



ENERGY MANAGEMENT SYSTEM (EnMS)

Polyoak Packaging (Pty) Ltd
Plastics packaging manufacturer
 2013

BACKGROUND

Polyoak Packaging is a privately-owned plastic packaging manufacturer specialising in the design and manufacture of injection and blow-moulded rigid plastic packaging material for various industrial sectors. Polyoak has manufacturing and distribution centres in Cape Town, Durban, East London, Johannesburg and Namibia.

The Polyoak Cape Town plant has 1,134 employees and a factory with floor space of 109,850m², with seven buildings housing ten different production centres.

Electricity is Polyoak's primary energy source, costing around R35 million per annum and savings in this area was a major priority.

Polyoak packaging Cape Town joined IEE Project to achieve this goal, and in July 2012 they began implementation of an Energy Management System (EnMS).

IEE Project capacity building programme

Polyoak's Maintenance and Energy Manager, Andre Treurnich, joined the IEE project's EnMS Expert Level programme and the plant signed up as a demonstration plant for an expert level training course. Other members of Polyoak's staff attended various end-user level training courses, thereby developing awareness and skill around energy saving.

KEY FINDINGS

During 2013, three projects were undertaken, resulting in a total energy saving of 3 112 693kWh.
 This translates to CO₂ savings of 2 978 tonnes and a financial saving of R2 925 931
 An investment of R 262 133 was required, resulting in a payback period of 0,1 years

IMPLEMENTATION OF AN ENERGY MANAGEMENT SYSTEM

The IEE Project offered technical support on various levels, resulting in the implementation of a customised EnMS as well as various systems initiatives.

An energy assessment was conducted in November 2012. The methodology included compiling detailed electrical energy balance and identifying opportunities for increased optimisation. Areas for saving identified included a 25% reduction in electrical energy costs and a 10% reduction in CO₂ emissions. Highlights of EnMS implementation included:

- The energy policy signed by the Managing Director committed Polyoak to reduce electricity consumption by 15% by December 2015.

- During the period covered by this report, Polyoak experienced an increase of 18% in production volume but only a 1.4% increase in energy consumption.
- Initially, energy applications were identified as significant energy users (SEU's), but due to difficulties with collection and correlation of data, production departments were selected as SEU's. Only three of the ten departments had adequate sub-metering installed, but these used almost 50% of Polyoak's total electricity consumption and production volumes. These departments showed a production increase of 11.6%, but an energy consumption increase of only 0.6%.
- The base load with zero production was very high at 54.3% of total consumption. This has been reduced by 4.6% during 2013 and further reductions are planned, so as to achieve a base load of 30 – 40% of total consumption.

SUMMARY OF INTERVENTIONS

System	Intervention	Capital Cost ZAR	Energy saving (KWh p/a)	Savings ZAR (Ave of R0.82/kWh)	Payback period (years)
Cooling Tower fan and pump	Retrofitting of variable speed drives to fans	0 (units leased)	414 349	398 488	0
Cooling reticulation system pumps	Optimised to run in parallel	260 000	102 340	96 200	2.7
Barrel extruder	Insulation jacket installed	2 133	14 796	13 908	0.2
Totals		262 133	531 485	508 596	

An Energy Performance Opportunity (EPO) database was compiled, and this formed the basis of the action plan for EnMS implementation. 14 projects were identified, and divided into groups according to the level of investment required and the expected return. Total energy consumption savings were estimated to exceed 25%, making the target of a 15% reduction easily achievable.

In addition, various staff training and awareness initiatives were conducted, including the establishment of a course in energy-related matters which employees could add to their “passport” of courses passed.

LESSONS LEARNED

- **Training** is necessary to change attitudes to energy efficiency and develop the skills required to implement EE programmes.
- **Behavioural changes** have a great impact on energy usage, and much of the savings achieved by Polyoak are due to this.
- **Measurement** is critical to assess performance of SEU's and aid future implementation.
- The Energy Manager must have **adequate resources** to ensure the continuity of the EnMS.



Enquiries



For more information about the training workshops and participation opportunities:
www.iee-sa.co.za • Tel.: 012 841 2768 (Pretoria) 021 658 3983 (Cape Town) or 031 242 2365 (Durban)

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