



MAKRO ENERGY SAVING JOURNEY

Makro's efforts to reduce electricity consumption date back to our 1998 awareness campaign to "switch the lights off". Here is a summary of some of the progress we have made since then.

Our focus areas

Makro's New Generation stores are focused on reducing energy consumption, while improving the in-store environment and customer shopping experience.

We have found that there are three key areas of store design that affect energy consumption - Lighting; Store climate control and Refrigeration.

Heat reclamation

Heat reclamation systems, play an important role in conserving and reducing energy consumption in our new stores. Essentially, these systems use heat exchangers to capture and store excess heat produced by the stores refrigeration plants

The heat reclaimed through this process is used to warm the store during winter and for domestic water heating puposes.

Lighting systems

We have implemented a number of lighting technologies aimed at reducing energy consumption. From using predominantly CFL (compact fluorescent light) lighting in our prototype new generation Makro

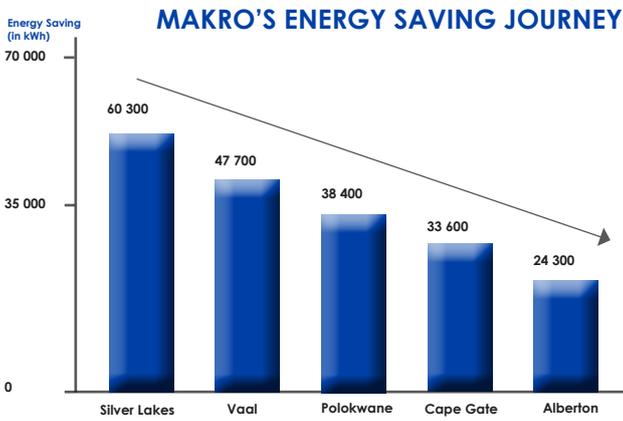
Vaal store, which opened in 2010, to using 100% LED (light emitting diodes) sales' floor lighting in our Makro Alberton and Amanzimtoti stores, both of which opened in 2013.

To further reduce lighting demands all of our new generation stores incorporate natural lighting through the introduction of day-light harvesting systems in the stores' roofs. These systems work in conjunction with the sales floor lights, which automatically dim when there is sufficient natural light on the trading floor. In addition, Makro's offices and all non-essential lights across the store complex are switched off after trading hours.

Energy storage

The cooling systems in new generation Makro stores are equally impressive achieving energy savings of up to 30%. A thermal storage system is used to produce chilled water for air conditioning, which helps reduce electricity demands during peak periods.

The system is ideally suited for the Eskom Time-Of-Use tariff, as chillers do not operate during peak periods. Instead, they run at night in low ambient temperature conditions, increasing efficiency and using power during times of low demand. Stored energy is released during the daytime to



assist units in keeping the store at the right temperature; and in this way 50% of a store's cooling capacity is made up by the air-conditioning unit's thermal storage tanks.

We have also replaced the traditional air handling unit with a belt-driven fan and variable motor system. The fan motors are all of the Electronically Commuted variety and slow down to 60% during low demand periods.

New generation refrigeration

The technological design of our new-generation refrigeration units is considered to be among the best in the retail industry. They are 18% more efficient when compared to legacy Makro stores and up to 35% more efficient than those traditionally found on the market. Makro's refrigeration units use carbon dioxide, which is a non-ozone depleting (ODP)** natural refrigerant with a global warming potential (GWP)** rating of one. In addition, water harvested from our refrigerators and air-conditioners is used to reduce the electricity consumed by our refrigeration plant when ambient temperatures exceed 27°C. As an added benefit, all the excess water captured in this way is used to supplement our landscaping irrigation requirements.

To further increase the efficiency of our refrigeration plants, freezer and cold room doors are high speed: and insulation in rooms and cabinets has been increased to improve the plants thermal inertia. Makro's refrigeration units are also fitted with

LED lighting in all cabinets and rooms; automated night blinds, and stainless steel piping to reduce gas leaks.

New generation Makro stores in a nutshell

- Natural lighting to supplement the amount of electrical lighting requirements.
- Dimmable LED lights, occupancy sensors and light meters.
- A thermal storage system to produce chilled water for airconditioning, which reduces demand during peak periods.
- The trading floor is temperature controlled using hot water when required which is obtained with the assistance of heat reclaimed from the refrigeration system.
- An energy efficient refrigeration solution with the latest energy saving features, automated night blinds, high speed doors and better insulation has been installed to reduce temperature loss.
- The restrooms use a metered water system for taps and cistern dual flushing systems for toilets, which assists in reducing water usage.

** More about CO2 refrigeration gas

A high purity carbon dioxide (CO₂) based refrigerant gas with a low moisture content, excellent thermodynamic properties and low energy-use. There is no ozone layer depletion and minimal or no contribution to global warming. It is increasingly being used by supermarkets as they look to replace traditional and environmentally unfriendly gases such as HFC (hydrofluorcarbon) and Freon.

**What is a GWP rating ?

Global-warming potential (GWP) is a relative measure of how much heat a greenhouse gas traps in the atmosphere - put another way, it is a measure of how much a given mass of greenhouse gas contributes to global warming. The gas being measured is compared over a specified time period to a similar mass of carbon dioxide, which is the base line for GWP ratings, with a standard rating of the one.