



Energy Management Guidelines for Wineries

Perth Region NRM is a not-for-profit Natural Resource Management Association committed to assisting small and medium sized Australian businesses minimise their Environmental footprint.

Perth Region NRM, with the support of the Office of Energy and in conjunction with principal energy consultants Eco Advance and the management and staff of Sittella Wines and Jane Brook Estate Winery, have produced this Guideline for Wineries keen to reduce their energy use and Greenhouse Gas (GHG) Emissions.

For details on how Energy Management Action Planning (EMAP) can be applied to your business, first read the *Energy Management Guide for Business*.

This Guideline is based on the pilot of Energy Management Action Planning at Sittella Wines and works undertaken at Jane Brook Estate Winery. It builds on the process outlined in the *Energy Management Guide for Business* by identifying areas of energy use in the wine production sector where further investigation may be warranted or where energy efficiency improvements could be targeted and realised.

The following information is provided as general advice however it should be recognised that businesses operate in different ways and in different circumstances. You should make your own inquiries as to the appropriateness and suitability of the information as it relates to your particular business.

Energy use in the wine production sector

Business operators should have a good understanding of where energy is used in business processes. The following systems are typically used in most wineries:

- Chilling & Refrigeration
- Plant and Equipment
- Hot Water Generation
- Lighting
- Compressed Air

Reducing energy use in these areas can lead to financial savings for your business as well as a reduction in Greenhouse Gas emissions from operations. Actions should be targeted at the areas where energy use is highest and where the potential for returns are greatest. Low or no-cost actions should also be implemented. This Guide applies both for operational businesses and new businesses.



Chilling & Refrigeration

- Often a large consumer of energy in wineries, engage the services of a refrigeration engineer with energy efficiency experience
- Use two brine tanks – a second brine tank allows the warmed returned brine to be more efficiently chilled before being returned to the chilled brine tank for winery use
- Increase brine capacity – the second brine tank also increases the amount of brine in the system that can be chilled with off-peak energy and allows more efficient chiller run times
- Chillers need to be regularly maintained – Check cooling tower for damage, check for ice build up on evaporators and delivery lines (should be suitably lagged), keep external coils clean and free from litter and regularly check system pressure (refrigeration mechanic)
- Ensure that chiller tank and refrigeration plant are shaded from direct sunlight to reduce radiant heat gain and increase energy efficiency
- Insulate wine tanks to reduce energy use for heating and chilling
- Install variable speed control mechanisms for brine delivery pumps – This will negate the need to use outlet valves to reduce flow rate
- Minimise cooling loss from system – Install door closers, insulation for storage and fermentation rooms, insulation for tanks and brine lines and efficient lighting (less heat) and locate refrigeration plant and equipment in a shaded, well ventilated area
- Use time of use tariffs if available and switch energy intensive operations (e.g. cooling of brine) to off peak periods
- Educate staff – Ensure that staff do not leave storage room doors open
- Turn off or raise temperature set points of refrigeration system during non-critical times
- Provide timers for drink fridges (cellar door) and vending machines/water fountains so these are switched off after hours

Plant and Equipment

- Turn equipment off whenever possible – Turn air conditioning systems off when not required
- Consider the use of variable speed controls for motors with variable demand – VSD controllers are appropriate for motors that spend a lot of time under partial load
- Ensure that motors are regularly serviced – Check for tight belts and for motors that run hot
- Enable energy saving modes on office equipment – Most new electronic equipment have energy saving modes that can be set to turn on at the earliest opportunity

Hot Water Generation

- Avoid installing oversized or inefficient hot water services – Consider the benefits of solar, instant gas/electric, storage and heat pump units when determining hot water provisions
- Use waste heat from refrigeration systems to pre-heat hot water
- Insulate hot water lines
- Have separate systems for hot and warm water requirements rather than heating then cooling for warm water (product warming)



- Reduce hot water use by reducing cleaning run times and using low flow, high pressure nozzles and taps
- Provide timers for hot water urns so these are turned off after hours

Lighting

- Turn lights off in unused areas - Install separate switching or motion sensors for areas that are infrequently occupied. E.g. barrel storage rooms, cellars, amenity areas and individual offices
- Avoid over lighting - Recommended interior light levels are provided by Australian Std 1680. Remove excessive lights from areas with low lighting requirements and from over-lit areas
- Use natural lighting - Provide sky-lighting and separate switching so that all lights or banks of lights can be turned off during the day
- Use energy efficient lights in low ceiling areas like offices - LED and T5 Fluorescent lighting systems are generally the most efficient and should be used to replace incandescent, halogen and older magnetically ballasted fluorescent lamps
- Locate lights closer to work areas - High bay lighting is required for areas where clearance is necessary for equipment such as wine tanks or forklifts. It may be possible to lower the height at which lights are suspended and use smaller, more efficient lights
- Use energy efficient lights in medium to high ceiling areas and for security lighting - Consider the use of Magnetic Induction Fluorescent and LED lights in lieu of traditional sodium vapour, metal halide and mercury vapour lamps for high bay situations. These new types of lamps use significantly less electricity, emit less heat and last twice as long so they don't need to be changed as often
- Provide task orientated lighting – Ensure that lighting is provided above work areas. It is not necessary to provide high levels of lighting for barrel stores, cellars, walkways, change rooms, storage areas and foyers. Lights should be located directly over areas where it is required

Compressed Air

- Install correctly sized compressors designed to suit specific requirements – Avoid installing oversized compressors and consult with compressed air engineers about the most efficient type of compressor for its intended use
- Develop an in-house maintenance program for reporting and repairing leaks as soon as possible
- Consider the use of Variable Speed Drive (VSD) compressors – For variable or fluctuating compressed air demand, the use of a VSD compressor can lead to significant savings
- Install shut off valves - This will enable air supply to unused equipment to be turned off
- Minimise compressed air use - Do not use compressed air for cleaning, mixing, agitating or cooling
- Turn compressors off during breaks and after hours
- Larger air receivers can reduce compressor cycling

For more information on Energy Management, visit www.perthregionnrm.com or contact Perth Region NRM via e-mail – info@perthregionnrm.com or telephone – 9374 3323.