



Photo: V Buccella/OEH

**Our 'vintage' times, when the cooling demand is high, are now much less stressful.**

**Tarek Heiland**  
Engineering Manager  
De Bortoli Wines

# De Bortoli Wines: striving for better energy efficiency

We've boosted cooling capacity while reducing our energy use by 17 per cent, saving us more than \$184,000 per year.

## ABOUT US

De Bortoli Wines was founded in 1928 and is still managed by the same family. We're based in Bilbul, in the Riverina, but have expanded into some of Australia's best known wine regions in NSW and Victoria. We are one of Australia's largest wineries with an annual turnover of more than \$170 million and employ close to 400 people. Depending on the growing season, we currently crush between 50,000 and 70,000 tonnes of grapes per year, and bottle between 15 and 20 million bottles of wine per year.

We grow and process our grapes and produce our wine in a sustainable way. De Bortoli is the first NSW Government Sustainability Advantage Gold Partner to achieve a Platinum Project, and a past winner of a Green Globe Award and an Australian Business Award for Sustainability.

## BY THE NUMBERS

**Implementation costs:**  
\$870,000

**Cost savings:**  
\$184,000 or 13% of total energy cost

**Energy savings:**  
960MWh per year or 17% reduction

**Simple payback:** 4.7 years

## THE TECHNOLOGIES

### Variable head pressure control

Many industrial refrigeration plants have a fixed head and inter-stage pressure (the compressor's discharge pressure). By changing to variable pressure, which involves the installation of temperature and humidity sensors and variable speed drives (VSDs) with control logic for each condenser fan, you can make significant energy savings.



De Bortoli Wines' refrigeration system cooling towers



Tarek Heiland with the optimised refrigeration plant

## OUR SITUATION

Our refrigeration system, which is made up of two plants to service the two parts of the winery, uses approximately 70 per cent of our annual energy usage. In order to reduce our energy costs, we knew we had to improve the efficiency of the refrigeration system.

## WHAT WE DID

We worked with the NSW Government to commission an energy audit which identified a number of inefficiencies in the operation of the refrigeration system. One key finding was that the fans were running unnecessarily to maintain a constant pressure, regardless of the season or the operating mode.

Following the audit we carried out an extensive optimisation of our two main refrigeration plants. First, we implemented variable head pressure control which involved installing variable speed drives (VSDs) and controls on the condenser fan motors in both refrigeration plants.

We made adjustments to the controls and the operation of the refrigeration compressors and pumps, including installing a VSD to one of the compressors, and we changed to a more efficient oil cooling system. We also installed heat exchanger equipment to two compressors which means we can now sub-cool the condensed refrigerant before it's returned to the plant.

## THE RESULTS

The optimisation has boosted the cooling capacity of our two refrigeration plants, while reducing the overall energy used. The system now responds to changes in ambient and operating conditions, reducing our annual energy use by around 960MWh or about 17%, and our annual greenhouse gas emissions by more than 800 tonnes.

## Condensate sub-cooling

By sub-cooling condensed refrigerant before being returned to the plant you can save energy. Sub-cooling can be done by using either town water with a heat exchanger on the cooling tower or evaporator fan systems, or by expanding some of the high pressure refrigerant to cool the remaining refrigerant through the economiser port of an ammonia plant.

There are many actions you can take to improve the efficiency of your industrial refrigeration plant. OEH has a **technical guide** to help businesses understand the options for optimising the operation of industrial refrigeration plants.

## TAKE ACTION

To find out how you can save on your business' energy costs, contact the Energy Efficient Business team.

## EMAIL

[energy.saver@environment.nsw.gov.au](mailto:energy.saver@environment.nsw.gov.au)

## CALL

1300 361 967 (ask for the Energy Efficient Business team)

## VISIT

[environment.nsw.gov.au/business](http://environment.nsw.gov.au/business)