CASE STUDY

Montague Cold Storage

Actions taken following an energy assessment have reduced Montague’s annual energy costs by more than $22,000 and cut greenhouse gas emissions by 269 tonnes per year, demonstrating that significant energy savings exist and are achievable, even for energy intensive businesses.

Business snapshot

Montague is an Australian family-owned business that has operated since 1948. The business consists of Montague Orchards, Montague Fresh and Montague Cold Storage (MCS). Montague Orchards has apple, pear and stone fruit orchards in Victorian and NSW. Montague Fresh procures and wholesales fruit Australia wide and overseas. Montague Cold Storage (MCS) operates six cold storage facilities, five located in Victoria and one in Tasmania.

MCS provides refrigerated warehousing predominately for the food and beverage manufacturing sector offering blast freezing, frozen, chilled and ambient temperature storage.

MCS has a demonstrated commitment to sustainability with rain water harvesting off its large roof areas for use in refrigeration condensers; recycling of office paper, stretch wrap and cardboard from the warehouse; and carbon emissions reporting and tracking.

Identifying energy efficiency opportunities

With an annual energy bill of more than $750,000 cold storage company Montague was looking for ways to reduce its energy use and in the process also reduce its carbon footprint. In 2014 MCS successfully applied for a $15,000 grant toward the cost of engaging an energy consultant to conduct a full energy assessment of its facility in Tullamarine.

The Tullamarine site operates two separate cold storage buildings served by a common refrigeration plant. One building contains four cool rooms and a loading dock, and the other contains a large freezer room and loading dock.

The assessment involved the installation of data monitoring equipment on site, and subsequent energy modelling of the site’s current and future energy consumption. The data enabled the assessor to determine the energy intensive activities and equipment, and identify energy efficiency opportunities.

The assessment identified the refrigeration systems as the major consumer of energy on the site, with lights and forklift battery chargers also significant users of power.

Recommendations for action

A number of recommendations were made focusing on the refrigeration systems, cool room lighting and forklift battery charging:

› installation of variable speed drives (VSDs) and variable speed control logic on evaporator fans;
› installing VSD on one compressor;
› installation of a liquid injection system into the vapour transfer line on the compound compressors;
› implement Variable Head Pressure Control to optimise the head pressure of a refrigeration plant at any given time;
› replacing lighting with LEDs with sensor controls.
› replacing conventional battery charging units with modern, modular battery charging units

If MCS was to adopt all recommendations, the potential energy savings was estimated to be 20 per cent, translating to a saving of about $127,000 per year.
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Taking action

Following the assessment, MCS replaced eight metal halide lights with LED fittings at a cost of $4,400, saving 9,672 kWh and $1,325 per annum, and reducing greenhouse emissions by about 11 tonnes. The payback period is 3.3 years. Sustainability Victoria provided a $3,000 implementation grant toward the cost. MCS subsequently replaced a further 16 metal halide lights with LEDs representing annual savings of 19,450 kWh and $2,650, and reducing greenhouse emissions by another 22 tonnes.

In 2015 MCS applied for a $25,000 capital grant toward the cost of installing sixteen 12 amp, 5.5 kW variable speed drives and three 23 amp 11 kW VSDs to fans in the freezer building, all with speed control logic. The consultant was engaged to optimise the fan speeds. Total annual savings from the VSD installation project was 200 mWh amounting to $18,000, with a greenhouse reduction equivalent to 236 tonnes CO₂. The payback period for the VSD replacement project is 3.8 years.

Future sustainability plans

MCS’s Glenn Edwards said that MCS will continue on its sustainability journey with plans to: complete the phased upgrade of all lighting; install insulated high speed doors to reduce temperature loss; replace existing refrigeration compressor motors with more efficient drive motors; and convert Freon refrigeration systems to ammonia.

Energy assessment and implementation support conducted by Minus 40.

“By reducing our energy use and carbon emissions the project has demonstrated to our employees and our customers that Montague is committed to being a sustainable business”.

Glenn Edwards, National Logistics and Property Manager, Montague Cold Storage