

Early Needs & Recovery Project: Energy Audits Delivered

John Hay, Recovery & Resilience Project Officer, Berries Australia

A key focus for Berries Australia's Early Needs and Recovery project was to increase the triple bottom line by highlighting the risks to business and using purposeful strategies to mitigate these risks. With that in mind, Berries Australia have now delivered rapid assessment energy audits and installed a switchable real-time energy monitoring device for an initial three farms in the Coffs Harbour region.

The process for the energy audit included an initial site visit to discuss the general design, current practices, and yields. At the same time, pictures were taken of the infrastructure, and details were noted about the models and sizing of equipment.

The farms were required to provide two years of energy consumption including the costs. Keeping in mind that general billing can be monthly or quarterly the ideal is 5-minute granular data from real-time monitoring which will provide higher accuracy.

Energy consumption data also included diesel or petrol fuel use, and it was just as important to separate out the fuel end uses such as vehicles and generators. If there was solar onsite, a download of the generation, imports, and exports was also necessary to complete the picture. Records of irrigation scheduling was needed to match against pump sizing and run times. Plus, for more complex audits more detail may be required including irrigation design, cold room door times (open and closed), and throughput.

A small, medium, and large site were chosen to show that opportunities exist no matter the size of the operation. The audits highlighted the need to improve data management for ease of auditing so that trends can be monitored over time, and areas for efficiency improvement can be identified. Savings can be relative to the size, current efficiency of the enterprise, and run time of equipment.

The opportunities identified at the sites included:

- Tariff reviews
- Irrigation design changes
- Solar installation and utilisation
- Batteries
- Installation of additional real-time monitoring
- Management and practice changes using metrics, benchmarks and tools

Across the three sites, thirteen opportunities were identified at a capital cost of \$51,800, resulting in an average payback period of 5.3 years. Potential annual energy savings of 29,509 kWh, a reduction in costs of \$9,806, and 23.90t CO₂-e were identified.

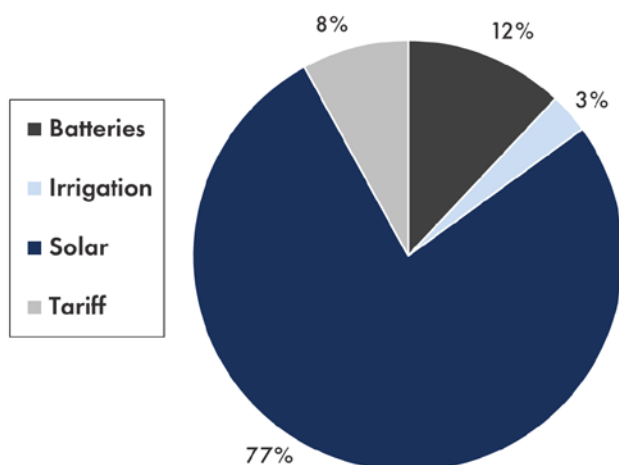
The monitoring devices were installed across main meters, pumping and general power circuits. Although not chosen for this project, solar generation is another option to consider if installing a device.

Due to the seasonality of blueberry production and the use of cold rooms at one site, the devices are important to capture the five-minute **Time of Use (TOU)** data so that a suitable hybrid solar system can be designed and precise **Return on Investment (ROI)** decisions can be made.

During and after the audit process, further opportunities were unpacked. These included:

- installation of rapid close doors on a cold room
- replacement of diesel gensets
- energy circuit design changes

Opportunity Cost Saving Breakdown (%)



Capital Cost (\$)	Average Payback (years)	Energy Saving (%)	Cost Saving (%)	Emission Savings (t/CO ₂ -e)
51,800	5.3	14	47	47

Investigations are also continuing for a wider project to replace smaller pump motors, as they are quite inefficient. In most cases, you wouldn't change one that is currently in good working order, but advances in technology with higher efficiency options now available mean that changes could be considered under the NSW Energy Savings Scheme (ESS). Under the ESS real-time devices are recommended to provide the level of data detail needed to accurately identify energy saving opportunities.

To further enhance the value of participating in the audit project, Irrigation Distribution Uniformity (DU) tests were also completed for the three sites. Knowing the pump specifications and the run times during the test enables kWh/ML/m head to be set and used as a metric for benchmarking and monitoring. There is a direct correlation between energy and water, and if either is underperforming there is likely to be increased costs.

The audits were emailed to the growers in the form of a PDF report and through a private online digital portal. The digital reports provide a collated data source as often there are multiple site visits conducting the same tests, as well as other projects at a single site over time.

The inclusion of additional datasets, such as averaged Bureau of Meteorology (BoM) climate data based on location, the closest Internet of Things (IoT) station, live stream gauges, and other sources can then be used to correlate against results on the farm. Overall, this will aid with forecasting and give deeper insights for easier decision making.

Although not considered a first line of defence for recovery and resilience, through the energy audit process you can:

1. Gather an updated list of infrastructure and images for insurance purposes
2. Increase knowledge so that changes can be considered should damage take place
3. Increase profits through adoption and practice change
4. Reinvest profits in strategies that provide resilience on farm

Additional free energy and irrigation audits are available for farms in the NSW region that are eligible under the Hort360 Recovery and Resilience project.

**Get in touch with John Hay,
Recovery & Resilience Officer to find out
more about how your business can benefit**

0488 147 800 | recovery@berries.net.au

Acknowledgements

The Early Needs Recovery Program is part of the \$150 million Primary Industry Support Package which is co-funded by the Australian and NSW Governments. For more information about the program, please visit Early Needs Recovery Program - Local Land Services (nsw.gov.au).



**Department of
Primary Industries**