20 years of sustainability at Mission Winery

Mission is a fully integrated winery undertaking winemaking, bottling, warehousing and distribution

ISO 14001

- Accreditation in 1998
- Started monitoring COD of winery waste
- Initiated a program of monitoring water and electricity use
- Projects on improved soil management on the Gimblett gravels 2002 – 2004
- Projects on Wastewater management in winery

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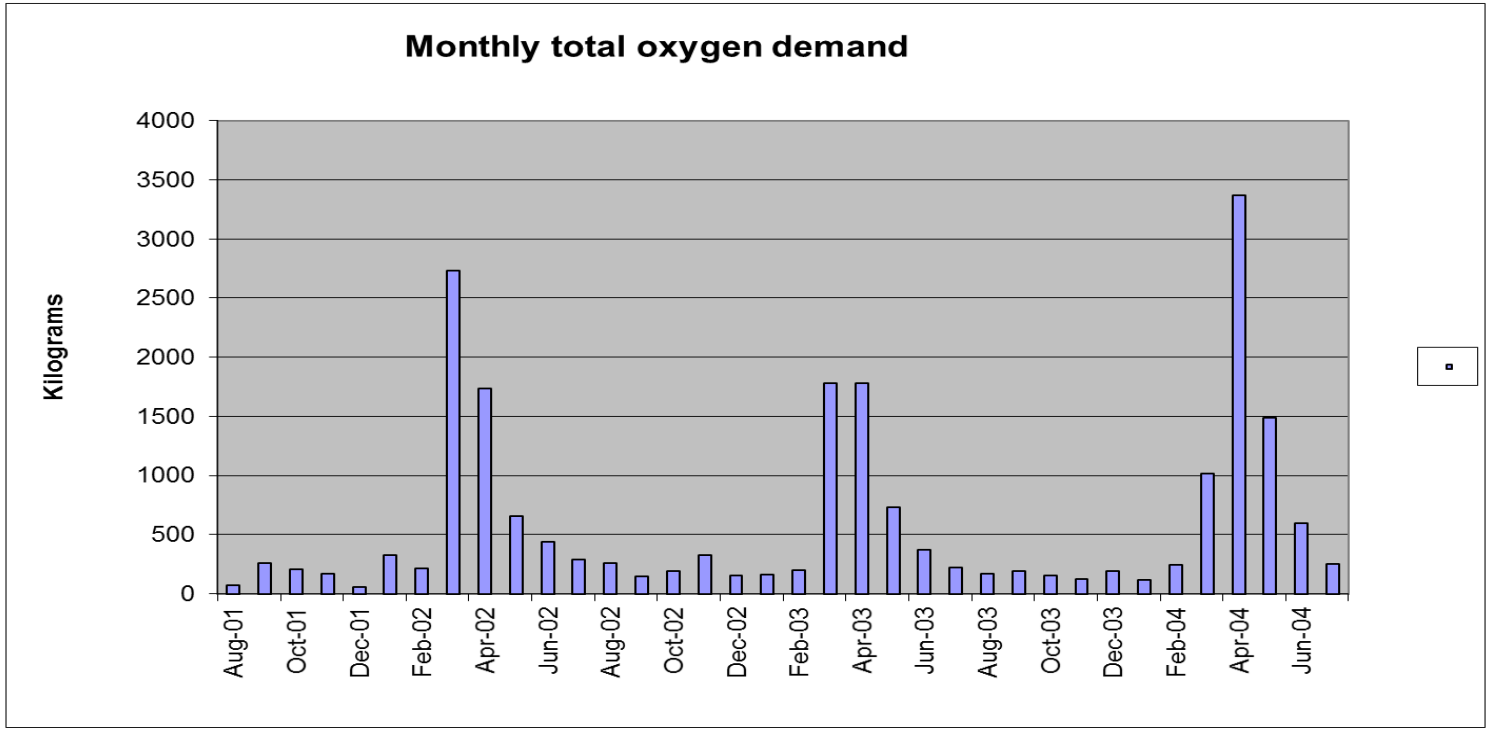
First project was to monitor COD and volume of water use

- **Found the following environmental impact of our waste water**



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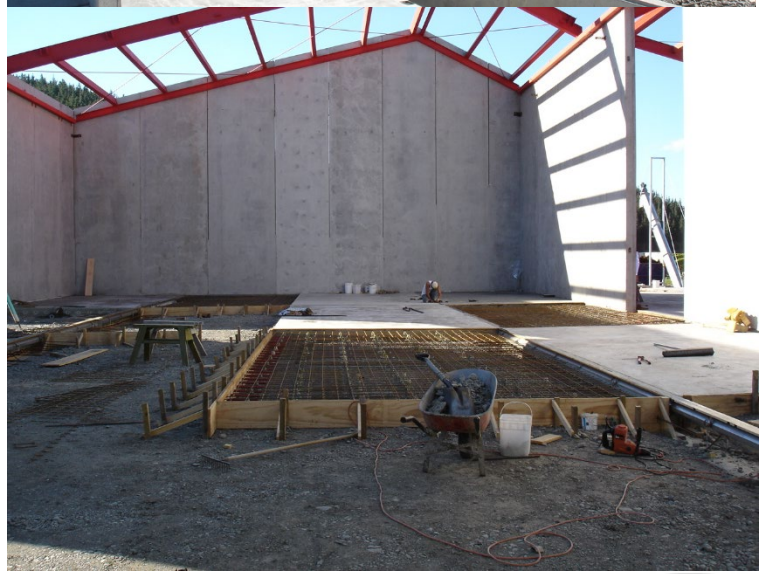
2005 - New Winery rebuild

- 2005–2008 a new winery was built on footprint of old winery
- Design was with thermomass walls with insulated roof and double glazed windows
- New refrigeration with two independent systems – one designed for cold stabilisation
- Installed Nitrogen generator



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2009
ISO 14001 EMS project – lower winery carbon footprint

- Analysis was undertaken in 2009 of the winery's electricity use. In this analysis the electricity use was charactarised into several areas of usage:
- Lighting – 1n 2009 accounted for 32% of energy usage
- Refrigeration of must and fermentations during vintage -31% energy usage
- Bottling line – 9% energy usage
- Cold stabilization – 5% energy usage
- Warming of wines during winter to encourage the malo lactic fermentation
- Chilling bulk wine in tank and barrel during summer to preserve quality and slow losses through evaporation

Several areas were investigated to reduce electricity usage

1. Solar water heating for bottling line sterilizing
2. Wind power generation
3. Alternative to refrigeration for heat removal from winery in summer
4. Solar panel electricity generation
5. Improvements in refrigeration efficiency
6. Install of more efficient lighting
7. Utilize floatation for removal of pre-fermentation solids to reduce must chilling requirements

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Payback on investment of different options

1. Solar water heating - 146 years
2. Wind turbine - over 40 years
3. Forced air circulation of cool nighttime air - 4 years
4. Solar panels - 67 years
5. 7 options for refrigeration were explored with the only viable one is an inverter on condenser fans with a 10-15 year payback on investment.
6. Lighting; replacing metal halide lights with new generation fluorescent fittings a payback on investment 6 years.
7. Flotation: Payback on investment for 1000 tonne production: 8.5 years.

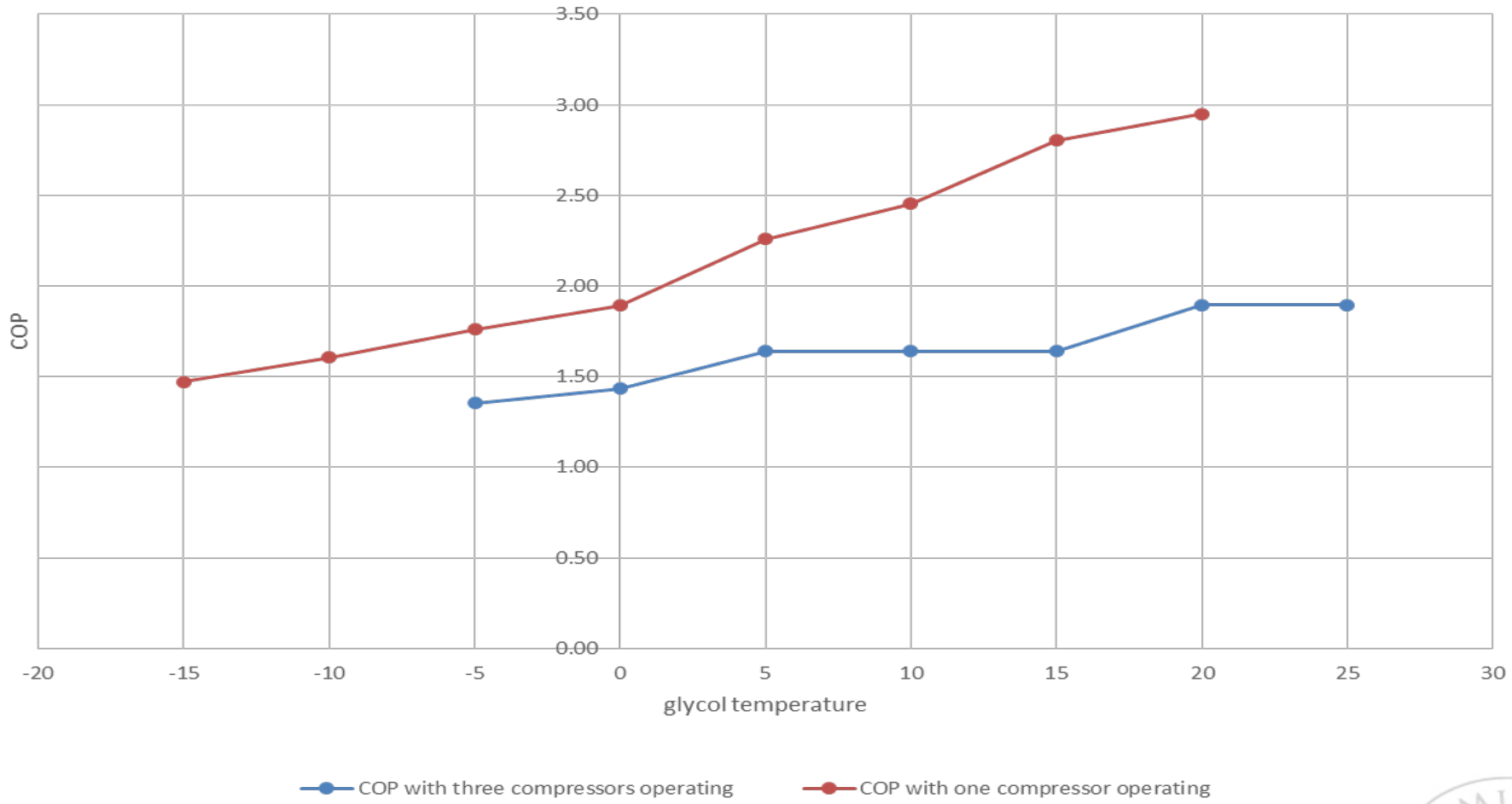
Options 3, 5, 6 &7 have been adopted.

Option 3 created a problem with wine loss through increased evaporation in barrel

Our refrigeration system

- Our refrigeration system comprises of two independent chillers. Each can be used to circulate chilled glycol through our winery
- Tests were made on refrigeration performance of main chiller set

Refrigeration performance vs refrigerant temperature on main system



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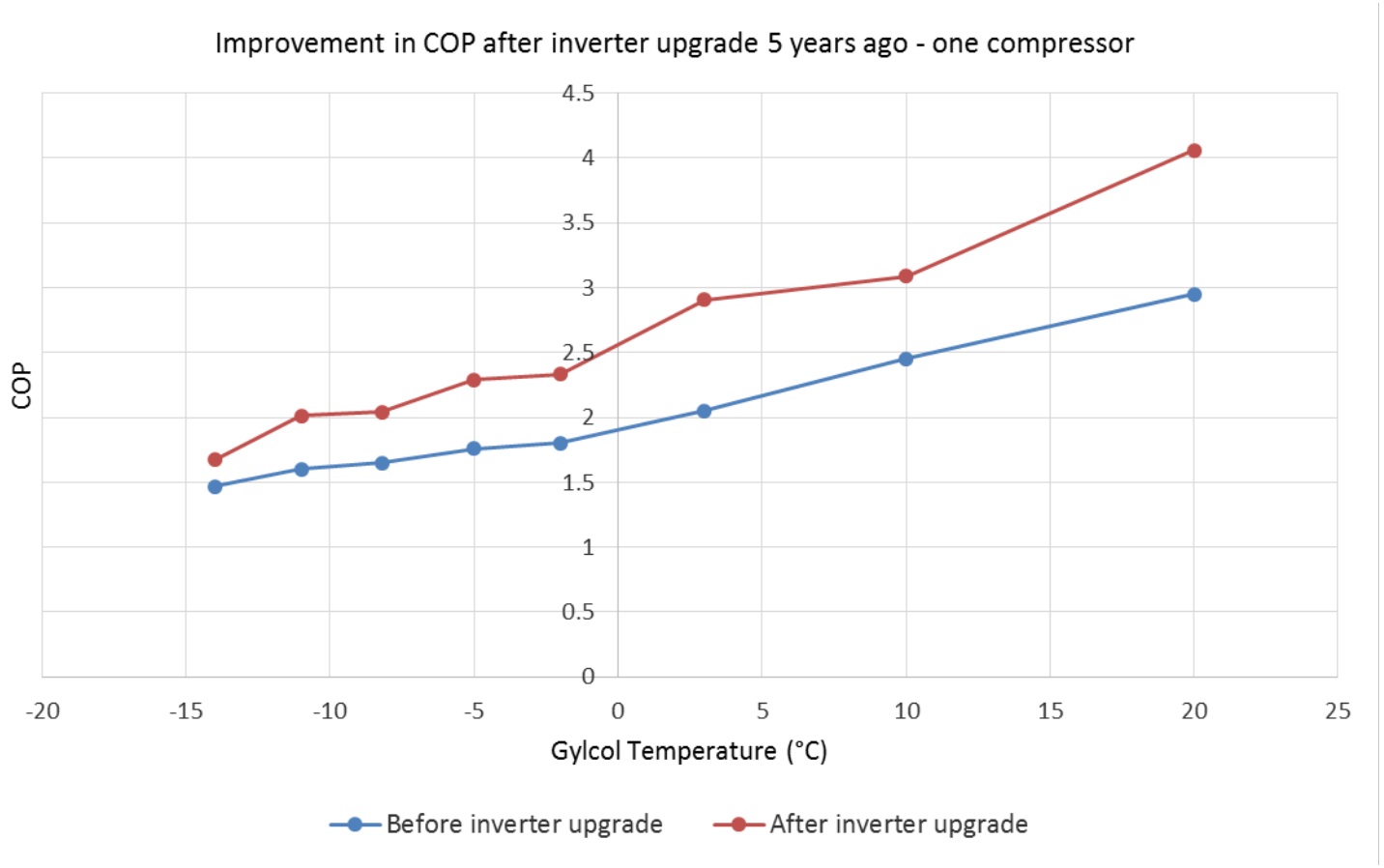

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Water use monitoring

- This has been monitored since 2002
- Usage increased when we moved to our new winery in 2005
- In 2009 set the EMS target to less than 2 litres water usage per litre of wine produced

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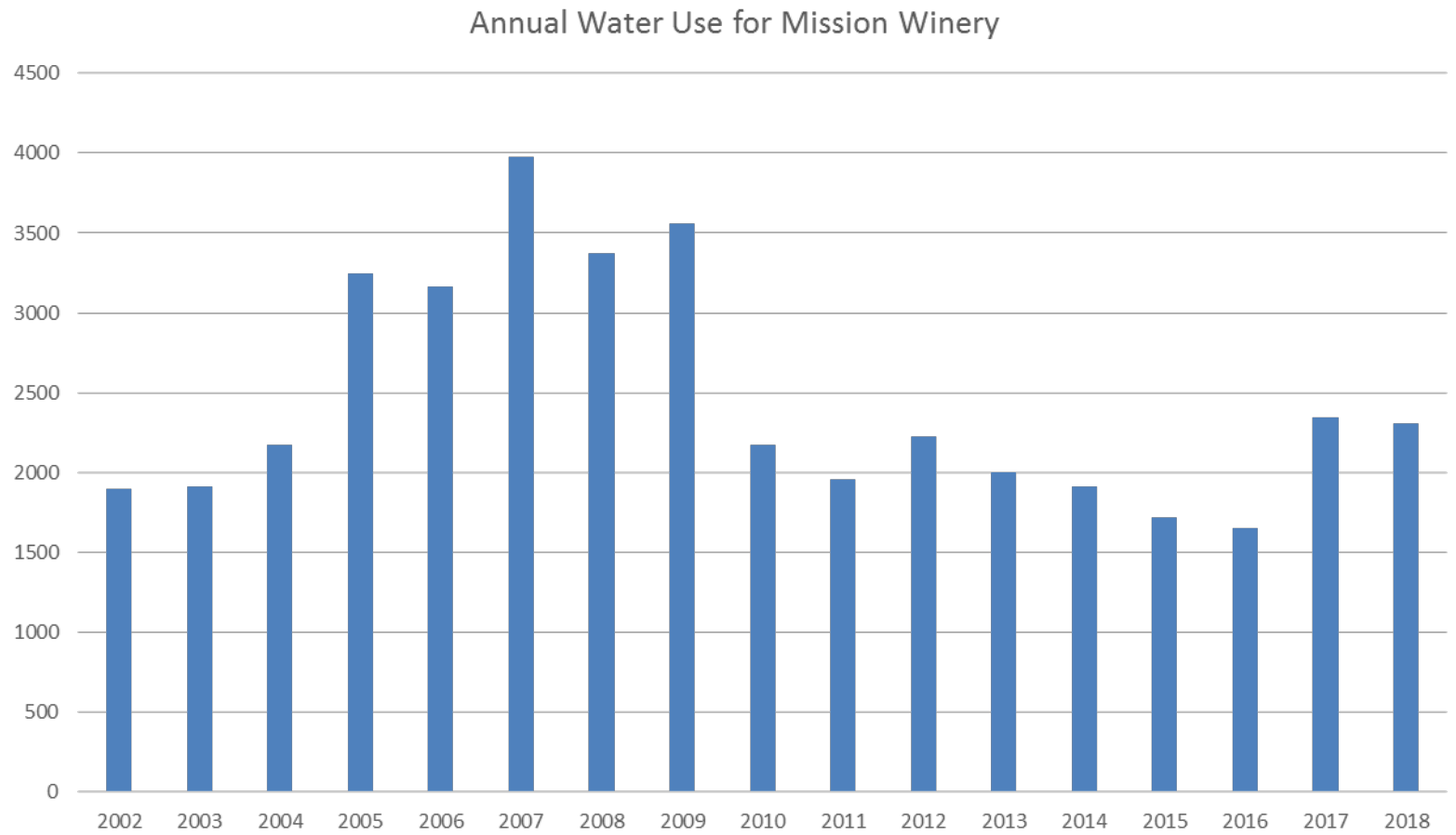

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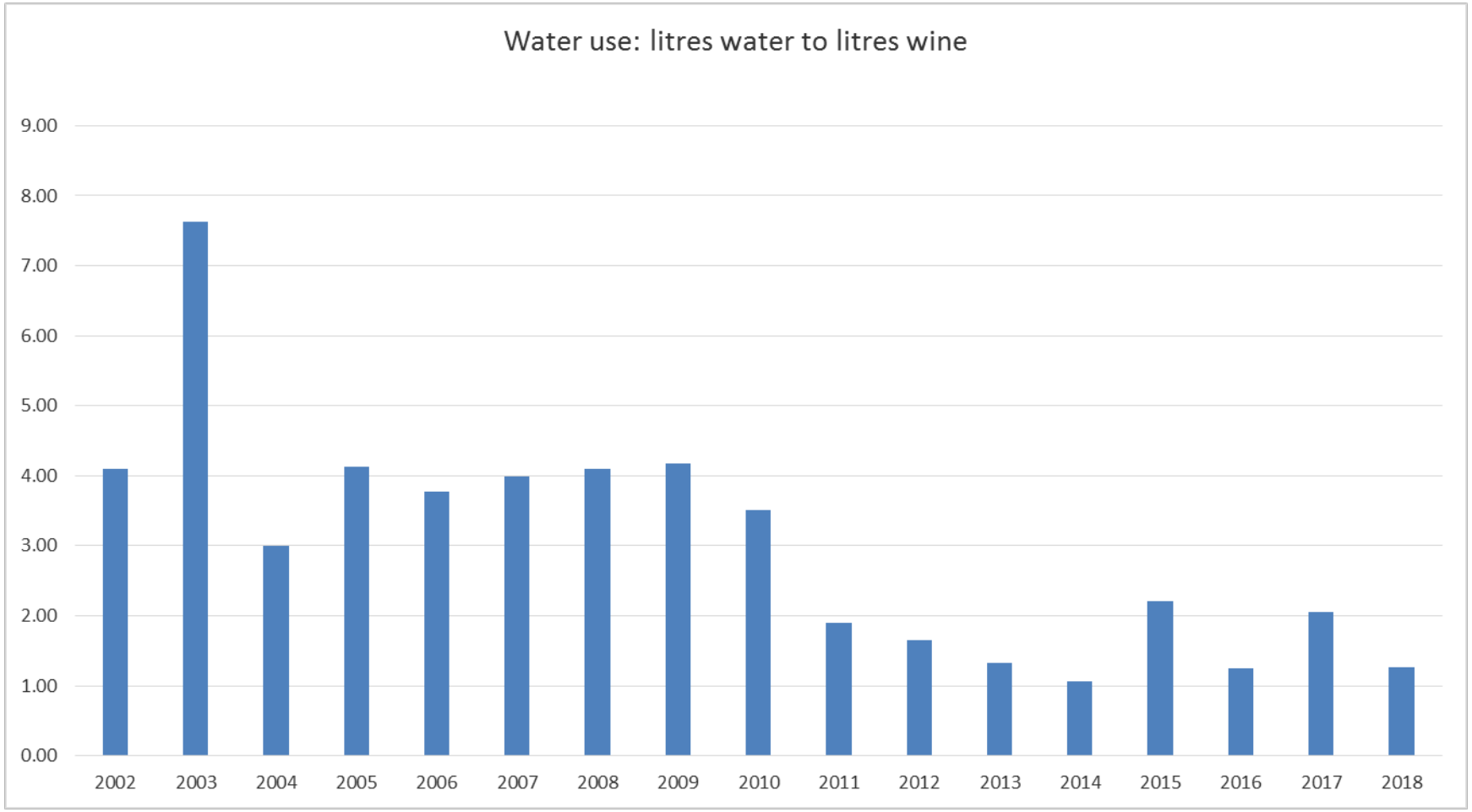

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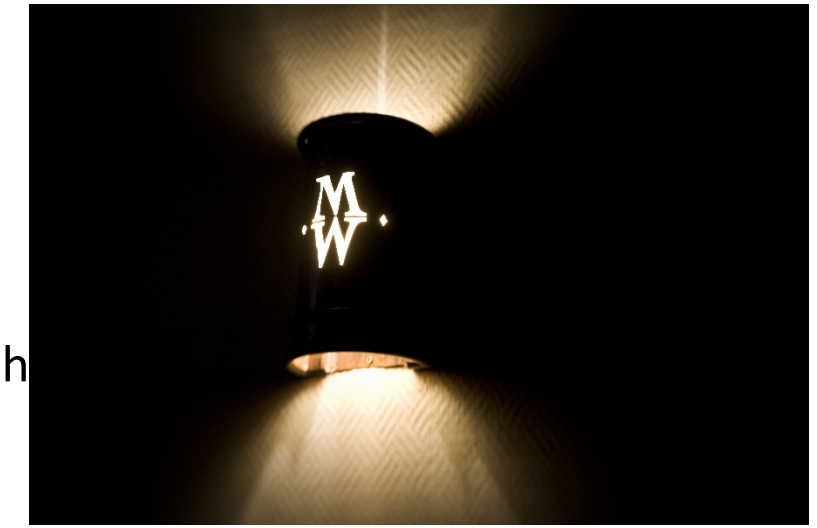
Electricity usage

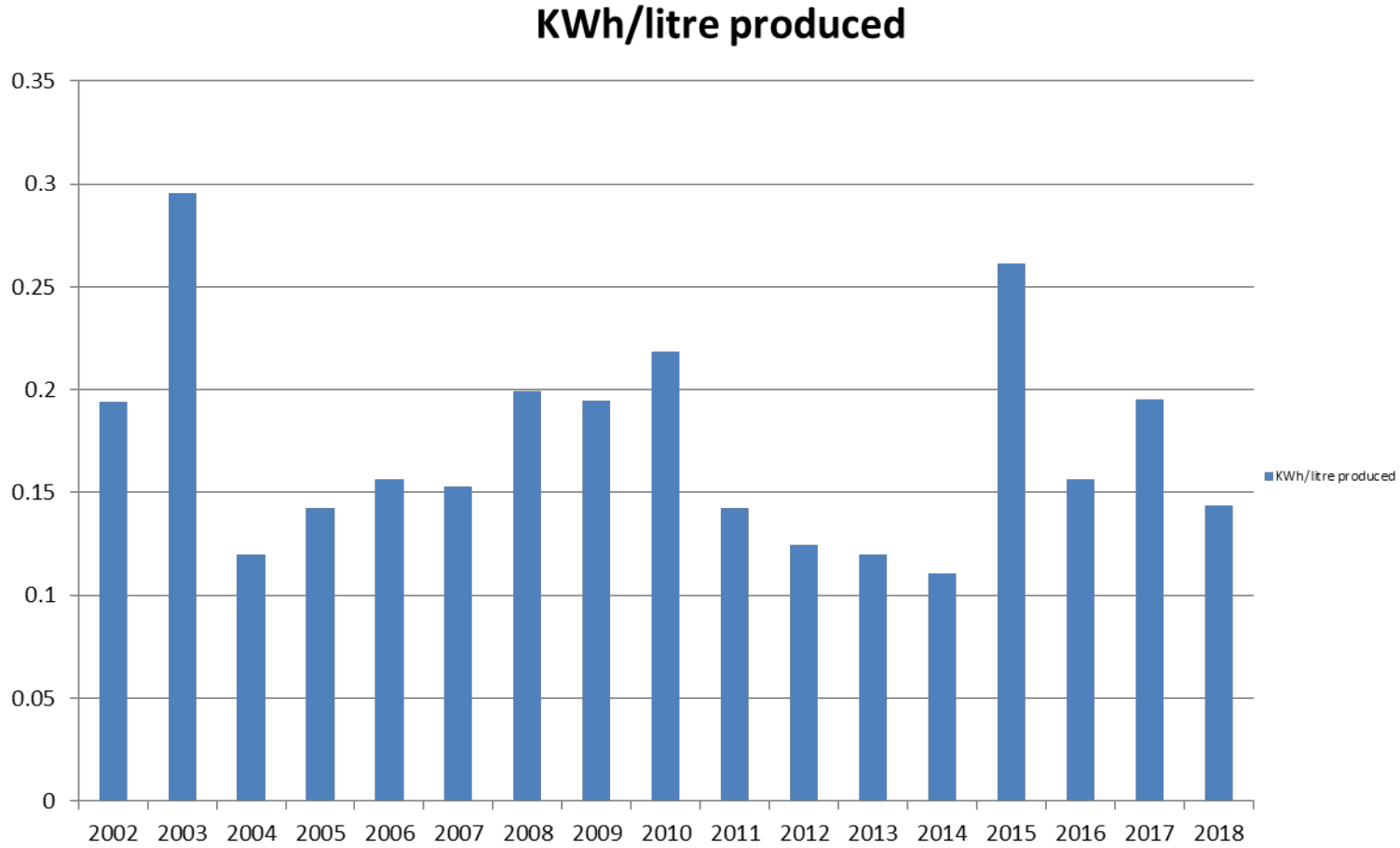
- Target has been to limit energy usage to less that 0.2 kWh per litre of production.



- Achieved target except in 2003 and 2015 which have been small vintages

- Best efficiencies were in 2014 when we approach maximum capacity

- Savings in recent years have been offset due to increased of cooling barrel hall during summer months



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What is Mission's carbon footprint?

- 500 Kg LPG for forklift – generates 1.5 tonnes of CO2
- Purchase of CO2 for inerting ullages –3 tonnes per annum
- Electricity – In NZ electricity is 80% from sustainable recourses – our electricity usage has a carbon equivalent to 30 tonnes CO2.
- Total winery CO2 equivalent footprint is less than 35 tonnes if we ignore the impact of refrigerant leakage.
- CO2 equivalent from refrigerant leakage is up to 30 tonnes

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