

# Managing **operational efficiency** in food retail—**5 global trends** and how to respond

If you work in facilities or energy management for a food retailer, change is something you handle every day. When the way we live, work, or shop changes, new food retail technology is close behind.

Right now, all those things are changing like never before. Megatrends like electrification, digital communications, and the fight against climate change are creating both opportunities and challenges for the food sector, worldwide.



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At Danfoss, we see that first-hand, because we work with hundreds of food retail chains in more than 60 countries. In particular, we see five big, overlapping changes that are combining to shape today's workload for supermarkets' teams... and five key ways to respond.

Proven in more than  
**50.000**  
installations worldwide.

### Intense pressure on operating margins makes cost savings essential

The average profit margin for a large food retailer currently stands at just 1.7%. This puts every operating cost under scrutiny—because it has a direct impact on competitiveness and profitability. **What this means in practice:** supermarket teams need creative ways to save operating costs—including new technology and partnerships. They might also need to implement the technology for new revenue streams.

### Increasing food safety and reducing food loss are more important than ever

According to the UN Food and Agriculture Organization (FAO), food wastage accounts for 3.3 gigatonnes of greenhouse gas emissions. Avoiding food loss has always been essential to limit costs; it's now part of sustainability too. **What this means in practice:** retailers will need to keep their focus on maintaining safe refrigeration temperatures—and avoiding equipment breakdowns that waste time, money, and food.

### Climate change regulation makes refrigerant choice critical

Initiatives like Europe's F-gas regulations and US Climate Alliance are having a direct impact on refrigerant availability and cost worldwide. Choosing an alternative with low global warming potential has growing advantages. **What this means in practice:** choosing the right refrigerant brings advantages in cost, regulation, availability, environmental impact, and sometimes tax.

### Utilizing waste heat as a resource

More than half the world's population now lives in cities, and the United Nations predicts that it will climb to 68% by 2050. This means urban neighborhoods will need new ways of meeting energy challenges—such as China's district heating systems. This can put retailers at the heart of the energy revolution. **What this means in practice:** in some Nordic countries, retail stores divert around 30% of their excess capacity into heating homes in the surrounding area. This is a potential source of revenue.

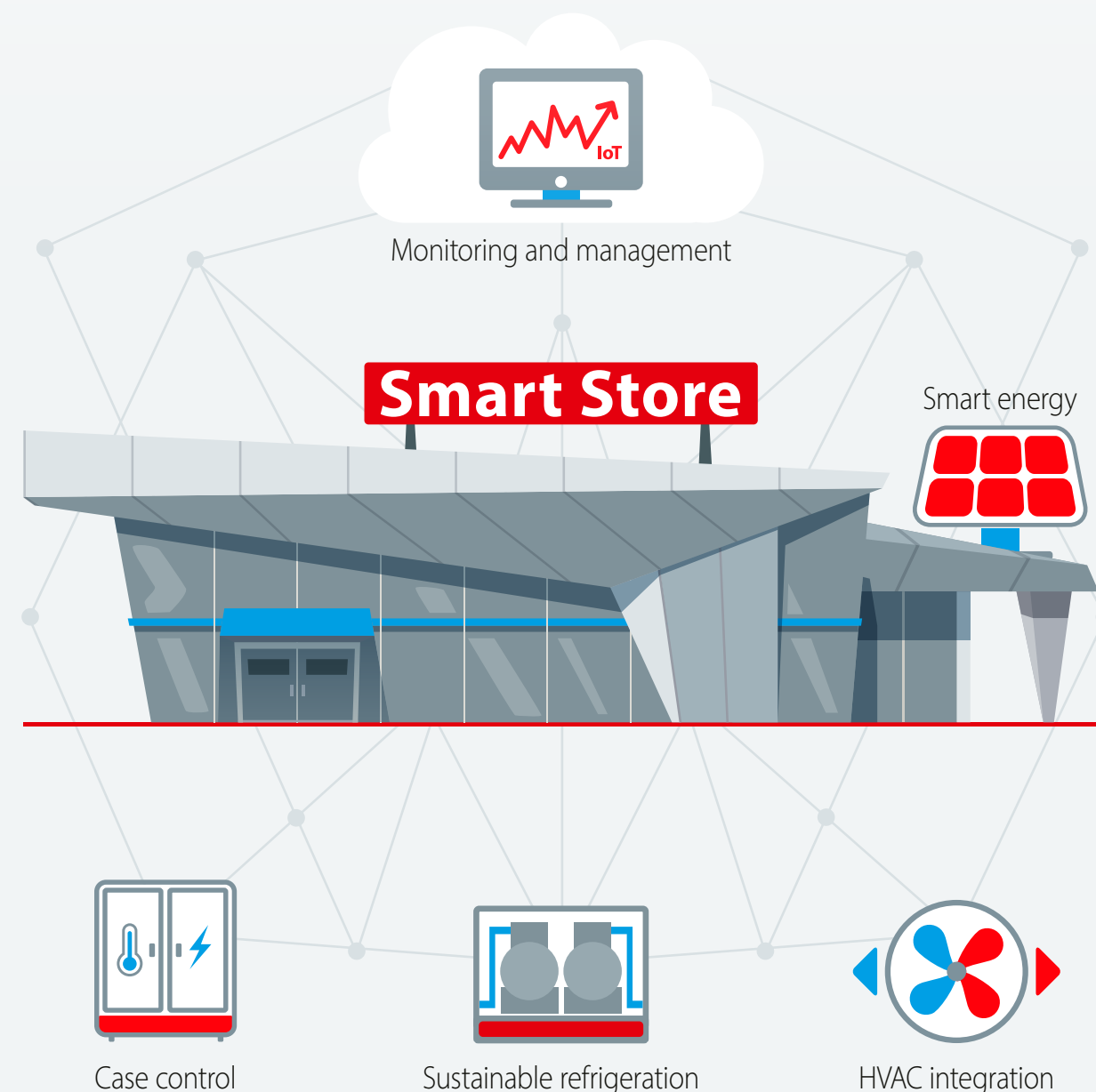
### Electrification is a challenge...and an opportunity

Bloomberg estimates 57% of all new cars worldwide will be electric-powered within the next 20 years, and many retailers are already providing charging facilities. But there are also significant opportunities to benefit from energy arbitrage. **What this means in practice:** as well as infrastructure, retailers need to find ways to prevent expensive short-term spikes in energy use as vehicles charge. But those who can find flexibility in their energy demand may be able to proactively cut costs.

## Overlapping **challenges** that demand a **coordinated** response

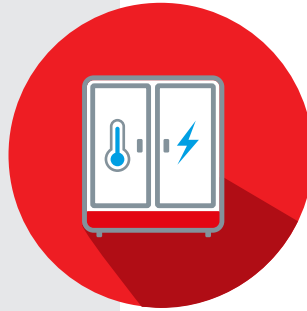
These five trends influence each other. For example, the opportunity to reduce energy tariffs by optimizing electricity demand is all the more compelling because of the need to find cost savings wherever possible.

In the same way, the changing food retail energy landscape needs a coordinated approach. We've identified five technical strategies which, when combined, will help supermarkets to stay ahead of—and in some cases benefit from—society's emerging demands.



1.

Use smart refrigeration case control to reduce operating costs



To optimize refrigeration efficiency, it's important to match capacity to demand. Too much cooling, and you waste energy; too little, and you risk system damage and food loss. An adaptive case controller, like the Danfoss ADAP-KOOL® series, can balance refrigeration performance to the load. And our Adaptive Superheat Control algorithm maintains the minimal stable superheat, so there's always just enough cooling.

The advanced controllers connect to the internet and the compressor pack controller via a system manager. They're also easy to use, simplifying the complexity of a modern refrigeration system, so you can focus on optimizing efficiency.

2.

Connect to the internet to eliminate food waste and cut service costs

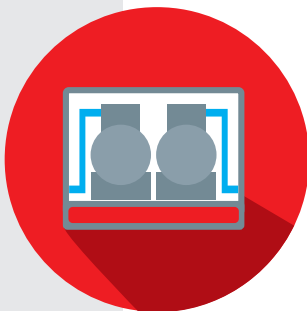


Connecting your refrigeration system to the cloud is not just a trend. It offers a world of possibilities to save money and improve food safety. Remote monitoring and management make it easy to check and triage system alarms, giving priority to those with an immediate impact on costs or potential food loss. What's more, it's possible to fix some issues remotely—cutting unnecessary callouts by up to 30%.

There are also longer-term savings. Benchmarking performance data using an online dashboard can help optimize efficiency and save costs across a retail chain. Soon, it will be possible to use big data to predict exactly which equipment is at risk of failure, before it happens.

3.

Treat refrigerant selection as a long-term decision

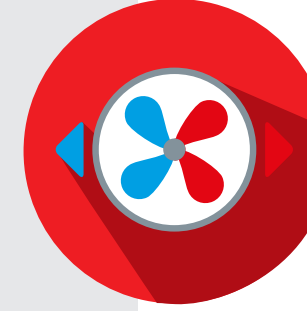


The refrigerant you choose has a significant impact on your costs—not just at installation, but for the life of a store. For example, CO<sub>2</sub> was once seen as an expensive option, best used in cold ambient temperatures. But now it's growing in popularity as new technology like the Danfoss Multi Ejector Solution™ makes it a viable option for all climates and store sizes.

The shifting legislation around refrigerants means options with high global warming potential (hundreds or even thousands of times higher than CO<sub>2</sub>) can quickly become expensive, highly taxed, and difficult to obtain. In this context, a natural, low-GWP alternative could be a good long-term choice.

4.

Integrate each store's systems to gain economies of scale



Every cost saving is valuable, and yet most retailers pay to run a heating and hot water system, while a separate refrigeration system releases heat into the atmosphere. Treating these facilities as an integrated solution can reduce a store's carbon footprint, while reducing installation and operating costs. When integrated, a store's refrigeration system can usually supply all its heat too—even eliminating the need for a boiler.

This integration was once difficult to achieve. However, the rising popularity of CO<sub>2</sub> is making it more common—while Danfoss's purpose-built Heat Recovery Unit helps to eliminate the technical challenge.

It can also be a good idea to build air conditioning and ventilation into the refrigeration system—that way, you can get the additional cooling load almost free of charge.

5.

Reduce energy prices by optimizing demand



As supermarkets get better at energy efficiency, the fastest cost reductions are increasingly found in managing demand patterns. Reducing moments of the highest load can help cut a store's energy price for the rest of the year, as well as enabling infrastructure savings, such as using a smaller transformer.

In some cases, this flexibility can enable a retailer to receive incentives from their energy provider. Utilities companies are increasingly seeking help to match energy production to demand—discounting off-peak energy or seeking a temporary reduction in power use to manage short-term "demand response" events.

There are several ways to achieve this—for example by using a battery bank, changing maintenance schedules, or storing the energy thermally. This could include pre-cooling freezers or using an ice-making unit to load up with excess renewable energy.

This isn't the future. It's happening right now.

Between them, these five approaches can help retailers to cut costs, minimize environmental impact, and find a competitive advantage, while safeguarding food safety.

They're best used in combination; for example, heat recovery is much easier with a CO<sub>2</sub> system, and smart case controllers maximize the benefit of monitoring online.

At Danfoss, we call this joined-up approach Smart Store. Food

retailers around the world are already using it to improve efficiency, find new opportunities, and meet the sector's current challenges head on.

We've compiled five articles to show you how each part works and introduce you to some of the real supermarkets who are taking the lead. You can also reach out to a Danfoss expert to discuss your store's own individual needs.