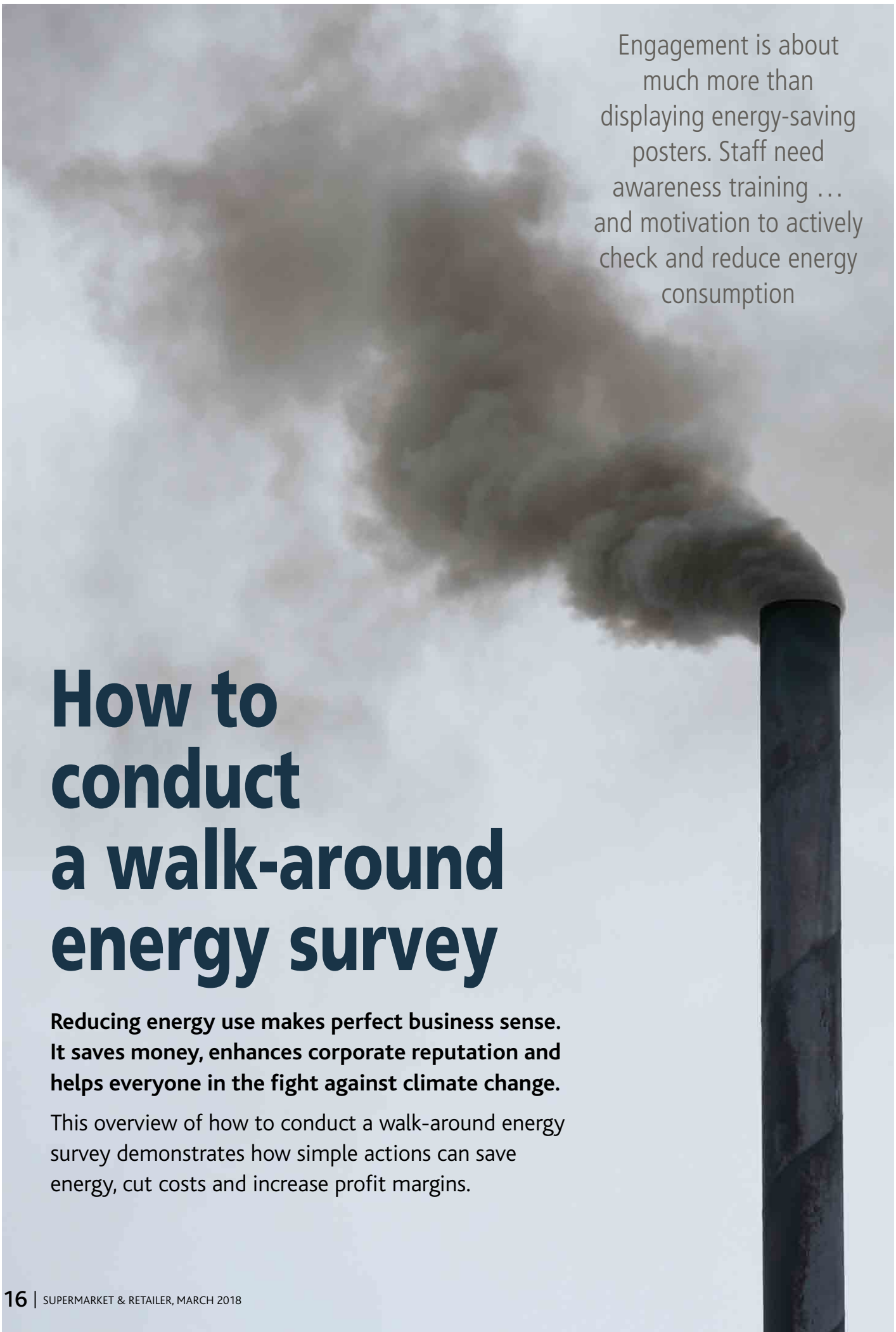

Engagement is about much more than displaying energy-saving posters. Staff need awareness training … and motivation to actively check and reduce energy consumption

How to conduct a walk-around energy survey

Reducing energy use makes perfect business sense. It saves money, enhances corporate reputation and helps everyone in the fight against climate change.

This overview of how to conduct a walk-around energy survey demonstrates how simple actions can save energy, cut costs and increase profit margins.

What is a walk-around energy survey?

A walk-around energy survey is a brief survey of all relevant buildings. This is the primary method of assessing energy use in an organisation.

There are three key aims of the survey:

- Identify what equipment uses the most energy within your organisation.
- Understand how energy-using equipment is controlled.
- Identify opportunities for savings.

Why carry out a survey?

In most organisations, energy is one of the most significant controllable costs. Saving energy improves profitability as well as decreasing CO_2 emissions and reducing impact on the environment.

Preparing for a walk-around energy survey

To get the most out of your walk-around survey, you need to prepare properly.

1. Safety first! Make sure you are aware of any risks that may be present, and follow the safety procedures and methods that are in use. Always wear protective clothing and equipment where appropriate and call in an expert when needed.

2. Review relevant information on energy use, such as utility bills, any sub-metering data, process diagrams and maintenance records.This may give you an indication of high base-load or out-of-hours energy use.

3. Prioritise high energy consuming equipment and processes during your assessment. Plan and agree your assessment with relevant people, operators often have ideas on how to save energy on their equipment so ensure that they are available.

4. Consider carrying out a second walk-around survey out of operational hours, to identify any equipment and lights left on unnecessarily.

5. Make sure you have the tools for the job. For example:
   - Relevant safety equipment.
   - Audit checklist.
   - Digital camera.
   - Infrared thermometer.
   - Torch.

You can use the checklist on page 16 or develop one for your own specific business needs.

Taking action

Once you have completed the walk-around survey, summarise your observations and recommendations in an action plan.

Discuss the plan and proposed amendments with your colleagues to increase their buy-in to the process.

An energy meeting may be useful for this, as all colleagues can then agree on which actions will be taken.

It is useful to include senior management in such a meeting, as resources may be required to implement the recommendations.

For each of the items on the checklist the finished action plan should set out:

- An observation (what defect or opportunity has been found?)
- A recommendation (what needs to be done to achieve the energy saving?)
- An agreed "owner" (who is responsible for taking the opportunity forward?)
- A completion date (when will it be done?)

The next step is to prioritise findings on the basis of business benefit against cost and payback. Implement quick wins and share successes. Keep the momentum going; keep people informed and continue to raise awareness of energy use. Maintain a list of the actions still outstanding and conduct regular reviews of progress against the plan.

Schedule the next walk-around, and consider focussing in more detail on a specific area. Feed the findings from further surveys into your current plans and activities. Follow up on the outstanding actions, implementing them over a time-frame according to your action plan.
– www.psee.org.za

EXAMPLE OF AN ACTION CHECKLIST		
Heating, Ventilation and Air Conditioning Equipment	**Completed**	**Action**
Age and condition of boiler or other source of heat		
Has the system been serviced in the last 12 months?		
Are radiators fitted with Thermostatic Radiator Valves (TRVS)?		
Are filters and grills clean and maintained?		
Are motors and pumps fitted with variable speed drives?		
Heating, Ventilation and Air Conditioning Controls	**Completed**	**Action**
Are there any areas of over or under heating?		
Have timers been set to match the hours of occupancy?		
Check set points and "dead-bands" (the gap between when heating switches off and when air conditioning switches on).		
Is there a risk of heating and cooling operating in the same area?		
Are any unoccupied areas being heated?		
Are windows and doors often left open in conditioned spaces?		
Building fabric	**Completed**	**Action**
Is the roof insulated to modern thermal standards?		
Are windows double-glazed or fitted with secondary glazing?		
Are there any uninsulated walls?		
Are there any air leaks at windows and doors or other openings?		
Do all exterior doors close automatically and quickly?		
Domestic hot water	**Completed**	**Action**
Age and condition of water heating equipment.		
Has the timer been set to match occupancy?		
Are the hot water cylinder and valves fully insulated?		
Are all hot water distribution pipes insulated?		
Have energy saving taps and shower heads been fitted?		
Lighting: lamps	**Completed**	**Action**
Are there any areas of over-or under-lighting?		
Are there any tungsten lamps still in use – e.g. in desk lights?		
Have T12 fluorescent lamps been replaced by T8 or T5 lamps or LED luminaires?		
Can halogen lamps be replaced by CFL or LED versions?		
Can light output be reduced in any exterior lamps?		
Lighting: control	**Completed**	**Action**
Are there any unused areas being lit?		
Can occupancy sensors control intermittently used areas?		
Can daylight sensors be fitted to lights adjacent to windows?		
Are windows and skylights cleaned regularly?		
Are manual switches accessible and clearly labelled?		
Is there a switch-off policy in place?		
Are all exterior lights controlled by timers or daylight sensors?		
Other equipment	**Completed**	**Action**
Does all IT equipment have energy saving features enabled?		
Is all other equipment switched off when not in use?		
Is all refrigeration equipment A-rated or better?		
Are vending machines and coolers fitted with timers?		
Is there a switch-off policy in place?		
Are all exterior lights controlled by timers or daylight sensors?		

CASE STUDY 1

Energy efficiency could save salt company more than R2m a year

A salt producer could halve its energy costs and save R2.1-million a year by implementing eight energy-efficiency measures.

The Swartkops Sea Salt factory near Port Elizabeth in the Eastern Cape produces about 24 000 tonnes of salt per year. In 2014 it used roughly 54 974 MWh of energy at a cost of R5-million.

The last decade has seen a drop in salt sales in South Africa, while salt prices increased by only 2%. At the same time, energy costs increased by 360% and labour costs by more than 90%. This made it vital for Swartkops to find ways to reduce costs in order to survive in the face of cheap imports.

An energy survey through the National Business Initiative's (NBI) Private Sector Energy Efficiency (PSEE) programme identified opportunities for the salt firm to halve its energy costs. The company operates on a 3 km^2 site in Missionvale, which is used for evaporation, and another 1.5 km^2 site, Swartkops, from which the final product is harvested and processed. Salt mining and processing uses mostly natural solar energy and wind for the evaporation of the water, but additional energy in the form of electricity and paraffin is needed.

Paraffin to dry the salt makes up 42% of Swartkops' total energy consumption, while diesel used by trucks transporting salt to the washers represents 20% and electricity for the pumps, factory and office the remaining 38%.

Energy-savings opportunities at Swartkops

- Installing a maximum-demand control system to limit demand during peak and standard times and save on the demand charge
- Switching off equipment not in use – such as the compressor during tea and lunch breaks
- Evaluating the existing tariff and production rates and times
- Evaluating the use of battery-powered forklifts
- Replacing old magnetic fluorescent light fittings with electronic ballast fittings and installing occupancy sensors on lights and air conditioners
- Installing translucent sheeting on the warehouse roof to bring in natural light, allowing electric lights to be switched off
- Installing solar water heating, heat pumps and heat exchangers

Key energy saving opportunities

Pumps

Two of the pumps at the Missionvale site are old and inefficient. The PSEE report suggested they be replaced with new 132 kW pumps with variable-speed drives (VSD), enabling them to run at lower speeds, thus reducing energy consumption.

Brine pumping

Pumping brine from Missionvale to Swartkops, instead of moving it by road, would save the company more than 440 000 kWh and R520 000 a year in energy costs and a further R720 000 on vehicle maintenance.

Air knife

The bag-sealing machines at Swartkops use compressed air for cooling. The report found that replacing compressed air with fan-driven air knife systems would save on energy, blowing the same volume of air, but using less pressure. This could save more than R230 000 and nearly 208 000 kWh a year.

Metering

Swartkops has a metering system on its main substation, but the PSEE survey found the data cannot be translated into reports because the meters are faulty. Repairing the system could save more than R160 000 and nearly 108 000 kWh.

Preheated air

Swartkops uses a rotary kiln to dry the salt, which accounts for 42% of its total energy consumption. The PSEE found that by using heat pumps and heat exchangers to redistribute warm air from the air compressors to the kiln would reduce the amount of direct heat that the kiln requires. The report recommended that Swartkops develop an energy schedule to optimise time-of-use rates and ability to switch between the two energy sources for the kiln – electricity and paraffin – to maximise cost savings.

Energy awareness

The PSEE audit recommended that energy training be offered to make staff more energy conscious. It estimated that a cost saving of 5% (R120 000 and nearly 108 000 kWh) could be achieved through a staff awareness campaign driven by management. This reduction could be rewarded to staff as an incentive not to waste energy. Two of the pumps at the Missionvale site are old and inefficient. The PSEE report suggested they be replaced with new 132 kW pumps with variable-speed drives (VSD), enabling them to run at lower speeds, thus reducing energy consumption.

Bottle-top manufacturer saves from energy efficiency projects

Coleus Packaging could save more than R1,5m annually, with first steps already saving the Johannesburg manufacturing facility R900 000 in electricity costs.

An energy audit at bottle top maker Coleus Packaging found potential electricity savings worth more than R1,5m annually. Opportunities were identified to cut consumption by 22% and reduce CO2 emissions by 1 451 tonnes.

The total cost of all interventions amounts to less than R1,74m, giving the project a payback period of just over a year. Four of the suggested interventions were implemented shortly after the audit, and Coleus has already seen savings of over R900 000 in under six months.

Located in the industrial East Rand of Johannesburg, Coleus supplies metal bottle tops to beer and soft drink producers in South Africa, Ghana, Botswana, Lesotho, Swaziland, Zimbabwe, Mozambique, Namibia and Uganda.

The production lines at Coleus produce 2 500 to 5 000 caps each every minute, continually updating equipment to meet quality demands. The production process involves steel sheets being bundled, sorted and cleaned, fed into a coater and then into a Sasol-gas fired oven for drying. The sheets are turned and the process is repeated before designs are printed for the caps. The caps are pressed and formed, and a liner is added. They are then cooled and packaged.

The plant's annual electricity and gas expenses for the next four years (2016 – 2020)are projected to be around R8 million and R3,1 million respectively, based on annual use of 6,7 million kWh of electricity and 17 900GJ of gas.

The company had already started working towards cleaner production and sustainability when an energy audit was conducted as part of the National Business Initiative (NBI) Private Sector Energy Efficiency (PSEE) programme.

Coleus worked with PSEE consultants to develop an energy policy and energy management system, and to seek energy savings by cutting consumption. Shortly after the audit was completed, the company corrected their power factor rating with Eskom, installed a lighting upgrade, new rings on their air pipes and new distribution boards. In one month, Coleus saved more than R360 000. In under six months, the company has already saved more than R900 000 in electricity costs.

The audit found opportunities to further cut costs at the plant. By scheduling more production during periods when off-peak power tariffs apply, and staggering the starting up of machinery, the costly Eskom phenomenon of notified maximum demand can be avoided.

Similarly, by migrating to a new tariff for gas supplied by Sasol, Coleus could save 36% on its gas bill each year, the audit found.

Gas consumption could be reduced by insulating its ovens, with retained heat energy used to heat water more cheaply than immersion elements.

Further savings could be made by replacing old pumps, filters and controls with modern energy-efficient alternatives, and through a new maintenance policy. Coleus plans to install a variable speed drive on the compressors by the end of 2015.

The use of ultrasonic infrared technology could detect air leaks which cause compression losses of up to 80%, the audit found. Coleus hopes to significantly reduce wasted energy through compressed air by installing new, more efficient equipment with built-in air blowers.

Energy consumption and costs from lighting could be reduced by replacing fluorescent tubes with LED lights on the factory floor, ensuring distribution boards are efficiently wired, and monitoring daylight sensors and lighting controls. Coleus upgraded lighting shortly after the audit at a cost of R800 000, which has contributed to the savings already seen at the facility.

The audit also recommended equipment be turned off during periods of no production.

ATMOsphere network Natural Refrigerants

07/06/18 - Johannesburg

FRIGAIR EXHIBITION 2018

ATMOSPHERE NETWORK FRIGAIR 2018

7 JUNE 2018

14:30 UNTIL 19:00

FRIGAIR EXPO, HALL 3, GALLAGHER CONFERENCE, JOHANNESBURG, SOUTH AFRICA

ABOUT THIS EVENT

The first ATMOsphere networking event on the African continent will be held in collaboration with exclusive sponsor and host Commercial Refrigeration Services (CRS) during FRIGAIR 2018, to promote the uptake of natural refrigerants in South Africa and beyond!

The event will take place at Hall 3, Gallagher Convention Centre, Johannesburg, on Thursday, 7 June 2018 from 14:30 until 19:00 and is free to attend.

TOPICS WILL INCLUDE:

- A look at the global refrigerant phase out | International market trends shecco's international activities | Natural refrigerants' local progress CO_2 case studies in South Africa | End user experiences with CO_2
- Come see what the world is doing in terms of natural refrigerants and see for yourself how South Africa measures up against the rest of the world!

Contact info@crservices.co.za for more information or visit www.atmo.org to register for free

CRS
INTEGRATED ENERGY EFFICIENCY

EXCLUSIVE SPONSOR AND HOST