case study

ENERGY MANAGEMENT SYSTEM (EnMS)

Sappi Specval Coatings (Pty) Ltd - Cape Craft Mill

Pulp and paper EnMS Expert level candidate plant 2013

BACKGROUND

Sappi is a global manufacturer of paper and paper-based products, with operations in Europe, North America and Southern Africa. The Southern African operation has six mills and consumes 46, 4 million GJ of energy per annum, of which 17, 4 million GJ (37%) is generated in-house using bark and black liquor. Because of the absorption of CO2 by plantations, however, Sappi had a net absorption rate of 0.7 million tons of CO_2 in 2013.

Sappi Specval Coatings (Pty) Ltd trading as Cape Kraft, is a paper mill based in Montague Gardens, Cape Town, which uses 100% recycled paper as its input raw material.

Sappi had committed to reduce energy consumption by 15% by 2015, based on levels in 2000. In addition, higher utility costs had reduced profits at all plants. There was thus a need to reduce energy consumption and improve operational efficiency. Sappi therefore decided to participate in the Industrial Energy Efficiency (IEE) Project's training component and implement an Energy Management System (EnMS). Sappi Cape Kraft's senior process engineer attended an advanced level course on EnMS implementation. This was a key initiative, and gave impetus to the programme which provided the framework for the implementation of an energy management system within the organisation.

Using this framework, Sappi embarked on a programme to implement an EnMS at Sappi Cape Kraft. In 2012 Cape Kraft volunteered to be a candidate plant for EnMS implementation at the Montague Gardens plant. The main objectives of the programme were to identify and realise energy savings within the plant in the short to medium term, and to build skills and capacity to manage energy in a sustainable manner in the long term. The programme was conducted by the IEE Project under the auspices of the National Cleaner Production Centre of South Africa (NCPC-SA).

KEY FINDINGS

During 2012 - 2013, five projects were undertaken, resulting in a total saving of 944 445kWh of electricity, 540 553kWh of steam and R894,000 for an investment of R70,000. A reduction in GHG emissions of 1 416 tons CO_2 was achieved, and a payback period of 2 months is envisaged.

IMPLEMENTATION OF AN ENERGY MANAGEMENT SYSTEM

Delegates from Sappi Cape Kraft attended various courses presented under the IEE Project's EnMS programme. Sappi also appointed two external consultants to assist with EnMS implementation. Benefits derived from attendance at these courses included creating awareness of energy saving opportunities within the plant, providing a framework

for conducting energy assessments on various processes, gaining an appreciation of the measurement of energy and enabling the integration of energy management systems into existing management systems. The major benefit is that senior management and process engineering personnel are viewing the plant from a different perspective, trying to gain better understanding of operations and then attempting to develop more efficient solutions.

An energy policy was drafted and integrated into existing quality management policies, and an energy team was established. Several operational energy savings opportunities in the production were identified and operators were retrained and work procedures amended as necessary to maximise these savings opportunities. Energy efficient criteria have also been incorporated into design specification for new plants and processes, including procurement systems. This also involved training of personnel to enable them to understand energy efficient criteria.

IMPLEMENTATION CHALLENGES

Management initially viewed energy as an expense rather than a controllable cost driver, and considered capital would be needed and invested to realise savings. There were several problems with the collection and collation of data in order to derive meaningful results and personnel changes also delayed the implementation of the programme.

SUMMARY OF INTERVENTIONS.

System	Intervention	Capital Cost ZAR	Energy saving (KWh / annum)	Savings ZAR (Average of R0.82/kWh)	Estimated Payback period (years)
Frotapulper	Switch off when not in use	0	701,389	264,000	0
Topline Refiner	Switch off when not in use	0	208,890	78,600	0
Totals		**0**	**910,279**	**342,600**	

In addition, three other high energy usage machines were identified as unnecessary for continued operation during peak times, and could also be switched off when not being required. This resulted in further savings in actual energy consumed as well as in monetary term values.

LESSONS LEARNT

- Implementation of the EnMS has however changed the way senior management perceive energy, resulting in a different approach to energy management**.**
- Key personnel have gained new skills in understanding and interpreting energy data that will drive key decisions and facilitate the development of actions plans to improve long term sustainability. These personnel include the support services of Maintenance, Finance and Procurement departments.
- EnMS implementation also created an environment for Sappi personnel to understand their specific manufacturing processes better and to identify possible new opportunities not only in energy, but also in other utilities and process optimisation.