



# Integrated energy management

Building electricity and business resilience in the Cape Town retail market



## Purpose

Systemic shocks, like the COVID-19 pandemic, and chronic stresses, like load-shedding are driving the need for businesses to enhance their resilience and agility. Shoprite has enhanced sustainability and reduced energy costs through nationwide investment in rooftop solar PV, LED retrofits and solar-powered refrigerated trailers. This intervention has not only reduced the company's electricity costs whilst increasing efficiency, but it enhances business resilience.

It is undeniable that the COVID-19 pandemic has severely impacted the global economy. While immediate health concerns prevail, economic recovery packages are being prepared at the global, regional and national level.

In South Africa, there is a strong call to #buildbackbetter. The movement is a call to use this crisis as a generational window-of-opportunity to collectively pivot towards economic growth paths that are both sustainable and socially responsible.

Even though lowering carbon emissions is at the heart of a climate-adaptive city, a green economy is also a prosperous, job-creating economy underpinned by sustainable (efficient, clean and profitable) infrastructure solutions that create resilience to chronic stresses and acute shocks.

This drive for local resilience is being seen in the City of Cape Town retail market.

## What is resilience?

In human terms, resilience refers to "the ability of an individual to recover from setbacks, adapt well to change and to keep going even when facing difficult circumstances".

A resilient Cape Town is a compassionate, connected, and capable City, where Capetonians collaborate across households, communities and institutions, to build collective responses to the current and future social, environmental and economic challenges.

## The case study discusses:

- The impact of chronic stresses (for example, load-shedding) and acute shocks (for example, COVID-19) on the resilience of businesses, particularly SMMEs.
- The viability and significance of energy efficiency technologies in improving a business's agility in the face of chronic stresses and acute shocks.
- The case study example of Shoprite.

## It is written for:

### Cities:

- Facing similar chronic stresses as the City of Cape Town.
- Looking to assist SMMEs with green solutions to enhance business resilience.

### Businesses:

- Seeking to replicate similar energy efficiency approaches in order to enhance their own energy resilience.
- Seeking ways to overcome the unintended consequences of national load-shedding.

## KEY INSIGHTS

Investment in rooftop solar PV, LED retrofits and solar-powered refrigerated trailers:

- ✓ reduces a company's electricity costs and improves efficiency;
- ✓ builds resilience to economic and environmental shocks (i.e. load-shedding, COVID-19 etc.).

## Challenge

In 2016, Shoprite began its energy resilience journey driven by concerns over climate change and escalating Eskom tariffs, at that point up 100% since 2007, as well promising reductions in the technology costs of PV which became more commercial feasible.

The major concern at the time was the implications of the future tariff trajectory and likely. Key initial considerations included navigating agreements with external landlords & solar PV suppliers, determining an optimal financing structure, and replicability across store locations.

Initial success on two solar PV sites prompted a long term strategy to explore and invest in viable energy efficient solutions. As the acute shock of the COVID-19 spreads through the retail sector in South Africa, a need to reduce company costs and promote efficiency while ensuring resources are provided to customers, has arisen.

## Solution

A deep dive into the activities of Shoprite Constantia in Cape town demonstrates a three-pronged approach to improve their business and electricity resilience journey:

1. Procurement of rooftop PV – A 440kWp grid-tied system set up to run in parallel with store generators during load shedding to reduce generator fuel consumption. This system has been purchased on a [solar power purchase agreement \(PPA\)](#) with a service provider, ensuring system performance and maintenance.
2. LED (Light Emitting Diode) retrofits of ±900 T8 tubes. Store lighting accounted for ±20% of total power consumption on the T8 tubes.

3. Solar-powered refrigerated trailers-trailers fitted with solar PV panels generate and store energy in on-board. This energy is then used to power the nitrogen refrigeration units and tail-lifts. It also allows allow drivers to switch off truck ignitions at delivery locations while still running the refrigeration system, thereby reducing noise, diesel consumption and exhaust pollution.

This case study highlights numerous technology options at varying investment levels available to commercial businesses that would like to take steps towards improving their energy sustainability. It is, however, important to note that this requires a long-term approach that is structured on the buy-in from key stakeholders<sup>1</sup>, thoughtful planning and tapping into the expertise of professionals who can put your plans into action.



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<sup>1</sup> This includes the important partnership that exists between the City of Cape Town electricity department and its customers.

## Business benefits

Through Shoprite Constantia's three-pronged energy efficiency activities, the following benefits have been achieved:

Intervention	Grid-tied 440 kWp Rooftop PV System	Solar Refrigerated Trailers	LED retrofits
Impact	Delivers ±30% of stored energy.	Investment payback within 1-2 years on each refrigerated trailer.	Improved lighting efficiency results in a reduced electricity bill.
Saving	30-40% reduction in the utility energy tariff.	Between 6000 – 8000 litre of diesel per saved through the acquisition of refrigerated trailers that operate with the truck not running.	Between 230 000 – 250 000 kWh reduction per year through the installation of LED retrofits.

## Future Plans & Lessons learned

The Shoprite Group recognises that climate change, driven by global greenhouse gas (GHG) emissions, will directly and indirectly impact its business and the communities in which it operates. The Group supports the goal set by the United Nations Framework Convention on Climate Change of limiting global temperature rise to well below 2°C above pre-industrial levels.

Their [response to climate change](#) has two objectives:

- 1 To reduce their GHG emissions and continuously improve energy efficiency in their direct operations and in their supply chain by engaging with suppliers.
- 2 To strengthen the resilience and adaptive capacity of our operations and that of the communities in which they operate

By taking a proactive approach to its energy planning Shoprite has ensured that its stores such as the Constantia location have a stronger energy resilience and adaptive capacity to withstand any foreseeable and unpredictable shocks to energy supply and Eskom tariffs. They have showcased the viability of three different energy efficiency investments by [replicating them over multiple sites](#).

To date an installed PV capacity with a generation capability of 12 300 MWh per year across 19 different sites has been developed. This generation has been implemented in conjunction with the retrofitting of ±630 000 LEDs and [775 trailers fitted with PV panel](#). Due to the successes of the programme, an expansion to 25 total sites is in the pipeline.



# IN THE CONTEXT OF CAPE TOWN'S RESILIENCE STRATEGY, THIS ENTERPRISE & INVESTMENT CASE STUDY ADDRESSES

## Stresses / Shocks



Economic crisis



Rapid urbanisation



Unemployment



COVID-19



Loadshedding

## Qualities of a resilient city



Job-creating city



Adaptable city



Robust city



Flexible city



Resourceful city

## RESILIENT CAPE TOWN PILLARS

**PILLAR 1:**  
People  
Compassionate,  
holistically healthy city

**PILLAR 2:**  
Place & Space  
Connected, climate  
adaptive city

**PILLAR 3:**  
Economy  
Capable, job  
creating city

**PILLAR 4:**  
Disaster readiness  
Collectively,  
shock-ready city

**PILLAR 5:**  
Governance  
Collaborative,  
forward-looking city

### PILLAR 3

Cape Town is a capable, job-creating City

#### VISION

Capetonians turn the challenges of resource constraints and rapid technological change into new opportunities.

**GOAL 3.1**  
Foster green  
economic growth

**GOAL 3.2**  
Enable enterprise  
development in the  
informal economy

**GOAL 3.3**  
Connect the  
workforce with a  
changing economy

**GOAL 3.4**  
Collaborate with  
businesses to achieve a  
resilient local economy

#### WHAT IS THE GREEN ECONOMY?

The working definition for the green economy as it relates to Cape Town is: "expanded economic opportunities created through the provision of goods and services and the use of production processes that are more resource-efficient, enhance environmental resilience, optimise the use of natural assets and promote social inclusivity."

#### For your business to also benefit

1. Connect with our Energy Team for executive support, market intelligence and network connections to service providers and green finance:

<https://www.greencape.co.za/content/sector/energy-services>

2. Become a GreenCape member and receive industry updates, news and events info:

<https://www.greencape.co.za/become-a-member/>

Authored by Argon Poorun, **GreenCape:** [energy@greencape.co.za](mailto:energy@greencape.co.za)  
Shoprite – Sustainability, Divan Van Zyl: [divanvanzyl@shoprite.co.za](mailto:divanvanzyl@shoprite.co.za)