

## Industry project for smarter energy use

### Case Study: Victor and Denise Rodwell, Rodwell Farms, Boyanup, Western Australia

Victor & Denise Rodwell have a dairy farm at Boyanup in Western Australia. Victor & Denise have recently installed a liquid fluid chiller (see image) to pre cool milk on demand during milking. Victor & Denise invested in this because one of the two vats they used is old and the compressors were taking a very long time to get milk down the desired temperature which can increase the chance of milk quality issues. Rather than purchase a new vat, Victor decided a fluid chiller was a better option as he could get milk to 6°C before entering the vats and thus the run time on both vats was greatly reduced. It also gave him flexibility to increase milk storage in the future by using some sort of thermal storage rather than purchase extra vat compressor capacity.

Energy use monitoring gear was installed to record the power use of the two vats, the fluid chiller, the vacuum pumps and hot water. With this the CT scanners send data to a receiver in the office which is connected to a website where data is recorded. This is possible as the 3G internet coverage is reliable at this dairy. The data recorded is measured in real time (per min) and can be collated on the website on a daily, weekly, monthly or yearly basis. The software is also able to select or isolate the piece of equipment of interest. To compare energy use before the fluid chiller was installed, it was switched off for two days so energy use could be measured when the milk cooling system was relying on the two vat compressors as was the case prior to the fluid chiller being installed. This produced energy use data for both milk cooling strategies.



Fluid Chiller at Rodwell Farms Boyanup

When the fluid chiller was switched off the energy use for milking cooling fell by an average of 85kWh per day (see Figure 1 Tuesday 10th Sept). So while the chiller was getting the milking colder a lot quicker there was more energy consumed in doing it. While on face value this may a reason to re-consider such a system, Victor considered the risks of using the old system with milk staying warm for longer are too great from a milk quality point of view. Another factor to consider is the chiller is able to take advantage of the off peak tariffs in the mornings whereas the compressors of the old system ran for a long time during the peak period.

This result was quite surprising but showed Victor & Denise the power of data monitoring to determine accurate energy use and allowed them to make decisions about their energy use and how to manage milk quality with the full set of information.

### Energy analysis: September 8 2013 – September 14 2013

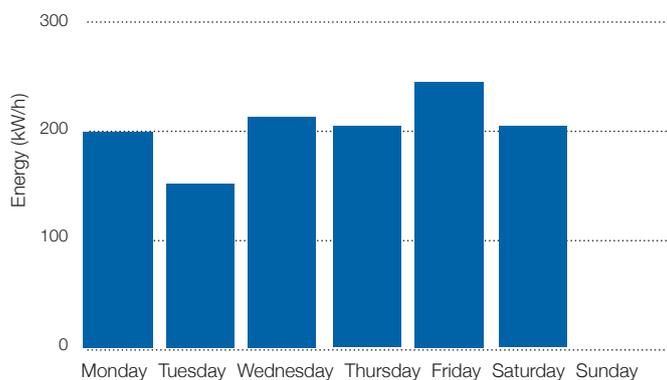


Figure 1: Milk cooling energy use Rodwell Farms (chiller switched off on Tuesday)

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