

Case story 7: solar energy

South Australia

The 'Watts in Your Business' project has completed energy audits of 30 packhouses and orchards Australia-wide. This case story of Drury Orchards' packing shed in SA shows where energy use and costs could be reduced.

Drury Orchards in Inglewood, SA, produces and packs 623 tonnes of apples and 11 tonnes of pears per annum. From January 2013 to December 2013 the site consumed approximately 70,000 kWh of electricity at a cost of just over \$18,000 (excluding GST).

Solar Photovoltaic (PV) System

In November 2013, Drury Orchards installed a ZEN 24kW AC Solar Photovoltaic System to off-set the import of peak electricity from the grid for their packhouse. The System's components include:

- 96 ZEN 250W high efficiency polycrystalline solar modules.
- ZEN micro solar control centres.
- A custom mount on a low pitched roof at approximately 15° due north.
- ZEN communications unit.
- ZEN Energy Manager monitoring system.

The ZEN Energy Manager monitoring system is an online management tool that allows Drury Orchards to track, record and report the electricity generation by the system in real time. It also enables the site's management team to monitor the performance of the System's components to ensure they are working in accordance with design. The total cost of the System was approximately \$44,000 (ex GST), but Drury Orchards was able to obtain a rebate of over \$18,000 under the Australian Government's Small-scale Technology Certificates (STC) rebate program.

Site savings opportunities:

- Install solar panels to provide packing sheds with electricity.
- Save more than \$9,500 a year with an initial investment of \$44,000 (after a rebate of \$18,000).
- Payback period of 4.5 years.

Performance of the ZEN System

From installation in November 2013 until June 2014, the System produced:

- A daily average of 106.7 kWh of electricity.
- A daily maximum of 185.6 kWh of electricity production (29 December 2013).
- A daily minimum of 3.2 kWh of electricity production (8 May 2014).
- Total production of 23,816 kWh.
- Total savings of \$6,648.

Evaluation

Drury's Management has been extremely satisfied with the System's operation and the professional service and performance of Zen Energy. They anticipate saving more than \$9,500 every year.

Zen Energy took less than a day to supply, install and commission the System. The procurement strategy for the System included a fee for the provision of Zen's online management tool to enable Drury management to track the Systems performance and carry out simple troubleshooting.

Figure 1: Electricity generated by solar panels and average daily solar exposure averages

Figure 1 shows the relationship between the generation of kWh by the solar panels (blue) and the Bureau of Meteorology (BOM) Daily Solar Exposure Average data (purple) over eight months. Less kWh of electricity are generated on days when there is less sunlight to activate the solar cells. And most electricity is generated during summer.

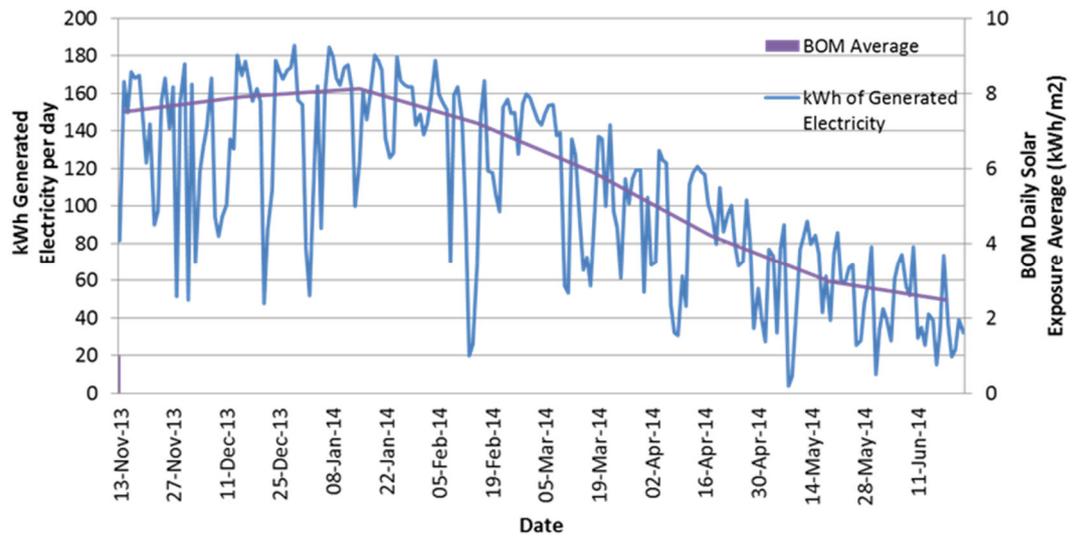
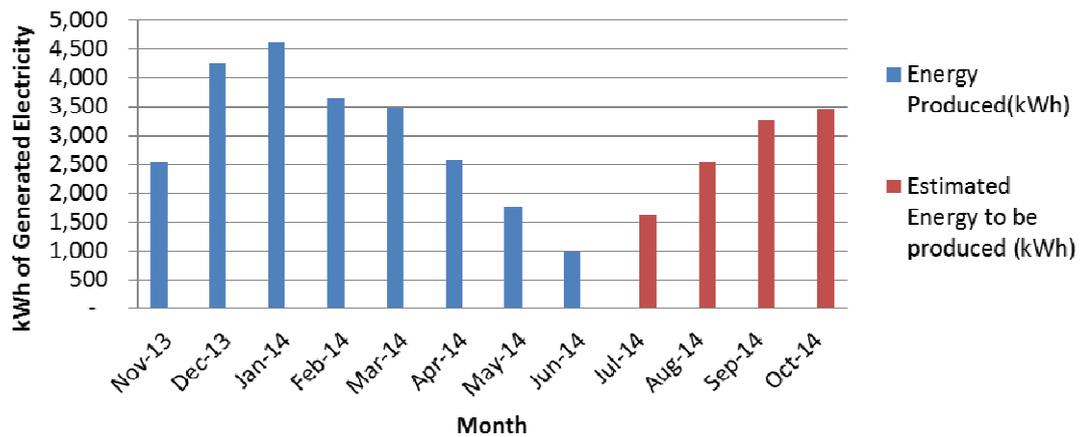


Figure 2: Monthly electricity generation of solar panels

Figure 2 shows the electricity generated from Nov 2013 to Jun 2014 and the forecasted generation until Oct 2014. The blue bars show actual electricity produced while the red bars show estimated generation based on forecast weather, trends and performance of the solar panels.



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