

The logo for EECA, consisting of the letters 'EECA' in a stylized, white, sans-serif font.

TE TARI TIAKI PŪNGAO
ENERGY EFFICIENCY & CONSERVATION AUTHORITY

A close-up photograph of several ripe, fuzzy kiwifruit hanging from a branch with green leaves. The background is a soft-focus green. On the right side of the image, there is a decorative geometric pattern of white lines forming a series of triangles and diamonds.

Energy efficiency checklist

Orchards

Cost-saving measures, productivity
enhancements, and optimisation
opportunities

March 2025

METRIC	MEASURE	COMPLETE?
Energy & fuel monitoring and benchmark	Monitor and record energy use of vehicles and equipment. Plan and review annually any opportunities to improve energy use.	
	Calculate the energy required, and associated emissions, per kg or tray of produce leaving site. This will highlight opportunities for cost reduction by improved energy efficiency.	
	a. Get relevant energy bills and product throughput to determine totals for the desired 12-month period.	
	b. Input the data into the EECA energy intensity calculator	
	c. Refer to standards and benchmarking metrics for the industry to identify how the site compares to the wider industry. [Note: if available; e.g., GlobalGAP]	
Staff engagement	<p>Educate staff about the importance of being as energy efficient as possible, managing water and diesel use, and turning off equipment when not in use.</p> <ul style="list-style-type: none"> Run an introductory session to update staff about why it's important to save energy. You can also integrate information about your energy programme into your site's induction training. Create a mechanism for contractors and staff to share their suggestions with you. Make sure you respond to comments and act on recommendations when feasible. You may even consider offering a prize for the best energy-saving ideas. 	
Maintenance	Choose the best power tariff that suits the electricity load profiles in your operations. Similarly, consider reducing peak electricity loads by rescheduling processes so that they do not coincide with peak times.	
	Implement appropriate scheduling to regularly perform basic energy maintenance by a qualified technician.	
	Use equipment monitoring and manual inspections for early failure detection and preventative maintenance.	
	Allocate budget for preventative maintenance to save energy and prevent disruptions from breakdowns and unscheduled maintenance.	
Asset register	<p>Develop an asset register capturing key details, such as:</p> <ul style="list-style-type: none"> Make Model Type of unit Age/ year of install Power rating Efficiency Operating temperatures 	
	Implement an asset replacement strategy focusing on energy efficient replacements.	

METRIC	OPTIMISE	COMPLETE?
Machinery	Reduce idle time by turning off machinery when not in use for long periods, especially during breaks or between tasks.	
	Operate machinery at optimal speeds for fuel efficiency. Avoid running machines at unnecessarily high speeds that lead to excessive fuel consumption.	
	Machinery with sensors that can track fuel usage, engine load, and overall performance can aid in optimising maintenance schedules and usage patterns.	
	Have a good traffic management plan so that there are direct routes on orchard between blocks, rather than having limited accessibility which requires a lot more driving.	
	Operate machinery at optimal speeds for fuel efficiency. Avoid running machines at unnecessarily high speeds that lead to excessive fuel consumption.	
	Explore precision spraying equipment to minimise the energy required for pesticide or fertiliser application.	
	Use equipment that is appropriately sized for the task at hand. Over-sized machinery can be wasteful in terms of energy use, while under-sized machinery can lead to inefficiency and overwork.	
	Where appropriate use specialised orchard equipment that enables a large volume of equipment or harvested product to move at once, i.e. bin trailers, hydro ladder trailer or ladder trailers.	
	Plan and schedule tasks to minimise the number of trips around the orchard. Group tasks to reduce fuel consumption.	
	Where possible use multi linkage tractors to do more tasks at once (i.e., mulching and mowing at the same time using both front and back linkages). Or carry a bin on back forks and bins on front forks, reducing movements of the machinery around orchard.	
	Consider low-emissions equipment such as electric fans for frost protection, battery powered tools (e.g., chainsaws, etc), and low-emission ATV's and tractors.	
Irrigation systems	Use the suppliers irrigation system or pump performance specifications as a benchmark for future checks and testing.	
	Ensure the irrigation system is designed and installed correctly. Check the flow and pressures are within 10% of the operating design.	
	Perform regular soil moisture monitoring to optimise irrigation.	
	Regularly check for leaks in pipes, valves and fittings to avoid wasted water and energy.	
	Explore the option of drip irrigation to reduce water and energy use.	
	Explore weather-based irrigation controllers or timers to reduce over irrigation and energy use.	
	Explore solar powered water pumping systems in the orchard to reduce energy costs.	

Metric	Optimise	Complete?
Lights	Check lights are clean and free from dust	
	Install automatic sensors for lights to operate only when areas are occupied.	
	Replace lights with LEDs to reduce power use in high occupancy areas. Install timers on main lighting circuits.	
	Where skylights or large windows are present, install automated dimming or switching systems on indoor lighting.	
Metric	Renewable Energy Options	Complete?
Solar	Engage a third party to assess site for potential to install a solar PV system and look at options for electricity generated sold to the site via a Power Purchase Agreement (PPA) or other arrangement.	
On-orchard equipment and forklifts	Explore options to reduce fuel use through best practice and utilising low-emission alternative innovation and technology – <i>refer to EECA’s technology scan once published July 2025</i>	
Company Fleet	Replace with battery electric (or plug-in hybrid) vehicles.	
Metric	Renewable Energy Options	Complete?
Other	Consider options for reduction in the use of fertilisers and agrichemicals.	