

Energy equipment upgrade checklist for wineries

TASK	DETAIL	COMPLETE?
Asset register	Develop asset register capturing key details, such as: <ul style="list-style-type: none"> - Make - Model - Type of unit (i.e., screw or reciprocating) - Age/ year of install - Power rating - Efficiency - Operating temperatures 	
	Implement asset replacement strategy focusing on more energy efficient replacements	
EQUIPMENT UPGRADES		
Refrigeration & Tank Storage	Install evaporative cooling or ice storage to pre-cool grapes	
	Ensure all refrigerators, pipe networks and tanks are insulated	
	Review type of insulation on cold walls and consider alternatives such as Polyisocyanurate PIR	
	Upgrade refrigerant pipe lengths to be as short and straight as possible	
	Install a second refrigerant storage tank to increase buffer capacity	
	Review fan design in condensers and consider if centrifugal fans could be replaced by axial fans which can be more efficient	
	Install automatic purger to remove contaminant in refrigerant line	
	Install variable speed drives on refrigerator, refrigerator compressors and fans	
	Install automated compressor staging and capacity control	
	Increase speed of cooling by installing a cross flow filter and/or centrifuge	
	Review alternative options for refrigeration, such as additives or STARS electro-dialysis technology for tartrate stabilisation	
	Install an underground cool room within basic winery design	
Pumping	Upgrade pipe lengths to be as short and as straight as possible minimising pressure drop	
	Apply precision castings, coatings, and polishing to create a smoother internal pump	
	Install controls to operate pumps only when required	
	Review options to install constant speed drives, direct drive (for pumps with variable loads) and variable speed drive on pumps	
	Install a multi-speed motor on pumps	
Compressed Air	Minimise the pressure drop of the pipe/hose network by minimising connections and using a standardised hose size	
	Relocate compressor to areas that are cool, well-ventilated and out of direct sunlight	
	On a screw compressor replace internal cooling with external cooling	
	Install controls to operate compressors only when required	
	Install a variable speed drive on compressors	
	Install automated compressor staging & capacity control	
	Install economisers or heat exchange systems to capture waste heat	

EQUIPMENT UPGRADES		COMPLETE?
Hot Water	Install heat recovery system to capture wasted heat for hot water	
	Relocate boiler to be near the major end users to reduce pipe lengths	
	Review all opportunities to pre-heat incoming water	
HVAC	Install tight building seals to prevent air infiltration & loss	
	Review ducting to standardise width, low internal roughness, and minimal length	
	Relocate HVAC unit to an area that is cool	
	Install insulation on HVAC duct networks which are outside the air conditioning space	
	Install controls to operate HVAC only when required	
	Install variable speed drive or multi-speed motor	
	Review options of changing to natural refrigerants that have very low Global Warming Potential	
	Ensure the responsible containment and destruction of refrigerants	
Lighting	Install day-lighting sensors to adjust lighting	
	Review how best to distribute daylight naturally internally	
	Install efficient lamps and luminaries	
	Install LED or self-luminous exit signs	
Notes		