Epta

# White Paper

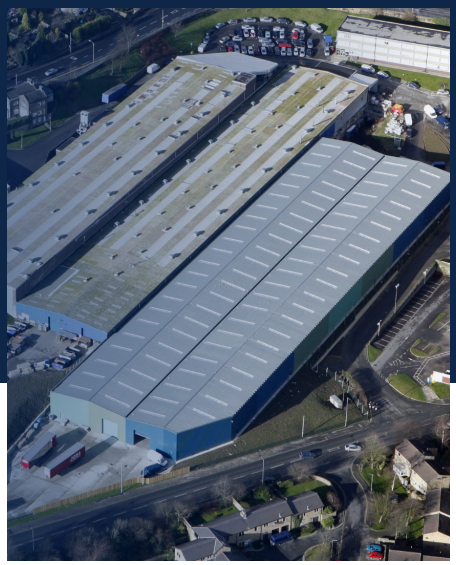
*The energy-saving approach every retailer should know*

**2025**

# Whitepaper
# Table of content

# Welcome

Refrigeration plays a critical role in everyday life—keeping food fresh, medicines safe, and supply chains moving. But its impact goes beyond what's visible in-store. Behind every system is a network of technical decisions, energy demands, and environmental considerations that shape how it operates.



For decades, Epta UK has worked with retailers to turn refrigeration from a necessity into a strategic advantage. By combining Epta Group's global expertise with Epta UK's local adaptability, the company has helped businesses transition to lower-impact systems, scale operations, and build long-term partnerships, proving that sustainable refrigeration can deliver both environmental and business value.

The move to natural refrigerants like $CO_2$ wasn't about reacting to regulations, but rather about moving cooling technology in the right direction. Today, Epta UK continues to drive this transition, helping retailers implement solutions that balance cost, efficiency, and sustainability.

Manufacturing in the UK allows refrigeration to be tailored to the specific needs of supermarkets, convenience stores, and forecourts. This local focus has been key to delivering tailored solutions that align with Co-op's sustainability objectives. Epta UK approached the challenge by rethinking refrigerant technology from the ground up. What began as a bold move to introduce doors to Co-op's stores has evolved into a decade-long partnership, with each milestone building on the last.

But technology alone isn't enough. Retail cooling has to work within store layouts, long-term cost plans, and the way store operators run their businesses. That's where Epta Technica comes in.

## A consultative approach that delivers results

Epta Technica is more than just a technical division—it's a specialist team of engineers, store planners, and industry experts who make sure cooling systems are designed to work efficiently in-store. From energy performance to layout integration, every system is built with retailers in mind.

This approach has led to strong partnerships with retailers who want refrigeration that delivers measurable savings and supports long-term sustainability goals. Beyond these measurable outcomes, the work with Co-op has inspired Epta UK's teams, cultivating a culture of innovation and resilience. The long-term success of the Gazelle Eco has also opened doors for future partnerships, setting a strong foundation for continued growth.

Think about it. Walk into any supermarket, and refrigeration is everywhere. For years, systems were built to do one thing: keep products cold. But cold storage systems have become more than just a necessity—it's now a strategic advantage that shapes long-term business performance, from reducing operational costs to meeting green objectives.

With a track record that speaks for itself, Epta UK was the clear choice when Co-op needed a refrigeration system that could reduce emissions without affecting performance.

That's how the Gazelle Eco was developed—a system built in the UK, designed around store needs, and capable of delivering tangible energy savings. It's changed the game, not just for Co-op but for other retailers looking to do the same.

## Expertise that goes beyond technology

Refrigeration systems are only as good as the people who design, install, and maintain them. With the industry facing a skills shortage, knowledge is just as important as the technology itself. That's why Epta has built a global $CO_2$ training network, ensuring technicians have the expertise to support the transition to natural refrigerants.

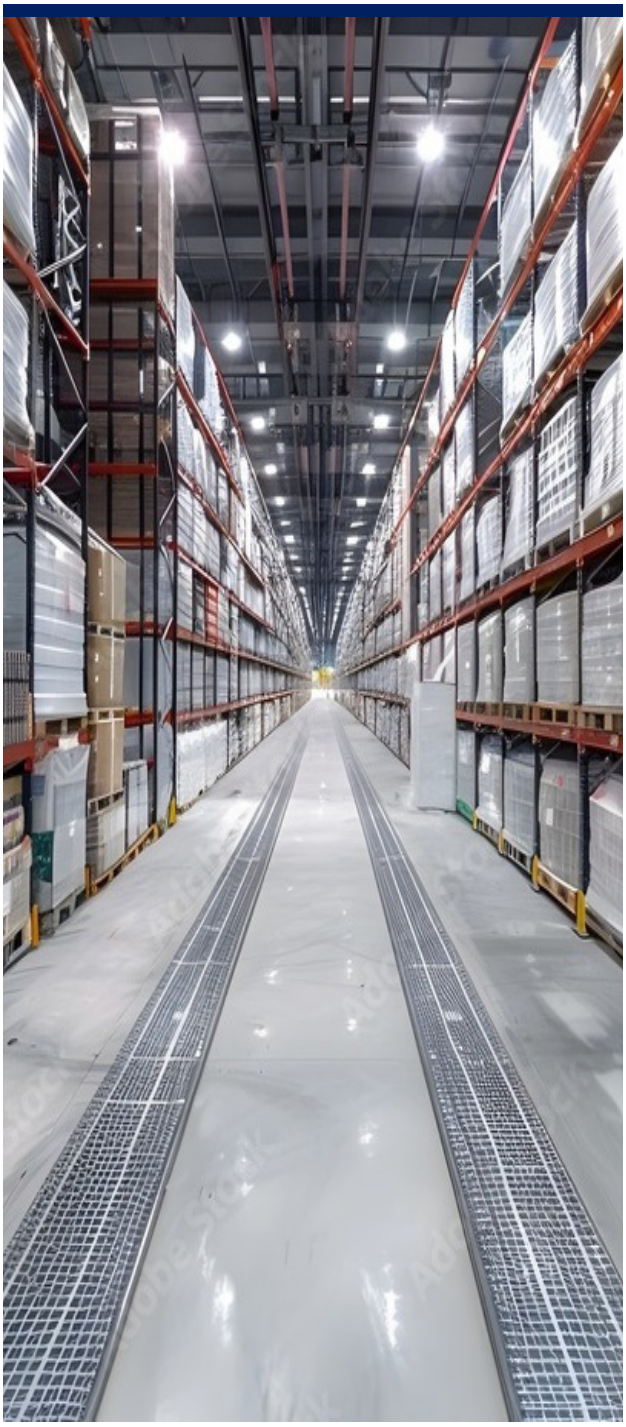
Ask someone what we do, and they might say, "Epta makes fridges." That's technically true, but it barely scratches the surface.

Refrigeration has moved beyond just keeping products cold. It's now a key driver of efficiency, cost savings, and compliance in modern businesses. It's about integrating green innovation into store operations, rather than treating it as a compliance box to tick.

Whether it's creating energy-efficient cooling solutions, working with retailers to test new ideas, or shaping industry standards, we're constantly rethinking what's possible and finding better ways to help our customers move forward with confidence.

# Redefining energy-efficient cooling in retail

With rising energy costs and evolving regulations, businesses are under increasing pressure to make cooling strategies a core part of their cost and environmental commitments. This whitepaper takes a closer look at how Co-op, one of the UK's leading supermarkets and Epta's long-standing partner, has redefined its approach to reduce energy use, lower emissions, and improve operational efficiency.



With more businesses now recognising the benefits of natural refrigerants, heat recovery, and digital monitoring, refrigeration is becoming an essential tool for long-term operational resilience—far beyond just cost savings.

Beyond Co-op's results, this paper explores the wider industry landscape—how regulatory changes are shaping the future of refrigeration, the role of $CO_2$ technology in improving energy efficiency, and why integrating multiple solutions delivers the best results. It also addresses the challenges commercial operators face, from rising costs to the industry-wide skills gap and the increasing pressure to transition away from high-impact refrigerants.

The whitepaper tracks the evolution of refrigeration, examining how the industry has moved from CFCs and HFCs to natural refrigerants like $CO_2$. It outlines the regulatory landscape, highlighting the key drivers of change and what businesses need to prepare for.

The business case for $CO_2$ refrigeration is explored in detail, demonstrating how it reduces energy consumption and lowers long-term costs. The paper also examines an integrated approach to refrigeration, showing how solutions like heat recovery, Waterloop, and digital monitoring work together to improve efficiency.

Drawing on Co-op's sustainability journey, the paper offers practical insights that other grocery chains can apply. Finally, it addresses the growing need for technical expertise, explaining how the industry-wide skills gap is impacting the adoption of sustainable refrigeration systems.

This transition requires both the right technology and expertise. Epta has taken a consultative approach through Epta Technica, a specialist division that takes a holistic view of refrigeration estates—ensuring systems are not just efficient in isolation, but optimised as part of a retailer's wider energy strategy.

Through Epta Technica, retailers can access dedicated engineering support to optimise energy use, meet regulatory requirements, and apply best practices across their entire refrigeration network.

# The changing face of the refrigeration landscape

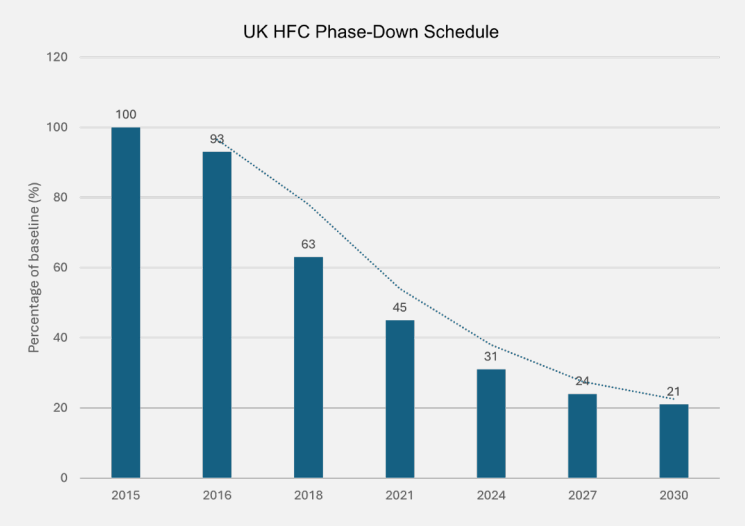
The story of refrigerants is a reflection of how industries have evolved in their understanding of environmental impact—moving from convenience-driven choices to solutions that prioritise efficiency, compliance, and long-term sustainability.

- **CFCs and HCFCs:** These were once the go-to refrigerants, but as we learned more about their role in damaging the ozone layer, the industry was forced to adapt. The Montreal Protocol pushed for their phase-out, marking a major shift in how refrigeration was handled.
- **HFCs:** These came next as replacements. They solved one problem but brought another—their high global warming potential (GWP) quickly became a concern, showing they weren't a viable long-term option.
- **Natural refrigerants:** Now, natural refrigerants like $CO_2$ and propane are leading the way. $CO_2$, a naturally occurring, odourless, and colourless gas, has become essential for low-impact cooling. Its high volumetric efficiency and low GWP make it a smart, future-ready choice for today's refrigeration needs.

As sustainability moves to the forefront and regulations tighten, the refrigeration industry is undergoing a fundamental shift. With stricter environmental policies, businesses need to rethink their approach, choosing solutions that balance efficiency, compliance, and long-term cost savings.

## Regulatory landscape

Refrigerants have evolved significantly over the years, moving away from harmful CFCs and HFCs to natural alternatives like $CO_2$ and propane. These low-impact options offer not only environmental benefits but also stronger long-term viability, as global policies phase down high-GWP refrigerants.




International frameworks like the Montreal Protocol and the Kigali Amendment continue to push for lower-emission alternatives. Meanwhile, the EU F-Gas Regulation is accelerating the phase-down of HFCs by 79% before 2030.

Large retailers are making the shift, but for smaller businesses, rising costs and reduced availability of traditional refrigerants present new challenges. Epta's $CO_2$-based refrigeration has a Global Warming Potential of just 1, making it 4,000 times less harmful than traditional refrigerants. As the industry moves forward, lower-impact solutions will become the standard.

ecovadis

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

# Why natural refrigerants matter

Unlike synthetic options, natural refrigerants like $CO_2$ come with a host of benefits that make them a no-brainer for companies looking to lower costs and operate more sustainably.

## Low global warming potential

One of the biggest advantages of $CO_2$ refrigeration is its ultra-low Global Warming Potential (GWP) of just 1. Compared to HFCs, which can have GWPs in the thousands, the difference is clear. Even in the rare event of a leak, its impact is negligible. For businesses, this is one of the easiest and most effective ways to reduce their carbon footprint.

## Energy efficiency

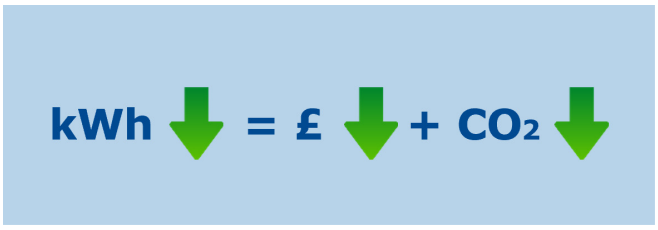
Thanks to its unique thermodynamic properties, $CO_2$ delivers powerful cooling while using less energy. Plus, these systems are often more compact, which means you get better performance without taking up unnecessary space, resulting in lower energy bills and bigger savings.

## Long-term availability and stability

Because $CO_2$ is a natural refrigerant, it doesn't come with the same risks of supply shortages or price spikes that synthetic options face. Yes, there were reports of $CO_2$ shortages in the press a few years back, but those were mostly tied to temporary production hiccups, not actual scarcity. For retailers, this means peace of mind knowing your refrigerant supply is stable and reliable.

## Operational and maintenance benefits

$CO_2$ systems are tough and built to last. They adapt easily to new regulations, meaning you won't have to constantly tweak or upgrade them to stay compliant. Plus, with features like heat recovery and leak detection technologies, these systems are both reliable and easy to maintain.




**"A refrigeration system using $CO_2$ can significantly lower emissions while lowering energy costs, making it a powerful choice for businesses prioritising sustainability."**

**Julian Ellis**

Commercial Director, Epta UK

# Delivering distinctive value through innovation

With the expertise of Epta Technica, refrigeration systems are evolving to meet modern challenges, making sustainability a built-in advantage rather than an afterthought.

## Heat recovery systems

Why let good energy go to waste? Integrated heat recovery systems capture excess heat from refrigeration and reuse it for store heating. This simple yet effective approach reduces both energy costs and carbon emissions.

## Waterloop technology

This technology connects refrigeration cabinets to a closed water circuit, minimising energy loss while optimising both cooling and heating. This adaptable solution is ideal for stores of all sizes, offering exceptional flexibility and performance.

## $Co_2$-based systems

These systems take full advantage of the gas's unique thermodynamic properties, delivering strong energy efficiency across a range of applications. With high volumetric efficiency, they are designed to be more compact and use energy more intelligently, making them perfect for businesses that want to maximise performance while reducing their environmental impact.

$CO_2$'s natural properties not only support consistent cooling performance but also help businesses stay ahead of evolving sustainability standards. A practical option for companies aiming to stay ahead of climate goals without compromising performance.

## Making $CO_2$ work in warmer climates

$CO_2$ refrigeration has historically struggled in high ambient temperatures, limiting its efficiency in certain regions. Extreme Temperature Efficiency (ETE) technology addresses this challenge, refining system performance to maintain reliable cooling even in extreme conditions.

By removing the need for synthetic refrigerants, flammable refrigerants, and water-wasting adiabatic systems, ETE makes $CO_2$ refrigeration a sustainable and scalable choice. Its optimised system design also enhances reliability, reduces maintenance, and extends equipment lifespan.

The figures below highlight how ETE technology compares to traditional parallel compression systems, demonstrating its ability to deliver greater efficiency in warmer climates.

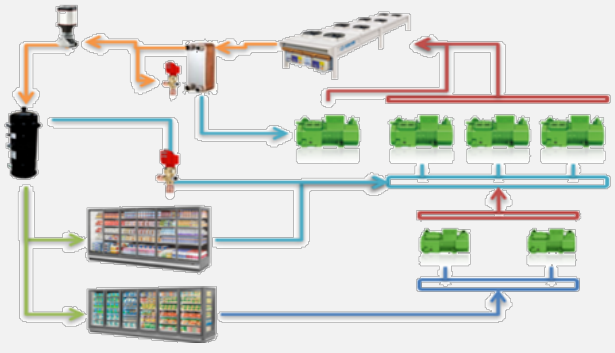


*Figure 1: ETE – Extreme Temperature Efficiency*

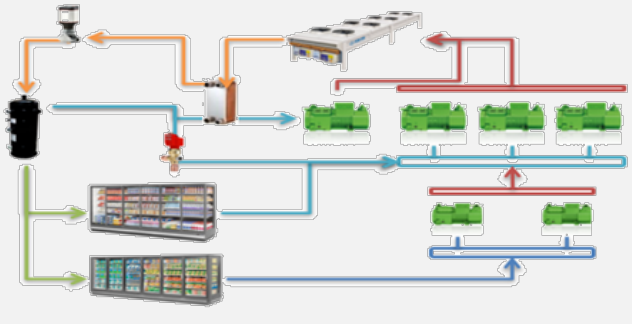


*Figure 2: Parallel Compression*

**"ETE technology is a game-changer for sustainable refrigeration, offering exceptional efficiency with a design built to perform in all kinds of conditions."**

**Matthew Crolla**

Senior Technical Lead, Epta Technica

Case study

# Co-op raising the bar in energy efficiency

Back in 2012, Co-op took a bold step by becoming one of the first retailers to install sliding doors on their refrigeration cabinets, challenging the belief that doors would negatively affect sales. Working together, they demonstrated that energy efficiency, sustainability, and a great shopping experience can all go hand in hand.

By introducing the Gazelle Eco cases, Co-op set a new benchmark for refrigeration efficiency, significantly cutting energy consumption while enhancing store operations and sustainability.

- Co-op's initial adoption of sliding doors led to nearly 50% energy savings.
- With Gazelle Eco, further refinements resulted in up to 60% cumulative savings, compared to Co-op's traditional open refrigeration cabinets used before 2012.
- High-visibility glass doors and motion-activated lighting didn't just cut costs—they also made stores more inviting, enhancing the overall shopping experience.

**"Not only do the Epta Gazelle Eco cabinets look superb but the energy savings delivered are a huge step change also enabling other benefits to be realised with smaller plant, reduced capacity heating systems and the associated cost benefit."**

**Nick Cairns**
Construction Contract Manager
Co-op Property

**This powerhouse partnership earned Co-op prestigious awards, establishing themselves as a leader in sustainable refrigeration**

**Environmental Collaboration of the Year 2024**

**Retail Project of the Year 2024**

rac COOLING INDUSTRY AWARDS 2024

60%

**The Gazelle Eco delivers up to 60% energy savings**

# Think $CO_2$ systems are complex? Think again

We're busting some myths as there are still plenty of misconceptions floating around. These myths often create hesitation for businesses thinking about making the switch. Let's clear up a few of the most common ones to provide a clearer picture of why natural refrigerants like $CO_2$ are the way forward.

### "$CO_2$ systems are too complex to maintain."

It's a common belief that $CO_2$ systems are complicated and hard to service. In reality, with advancements in design and dedicated training like Epta's $CO_2$ Training School, maintaining these systems is straightforward. Engineers now have access to intuitive monitoring tools and user-friendly system designs, making maintenance easier than ever.

### "Switching to natural refrigerants disrupts operations."

Many businesses fear that moving to natural refrigerants will disrupt their day-to-day operations. But Epta's scalable and adaptable systems are designed to fit seamlessly into existing infrastructures. That means minimal downtime and a smooth transition, with no need to overhaul your entire setup.

### "Natural refrigerants are not as efficient as synthetic options."

There's a misconception that synthetic refrigerants outperform natural ones. But $CO_2$'s thermodynamic properties tell a different story. It's incredibly efficient, especially in low-temperature applications. In fact, Businesses using $CO_2$ solutions regularly see energy savings of up to 60%.

### "High pressures make $CO_2$ systems unsafe."

Some worry that the higher operating pressures in $CO_2$ systems mean they're unsafe. But modern systems are built with advanced safety features, like high-strength materials and pressure relief valves, to ensure safe operation in all conditions.

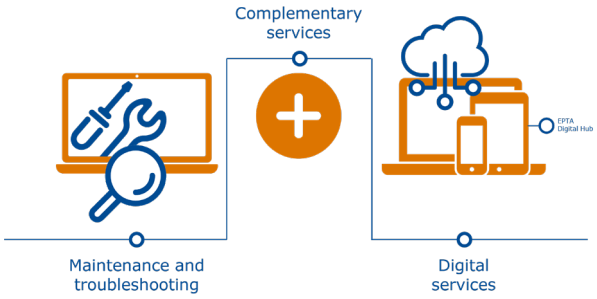
Epta's digital hub

# Digital tools that put you in control

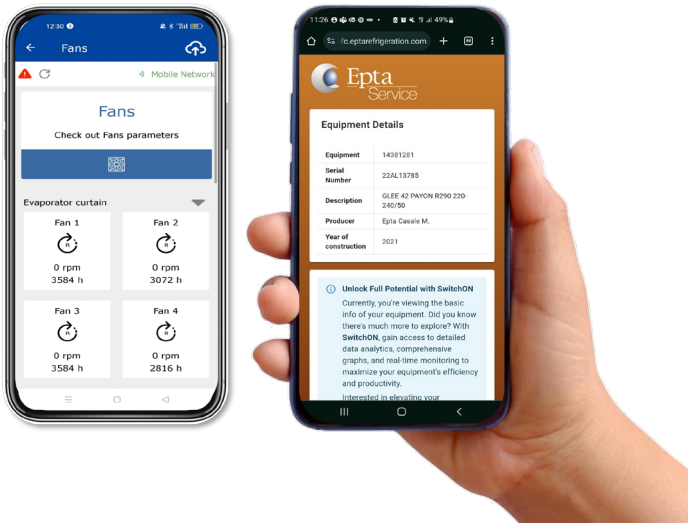
With advanced digital tools built right in, businesses can monitor energy use, track system performance, and even predict maintenance needs before issues arise. This means fewer surprises, less downtime, and more control over day-to-day operations. By giving businesses real-time insights, these digital tools help reduce costs and keep things running smoothly. Whether it's spotting a minor issue early or optimising energy use across multiple sites, Epta's technology drives measurable change and puts the power back in your hands.

SWITCHON

LINEON







# Maximising performance across your estate

As refrigeration systems become more advanced, taking a full-system approach is more important than ever. Epta Technica works alongside businesses as a strategic partner, helping them optimise energy use, navigate compliance challenges, and maximise the lifespan of their refrigeration assets. With specialist engineering expertise, we take a holistic view across entire estates, ensuring every component works together to drive performance, efficiency, and lasting value.

### Epta Technica at a glance

We work with industry bodies to help shape regulations and set new standards

We take a consultative approach, working with businesses to develop tailored strategies

We partner with universities and research hubs to stay ahead of emerging trends

We trial new solutions with retailers and strategic customers, sharing insights in confidence

We explore new technologies that will shape the future of commercial refrigeration

**"Epta Technica helps businesses get the most out of their refrigeration systems, from energy savings to long-term reliability."**

**Jordan Tomes**
Senior Technical Lead, Epta Technica

## What's next for the industry

Refrigeration isn't just about the equipment, it's about having the right expertise to get the best out of it. From optimising energy use to ensuring long-term performance, taking a specialist approach is key to getting the most out of your refrigeration investment. That's why more businesses are turning to dedicated engineering expertise to fine-tune their systems. Innovations like $CO_2$ optimisation, heat recovery, and Waterloop technology are turning refrigeration into a strategic advantage rather than just an operational necessity. With decades of experience and a hands-on technical team, Epta Technica is here to help businesses bridge that gap.