

Case Study

Radevski Coolstores

R22 Refrigerant Exit

MINUS40

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Radevski Coolstores has enjoyed dramatic cost savings following completion of a new refrigeration system designed by Minus40. The Goulburn Valley fruit supplier harvests 450 acres of apples and pears, with all of the produce stored in cool rooms waiting for staged delivery to major supermarkets.

Fruit is chilled after picking in February and March, then retained in a controlled atmosphere through to delivery. Energy usage gradually declines as stocks are depleted and ambient temperature decreases, with no storage during December and January.

The existing plant used R22 (glycol) refrigerant. Faced with a \$150,000 bill to charge the plant with alternative drop-in R22 refrigerant replacements, Managing Director Peter Radevski engaged Minus40 to provide design alternatives.

Opportunities for improvement

As part of the consulting process, Minus40 proposed redesigning for lower energy demand. Radevski had reservations about the claims – “I was not confident about our prospects, after having a lot of trouble getting another of our plants to perform properly after an upgrade”.

With 16 coolrooms, energy demand peaks in March – the baseline figure was 94,000 kWh in 2012. Minus40 completed a site energy audit report, which identified opportunities for significant reductions in energy usage of the refrigeration system.

The design recommended by Minus40 used pumped recirculation ammonia to replace the original direct expansion R22 refrigerant. Due to the projected reduction in energy usage and carbon output, the project qualified for financing via Low Carbon Australia (now the Clean Energy Finance Corporation).

Work was started in December 2012 and completed in January 2013 during the off-season. Minus40 provided consulting during system

commissioning, ensuring that it was tuned for optimum performance.

The results have exceeded expectations: energy usage in March 2014 was less than 57,000 kWh for an equivalent amount of fruit storage. “Power demand is on track to be 40% lower for the first year”, said Peter.

With much lower peak demand, this also provided Radevski Coolstores with an opportunity to negotiate a more favourable energy rate.

Stakeholder relationships

The Radevski Coolstores project involved collaboration between Minus40, the plant operators and Radevski management. This is typical of an upgrade project.

In addition to ensuring that the plant retained maximum availability, Minus40 welcomed input from plant operators. Radevski found this to be a productive aspect of the project. “They presented their design, but they also followed up on suggestions”, he said.

Retrospective

The project has provided reduced energy costs, reduced refrigerant cost, and reduced maintenance costs. It has also become a showpiece for the site.

Radevski was impressed with the result, saying that “Minus40 exceeded their own claims. I’m a really happy customer”.

