EnergyManagement
Association of New Zealand

Serious energy savings support best practice in dairy processing

Client: Open Country Dairy Limited
EnergyMaster: Erin Roughton, Emsol
Challenge: Achieve profitable energy savings at Open Country's three sites in the Waikato, Wanganui and Southland.
Solution: Initial Level 2 energy audits were carried out in 2010, followed by Level 3 investment grade audits on refrigeration and compressed air in 2012. Opportunities identified in both audits led to many efficiency-enhancing maintenance solutions.
An Energy Management Plan was developed and implemented. EECA grants were obtained for the audits and additional sub-metering.

In brief: Emsol carried out energy audits of Open Country's milk processing sites, identifying opportunities to improve on existing energy efficiency programmes that could be implemented immediately as well as providing longer-term options for larger savings. Overall, the projects have:

- Delivered annual energy savings of $315,650 at Waharoa, Waikato (the largest site).
- Potential savings from longer-term projects estimated at $321,400 per annum, with payback periods ranging up to five years.
- Additional savings of $176,000 per annum forecast through the implementation of the business case recommendations for energy savings projects for compressed air and refrigeration.
- Improved reliability and energy use of the systems involved.

The project

Open Country wanted to better interrogate its understanding of the energy used across its three milk processing sites, where they produce milk powders, proteins, fats and cheeses. How could they reduce their energy costs and maintain these improvements?

Erin Roughton, Managing Director of Emsol, completed Level 2 energy audits at Waharoa (Waikato), Wanganui (Taranaki) and Awarua (Southland) in 2010. Erin identified improvements that could be implemented immediately, and saw the potential for larger savings in its compressed air, refrigeration, process heat, fans and pumps systems.

The solution

In 2011 Open Country adopted some of the quick, simple and low-cost efficiency options. Hot water tanks were insulated, lighting controls were automated, and peak electricity loads were reduced. Power factor was improved, the frequency of boiler tuning was increased, and the frequency of tagging and fixing compressed air leaks was also increased. One air compressor is now switched off in the off-season. These measures led to annual savings of $315,650 at the Waharoa site.

For larger savings to be realised the compressed air, refrigeration, process heat, fans and pumps systems required a Level 3 investment grade energy audit to measure and calculate accurately energy savings and implementation costs.

In 2012 Open Country commissioned Emsol to guide its energy management work and to conduct investment grade audits on the refrigeration at Waharoa and compressed air systems at all three sites.

These audits were conducted to a level 3 standard as defined by AS/NZS 3598:2000 Energy Audits and EECA's Industrial Technology Audit Standards available on the EMANZ website.

Erin worked closely with Open Country's Group Projects Manager Andrew Wellington to develop an annual Energy Management Plan. This specified the budget and objectives, including the refrigeration and compressed air project, and energy management tasks required to improve efficiency opportunities.

Emsol worked closely with key staff and with existing refrigeration and compressed air contractors. Energy-use baselines were identified for Waharoa. Open Country also looked at re-establishing its electricity purchase contract.

Emsol measured the high frequency power dynamics of each compressor using a 3-phase poly logger. This data logger measured real power, power factor, phase angle, volts and amps. The measurement was critical in identifying and calculating significant efficiency opportunities. The big savings came from reducing compressed air demand by desiccant air dryers and leaks, and also using more efficient compressor configurations. The sizes, types and control of the compressors proposed would reduce a lot of wasted electricity.

Potential energy savings for compressed air and refrigeration identified through the audits are $321,400 a year with payback periods of up to five years – this included efficiency improvements of 50-60 per cent for compressed air at each of the three sites.

Emsol helped develop a business case to implement most of the energy savings projects identified in these compressed air and refrigeration audits. Those approved have collective energy savings of $176,000 a year.

The company

Emsol, established by Erin Roughton in 2002, is one of New Zealand's longest-standing independent businesses specialising in energy management consultancy services. Emsol influences energy decision makers toward making significant energy savings, and then helps implement the energy-saving projects with their EnergyMasters expertise.

"Open Country Dairy was already energy-conscious but Emsol's unique contribution to energy management has widened the vision through the audit process and identified where the big gains were to be made. Focus was then placed on the big ticket items and, together, we'll work through the rest of the energy projects in the coming years. Erin has an eye for spotting energy wastage and his perseverance among our busy day-to-day activities ensures we harness the energy savings that are there. This has included identifying and developing business cases for highly profitable energy efficiency projects. In most cases other benefits included reduced maintenance costs, improved reliability and better working conditions."

Andrew Wellington, Group Projects Manager, Open Country Dairy Limited.

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