



Eskom has just announced a 13,87% increase if you are a direct user and 15,63% if you are a municipal user as from July 2019. With further price increases granted Eskom for next year and the one after, we're looking at a compound increase of around 40% over the next three years

Easy to follow tips on energy saving

Some pointers on how to take this matter beyond refrigeration

By Hippo Zourides

Energy costs are increasing dramatically. Still, there is a lot that can be done to reduce energy costs in-store.

The first place to do this is undoubtedly refrigeration as it is typically responsible for well over half of store energy usage. However, as costs rise it pays to also look elsewhere. If the rest of your expenses to run your store were to be at these levels, you might have

to close down your business. But, we have to persevere and look for ways and means to reduce our energy consumption to lower levels to minimise the damage to our balance sheet and business viability.

We researched this subject widely and this article has some pointers on how to take this matter beyond refrigeration. As you'll see, it is also important to involve your staff in the process to get the best results out of your combined efforts.

Here are areas that require your urgent attention.

Lighting

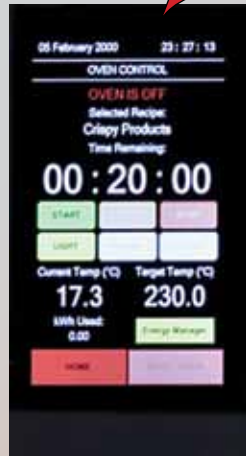
- Incandescent lights are out. If you still have old-fashioned light bulbs and/or fluorescent tubes, the time has come to spend the Capex and replace them.
- Compact Fluorescent Lights (CFL) save more than 20% energy and have eight times the life span of conventional incandescent



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Take advantage of the new

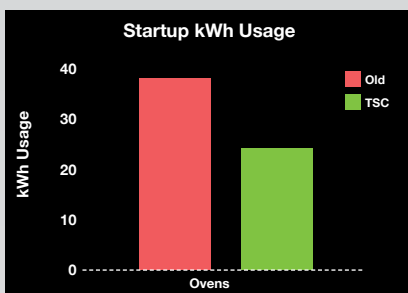
Touch Screen Control



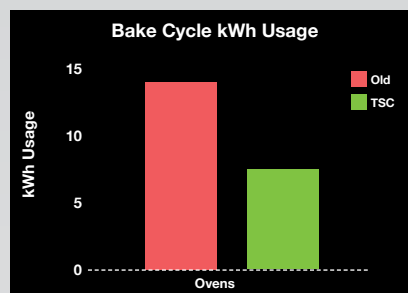
New Touch-Screen Control (with energy management) vs Old Manual Control Oven

The purpose of the case study was to compare the energy usage of the new Touch-Screen Control (TSC) oven against the old Manual Control Oven

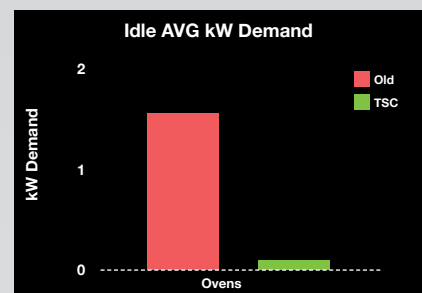
Both ovens were measured using the same Electrex GIGA Box Energy monitoring system under exactly the same situation with same temperatures, steam and baking times over a period of 2 days at the Tombake premises



36% less usage during start-up



46% less usage during baking cycle



95% less usage during idle time

Tombake offers all existing customers a complete retrofit for their old electric manual control ovens.

Note: We reserve the right to both technical, as well as design modifications

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KWAZULU-NATAL: Unit 5, Heron Park, 80 Corobrick Road, Riverhorse Valley, Tel: 031 569 1517 | Fax: 031 569 1477

lighting (up to three years lifespan or 6 000 hours). The payback period is 10 months.

- Use T-12 fluorescents with magnetic ballasts
- Use LED where possible
- Switch off lights when not needed
- Keep clean. Not enough attention is paid to this basic requirement. The gathering of dust and dirt on tubes reduce the lighting level. Tubes should be properly cleaned at least twice a year.
- Use "occupancy cells" (cells that react to human movement) to control the switch on and off of lights in areas such as toilets, staff rooms and other small areas
- Use solar panels as renewable energy
- Involve the staff by training them to follow all of these procedures
- Check with your electricity supplier (City Power or Eskom) to see if you are paying the lowest electricity tariff for your business

Aircon, Heating and Ventilation

- Start aircon two hours before opening time and shut it down 30 minutes after closing
- Do not cool off unnecessary areas, such as store rooms, toilets, warehouses or unoccupied areas
- Service your aircon and refrigeration installations twice a year – the change of seasons requires that your service provider does a thorough check of your system and resets it for winter or summer months
- The basic service should consist of cleaning/replacing filters, checking for refrigerant leaks, lubrication of all moving parts and recalibration and fine tuning of the electronic systems
- Keep coolness or warmth indoors – use air curtains
- Wash fridges on a regular cycle
- Defrost cold rooms on a rotational basis
- Use fans where possible, such as staff rooms – they are 25% cheaper to use than aircon
- Buy new aircons that comply with EER (Energy Efficiency Rating) of 100 or higher
- Replace defrost elements with heat pumps or reverse cycle instruments
- Check door seals for cold rooms
- Clean condenser coils on a regular basis
- Place fridges 10cm away from walls to allow for circulation
- Have regular defrost cycles, do not allow ice to accumulate more than 5mm thick
- Do not exceed (or go lower) than manufacturer's prescribed temperature requirements

COST COMPARISON

Here is a relative cost comparison between some equipment

If a	Microwave	uses	1	unit of electricity
then a	Standard electric oven	will use	4,8	units of electricity
and a	Self-cleaning electric oven	will use	4,1	units of electricity
and a	Self-cleaning convection oven	will use	3,1	units of electricity



- Fridges that have anti-sweat switches – use them, On in summer and Off in winter
- Thermostats can be adjusted upwards in summer and down in winter, a 1% change in temperature results in a 5% savings

Water heating

- Insulate water heater cylinders, as well as pipes
- Drop temperature to 50/60 degrees Celsius
- Install hot water cylinders that use heat from your refrigeration plant
- Install timers that heat up the cylinder from 4am to 7am only – you will have enough hot water for the whole day
- When buying a new water heater, consider an instant water heater – it will result in 20% to 30% lower energy charges

HMR, Kitchen and Deli

- There are controllable expenses – control them as they can account for 12% of your total electricity bill
- Here is what each function in a kitchen costs you
 - Cooking 35% of costs
 - Heating and cooling 28%
 - Dishwashing 18%
 - Lighting 13%
 - Refrigeration 6%

When considering new ovens, stove tops, fryers and broilers

- Consider gas instead of electricity
- Schedule start and end switch on/off
- Stagger starting times to avoid maximum demand penalties
- Follow manufacturer's recommended pre-heating schedule – 10 to 15 minutes should suffice
- Check oven door seals regularly
- Do not open door of oven while cooking – there will be a minimum of 20% loss of heat
- Use the oven timer

- Keep ovens clean from food particles especially around the door
- Switch off equipment a few minutes before the end of the cooking process
- Use an oven thermometer to check temperature
- Ceramic and glass pans use 14% less energy than metal pans
- Keep all equipment spotlessly clean
- Use pressure cookers – they use 25% less energy and cook faster
- Use flat-bottomed cookware
- Induction stove tops that use magnetic fields heat faster and are 8% more efficient than conventional electric stove tops
- Burners – select the correct size equipment for the correct burner ring
- Install aerators to the taps in the kitchen or low-flow valves – results in up to 50% water saving
- Keep extractor fans clean (do it at least twice a year)
- Fryers – do not keep on when not required
 - Start 7 to 15 minutes before use
 - Remove sediment, change oil regularly
 - Clean heating elements
 - Use a thermometer to check cooking temperatures – chips vs. deep fried chicken strips require different temperature settings

ELECTRICITY PRICE INCREASES ARE A FACT



The reduction thereof requires a great deal of effort on your part. Do not neglect this!

The natural evolution of connected efficiency



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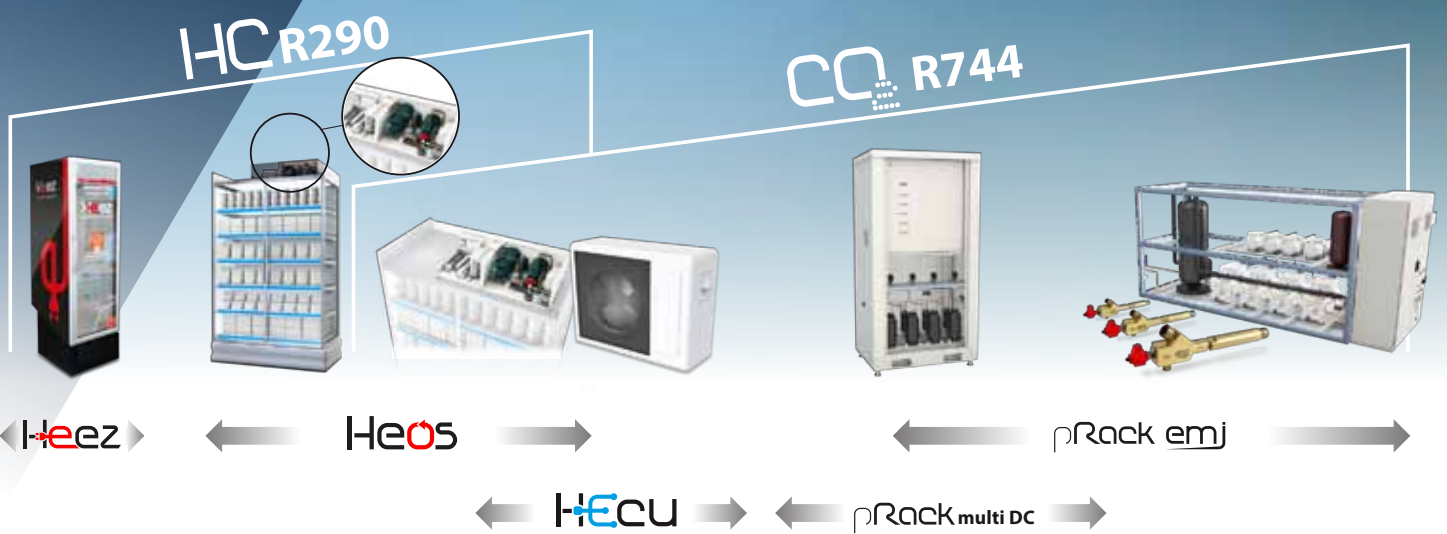
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ADRTPHQEN4 - 2019



Connected Efficiency

Cold stores and load shedding

Operations have to stop for the duration and cold store doors kept closed. Stock can be neither received nor dispatched

While South Africa's situation is not as serious as Venezuela's, outages are likely to continue for the foreseeable future. If union threats materialise to prevent ESKOM's break up, this prognosis could deteriorate.

The recent and continuing load shedding must be extremely frustrating for cold store owners. So says James Cunningham of Barpro an expert in cold store operations.

Available information suggests that while the situation is not as serious as Venezuela's, it is likely to continue for the foreseeable future. If union threats materialise to prevent ESKOM's break up, this prognosis could deteriorate.

At the moment the outages are approximately two hours in length. But every time they happen, bigger refrigeration plants may require a manual start up if they are not set up correctly especially if they have variable frequency drives. The VFD drives or

the electronic controllers often trip when there is a voltage spike when the power is switched on. Christo van der Merwe of service provider MRE recently said that their service department had gone crazy assisting clients to restart their refrigeration plants but this has normalised as the plant operators learn to manage the start ups. While smaller Freon systems can start themselves, bigger plants need experience to get them going. One customer lost five fan motors in a recent outage.

In the cold store itself, power outages are chaotic. With no lights, dock loaders, computer systems, door opening devices and static mobile racking, operations have to stop for the duration and cold store doors kept closed. Stock can be neither received nor dispatched.

Here there are two options. Either buy or rent a generator which will power your complete plant, with automatic switching, or go for one which is sufficient to run the operational equipment with automatic switching during working hours only.

A big commercial cold store, say 8000 frozen pallets plus, could need 1000 KVA. Suitable generators will cost around R2m,

although 2x 500 KVAs can be synchronized to run in parallel. Here there is a saving on capital cost and one set can be switched off at times of low demand. If a set is down for maintenance you still have the other, and spares are generally easier to come by for the smaller sets.

Another cost is diesel usage which, for a 1000 KVA genset on full load, can run at 200 litres per hour. Then space must also be found as close as possible to the main breakers. While a 1000 KVA set can fit in a six meter container sound attenuation requires a twelve meter, excluding the fuel tank. Exhaust pipe arrangements can be considerable and sufficient space must be left around the generator to allow for sufficient air flow.

The alternative is a smaller generator set which has sufficient capacity to power equipment necessary to continue operations. A 125 KVA machine will cost just over R300 000 and use about 25 litres per hour at full power. Sizing a generator requires a survey of the equipment required to operate. LED lighting requires less power than high pressure sodium fittings but possibly more than mobile racks where the motors are heavily geared. Electric chargers for forklifts are big users and should be considered for exclusion. All computer equipment should be isolated by means of a UPS. With a fuel tank in the sub frame and sound attenuated canopies, smaller generators have advantages.

Although the 'high' prices can be off putting, when the actual costs and frustration caused by frequent power outages are calculated at least a smaller generator set can look increasingly attractive.

Freezer stores, especially with mobile racking, keep temperature better in power outages than say those with fixed selective racking. The concentration of product is relatively high and there is less cold air to flow out when the door is open. But entrances must be kept closed by means of high speed doors and consideration should be given to air driers to stop moisture from ending up as ice on the cold room floor. If this happens with mobile racks the mobiles will slip and the rails must be cleaned with a wire brush.



A 1 000 KVA generator set runs at around 200 litres of diesel an hour.

A 2 x 500 KVA set up has a number of advantages.



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Electricity in South Africa – Crisis or Opportunity?

A structured approach to investing in in-store-energy saving technology and renewables

This article and case history show how many of the strategies in our Energy Saving Tips, starting on page 4, can be accurately measured and costed and prioritised based on ROI and other considerations in a structured energy saving plan. Presented by Tim Whitaker of energy management consultancy IDM Solutions. He can be contacted at tim@idmsolutions.co.za

Prior to our current electricity crisis, South Africa had been blessed with an abundance of cheap electricity. As electricity costs were minimal, facilities were often not designed with energy efficient technologies. Electricity now accounts for the third largest cost in supermarkets, after real estate and employee costs. This is primarily driven by the refrigeration system, which uses around 50% of the electricity in an average store. Supermarkets have thin margins, making cost savings an important contributor to profitability. They are scrambling to reduce costs – and energy is a huge opportunity.

The rapid decrease in renewable energy technology costs, such as solar photovoltaics, coupled with rapidly increasing electricity tariffs and more efficient technologies, are creating unique business opportunities for retailers. These changes in energy demand, technology and regulation are bringing about a new energy economy. Energy consumers will need to become more sophisticated and informed about the toolsets available if they want to take advantage of this industry shift and keep pace with their leading competitors.

As the market rapidly transitions to the new energy economy where energy consumers become proactive energy users (prosumers), efficient technology replacement can offer great financial returns. Retail decision makers will need to deploy the technologies best designed to take advantage of a fast changing energy landscape if they hope to remain competitive and resilient. Commercial and industrial consumers have more tools than ever to respond to these dramatic changes in energy pricing.

An example of such a tool is an Energy Management Information System (EMIS). EMIS is a fancy term for a system to collate all energy related data from the portfolio of facilities into a single database. This centralised database of energy related data is a vital tool to gain insight into energy usage and is often overlooked in most retail facilities. Energy costs are often recorded through the financial system, and non-financial energy data is not collated. Through the analysis of the energy data, accurate benchmarking can be done, as well as feasibility studies conducted that substantially reduce both performance and financial risk. An accurate baseline can be created

per facility and updated monthly to track and monitor monthly energy consumption and costs.

Through the implementation of low-cost energy sub-meters, there is greater visibility and control over energy consumption in the different sections of e-store, eg. refrigeration, lights, bakery and kitchens, leading to improved cost control and accurate feasibility studies for investing in and determining the ROI for each of them in more efficient technology. The business case for replacing inefficient technologies with new equipment requires careful analysis of not only the purchase price, but rather the life cycle costing of the various technologies.

As renewable energy technology costs drop and energy costs rise, at some point this structured approach will advise on the benefits of investing in renewables.

This data-centric approach to decision making regarding energy issues has proved to be an extremely cost-effective solution and has been successfully demonstrated in the case study below.

Western Gruppe, an East London based holding company with a diverse range of entities specialising in fast moving consumer goods (FMCG) has 14 retail and 15 liquor outlets, as well as warehousing, distribution, import and export divisions and a fleet of vehicles.

In 2015, with electricity prices rising and load shedding increasing, the company contracted Integrated Data Management (IDM) Solutions to conduct energy audits across all of its SPAR facilities.

One of the key insights gained from the audit was the need to establish a formal energy management system. Firstly, an Energy Management Information System (EMIS) was created to collate all energy-related data. An annual energy baseline was created for each facility, which included electricity, paraffin, and diesel usage. A monthly feedback loop to management was implemented to allow for the monitoring and reporting of monthly energy KPI's. Various energy savings opportunities were identified in the audits, and consequently quantified, costed and qualified using RETScreen Clean Energy Management software. Proof of concept installations were trialed, and the results monitored on a monthly basis.

The annual energy spend over the group for the 2015/2016 year was R17 400 000, with an average annual energy intensity per store of 1 259 000 kWh.

Several energy saving interventions have been implemented including an Energy Management System installation, capacity building through staff training, efficient luminaire replacement, Power Factor Correction, Voltage optimisation, and Solar Cool Technology. The group used both Energy Performance Contracting (through an Energy services company) and their own resources to fund the energy saving opportunities.

All interventions have been subject to a vigorous Measurement and Verification study by IDM Solutions, as per the International Performance Measurement & Verification Protocol. This allowed for accurate estimates of the avoided energy usage and associated energy costs.

The group achieved an annual energy saving of 7,6% in 2017, and 11,9 % in 2018. Currently YTD figures for 2019 show an 18,8% energy saving. This resulted in a total cumulative electricity cost saving of R5 000 000 to date.

This avoided energy use resulted in emission savings of 3 354 Tonnes CO₂ equivalent.

Further energy saving interventions are in the pipeline, as well as the installation of photovoltaic panels. **SR**

Salvis Combi Steam Ovens demonstrate huge energy savings at the Durban ICC

When Culinary Equipment Company took on the project to equip Durban ICC, Africa's Leading Conference Centre, with state of the art Salvis Combi Steam Ovens, it would prove that no kitchen project is too big for the premium kitchen and catering supplier. The kitchen facilities are now installed with 45 Salvis combi steam ovens – 20 pan GN 1/1, presumably the largest such installation of ovens in Africa.

This new installation equips the DICC to serve 7 000 guests in just 10 minutes – a world class feat! Moreover the ovens support HACCP and ISO 22000 standards compliance. Each touch screen oven is programmed with the convention centre's own recipes and a smartweb system to enable downloading of HACCP data to the chef's office.

The Salvis Combi Steam Oven is also what most would call a 'South African kitchen essential' for its energy-saving technology:

- A motor reducing energy consumption by up to 65% from start to heating phase
- Counter-current heat exchanger reducing energy costs by up to 30%
- Vapour condensation reducing water consumption by up to 80%
- Switches to energy saving mode after 15 minutes of inactivity



DICC executive chef, John Moatshe, was very pleased with the success of the project, stating that the DICC was both happy with sales service and the ongoing after-sales service contract with Culinary.

"It's been a marathon and truly a prestigious accomplishment as a result of the monumental efforts from all parties involved." said Culinary Equipment Company MD, Stefan Gutstadt.

About Culinary Equipment Company

Culinary Equipment Company is South Africa's leading supplier of premium catering equipment with national representation. With hundreds of projects completed and exclusively representing over 80 world-class brands, it has developed the best practices and expertise in the culinary field: kitchen design, equipment installation, training and maintenance.

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