EECA ENERGY EFFICIENCY & CONSERVATION AUTHORITY
TE TARI TIAKI PŪNGAO

Make sense of solar

Independent advice to help you make confident decisions about solar on your farm.

Get started with solar

This quick-start guide helps New Zealand farms navigate the key decisions around solar from day one, and find independent advice about the process.

What you'll find in this guide

→ Getting started checklist
Find out if your farm is suitable.

→ Finding the right installer
Questions to ask and tips to find the right fit.

→ System planning simplified
Balance your energy use, goals and farm setup.

→ Quote comparison tips
What should be included and how to compare them.

→ Make the most of solar
Get the most value from your system.

→ Hear from other farmers
Advice from farms like yours.

Independent advice for farms

EECA (the Energy Efficiency & Conservation Authority) provides practical, independent guidance and resources to help farmers make informed solar decisions — from first questions through to getting the most value from a system.

Visit the Solar on farms hub

Does solar make sense for your farm?

Solar has never been more affordable for New Zealand farms and businesses, and the benefits are stacking up.

Lower energy costs
Generating electricity on-site can reduce reliance on the grid when costs are higher, reducing energy costs immediately.

Strong return on investment
Many farm solar systems can pay for themselves within 5-7 years, and provide free electricity for the rest of their 25+ year lifespan.

Keep the farm running
Improve energy resilience and security by keeping key operations running during outages. You need a battery to utilise solar when the power is out.

Control over your energy
Gain more certainty over long-term power costs, manage your own power use on-farm, and export what you don't need to the grid.

Future-proof your business
Solar can support electrification of on-farm machinery and long-term farm efficiency — while getting ahead of rising energy costs.

Does solar stack up for farms like yours?

EECA is working with a group of demonstration farms to monitor and share practical insights, lessons and performance data from 10 different farm types — so you can invest with more confidence.

Learn about EECA's demonstration farms

Getting started checklist

Use this checklist to help decide if solar is right for your farm and energy use.

Your farm's energy use

Do you have high annual electricity costs?

Farms that are large energy users typically see the strongest returns.

Do you run a lot of electric equipment?

Solar can power anything with electrical demand. The more electrified your farm is, the greater the potential benefit.

Do you use electricity mainly during the day?

Solar has the biggest payoff during daytime hours. If you need to use power outside of daylight hours, it can be worthwhile investing in a battery.

Is your electricity use steady or seasonal?

Highly seasonal loads (for example during irrigation or harvesting) can still suit solar, but sizing should be planned carefully.

Do you have any electric vehicles?

EVs, ATVs and side-by-sides that can charge from your system can mean you benefit more from solar.

Your farm setup

Do you get enough sun?

Solar works well across the whole of New Zealand, even though sunshine hours vary.

What space is available for the panels?

Solar panels can be installed on buildings or can be ground mounted. You'll need around 150 m² for smaller systems, and up to 1,000 m² or more for larger systems.

Is your roof in good condition?

It's best to do any necessary major repairs or replacement (if needed in the next 10 years) before installing roof-mounted solar.

Do you need more resilience during power outages?

A solar array will need to be paired with a battery to keep your critical farm systems running during an outage.

Do you own the buildings and meter where solar would be installed?

If the site is leased or shared, it's important to clarify who pays for the system and who benefits from the savings.

Choosing an installer

Solar can be installed by specialist solar providers or registered electricians. A good installer should work with you to design your system, and explain the process and your options.

→ Create a shortlist

Start by looking for installers online in your area, then shortlist a few for quotes and on-site visits.

→ On-farm experience matters

SEANZ has a directory of solar suppliers who are familiar with planning and designing on-farm solar systems. Visit seanz.org.nz

→ Get more than one quote

Get two or three different quotes so you can compare both system design and costs.

→ Request references

Your solar installer should be able to provide references from recent customers with similar installs.

→ Ask other farmers

If you know any farmers or growers who have already installed solar ask them about their experiences as part of your research.

→ Check ongoing support

Ask about warranties and support – information should be easy to access, not hidden.

Questions to ask

Before you commit to an installer, it's a good idea to ask some key questions to ensure your system is properly designed and there are no hidden costs. Questions could include:

- What is included in the quote? (Does it include design, installation and commissioning?)
- Is there room for future expansion including batteries?
- What ongoing support do they offer, including warranty?

Gorton Farming, Manawatū

The basics of planning your system

The design of your system should be a collaborative process between you and your installer. It should balance the needs of your current and future energy use, your space, your business objectives and your budget.

Size of system

Solar arrays are rated in kilowatt peaks (kWp). This is the amount of power the array will produce in ideal conditions.

It's best to size a solar system based on your typical annual, seasonal and daily electricity use — while planning for any likely changes in the future.

Small systems

- Around 20-50 kWp.
- Generate around 24-60,000 kWh per year.

This would be suitable for a sheep and beef farm with low electricity use.

Larger systems

- More than 200 kWp.
- Generate more than 240,000 kWh per year.

This would be suitable for a dairy farm with 600+ cows that also irrigates.

Kaiwaiwai Dairies, Wairarapa

Location of panels

Roof-mounted systems

These systems can be installed on barns, sheds, and storage buildings, but the roof's condition matters.

Mt Somers Station, Canterbury

Ground-mounted systems

These systems are useful for larger sites and systems, or where roof space is limited, poorly oriented, or unsuitable.

Mount Rivers, Canterbury

Electrical setup

- **Switchboard location** — It's cheaper and simpler to install panels close to your main switchboard, as longer cable runs and trenching can add to the cost.
- **Electricity connections** — Solar systems are usually connected to one ICP (installation control point), while many farms have multiple ICPs. If you want solar to supply multiple ICPs, this needs to be clear in your planning and may not always be feasible.
- **Three-phase power** — Each phase is metered separately, so you'll need to understand which loads are on each phase to make the most of solar power generated.

Should you plan to export to the grid?

Some farms export excess solar generation back to the grid to help offset costs, but export limits exist, and buyback rates are usually lower than the price you pay for grid electricity. Your installer or electricity lines company can advise on export limits.

The more solar electricity you use on site, the less electricity you need to buy from the grid. This is where most of the value comes from having solar, so it's better to size your system to maximise self-use.

System design

The essential parts of a system are the panels and an inverter, while a battery is optional.

Panels

Solar panels convert sunlight into electricity. Systems can be scaled up or down depending on space and demand.

Panels last around 25-30 years, and have a rated capacity, which refers to the maximum power they are designed to generate.

Electric Cherries, Central Otago

Inverter

Direct current (DC) electricity produced by your panels is converted by an inverter into alternating current (AC) electricity to be used on your farm.

Having slightly lower inverter capacity than panel capacity often provides the best value. Inverters usually need replacing after around 10-15 years.

Mount Rivers, Canterbury

Battery

Batteries allow electricity generated during the day to be stored and used later, such as overnight or when the grid is down during outages.

A battery is most useful if a large share of electricity use is outside daylight hours, loads cannot be shifted, or resilience and backup power are priorities.

Fairbank Farms, Southland

Get clear on your objectives

Your installer should work with you to design a system that works for your farm, what you want to get out of your install, and your future plans.

Objective	Solution
Lower energy costs	Optimise daytime self-use.
Resilience	Consider battery storage for critical operations.
Future growth	Plan for expansion and electrification.
Export potential	Factor in local network rules and export pricing.

How much does solar cost?

System size

Small systems around 20 kWp — from $30,000, or $1500/kWp installed (excluding GST).

Large systems around 200 kWp — from $250,000- $300,000, or $1250-1500/kWp installed (excluding GST).

Batteries — from $700/kWh to around $1200/kWh installed (excluding GST).

Costs are estimates based on a range of systems EECA has supported.

Site preparation

There may be costs associated with electrical work like wiring, metering and switchboards, and non-electrical work that is specific to your install location.

Accessibility

The distance and travel time for installers may impact costs in particularly remote locations, as well as site-access for the installation.

Must-haves of a good on-farm solar quote

For farms, the design matters more than the price alone due to the varied nature of farms and their operations. Generic or 'package' designs can lead to poor performance or unexpected costs later.

It's important to take the time to understand your quote and ensure that the system aligns with your objectives for solar.

System design

This explains how the exact system has been planned and configured for your farm.

What to look for:

- The system capacity (in kilowatt peak or kWp). System capacity is calculated using the number of panels multiplied by the rating of each panel. E.g. 120 panels × 415 W = 49.8 kWp
- How the installer determined the right size/capacity for your system.
- Details of the technology proposed and how the components work together.
- A diagram or farm photos may be used to show proposed layout.

Costs and financials

This breaks down the cost of the system, how it has been calculated and how savings, payback, and returns have been estimated.

What to look for:

- An itemised list of what is included in your quote.
- The total cost, whether it is inclusive or exclusive of GST.
- Payback period, return on investment, lifetime savings.
- Carbon emissions savings are sometimes included.

Assumptions

This explains what is assumed about your energy use, exports, and prices. It pays to check these are consistent when comparing different quotes.

What might be included:

- Estimated annual generation.
- Export limits and network constraints.
- Electricity pricing and tariffs.
- Your energy profile.

Warranties and responsibilities

Quotes should clearly outline any required consents and approvals, payment terms, warranties, workmanship responsibility, and installer credentials so that roles, risks, and costs are transparent.

Get advice on your quote

Our team can help with navigating and understanding quotes. Call the EECA Solar on farms team on **0800 300 643** or email **solar@eeca.govt.nz**

Get the most value from your system

Make sure your power plan works for you

The power plan you're on can make a big difference to the value you get from your solar system.

Shift energy use into daylight hours

Use as much of your everyday electricity while the sun is out and your system is generating power. That might mean shifting energy intensive tasks, and avoiding spikes – automation and timers can help.

Monitor performance

Use monitoring tools or apps to keep an eye on performance, and ensure your system is working correctly.

Keep panels clean and cared for

Dust, dirt and shading can affect performance – cleaning once a year (or every 3-6 months in more exposed areas) is good maintenance. Checking for damage after storms or high winds can also help spot issues early.

Future upgrades

Add a battery

A battery can store surplus daytime solar for use later, such as in the evening or early morning. If you think you might install a battery later, consider installing a battery-ready hybrid inverter.

Increase capacity

Additional panels can be added if electricity use grows, for example due to new equipment or longer operating hours.

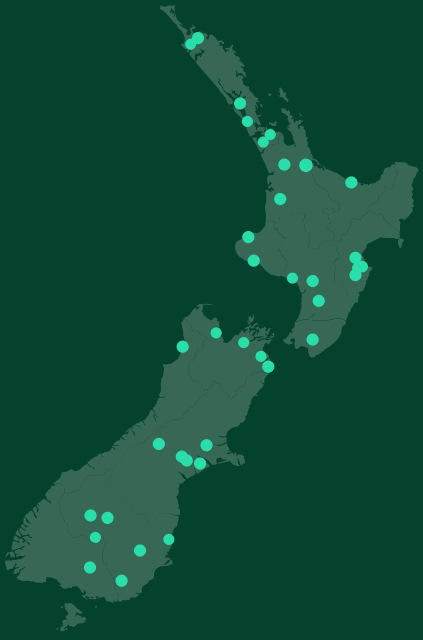
Electrify technology

Replacing diesel or gas equipment and vehicles with electric alternatives can improve solar performance.

Real farms. Real results

EECA demonstration farms

The Solar on farms programme is sharing insights and real-world data from 37 farms of various types and sizes throughout New Zealand, so you can decide if solar makes sense for your farm.



"The last power cut we had here we didn't even know there was one, we just sailed on through with the system we've got."

Michael Farmer
Fairbank Farms – Southland

"If you're having a good year, it's a great time to invest. Not just for cost savings, but to future-proof the farm against rising prices and meet customers' expectations."

Vern Brasell
Kaiwaiwai Dairies – Wairarapa

"We've never had a situation where power wasn't available when we needed it."

Mike Casey
Electric Cherries – Central Otago

Case studies

Read about New Zealand farmers who have already installed solar systems on their farms, and are reaping the benefits of lower energy costs and improved energy resilience.

Read New Zealand on farm case studies

Questions about the process?

The EECA Solar on farms team can help with planning and navigating quotes, through to best practice operations.

Talk to an advisor

Call **0800 300 643**
Email **solar@eeca.govt.nz**
Or visit **eeca.govt.nz/solar-on-farms**

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Published June 2026