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Sustainability Initiatives – Solar Array and Hot Water Generation

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Sustainability – What does it mean?

- At Yealands we have a goal of becoming 'the most sustainable winery in the world'
- Sustainability means different things to different people, to us it is simply about finding better ways of doing things
- Initiatives at Yealands – finding the right ones – ideally lots of big / easy or small / easy
- Lots of small things combined can make a big difference, these are 2 examples of projects we have undertaken

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Solar PV System

- **Long term goal of being self sufficient with our power requirements**
  - Solar an easy and obvious choice, although long term ROI
  - Commercial wind turbines deemed too hard…..for now
    - We have 3 small residential turbines, so we know its windy enough!
- **Equipment**
  - **2014 installation of 99kW, 396 panels**
    - 132,000 kWh / yr
  - **2016 installation of 312kW, 918 panels**
    - 408,000 kWh / yr
    - 13 x ABB 27.5kW solar inverters
  - Now largest solar array anywhere in NZ at **411kW** peak output – equal to 68 homes, 362T of CO_2 emissions
  - Provides **540,000kWh**, or **30%** of our power requirement

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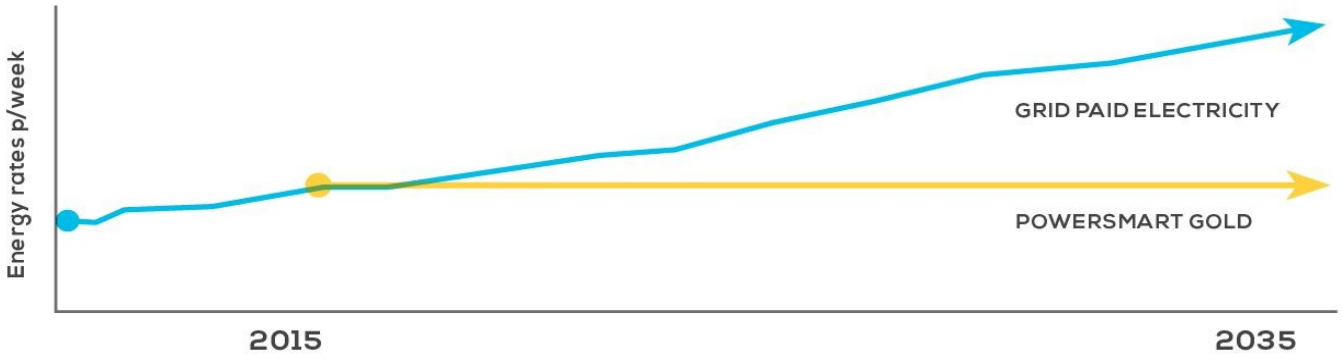
PowerSmart GOLD

Solar PV System

- **Costs….**
  - **Partnered with Powersmart Gold**
    - Zero capital cost.
    - Pay a fixed price for the electricity produced, for a fixed number of years



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Yealands Estate

Status

NORM

Power Right Now

152.0 kW

Energy Generation

TODAY	LIFETIME
602.4 kWh	296.6 MWh

Environmentals from Weather Station

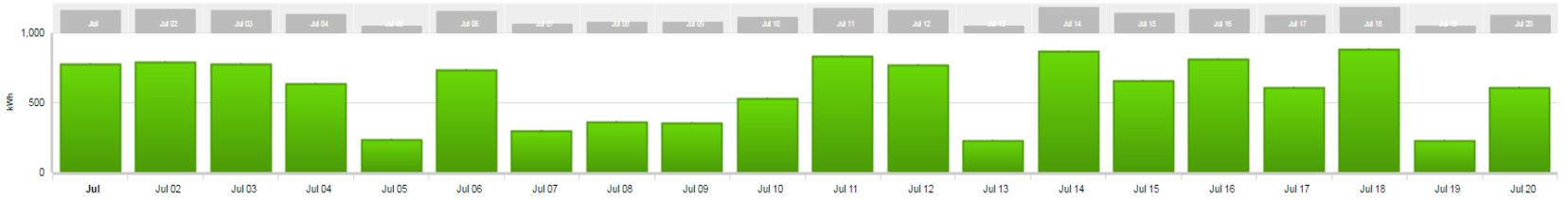
0.0 °C
Ambient Temp.

Energy

Download CSV

1D | 7D | 30D | 12M | WTD | MTD | YTD

Jul 01, 2016 - Jul 20, 2016



Environmental Benefits

Environmental Equivalents

Achieved by use of renewable energy

The energy to operate a TV for **85,890** days

The pollution an *average* passenger car emits over **55.27** years

The energy to power **2,281.54** computers for 1 year

Greenhouse Gases

Greenhouse gases avoided by use of renewable energy

CARBON DIOXIDE

CO_2 **250,717.26** kg

NITROGEN OXIDE

NO_x **257.55** kg

SULFUR DIOXIDE

SO_2 **3.27** kg

Carbon Offset

250.72 metric tons

You have offset the equivalent of:

21.67 ha

Typically one acre of pine forest will offset the equivalent of 4.69 metric tons of C02

Seddon, Blenheim, MBH 0000

Install Date: 2013-12-03

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Solar PV System

- **Results / Benefits**
  - Powersmart responsible for all maintenance and repairs, electrical compliance, minimised interruption to the winery
  - Massive marketing opportunities – largest solar array in NZ, vehicle recharging station.
  - 'Solar Container' - visual presentation for winery visitors
  - Social, environmental and marketing benefits – some of which are hard to quantify

- **Improvements / Challenges**
  - Using the generated power when it is there, rather than selling back to the grid
    - VinWizard Refrigeration – cooling tanks when power is available dependant on wine status

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Hot Water Generation – Bale Burners

- **Why?**
  - In 2010 were looking for ways to primarily increase our ability to warm glycol especially during harvest, without increasing LPG usage, and also increase the availability of hot water for tank cleaning and yeast rehydration
- **Equipment**
  - 2x 240kW Central Boiler 'Pallet Burners' – from the US
  - Pipework and HX to connect into existing hot water main
  - Baler, trailer, storage shed
- **Costs**
  - Total cost 180K, 40% of which was subsidised by an ECCA Technology Grant.
  - ROI – less than 2 years

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Bale Burners

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Bale Burners

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Bale Burners

- **How it works**
  - Cycle bales into each burner – depending on winery load / demand
    - During vintage burn 1 bale / burner ever 2hours (20KT+)
    - Outside of vintage 5 - 7 bales / day dependant on bottling schedule (20KT+)
    - ~3000 bales for 20KT+ / yr
  - Heats hot water elements in the back of each burner, water is then pumped to the plant room where it passes thru a HX with warm glycol, once warm glycol tank is up to temp, excess heat then goes directly to hot water tank
  - 85C – 90C water from each burner, HX down to 55C
  - Each bale ~120kg and provides equivalent heat of ~60kg LPG

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Bale Burners

- **The numbers…..**
  - 2009 *7,000T fruit,* **19T of LPG, $51K** – no bales
  - 2010 *14,000T fruit,* 11T of LPG, $32K – including bales
  - 2011 12,000T fruit, 7T of LPG, $22K – including bales
  - 2012 14,000T fruit, 11T of LPG, $32K – including bales
  - 2013 17,000T of fruit, **18T of LPG, $51K** – including bales

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Bale Burners

- **Benefits / Results**
  - Warm glycol – we can now warm tanks for ferment on demand, although system is now completely stretched at 20KT
  - Hot water – we have unlimited hot water outside of vintage
  - CO2 emissions – reduction of ~125T / yr
  - No real extra cost in baling / vs mulching

- **Improvements / Challenges**
  - Designed for 10-12KT, now 20KT+
  - Hopper to hold a number of bales, self loading 24/7
  - Cant be loaded out of work hours

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