the test to Russia in 2015. We consequently worked to improve our technology, store by store, country by country, e.g. in France, Austria, Spain, Poland, Belgium, Netherlands. Our aim was to combine natural refrigerants with best-in-operation and best-in-energy efficiency. So it was a consequent step forward to move towards the ejector technology. In 2018, we started the operations of this technology in Bulgaria, Poland and Italy, as well as our first transcritical systems in China and Russia. In 2019, we implemented the first ejectors in Russia and China. In 2020, we plan to have more transcritical than subcritical systems. From our experiences, the technology transfer is a success story. We have already shifted a lot of our operations to clean refrigerants and high energy efficiency. What we have ultimately learned, is that the challenges are not always easy to overcome. Especially, when scouting for the technical experience and expertise to install these systems in countries in which we are frontrunners. But where there's a will, there's a way.

## OUR RESULTS

To this day we are operating 102 stores with transcritical equipment, of which include 18 with ejector technology, in France, Germany, Netherlands, Austria, Bulgaria, Romania, Poland, Croatia, Italy, Russia and China, as well as 113 stores with subcritical equipment. All of our depots are operating with Ammonia. This means that 27% of our store portfolio is ready for 2030! The leakage rate from H(C)FC was reduced from 14.6% in Financial Year 2014 to 8.2% per August 2019. In 2019 we announced the commissioning of ejector technology in our METRO stores in Frankfurt, Brasov, Sibiu, Moscow, Beijing, Chongqing, Czestochova, Dubrovnik, San Donato, Narbonne, Belfort or Lille - to name but a selection. The share of METRO stores with closed low cooling equipment is strongly increasing. For our deep cooling units we have completed this task since years. To summarize the positive effects of our work so far: we see store by store that the ejector technology leads to 20% like-for-like energy savings. Ultimately, this means that modern cooling equipment with natural gases will support the quality of our goods, the customer inspiration, the internal cost management and the reduction of our corporate emissions.

## KEY FIGURES

**Reduction of leakage rate from METRO Cash & Carry fell from 11.0% in FY15 to 8.2% in FY19 worldwide refills, including accidents.**





“ AT NESTLÉ, WE ARE FULLY COMMITTED TO PROVIDING LEADERSHIP ON CLIMATE CHANGE. ACTION IS WHAT MATTERS, AND AMONG OTHERS, WE HAVE TAKEN DECISIVE STEPS IN THE AREA OF REFRIGERANTS AND ACHIEVED A BROAD EXPANSION OF THE USE OF SAFE AND NATURAL REFRIGERANTS. WE BELIEVE THAT BUSINESS IS PART OF THE SOLUTION AND THAT INDUSTRY WIDE, MULTI-AGENCY, COLLABORATIVE EFFORTS ARE PIVOTAL TO SCALE EFFORTS AND MAKE LASTING CHANGE.



PAUL  
BULCKE,  
CEO,  
NESTLÉ



## OUR POSITION

” At Nestlé, we are determined to play a leading role in taking action for Climate Change. As the world’s leading Nutrition, Health and Wellness company, we believe that to be successful over the long term we need to create value for our shareholders and for society at the same time. We call this Creating Shared Value, a way of doing business that has embedded sustainable development in our activities, brands and products.

Ultimately, our goal is for our products to be tastier, healthier and better for the environment. This requires protecting the future by making the right choices in an environment where water is increasingly scarce, natural resources are constrained and biodiversity is declining. All of these elements are vital for feeding a growing world population and for the development of Nestlé. Moreover, climate change may exacerbate our planet’s environmental challenges. We are thus determined to take a holistic set of actions along our value chain.

We are committed to phase out the use of high global warming potential refrigerants such as hydrofluorocarbons (HFCs) and replacing them with safe and natural refrigerants alternatives.

## OUR ACTION

As stated in The Nestlé Environmental Sustainability Policy, we are committed to use safe natural refrigerant alternatives for industrial refrigeration installations and implement new solutions to improve their performance. We are also supporting the development and use of safe and efficient natural refrigerant solutions for commercial applications and progressively phase out HFC appliances.

Using ammonia and carbon dioxide together in a cascade refrigeration system can offer better environmental performance, great benefits on efficiency and high operating performance. In 2003, we installed the first carbon dioxide/ammonia (CO<sub>2</sub>/NH<sub>3</sub>) cascades in the UK and US. This technology became our standard worldwide for low temperature applications such as coffee freeze drying, frozen food manufacture and cold storage. Since 2010, we also introduced the use of hydrocarbons and CO<sub>2</sub> systems for various cooling applications in factories, small distribution centres, R&D centres, offices and Nestlé Shops. More recently, in 2015, we inaugurated a carbon dioxide/ammonia cascade cold store in the Greater China Region.

In 2013, we committed to buying only new horizontal ice cream chest freezers with natural refrigerants in Europe. And in 2014, we made this pledge global. This is the second stage in a wider process of making our entire fleet of freezers more cooled using natural refrigerants.

These actions have helped move us beyond meeting The Consumer Goods Forum Resolution on Refrigeration, which encourages businesses to take action towards phasing out some HFC refrigerants from 2015. They also contribute to make Nestlé products not only tastier and healthier, but also better for the environment along the entire value chain.

## OUR RESULTS

Over the last 10 years, we have halved our greenhouse gas emissions per kilo of product and expect to further reduce them by 35% in 2015 compared to 2005 levels.

We continue to expand the use of natural refrigerants, which do not harm the ozone layer and have a negligible impact on climate change, in our industrial refrigeration systems. We have invested over CHF 260 million since 1992 to replace synthetic refrigerants with natural alternatives in more than 92% of our industrial refrigeration systems.

Regarding commercial applications, at the end

of 2014, all our new ice cream chest freezers in Europe used natural refrigerants. Our new ice cream chest freezers, which represent 70% of Nestlé's total spend on freezers, now consume 50% less energy. By 2015 all of our new ice cream chest freezers worldwide will use natural refrigerants.

Our Nestlé global refrigeration experts contribute to transfer knowledge worldwide, facilitating the implementation of natural refrigeration systems.

To overcome the barriers to wide-scale adoption of more climate-friendly refrigeration, we continue to work with major equipment suppliers and organisations to test and monitor different refrigerants in various applications.

## KEY FIGURES

**By 2015 - To contribute to greenhouse gas (GHG) emission reduction, we will reduce our direct GHG emissions per tonne of product by 35% since 2005, resulting in an absolute reduction of GHG emissions.**

*We have reduced our direct GHG emissions per tonne of product by 40% since 2005, achieving an absolute reduction of 11.4%.*

**By 2014 - Expand the use of natural refrigerants, which do not harm the ozone layer and have a negligible impact on climate change, in our industrial refrigeration systems.**

*By the end of 2014, we had phased out 92% of our industrial refrigerants, replacing them with natural refrigerants.*

**By 2015 - All of our new ice cream chest freezers will use natural refrigerants.**

*We have been systematically introducing more environmentally efficient refrigeration that uses natural refrigerants and save energy.*





**PEPSICO**



“ **COMBATING CLIMATE CHANGE IS CRITICAL TO THE FUTURE OF OUR COMPANY AND OUR WORLD. PEPSICO HAS TAKEN ACTIONS IN OUR OPERATIONS TO HELP ‘FUTURE-PROOF’ OUR COMPANY, WHICH DELIVERS COST SAVINGS, MITIGATES RISK AND CREATES RESILIENT SUPPLY CHAINS.** ”



**INDRA NOOYI,  
CHAIRMAN  
& CEO,  
PEPSICO**

## OUR POSITION

PepsiCo is one of the world’s largest food and beverage companies, reaching consumers with leading brands in more than 200 countries and territories. At the heart of PepsiCo is Performance with Purpose, our vision to deliver financial performance over the long term by integrating sustainability into our business strategy.

PepsiCo relies on natural resources to fuel our operations, so we continuously look for innovative ways to reduce the company’s impact on the environment, lower costs through energy and water conservation and reduce the quantity and weight of our packaging materials.

In particular, mitigating the effects of climate change is critical to both PepsiCo’s success and the global environment. One way PepsiCo addresses climate change is through the reduction of Hydrofluorocarbon (HFC) emissions in our equipment.



*PepsiCo is working to reduce GHG emissions throughout all areas of our supply chain, including our global delivery fleets.*

## OUR ACTION

In September 2014, as part of an announcement with the US administration, PepsiCo established an ambitious goal that all of its future point of sale equipment (coolers, vending machines and fountain dispensers) purchased in the US will be HFC-free by 2020. PepsiCo also joined a private-sector initiative led by the Obama administration to reduce cumulative global consumption of HFCs by the equivalent of 700 million metric tonnes of carbon dioxide through 2025.

Outside of the US, the company's work to become HFC-free began in 2006 and to date, PepsiCo has placed HFC-free equipment in more than 25 countries, including Mexico, China, Russia, India and Brazil. Additionally, the company uses Hydrocarbon (HC) refrigerants - natural, non-toxic and non-ozone depleting gases.

## OUR RESULTS

PepsiCo improved the efficiency of its vending machines by 53% and by 67% for coolers in 2014, as compared to a 2004 baseline. Additionally, from 2013 to 2014, PepsiCo decreased scope 3 GHG emissions by 205,000 metric tonnes.

Through innovation and partnership, we are working to achieve an absolute reduction in GHG emissions across our business. We aim to achieve this by reducing energy use in our manufacturing operations, exploring renewable alternatives to fossil fuel, improving the efficiency of our fleet, and working with suppliers to help them manage their energy use. Implementing these practices successfully will allow us to use less energy and reduce GHG emissions.

## KEY FIGURES

- PepsiCo improved the efficiency of its vending machines by 53% and by 67% for coolers in 2014, as compared to a 2004 baseline.
- From 2013 to 2014, PepsiCo decreased scope 3 GHG emissions by 205,000 metric tonnes.





“ **SABMILLER IS COMMITTED TO PROMOTING THE SUSTAINABILITY OF TRADE REFRIGERATION. AS PART OF OUR PROSPER SUSTAINABLE DEVELOPMENT AMBITION WE PUBLICLY COMMITTED TO REDUCE THE CO2 FOOTPRINT OF REFRIGERATION BY 25% BY 2020, AND NOT TO PURCHASE ANY HFC FRIDGES AFTER 2020.** ”



**ALAN CLARK,  
CHIEF  
EXECUTIVE,  
SABMILLER**

### OUR POSITION

As part of our Prosper ambition, SABMiller committed to reduce CO2 emissions across its value chain by 25% by 2020, based on a 2010 baseline. Analysis demonstrated that trade refrigeration is a meaningful component of about 20% of the end to end value chain emissions of the group. Although the bulk of the CO2 emissions come from the electricity used by such coolers, it was further recognised that HFCs have a disproportionately negative environmental impact and would represent substantial risks to the group into the future, such as falling behind peer companies on a key carbon issue and falling behind the curve of rapidly changing regulatory environment on HFCs.

The group also recognised opportunities in this new strategy such as underpinning a cold refreshment brand positioning, lower energy costs for customers, building loyalty with customers and increased reputation as a respected FMCG company.

## OUR ACTION

Our consumers enjoy the refreshment of a cold beer and we are partnering with our retail customers, where possible, to enhance this experience by providing trade fridges on-premise. But refrigeration can have harmful impacts on the environment. The move to HFC free fridges started in our European operations. Initially we purchased some 8,000 new fridges for our Polish retail network, all of them equipped with propane gas refrigerant. This innovation reduced the cost of cooling beer while removing the harmful global warming impact of hydrofluorocarbons. This underpinned a future scaling up of this strategy.

In 2014, SABMiller published an external target not to purchase any HFC fridges beyond 2020, where technologically and financially feasible. A formal KPI tracks performance against the target and is reviewed every six months. Pilot projects have been launched in a number of markets, to test the performance of natural refrigerants in different conditions. All the pilots confirm the viability of natural refrigerants, if the required technical expertise and maintenance capacity is available. We work closely with suppliers in this regards. It remains essential to remain focused on the safe implementation of this technology.

SABMiller developed user-friendly guides and training tools for both our sales representatives and for retailers to guide them on the safe and sustainable operation of trade fridges. Useful tips on the placement, condition and operation of the fridges ensure optimal cooling of the beer and energy and cost savings for the retail owner.

SABMiller recently became the first major brewer to join Refrigerants Naturally!, a global, non-profit initiative dedicated to shifting point-

of-sale cooling equipment towards natural refrigerants. The current corporate members are Coca-Cola, Unilever, Red Bull and PepsiCo, with active support from Greenpeace and the United Nations Environment Programme.

## OUR RESULTS

The market conditions vary substantially between different regions, and the regions are progressing at different paces towards the target; however, all have committed to phase out the purchase of HFC fridges by 2020:

- In Europe, substantial progress has been achieved - up to 85% of new fridges purchased in our European operations in 2015 have been HFC free. In the bulk of cases the outstanding numbers relate to specific models not yet available in the required technology, and it is expected that this will be solved before F20;
- In Africa and Latin American markets, the challenges of technology, costs and service availability provide different challenges than in Europe. Pilot projects have been launched in more than a dozen markets to test HFC-free technologies. In Latin and Central America, nearly 19% of new fridge purchases in 2015 were HFC free, with about 8% achieved in Africa. This includes the use of CO2 refrigerant in fridges for carbonated soft drinks.
- In some of our developing world markets the introduction of HFC-free fridge models without the required local maintenance capability has led to some disruption in trade. We are working with suppliers and local markets to address the issue.

## KEY FIGURES

- **SABMiller is committed to purchase 100% HFC-free fridges from 2020;**
- **The group is on track to reduce total emissions from refrigeration by 25% by 2020, based on a 2010 baseline;**
- **Our Europe region is already purchasing 85% of new trade fridges using natural refrigerants;**
- **SABMiller recently joined Refrigerants, Naturally!, a global, non-profit initiative dedicated to shifting point-of-sale cooling equipment towards natural refrigerants.**



“ SAINSBURY'S RECOGNISES THE NEED TO DEMONSTRATE ENVIRONMENTAL LEADERSHIP IN OUR COMMITMENT TO PHASING OUT HFC'S AND LIMIT GLOBAL WARMING TO 2°C. TRANSITIONING FROM HFC REFRIGERANTS TO NATURAL REFRIGERANTS IS CRUCIAL AND THE CONSUMER GOODS INDUSTRY MUST LEAD THE WAY AND STAY AHEAD OF THE CURVE ”



**MIKE COUPE,**  
**CHIEF**  
**EXECUTIVE**  
**OFFICER,**  
**SAINSBURY'S.**



## OUR POSITION

We have witnessed the industry respond to the Montreal Protocol by transitioning from Chlorofluorocarbon refrigerants R12 and R502 to the Hydrochlorofluorocarbon refrigerant R22 and the subsequent introduction of Hydrofluorocarbon F-Gas refrigerants which have been targeted by the Kyoto Protocol to reduce emissions of greenhouse gases.

Best practice now requires companies to set long-term targets to limit global warming to below 2°C and Sainsbury's is taking a leadership position of having a strategy to phase out HFC's by 2030 and to replace them with natural refrigerants (primarily carbon dioxide R744) for new systems and R448A/R449A as a "drop in" replacement for our existing assets. The decision was made after an in-depth analysis of government policy and environmental regulations.

In 2009 Sainsbury's decided to limit the amount of new HFC refrigeration systems installed and migrate straight from R22 assets to natural refrigerant solutions.

## OUR ACTION

We have adopted dual temperature transcritical CO<sub>2</sub> booster packs as “business as usual” in our supermarket estate since 2010 and 2017 for our convenience stores. Today we have 243 supermarkets and 34 convenience stores out of 607 supermarkets and 824 convenience stores operating on these systems.

The convenience store systems deliver a combined mechanical, electrical and refrigeration systems making use of heat reclaim to avoid the use of HFC based refrigeration systems, whilst saving energy. Transcritical CO<sub>2</sub> cycles are an efficient choice in applications that require both heating and cooling as they can reject a large proportion of cycle heat.

The initial step in this process was to ensure that the correct technology was available and robust enough to pilot. Sainsbury's took a lead within the retail sector to adopt the new technology as this was not prevalent within the industry at the time. Sainsbury's invited multiple suppliers to offer designs for new systems, progressing from pilots with 3 suppliers over a period of 12 months before standardising one design. In addition, recognising the gap in knowledge of this emerging technology Sainsbury's invested in training for refrigeration technicians that required them to reach a proven working level proficiency with CO<sub>2</sub> systems.

Today, our focus is to improve the resilience and efficiency of the CO<sub>2</sub> systems we install. Adopting systems designed for higher pressures

has improved resilience and reduced refrigerant usage by comparison to our initial systems. Additionally we are looking to extend the principles of our convenience store installations into our supermarket estate for improved efficiency and to address the difficulty of sourcing natural refrigerant solutions for HVAC applications.

## OUR RESULTS

To date, in our supermarket and convenience store estate we have achieved a 60% reduction in Sainsbury's F-Gas footprint since 2011 (277 ktCO<sub>2</sub>e) despite an increase in supermarket sales floor area of 34.2% and convenience sales floor area of 238.7%. There has been minimal if any impact on energy consumption in our supermarkets despite many believing that the systems would perform far worse than HFC systems. The systems incorporating heat reclaim that are installed in our convenience stores deliver energy consumption reductions of typically 20%.

All our distribution facilities refrigeration systems operate with natural refrigerant solutions, our latest Frozen Food Distribution Centre combines CHP technology with an Ammonia adsorption system and traditional two stage pumped Ammonia incorporating many energy saving technologies that have delivered a 44% energy saving relative to the two facilities it replaces despite a 70% increase in volume. Water and chemical consumption has also been reduced 86% by comparison.







“ SOBEYS INC. IS COMMITTED TO REDUCING OUR CARBON FOOTPRINT AND CONTRIBUTING TO THE CGF’S EFFORTS TO SLOW GLOBAL WARMING THROUGH PRACTICAL AND ENVIRONMENTALLY RESPONSIBLE PRACTICES. THE INTRODUCTION OF NATURAL REFRIGERATION SYSTEMS IN OUR STORES IS ONE OF OUR MOST SIGNIFICANT SUCCESSES TO DATE.



**MARC  
POULIN,  
PRESIDENT  
& CEO,  
SOBEYS INC.**

” **OUR POSITION**

Sobeys Inc. has been serving the food shopping needs of Canadians for more than 108 years. With a network of approximately 1,500 stores from coast-to-coast bringing thousands of products to customers, we recognise that our operations and business practices can have a significant impact on the environment.

In 2009, we began reviewing alternatives to traditional hydrochlorofluorocarbon (HCFC) and hydrofluorocarbon (HFC) refrigerant systems. While common place in grocery retailing, HCFC and HFC systems are known for their high greenhouse gas impact and have Global Warming Potential (GWP) ratings of up to 4,000; meaning that a kilogram of leaked refrigerant is the equivalent to leaking approximately 4,000 kilograms of carbon dioxide (CO<sub>2</sub>) into the atmosphere. In 2010, Sobeys joined other members of The Consumer Goods Forum (CGF) in a commitment to begin phasing out HFC refrigerants for natural refrigerant alternatives in new builds by 2015.

As background, previous internal studies indicated that our retail store network was responsible for the majority of our direct operations' carbon footprint and that refrigerant leaks accounted for approximately 25% of that amount. These results are similar to that of the North America food retailing industry. Based on this understanding, we knew Sobeys could make a material reduction of our carbon footprint by focusing on the refrigerants used in our stores.

After a global review of potential technologies and considering Canada's wide ranging climate, several carbon dioxide options were identified. Sobeys ultimately decided on an approach that balanced our goals of environmental improvement and financial benefit.

## OUR ACTION

A key part of the design was the inclusion of a heat reclamation unit. This component uses the waste heat generated through refrigeration to offset heating requirements in our stores, leading to both greenhouse gas and energy savings.

Results have been overwhelmingly positive. Compared to traditional systems, our transcritical systems have reduced GHG emissions by an equivalent to over 800,000 kilograms less per store per year. In addition, they have reduced not only our energy costs, but also our maintenance and installation costs. The financial benefits may grow as more Canadian jurisdictions institute carbon tax benefits. Natural refrigeration is now the corporate standard for all new store builds and major retrofits.

Sobeys has been well recognised both in North America and internationally for our progress and industry leadership in transitioning to natural refrigeration systems. The United Nations Environment Programme (UNEP) included Sobeys in a compendium of case studies for their Climate and Clean Air Coalition to Reduce Short Lived Climate Pollutants. The United States Environmental Protection Agency has awarded us with their GreenChill Platinum rating at 44 of the 72 sites. The Retail Council



of Canada also recognised Sobeys with their annual environmental award.

Sobeys will continue to expand the number of stores having natural refrigerant systems, adding approximately 15 - 20 sites on an annual basis. However, global climate change is a challenge that we all share and one which cannot be solved in isolation by any single company, sector or country. We believe that our participation in worldwide organisations like the CGF provide a unique, effective, and efficient approach to contribute to socially responsible environmental practices.

## KEY FIGURES

**Results from trials comparing a natural refrigerant system to a traditional HFC system.**

**Comparing to a traditional HFC system, the use of a natural refrigerant system enables:**

**Greenhouse Gas Emissions: -62%**

**Installation Cost Reductions: Up to -15%**

**Electrical Energy Usage: Up to -15%**

**Heating Gas Savings: Up to 20%.**





“ WE HAVE A CLEAR COMMITMENT TO MINIMISE THE ENVIRONMENTAL IMPACT IN OUR OWN OPERATIONS.” ”



DAVE LEWIS,  
CEO, TESCO

## OUR POSITION

In 2017 Tesco were the first company to align our Science-based absolute carbon reduction targets to a 1.5 degree trajectory for our own operations, as proposed by the UN Paris Climate Agreement. These targets supersede the original carbon reduction targets that were set in 2006, this is when we commenced a journey to make natural refrigerants the only choice in our stores by setting targets on reducing our carbon emissions. Since then we have been working hard to develop natural refrigeration systems and to encourage innovation to provide reliable and safe systems for our stores.

When we first calculated our carbon footprint in 2006, we found that a fifth of it came from refrigerant leakage. Our strategy for the last 10 years has been to reduce leakage and move to natural refrigeration systems where possible and we have over 250 stores installed to date across our group.

## OUR ACTION

With an estate as large and varied age as Tesco has with HFC's we have had to adopt a three stage approach to meet the challenges of the 2015 EU regulations and our own commitments to carbon emission reduction. This was categorised into three areas:

**New stores:** building new stores that are fit for beyond 2020 from opening – all new stores using natural refrigerants

**Current estate:** Replace the HFC refrigerant gas in our estate with a lower GWP HFC alternative.

**Aged estate:** Sustain aged equipment until its replacement using best practice leak prevention techniques.

We currently have 250 natural refrigeration Stores across the Tesco Group and will continue to increase that number by ensuring our new stores are built with CO<sub>2</sub> and using CO<sub>2</sub> to replace end of life equipment. We are continually looking to capitalise on some of the broader energy saving benefits of this technology. Heat recovery and parallel compression have been utilised. Tesco where the first UK supermarket to implement rotary compressor technology in a refrigeration system to help meet the small convenience store cost challenge. All of which help us to improve the efficiency and reduce our life cycle costs of our systems and meet our carbon targets and capital cost challenges

We have carried out over 400 retrofit gas conversions in the UK and 900 in Thailand removing nearly 100t of R404A from our systems and replacing with R448A which is c67% less harmful to the environment.

## OUR RESULTS

Through our strategic approach to an estate as complex and varied in age as Tesco's we continue to see year-on-year reductions in our carbon emissions through refrigerant leakage, since our 2006 baseline we have reduced our direct emission by 26% which is a 60% reduction per square foot so as our estate has increased we have been able to maintain a

strong performance.

We have overcome the capital challenge in our larger stores by replacing multiple small HFC systems with larger CO<sub>2</sub> systems which means less high capital components. This has allowed us to provide cost parity in our system design and even savings. On convenience store the challenge has been more difficult and we cannot scale down as with our larger formats. We have looked at heat recovery to reduce overall life cycle costs but have installed alternative compressor technology which reduces the capital cost of our plant.

Tesco has a challenge around the perceived reliability of our Co<sub>2</sub> systems due to a plant failure having a major operational impact on trade because of the capacity of our systems. By using alternative compressors we can add more resilience into our systems, this means the impact of a system or component failure minimises the disruption to store operations and customer experience and still delivers on capital cost. This helps to make Co<sub>2</sub> a more attractive choice for our business strategy.



## KEY FIGURES

**40% reduction in CO<sub>2</sub>e tonnage from lower GWP replacement program.**

**31% of equipment near EOL and planned to move from HFC to Co<sub>2</sub> as part of capital replacement works over next 5-10 years**

**45% stores to convert to lower GWP gasses.**

**16% stores with lower GWP HFC Refrigerant.**

**8% carbon friendly stores.**



“ AT COCA-COLA, WE ARE COMMITTED TO REDUCING OUR CLIMATE IMPACTS ACROSS OUR VALUE CHAIN AND WE’VE MADE SUSTAINABLE REFRIGERATION THE CORNERSTONE OF OUR CLIMATE PROTECTION PROGRAMME. OVER THE PAST DECADE WE HAVE INVESTED MORE THAN \$100 MILLION TO MAKE OUR COOLERS BETTER FOR THE ENVIRONMENT. AND WE HAVE SIGNIFICANTLY REDUCED OUR OVERALL CARBON FOOTPRINT AND WILL CONTINUE TO DO SO AS WE PLACE HFC-FREE UNITS AROUND THE WORLD. AS CO-CHAIR OF CGF WHEN THE ORGANISATION ANNOUNCED ITS HFC-FREE COMMITMENT, I STRONGLY BELIEVED IN THE INITIATIVE THEN AND COCA-COLA REMAINS DEDICATED TO IT TODAY. ”



**MUHTAR KENT,  
CHAIRMAN  
& CEO, THE  
COCA-COLA  
COMPANY**



## OUR POSITION

At The Coca-Cola Company, we are committed to making changes in our operations geared toward reducing our climate impact. We set a goal to reduce the carbon footprint of the “drink in your hand” by 25 percent by 2020. To do so, we are striving to reduce emissions from our manufacturing processes and also driving collaboration throughout our supply chain to reduce emissions associated with the growing of our ingredients, the production of our packaging, and the distribution and refrigeration of our products.

Recognising refrigeration is the largest source of our system’s carbon emissions footprint, and because of the high global warming potential of hydrofluorocarbons (HFCs), we have been working to phase out the use of HFC refrigerants in our cold-drink equipment across our global value chain.

In fact, Coca-Cola was instrumental in securing an HFC-free commitment of CGF’s full membership in 2010 and helped coordinate three refrigeration summits for CGF members to advance progress on these commitments.

## OUR ACTION

The Coca-Cola Company identified natural refrigerant fluids to replace HFC refrigerants and we are working to phase out the use of HFCs in all new cold drink equipment. About 40% of our 1.7 million HFC-free coolers are CO<sub>2</sub>-based. CO<sub>2</sub> has 1,430 times less global warming potential than typical HFC refrigerant gas. CO<sub>2</sub>-refrigerated equipment has been in the marketplace for almost a decade and has been proven reliable, with a lower lifetime cost. We also transitioned to HFC-free insulation foam for new equipment, eliminating 75% of direct greenhouse gas emissions.

As an active, founding member of the organisation, The Coca-Cola Company helped craft Refrigerants, Naturally!'s policy position that does not consider the use of HFC refrigerants as a medium- or long-term alternative since the contribution of these substances to global warming would lead to irreversible environmental consequences in the business-as-usual scenario.

In 2014, The Coca-Cola Company became a member of the Climate and Clean Air Coalition (CCAC), focused on the coalition initiative of "promoting HFC alternative technology and standards." The organisation's goals align with our sustainable refrigeration programme, which recognises and supports the need to address climate change and depletion of the ozone layer by replacing environmentally harmful fluorinated gases with natural refrigerants.

In addition, as United Nations Global Compact participants, we signed the "Caring for Climate"

leadership statement, committing to take action to increase the efficiency of energy use and to reduce the carbon burden of our products, services and processes. We also signed the Copenhagen and Cancun Communiqués and the 2 Degree Challenge Communiqué issued by the Prince of Wales's Corporate Leaders Group on Climate Change.

## OUR RESULTS

In 2015, the Coca-Cola system has placed approximately 300,000 units of HFC-free equipment (approximately 40% of new equipment purchases), bringing our global total to more than 1.7 million units. It is estimated that these installations will prevent the emission of nine million metric tonnes of CO<sub>2</sub> over 10 years.

In some markets, more than 75% of our cooling system purchases are HFC-free. But higher costs and difficulty in sourcing HFC-free equipment in certain countries have hindered our progress. We have also faced challenges developing HFC-free coolers in certain categories, such as countertop units.

Overall, the Coca-Cola system has invested more than \$100 million over the past decade to make our coolers more environmentally responsible. We have certified 260 cooler models as meeting our performance standards. More than three-quarters of these certified models are more energy efficient than legacy models, and 60% have a higher cooling capacity. Nearly 40% are certified to perform in hot or humid conditions.

## KEY FIGURES

- The Coca-Cola system has invested more than \$100 million over the past decade to make our coolers more environmentally responsible.
- In 2015, the Coca-Cola system placed approximately 300,000 units of HFC-free equipment.
- Our global total of HFC-free equipment placed is more than 1.7 million units.
- Total HFC-free installations will prevent the emission of approximately 9 million metric tonnes of CO<sub>2</sub> over 10 years.
- In some markets, more than 75% of our cooling system purchases are HFC-free.
- Our HFC-free new equipment purchases are going up each year as we work toward our 100% goal.



“ AS THE LARGEST PRODUCER OF ICE CREAM IN THE WORLD WE HAVE A RESPONSIBILITY TO MAKE A POSITIVE DIFFERENCE IN REDUCING THE ENVIRONMENTAL IMPACT OF OUR CABINETS AND FREEZERS. THE POTENTIAL FOR EMISSIONS REDUCTIONS THROUGH THE USE OF NATURAL REFRIGERATION TECHNOLOGIES IS ENORMOUS. I WOULD ENCOURAGE EVERYONE IN THE INDUSTRY TO GO FURTHER AND FASTER IN THEIR JOURNEY TO HFC-FREE REFRIGERATION SYSTEMS. ”



## OUR POSITION

We are the world's largest producer of ice cream with brands such as Wall's, Magnum, and Cornetto on sale in over 45 countries.

Tackling climate change is critical to the success of our company and our future as an ice cream business.

Our Unilever Sustainable Living Plan (launched in 2010) aims to decouple our growth from our environmental impact. We recognise the need to reduce future risks from increased carbon regulation and rising energy bills and have responded by minimising the contribution of our freezers to climate change.



**PAUL  
POLMAN,  
CEO,  
UNILEVER**

## OUR ACTION

Our approach has two elements:

- Developing innovative technologies to enable our retail customers to lower their GHG impact. For example, we have introduced climate-friendly hydrocarbon refrigerants and made continual reductions in the energy consumption of our purchased freezers.
- Advocating for regulatory change so that new, greener technologies can be introduced in certain markets. We worked with governments, NGOs, industry groups and other manufacturers to bring about this change.

HFC refrigerants or Hydrofluorocarbons are designed to work as efficient refrigerants. Although Unilever freezers are designed to keep refrigerants sealed inside, if released they are harmful and have a global warming impact thousands of times greater than the equivalent quantity of CO<sub>2</sub>. It is for this reason that we favour the use of natural refrigerants.

Some refrigerant coolants are highly potent greenhouse gases, and the energy footprint of the nearly three million freezer cabinets we rely on to reach consumers, is a significant contributor to the total greenhouse gas footprint of our ice cream business.

We first started to pioneer the use of hydrocarbon (HC) refrigerants in our ice cream cabinets in 2004. Since then, we have been driving a strategic agenda to reduce the carbon and energy footprint of our cabinets worldwide, engaging customers on our progress and driving a shift in the broader industry.

We have been working with Refrigerants Naturally! (a multi-stakeholder group that we joined as a founding member) and have presented our

commitment to many of our major customers over the last few years.

There have been challenges along the way. The lack of sufficient service and maintenance infrastructure necessary for the deployment of natural refrigerant-based equipment has been overcome in most parts of the world. HC gases are now standard in the refrigeration industry and this is a huge environmental advance.

We work with our suppliers, and contractors to ensure all safety aspects in design and service are incorporated in the HC implementation.

## OUR RESULTS

We have been replacing point-of-sale ice cream freezer cabinets with climate-friendly alternatives, using HC refrigerants, which are naturally occurring and are approximately 10% more energy efficient. We continue to also incorporate other energy saving technologies to make our ice cream cabinets energy efficient. New equipment is typically 50% more energy efficient than those purchased in 2008.

Together, the reduction in the use of HFC refrigerants and our energy efficiency programmes are contributing to a reduction in the carbon footprint of our ice cream freezers. We continue to accelerate our efforts to roll out cabinets that use climate-friendly HC refrigerants (propane and isobutene).

Unilever scientists are now working on further technologies and best practices including the use of renewable energy like solar to power our ice cream cabinets and mobilising units.

## KEY FIGURES

- We have around **3 million** point-of-sale freezer cabinets in the market.
- By the end of 2017 we purchased over **2.6 million** HC based ice cream freezer cabinets.
- We are the world's largest producer of ice cream with brands such as Wall's, Cornetto, Magnum & Ben & Jerry's on sale in over **45** countries.
- Since 2004, we have been replacing point-of-sale ice cream freezer cabinets with climate-friendly HC refrigerants, which are approximately **10%** more energy efficient.
- Freezer cabinets purchased in 2017 had an average energy consumption **50%** lower than those purchased in 2008.





“ AS A MARKET LEADER IN CONVENIENCE, WE FOCUS ON FOOD SAFETY REQUIRING RELIABLE REFRIGERATION EQUIPMENT. WE ARE AWARE OF THE RESULTING RESPONSIBILITY TOWARDS THE NATURAL ENVIRONMENT, WHICH IS WHY WE TREAT THE REDUCTION OF GAS EMISSIONS AS A PRIORITY CHALLENGE.

## ” OUR POSITION

As a convenience store chain, we want to be close to our customers and constantly follow their needs. Quick Meal Solutions - fresh and dairy products and on-the-go meals, play the key role in our offer. Ensuring food safety and providing the customer with the highest quality product is our priority, which is why refrigeration systems are very important in our distribution - both in stores and in logistics chain.

Managing nearly 6,000 stores, we are aware of our impact on the natural environment. Energy consumed by stores, including primarily refrigeration equipment, accounts for 90% of the energy used by the entire organization. We are aware that refrigeration influences climate change and global warming through significant greenhouse gas emissions. That is why we are constantly analyzing the scale of our organization's impact on the natural environment and looking for innovative solutions to reduce both the energy consumption and the use of harmful refrigerants.



**TOMASZ  
SUCHANSKI,  
PRESIDENT  
OF THE  
BOARD,  
ABKA  
POLSKA**

## OUR ACTION

In 2017, we started the remodeling process of our stores, completely changing their image. The changes concern both the brand communication, as well as the interior design and equipment of stores. Along with the modernization of branches, we systematically exchange the refrigeration equipment for more energy-efficient. Among the main innovations that will have a real impact on the environment is the replacement of plug-in devices with remote devices with external refrigeration units.

At the same time, we are working on replacing the refrigerant with a more ecological one. In 2018, during remodeling of operating stores, we changed the refrigerant in 663 branches. In 2019, we plan a similar change in another 1,553 stores. Simultaneously, all newly opened stores are already using the new technology.

In freezers operating in our stores, we also use natural R290 refrigerants. We already use this system in over 4,000 devices.

We will continue and complete the entire refrigerant replacement process, both in refrigerators and in freezers, in 2020.

Due to the importance of the environmental aspect related to refrigeration and energy consumption in the entire organization, in 2019 the company implemented and certified an energy efficiency management system based on the ISO 50001:2011 standard.

The scale of activities is huge, but much remains to be done. That is why we decided to appoint a group of specialists in Żabka who are to look for innovative solutions for further energy savings and to test their suitability for our organisation. We called them the Volt group.

## OUR RESULTS

Żabka is constantly increasing the diversity of its offer and expanding its range of fresh products that require refrigeration. Consequently, the cubature of items stored at

low temperatures increases. The operation of completely replacing refrigeration equipment with installations with external refrigeration units allowed us not only to increase energy efficiency, but also to extend the life of our fridge-freezers. This process resulted in specific energy savings estimated at 13.9 GWh in 2018.

Over the past two years, we have exchanged refrigerants in over 2,700 stores, introducing a more eco-friendly reagent. This operation had clear effects and translated into a reduction of CO<sub>2</sub> emissions by 75,659,100.00 tons. It reduced the amount of CO<sub>2</sub> emissions into the environment by 40% compared to the emissions of gas generated by previous refrigeration equipment. At the same time the use of a new refrigerant has allowed us to reduce CO<sub>2</sub> emissions in new installations by 63%.

Further exchange of factors planned for the end of the first quarter of 2020 in another 700 stores will allow us to achieve savings in excess of 45% in 2020. These changes are not the end of our plans related to environmental protection. The fate of our planet and the comfort of life of future generations are extremely important to us, which is why we are constantly looking for even more ecological and more effective solutions for refrigeration.





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