



## Energy Management System in an SME

### Sundays River Citrus Company

*Agroprocessing Sector*

*November 2014*

## BACKGROUND

Sundays River Citrus Company (SRCC) operates from three facilities in the Sundays River Valley between Kirkwood and Addo in the Eastern Cape. Its main activities are the packing and selective de-greening of citrus fruit for local and export markets.

The operations at SRCC are seasonal and follow the citrus-harvesting period between April and October each year.

Energy sources are electricity, paraffin, diesel and coal, with a total consumption of 7 315 308kWh during 2014. The paraffin, diesel and coal are used for process heating and drying tunnels and make up 16%, 13% and 26% of the total energy use respectively. The remaining 45% is electricity obtained from Eskom and via the Kirkwood Municipality.

## KEY FINDINGS

The SRCC used a total of 7 315 308kWh of energy in 2014, a saving of 32% against use in 2007, the year the company uses as the base year for its energy-saving measurements.

## IMPLEMENTATION OF AN ENERGY MANAGEMENT SYSTEM

An Energy Management System (EnMS) was implemented at SRCC between November 2013 and November 2014 as part of the IEE project.

The project was planned in such a way that all the preparation and training could be done before the start of the 2014 packing season. SRCC started with energy-efficiency initiatives in 2007 and had made most of the obvious improvements by the time the EnMS was implemented.

Working through the structured approach of ISO 50001, the energy team defined the scope and boundaries, significant energy users, energy drivers, energy-performance indicators and eventually drew up an opportunities list to achieve this objective. Critical operational and maintenance criteria were identified and appropriate training was provided.

The five significant energy users were identified as the three warehouses and two de-greening facilities. Having four energy sources (electricity, coal, diesel and paraffin) and up to three energy drivers for each significant energy user, the development of an energy-information system that provides information on energy performance on a weekly basis was one of the crucial elements of the EnMS.

The energy policy contains an objective of an energy-use improvement of 30% over a 10-year period with 2007 as baseline. SRCC wanted to use the 2007 figures as it has already implemented many improvement actions and wanted to recognise these achievements.

## ENERGY-PERFORMANCE RESULTS

The energy-management system was implemented during 2014. Against all expectations, the company experienced a 5% drop in performance, bringing the cumulative total to 32%. The action plan for 2014 was implemented successfully with an anticipated 2% increase in performance. That brings the total negative swing to 7% from 2013 to 2014.

This performance was discussed in the management review and for the first time the newly installed energy-management system could report on the energy performance and also provide reasons for the unexpected negative result.

## IMPLEMENTATION CHALLENGES

One of the most concerning issues about the energy performance of 2014 was that the negative trends were detected too late to fix them before the end of the packing season in October. This shows a lack of checking in the system. The internal audits were also more conformance-orientated, with no attention given to energy performance. These issues were discussed in great detail in the management review and actions were formulated to correct it in the next season.

## ENERGY-SAVING OPPORTUNITIES IDENTIFIED

At the end of the 2014 season the collected energy data was used to establish the baseline for each significant energy user. The baselines for the warehouse significant energy users have temperature and volume per fruit variety as variables, while the baselines for the de-greening significant energy users have temperature and volume throughput as variables. Due to the seasonal nature of the SRCC processes, the full set of energy data for one season is needed to establish the baseline for each process. These baselines will now be used during the 2015 season for energy-performance measurement.

## LESSONS LEARNT

The poor energy performance of 2014 is a result of neglecting the checking part of the EnMS. Although the checking part of the system was considered as implemented, the execution of checking failed to highlight the lack of energy performance before it was too late.

The actions on the energy opportunities list were all implemented with a forecast of a 2% energy-efficiency improvement. This demonstrates that focus on energy improvement alone is not enough for achieving targets. The total system should be managed to avoid unexpected losses.

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