

EFFICIENCY SOLUTIONS FOR INDUSTRIAL COOLING

CASE STUDY



INDUSTRIAL ENERGY ACCELERATOR



Distell, Adam Tas site

Stellenbosch, Western Cape, South Africa

Sector
Wine Making & Bottling

Intervention
EnMS and system optimization of main cooling plant (primary production)

EnMS and cooling system optimization period
2012-2013

Investment	R956,960
Energy savings per annum	825,760 kWh
Annual financial savings	R700,000
Annual CO ₂ emissions reduction	726,133 (kg)
Payback time	1.4 years

Company profile

Formed in 2000, the Distell Group is considered one of the leading producers and marketers of spirits, wines, ciders and ready-to-drinks in Africa, supplying leading liquor brands across the globe. With 18 production sites across South Africa, Distell employs 5,000 people and turns over R15.9 billion annually.

From the outset, the company has been strongly committed to reducing the carbon footprint of its production processes. But, by the mid-2000s, faced with increasing electricity and fossil fuel costs, it was apparent that Distell required more focus on energy efficiency in order to comply with its corporate targets as well as social responsibility. So, in 2012, the company started working with the UNIDO-supported [South African Industrial Energy Efficiency Project](#) to boost its goal of reducing fossil fuel consumption by 25 per cent and electricity usage by 15 per cent per litre packaged.

As the second largest electricity user in the Distell group, managers decided that the Adam Tas site was the ideal pilot site to rollout the Energy Management System (EnMS) as part of the company's work with UNIDO. For the first phase of EnMS implementation, it was decided to focus on electricity usage in the primary and secondary production departments, where cooling systems were significant electricity users.

Energy consumption

Primary production at Distell's sites starts with offloading raw materials, which is then de-stemmed, crushed and cooled. Depending on the product, separation, pressing, fermentation, microbial preparation, settling, cooling, maturation, cold stabilization, blending and cold storage are used. Electricity is predominantly used for refrigeration purposes. The main cooling plant services various cold stores via chilled water or Glycol and accounts for 40 per cent of primary production electricity use. When it comes to secondary production, which focuses on product bottling and packaging, the main bottling plant uses 30 per cent of the electricity needed for this phase of production.

The energy optimization solution and UNIDO's role

Given the energy consumption of both the main cooling plant used during primary production and the main bottling plant used in secondary production, managers decided to focus on these for the first phase of EnMS implementation. An energy management team was formed, a list of energy savings opportunities were identified, while objectives, targets and a series of actions to reach these were established. Communication and documentation strategies were prepared. Awareness training sessions were held with 166 permanent and contract staff as well as the 86 casual staff members in attendance.

In the primary production department, a **refrigeration system optimization project** was launched with help from an external contractor. The goal was to optimize the main cooling plant by configuring changes and the installation of a variable speed drive on one of the compressors. In addition, a Freon plant was decommissioned by using the under-utilized glycol plant for the stabilization process. Further savings were also achieved by replacing 11kW cold water pumps with 7.5kW alternatives, while maintaining the same flow rate.

At two other cooling plants on site, timers were installed on the cooling compressors to reduce usage in peak tariff periods. A computerized control system was also installed at one of the cold stores to control the cooling demand and save energy.



Overall achievements

The following interventions were planned for the period of July 2012 to June 2013, and total energy savings of R700,000 with a combined payback of 1.4 years were achieved.

System	Intervention	Capital Cost ZAR	Savings ZAR	Payback Yrs	Energy saving kWh
Air Compressors	Switch off on weekends	none	R62,700	0	114,000
Main Cooling Plant	Plant Optimization	R850,000	R513,903	1.65	552,587
Lighting	Replace with EE alternatives	R45,900	R7,840	5.9	14,256
Lighting	LED's	R51,060	R7,582	6.7	13,787
Main Cooling Plant	Decommission Freon plant; use under-utilized glycol plant for stabilization	<R10,000	R41,184	<0.25	74,880
Cold Rooms	Timers on cooling compressors (St 24)	<R10,000	R65,317	<0.25	56,250
Air Compressor	Compressor Optimization			Not completed	



Challenges and lessons learned

The set-up of the energy team was crucial in closing the communication gap between different departments and planning a unified way of moving forward. Targets were aligned with corporate requirements and action plans could be defined accordingly and evaluated against agreed targets. Meanwhile, consolidating energy related data proved challenging and highlighted the importance of effective communication and documentation strategies. The ability to monitor energy performance is reliant on accurate, accessible data. It was apparent, though, that current measures were not indicative of

actual energy performance, so a measurement plan was developed, aimed at addressing these shortcomings in future. Finally, despite the limited scope and boundary selected for this EnMS, it was also clear that sufficient capacity should always be created and adequate resources allocated. This is important for each individual in the team to be able to take ownership and ensure continued commitment; especially if the scope of the EnMS is to include other energy sources and significant energy users.

About the energy efficiency solutions series

Throughout 2020, the Accelerator is drawing on its collective wealth of experience and expertise to produce a series of knowledge kits on industrial energy efficiency. These cover five key energy efficiency solutions: Energy Management System; efficiency solutions for Motor-driven Systems; for Industrial Heat; for Industrial Cooling; as well as Energy Metrics and Performance Indicators. Find out more: www.industrialenergyaccelerator.org/efficiency-solutions/

Ready to take the next step in your industrial cooling system optimization journey?

Download the full UNIDO Solutions for Industrial Cooling kit [here](#)

For more information about UNIDO's Industrial Cooling training contact programme manager Marco Matteini: M.MATTEINI@unido.org.

For more information about UNIDO's Industrial Energy Accelerator visit: www.industrialenergyaccelerator.org or contact R.GHONEIM@unido.org.



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