case study

ENERGY MANAGEMENT SYSTEM (EnMS)

Green Office – Pinetown

Document solutions supplier 2015

BACKGROUND

Green Office is a document and printer solutions company that was conceived in 1997 as a remanufacturer of used printer cartridges and has since developed into a comprehensive end-to-end solution for the document environment. The head office is based in Pinetown, KwaZulu-Natal (KZN), with satellite offices in Johannesburg and Cape Town. The KZN plant implemented the Energy Management System (EnMS) in 2015 as a means of reducing the office's energy consumption.

In an adjacent office space to the KZN plant, the company established Green Able, a non-profit organisation (NPO) that recycles plastic from old cartridges. The remanufacturing facility in Pinetown receives used cartridges from customers then strips them down and replaces out any worn parts before refilling them for further use. Redundant cartridges and parts that cannot be used in the remanufacturing process are recycled by Green Able.

The KZN plant was approached by the National Cleaner Production Centre (NCPC-SA)'s Industrial Energy Efficiency (IEE) Project for an energy efficiency assessment in 2012. Obtaining useful and accurate information on electrical consumption was a challenge during the assessment. This was because the building used for operations was divided and leased out to 3 tenants thus resulting in an electricity bill that was shared by the tenants. This led to the consulting auditor drawing inaccurate assumptions in apportioning the usage between the different systems. As a result, the initial assessment focussed heavily on reducing the lighting load through the introduction of natural light in the factory area, leading to missed opportunities for the inclusion of HVAC and the processing equipment.

Significant improvements have since been made to the NCPC-SA offerings. A major change has been the development of skills and the focus on building capacity both within the NCPC-SA and with their approved consultants. Notwithstanding the challenges faced during the assessment in 2012, the engagement with the NCPC-SA assisted in highlighting the benefits of energy efficiency within Green Office, thus resulting in an internal team from Green Office implementing EnMS in 2015.

KEY FINDINGS

Over the 2015 period, 1 project was undertaken, resulting in a total energy saving of 31 450 kWh, valued at R46 200, with a total investment of R42 000, resulting in an average payback period of 1 year. A reduction of 30.1 tonnes CO_2e was achieved.

IEE capacity building programme

Although none of Green Office employees attended the initial IEE training, they were interested in future training, especially in the area of energy management.

IMPLEMENTATION OF AN ENERGY MANAGEMENT SYSTEM

The internal team responsible for performing subsequent energy assessments at Green Office facility were experienced in the Plan-Do-Check-Act cycle synonymous with ISO Management Systems. Using this approach, they profiled the energy usage, identifying significant energy users (SEU's) and targeted improvements within these areas.

These activities formed part of the initial planning phase of engagement with EnMS. This initial work formed a strong foundation for continuous improvement in energy efficiency.

IMPLEMENTATION CHALLENGES

As a result of the inaccuracies in the original report prepared by the NCPC consultant, Green Office was not confident in implementing any initiatives that were proposed. They subsequently took it upon themselves to perform their own internal energy assessment. Based on this work, a number of initiatives were identified. One significant saving was made in the retrofitting of lighting.

Although energy savings have been achieved as a result of the retrofitting, the downside to this change is the impact it has on the quality of lighting and lux levels in the factory. These have been significantly compromised. As a result, there are now areas within the facility that may not comply to the necessary lighting levels stipulated within the OHS Act. Additional costs have thus been incurred to ensure compliance with standards for lighting in the factory area.

SUMMARY OF INTERVENTIONS

System	Intervention	Capital Cost (ZAR)	Energy saving (KWh / annum)	Savings ZAR	Estimated Payback period (years)
Lighting	Retrofitting 28 high bay lights were fitted with 100W CFL's which resulted in significant energy saving. Previously these were fitted with 400W metal halide bulbs.	42 000	31 450	46 200	1

LESSONS LEARNED

- **Implementing an EnMS** assists with documenting all energy consuming equipment.
- **Impact on performance** must be considered before energy initiatives are undertaken.
- **Measuring and monitoring** assists with managing and improving consumption and motivating for behavioural change.

FUTURE PLANS

- A key requirement moving forward is to improve on the measurement and monitoring of electrical consumption.
- Green Office to use lighting simulation programme before installing new light as a means of balancing between saving needs and compliance with lighting standards.
- Identified employees to attend skills development training in energy management.
- Investigate PV solar as an option for renewable energy.