

Tackling energy solutions with technology

Energy matters, particularly for local retailers and wholesalers. The South African energy grid is under pressure – and that puts the country under pressure. For stores whose very business relies on a stable, affordable energy supply, alternative energy sources and sustainability must be built into every system and process.

Developments in AI and the Internet of Things (IoT) are being complemented by technological advancements in equipment and systems that are more energy efficient, reliable and controlled. This means harnessing technology to achieve energy savvy operations.

A switch to solar for sustainable business

Local powerhouse, the Shoprite Group, recently celebrated an impressive milestone of 100 solar installations. The 100th solar photovoltaic (PV) system was installed 10 years after Shoprite launched its first solar project in 2015. According to the Group, “With an installed capacity of over 43 300 Kilowatt-peak (kWp), the retailer’s solar portfolio ranks among the largest of any South African private company.” The decision to switch to solar was based on uncertainty surrounding stability of the national grid and in response to the climbing cost of electricity. Their spokesperson



Lightning is one of Earth’s phenomena, and while we marvel at the sight of lightning strikes, they can be extremely dangerous. They are the single biggest cause of damage and destruction of electrical and electronic equipment in homes and offices. It is estimated that lightning strikes occur 1.4 billion times a year! <https://www.sollatek.com/>

adds, “These investments have significantly strengthened the Shoprite Group’s energy resilience by reducing reliance on the national grid and improving operational continuity, while also helping to manage long-term electricity costs amid rising tariffs.”

According to Shoprite, their distribution centres are their biggest energy consumers and have consequently realised the greatest efficiency gains and cost savings through solar PV and renewable energy projects. Within their stores, refrigeration and heating, ventilation and air conditioning

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(HVAC) systems are the largest electricity users. Both these systems make good use of solar power and are now being designed with solar power or hybrid power sources in mind.

Solar, battery storage and electricity wheeling (the process of transporting electrical power from a generator to a customer through a third-party network) are helping to reduce reliance on the national grid, which the Shoprite Group is keen to take advantage of. "Wheeling helps to diversify supply, reduce grid dependence and improve supply stability across our operations. Our rooftop solar systems alone generate enough clean electricity to power nearly 12 300 households annually, which is reducing pressure on the national grid."

Tracking and managing energy performance across a vast national footprint is essential for maintaining efficient operations, identifying problem areas and calculating cost and energy savings. Shoprite uses a utility platform to measure, track and report monthly energy and water consumption across stores, distribution centres and offices. This enables them to identify high-consumption sites and develop and implement targeted energy-efficiency programmes to drive continuous improvement.

According to Shoprite, the Group has committed to reducing its absolute scope 1 and 2 greenhouse gas (GHG) emissions by 42% by 2030, using 2020 as a baseline, and absolute scope 3 emissions from the use of products sold by 25% over the same period. These targets were approved by the Science Based Targets.

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About Absolute Scope GHG emissions

Absolute Scope 1, Scope 2 and Scope 3 greenhouse gas (GHG) emissions refers to the total amount of direct and energy-related indirect emissions an organisation produces, measured in actual tonnes of carbon dioxide equivalent, without adjusting for revenue, production or growth.

Scope 1 emissions (direct emissions) are from sources that a company owns or directly controls, such as:

- Fuel burned in company vehicles
- Gas used in boilers or generators
- Refrigerant leaks from cooling systems

Scope 2 emissions (indirect energy emissions) are from the electricity, steam, heating, or cooling a company purchases and consumes.

Scope 3 emissions are all other indirect emissions that occur upstream and downstream in the value chain.

The Group also set a long-term goal to reach net-zero emissions by 2050, aligned with limiting global warming to 1.5°C above pre-industrial levels.

"While we remain committed to our decarbonisation targets, we continue to balance these goals with our core purpose of providing customers with access to affordable goods and services," the spokesperson says.

"Over the next three to five years, local retailers will need to focus on strengthening partnerships with stakeholders across the electricity value chain, including the national utility, municipalities, landlords, independent power producers and energy traders. Equally important is embedding energy efficiency as a core operational priority."

For Shoprite, solar energy is a proven and scalable solution to improve energy resilience, manage costs and reduce emissions, making it a strategic priority for retailers operating in a constrained and uncertain energy landscape.



The Shoprite Group has achieved a major sustainability milestone with the installation of its 100th solar photovoltaic (PV) system, 10 years after launching its first solar project in 2015.

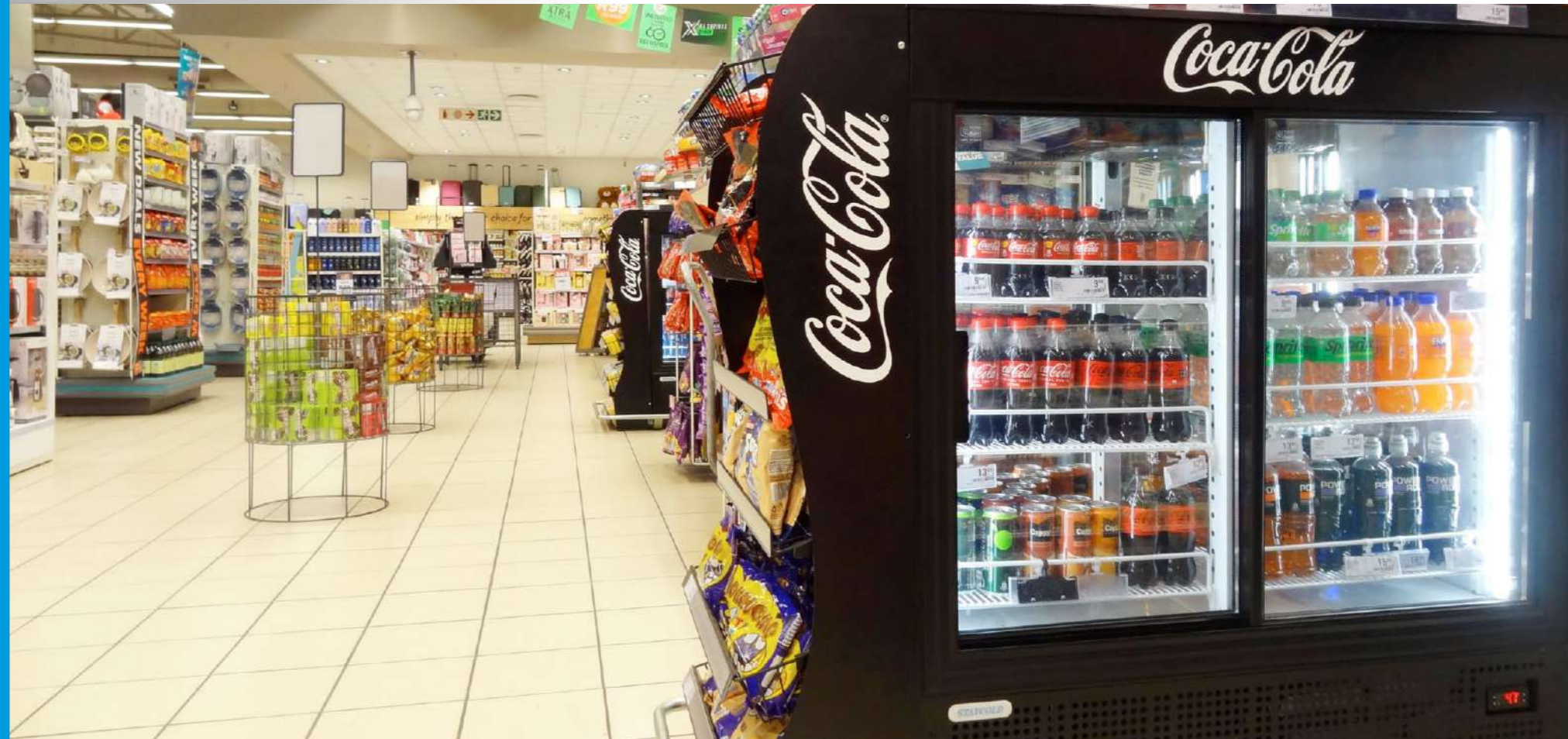
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Hi-tech approach to energy efficiency

Commercial refrigeration manufacturer Staycold International supplies high-quality, self-contained commercial fridges and freezers. With a long-term commitment to sustainability and their own pathway to net zero, this locally based company has a deep understanding of the unique challenges and obstacles faced by local retailers and wholesalers.



Sebastian Hills

Sebastian Hills, Sales Director at Staycold International, is well aware that in the retail environment, refrigeration and wider HVAC systems are acknowledged as the most energy-intensive cost burdens. He says, "Staycold's range of beverage coolers and display

fridges and freezers utilise the latest technologies available to reduce energy consumption. These include high-efficiency IQ fan motors, Low-E glass doors, digital energy management devices, EcoMate PU insulating foam and low-GWP hydrocarbon refrigerants. These features not only reduce energy consumption but also limit their broader impact on the environment."

Staycold has several energy-efficient technologies available for retailers and wholesalers, although they come with a price tag that reflects the research and development that has gone into them. According to Hills, it's an investment that's more than worth it. "The adaptation of IQ or EC fan motors within a refrigeration system can



Automotive Net-Zero. The road transport sector is among the largest sources of global emissions. The SBTi is developing an automotive Net-Zero Standard. <https://sciencebasedtargets.org/>

reduce energy usage by up to 70% when compared with shaded pole fans," he explains. "Although these types of fans can be much more expensive, the return on investment (ROI) can be as low as eighteen months to two years. Couple that with the peace of mind knowing that these types of fans are sparkless and are compliant with IEC safety standards when manufacturing systems that operate on hydrocarbon refrigerants."

LEDs offer another area for increased efficiency and savings. Hill explains, "For a number of years, LEDs have been seen as a way to reduce energy consumption. They have been deployed extensively

to reduce the energy consumption element in the lighting systems within refrigeration system units. They continue to evolve through further reductions in energy consumption, a better quality of light radiance and more durable chip sets and transformers for longer life expectancy."

Although back-of-house areas can benefit from automated or motion-activated lighting systems, this doesn't always translate well instore, as Hills explains. "Anything that can be deployed to reduce energy consumption should be considered, however, it is important, especially in a retail environment, to make sure that everything looks



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'on' at all times when consumers are present. Anecdotal tests have shown that customers are more likely to buy soft drinks from a cooler that is illuminated but not cooling, as opposed to one that is cooling but not illuminated.

"It is also worth remembering that the cooling system in a refrigeration unit offers much more opportunity for energy reduction than an LED lighting system. This is why energy management devices (EMDs) that reduce the level of cooling during off-peak times through intelligent control of fan systems and cooling profiles, offer a bigger pay-off for energy reduction than just periodically turning lights off."

For Hills, the growth of IoT and the advancements in AI are a boon to anyone looking to increase efficiency while reducing costs.

“ Telemetric systems are becoming increasingly popular as they allow the user to optimise multiple elements of their refrigeration system, or any other system for that matter, through continuous monitoring of performance, condition and sales metrics. ”

"Couple that with deployment of intelligent algorithms that automatically suggest improvements and optimisation that will enable better utilisation of assets and energy usage, and you have a solution that can really make an impact on your business." He adds, "When different systems are able to cross communicate with each other for improved understanding and systems optimisation, you start to see real improvements."



This is IBM in 1916, back when they were called the Computing-Tabulating-Recording Company. One of their original divisions was the International Time Recording Company (or ITR), which developed systems to help businesses measure and manage time. <https://www.ibm.com/>

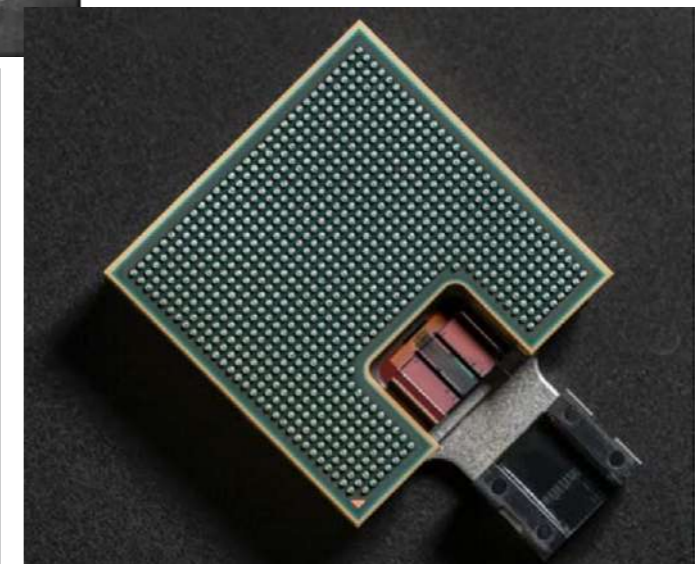
"When you factor in energy saving and cost reduction, the total cost of ownership (TCO) or total value of ownership (TVO) benefits far outweigh this initial investment in the future."

Looking ahead at the energy management trends and innovations that the retail and wholesale sector should prepare for in the next three to five years, Hills tags AI as one to watch. "Deployment of a layer of AI across physical system platforms will, in my opinion, be something that will bring harmony to retail environments and their machines. This will allow for better optimisation across multiple applications while reducing cost and environmental impact and, at the same time, improving the shopper's experience and satisfaction."

Cost-effective energy-saving

Cost-effective energy-saving measures that deliver fast and impactful results are vital in the highly competitive retail space. Staycold invests heavily in research and development in order to manufacture equipment that produces these results.

Hills says, "System optimisation and the use of components that are often more expensive than the standard in the manufacture of our products can increase the purchase cost of equipment, but the improvements realised by this equipment is worth it."



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Connected systems (IoT) increase efficiencies



Dimitris Flokos,

Sollatek, global leaders in voltage protection and energy efficiency, has made it their business to understand how to use technology to improve energy efficiency. Dimitris Flokos, Head of IoT Solutions at Sollatek, shares some insights on how the IoT can help retailers and wholesalers make informed decisions, identify areas of improvement and finetune energy consumption for maximum efficiency.

Refresher: What is the IoT?

The Internet of Things (IoT) refers to a network of physical devices, vehicles, appliances, and other physical objects that are embedded with software, sensors and network connectivity that can collect and share data. Simply put, IoT is a vast number of 'things' that are connected to the internet so that they can share data with other 'things'.

The IoT is not an AI solution, but it works with AI – AI is the technology that analyses data and makes decisions or predictions.

IoT devices are also called 'smart' objects – and include wearable devices like a smartwatch or RFID-enabled clothing, smart fridges, security cameras, delivery trackers, smart factories, and even smart cities. These physical objects create a network of interconnected devices that communicates and exchanges data and can act on this data.

In a commercial energy context, IoT is used in smart refrigeration monitoring and predictive maintenance, and monitoring of a wide range of parameters such as temperature, humidity, air quality and energy consumption. A smart thermostat can detect room temperature and adjust heating or cooling. Distributed grid resources like solar and wind are also integrated through IoT.



<https://stockcake.com/i/futuristic-cityscape-visualization>

Improving energy resilience using IoT

Using IoT tools to track, manage and optimise energy usage in real time is not only the future of energy savings – it is the immediate reality for energy savvy businesses. Flokos says, "The integration of IoT improves cold-storage management across the retail sector. Real-time monitoring of key parameters such as temperature and humidity provides data on optimal storage conditions while improving the efficiency, reliability, and overall performance of refrigeration assets. This continuous flow of data fosters smarter decision-making while enabling predictive maintenance, therefore reducing the risk of costly equipment failures."

He adds, "With loadshedding remaining one of South Africa's most significant operational challenges, IoT-enabled devices offer retailers an important layer of resilience against the impact of disruptions. These devices can track temperature trends, compressor performance and overall asset behaviour before, during and after power disruptions.

"When analysed correctly, this data allows for immediate actions such as activating backup power, adjusting temperature set points or protecting at risk stock, which helps stores to maintain product integrity even under unstable grid conditions. Retailers can model consumption patterns, forecast when and where loadshedding will have the greatest impact and proactively schedule defrost cycles or maintenance during expected downtime. These insights reduce energy waste and extend equipment lifespan."





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When it comes to larger national and African operations, this connectivity becomes even more important. “For multi-site retailers, centralising refrigeration data across locations provides a significant operational advantage,” explains Flokos. “Facility managers can identify which stores are most affected by outages, evaluate recovery performance and allocate maintenance resources more effectively. Over time, the cumulative data strengthens overall asset and business decision-making.”

Once again, refrigeration, and the cold chain in general, are areas that Sollatek takes into serious consideration. “Within retail and wholesale operations, refrigeration is one of the largest energy consumers, particularly across the cold supply chain,” says Flokos. “It is required from production to transportation to instore display to maintain strict temperature control for perishable goods. In supermarkets, refrigeration systems can account for 30% or more of a building’s total energy consumption. These systems, consisting of multiple display cases, freezers and cold storage areas, must operate consistently and efficiently to maintain product safety and quality.”

It is with this in mind that Sollatek designs and manufactures IoT-enabled energy management devices such as the FDE, JEA and GMC product ranges. These are used globally by companies seeking greater efficiency and resilience in commercial refrigeration. According to Flokos, “These devices collect and transmit data to secure online portals and apps, giving operators full visibility



<https://staycold.co.za/>

on equipment performance and enabling informed decision-making.”

Balancing cost savings with sustainability goals is no mean feat. The components, equipment or solutions that can deliver real energy and efficiency savings are not inexpensive. However, the ROI speaks for itself. Flokos says, “Sollatek’s FDEx2i has been engineered as an all-in-one temperature management and connectivity solution for retailers and wholesalers. Installed inside commercial coolers and freezers, the FDEx2i combines three core capabilities into a single compact device: an electronic temperature controller, an energy-saving management system and a full IoT/telemetry hub.”

The FDEx2i uses smart technology to monitor performance, allowing for predictive and preventa-

tive maintenance as well as automated solutions to common scenarios. The unit senses refrigerator behaviour to activate temperature set-back, reduce light usage and cycle fans during off-peak hours. Using GSM/LTE modem, Bluetooth and Wi-Fi geo-location, operators can view temperature, alarms, performance data, location and cooler health in real time, from any location. Variable Speed Control (VSC) adjusts compressor speed according to cooling demand while advanced defrost management allows for timed, temperature-based, manual or emergency defrost modes to maintain stable performance. A built-in battery, Wi-Fi geolocation, GSM/LTE modem and an accelerometer allow tracking during power outages or movement, which means that units can be disabled if stolen or relocated without authorisation. There’s a lot of punch packed into this package, showcasing how IoT creates a holistic solution.

Flokos puts it succinctly, “In an environment defined by energy instability and an increase in the demand for sustainability, investing in intelligent, energy-efficient refrigeration systems is no longer optional. By embracing IoT-enabled technologies and optimising their supply chain networks, retailers and wholesalers in South Africa can reduce their carbon footprint, protect valuable inventory and build more resilient operations for the future.” **SR**



Ann Baker-Keulemans writes on topics related to business, lifestyle, technology, and health, with extensive knowledge on the SA retail and wholesale landscape. Contact annbk@wilkinsross.co.za | www.wilkinsrossglobal.com

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