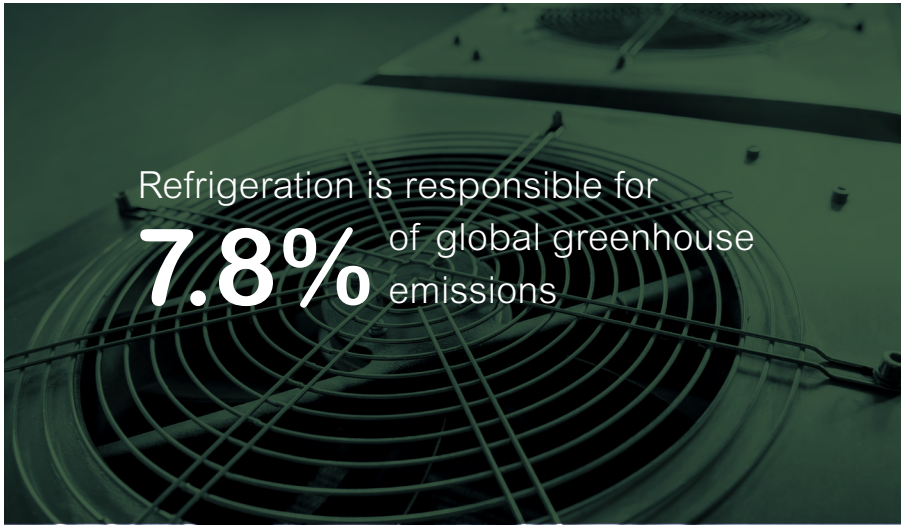
Decarbonizing grocery stores: A two-pronged approach on the path to net zero

Introduction

Supermarkets, or grocery stores, are unique among retailers. In addition to the typical energy usage from systems like lighting and HVAC, they also have to manage large-scale refrigeration loads. This is not only costly to the bottom line, it's also costly for the environment.

This paper looks at the energy challenge faced by large, stand-alone grocery stores, and proposes a two-pronged approach to decarbonizing through onsite renewable energy generation and advanced refrigeration management.

This document is a short executive summary of the study. To access the full research, **click here**.



Why decarbonize?

Operational Cost Savings

Energy efficiency measures and refrigerant management reduce utility bills and maintenance costs.

Energy Resilience

On-site generation, supported by microgrids, enhances reliability and minimizes disruptions.

Market Leadership

Go beyond compliance and position your company as a leader in climate action.

Maximize onsite renewable energy generation

For the average building, HVAC improvements are a major focus. Supermarkets, however, require a more tailored approach due to their heavy reliance on refrigeration, which account for **over 50% of their energy use**. While energy efficiency is hard to improve in supermarkets, there are a few things you can do that will yield significant decarbonization results.

Rooftop Solar PV with Microgrid Solutions

The highest potential to reduce carbon emissions is through rooftop PV with battery energy storage and microgrid controls. Installing rooftop PV and pairing it with microgrid technology can reduce energy use by 20-35% with a proportional reduction in operational emissions. These emission reductions can be increased by making use of large parking lots often present in standalone supermarkets to install carport solar PV arrays.

Schneider Electric's MicroGrid Flex solution enables optimal energy management, ensuring operational continuity while supporting decarbonization.

Refrigeration management is the key

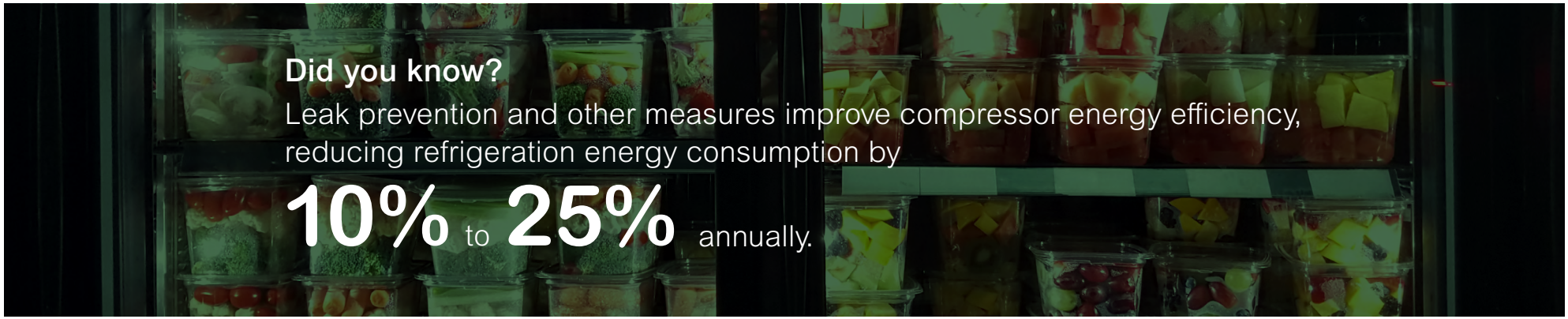
Refrigeration accounts for over half of a supermarket's energy consumption and operational carbon emissions, and it's estimated to contribute 37% of global GHG emissions associated with the supermarket sector. What can you do about it?

First, replace the worst-offending refrigerant gases you may be using with newer refrigerants designated to have low global warming potential, or GWP. This is an easy and effective way to improve energy efficiency and reduce harmful emissions.

Next, adopt a leak prevention program based on proactive maintenance and leak detection technology. **The most effective control systems can provide real-time leak detection, reducing refrigerant leakage by 30 - 50%.**

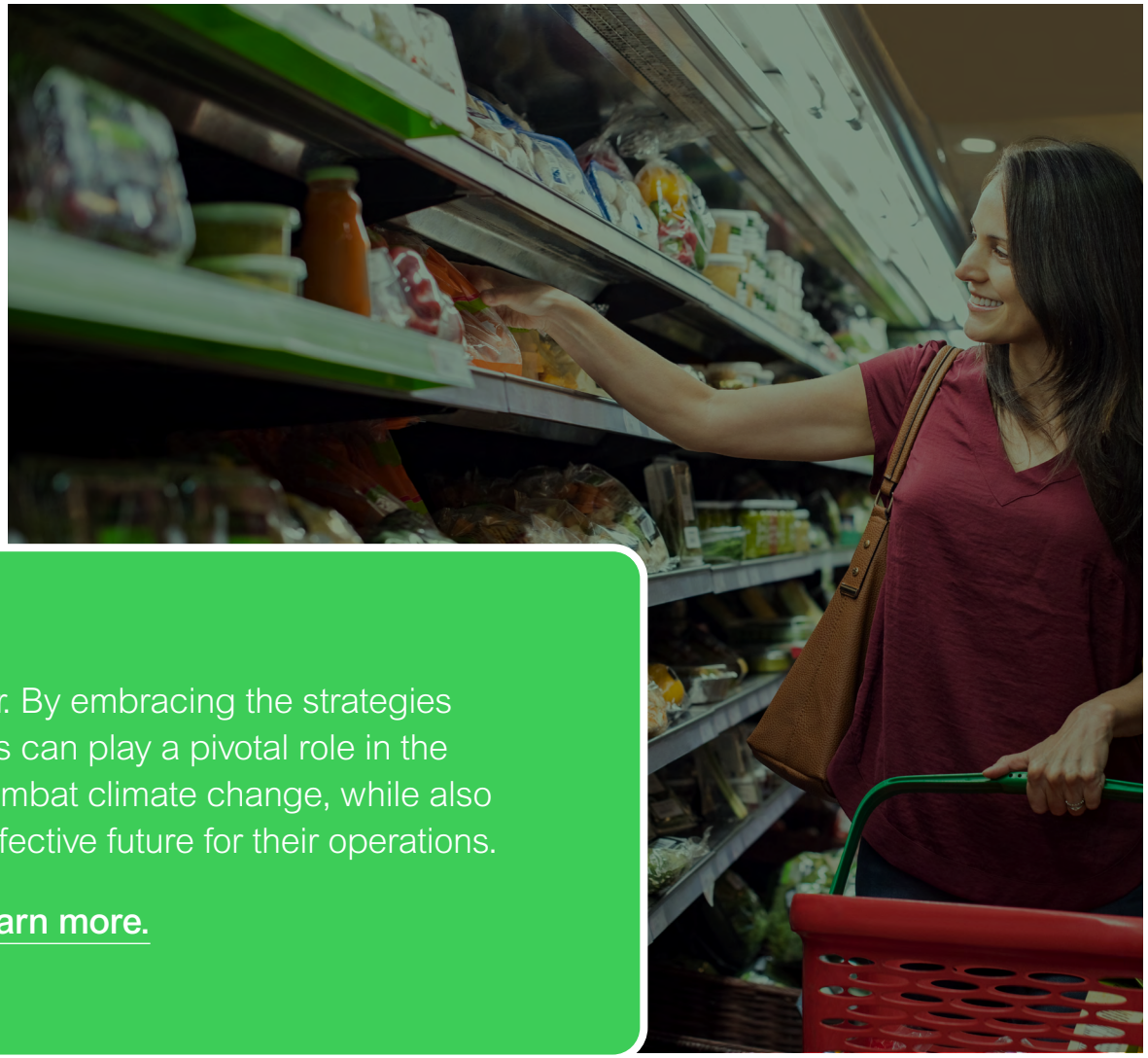
How leak detection works

Schneider Electric's Eliwell industrial automation controllers can be paired with the BMS to create a leaksensing network, connected with distributed leak detection at each refrigeration case. A centralized automation server processes the pressure data and sends alarms at the first signs of a reduction in pressure, allowing real-time detection and rapid response.



The path to decarbonization is clear

Supermarkets have a unique opportunity to lead the global decarbonization effort. The dual approach outlined in this white paper—focusing on renewable energy generation and refrigerant management—provides a comprehensive strategy for reducing the carbon footprint of these facilities. Implementing these measures not only aligns with global climate objectives but also offers practical benefits, such as reduced energy costs and improved operational efficiency and resiliency.



How to get started

The path forward is challenging but clear. By embracing the strategies discussed in the full paper, supermarkets can play a pivotal role in the global effort to reduce emissions and combat climate change, while also securing a more sustainable and cost-effective future for their operations.

Download the paper today to learn more.

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About Schneider Electric
Schneider's purpose is to **empower all to make the most of our energy and resources, bridging progress and sustainability** for all. We call this **Life Is On**.

Our mission is to be your **digital partner for Sustainability and Efficiency**.

We drive digital transformation by integrating world-leading process and energy technologies, end-point to cloud connecting products, controls, software and services, across the entire lifecycle, enabling integrated company management, for homes, buildings, data centers, infrastructure, and industries.

We are the **most local of global companies**. We are advocates of open standards and partnership ecosystems that are passionate about our shared **Meaningful Purpose, Inclusive and Empowered** values.

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