

Proposed Rangitīkei Solar Farm

About FRV

FRV delivers clean, affordable and renewable energy solutions around the world.

In Australia, FRV is operating eight solar farms and building two battery projects.

In New Zealand, FRV and Genesis Energy built and operate the country's 2nd largest solar farm in Lauriston, Canterbury.

FRV plans to expand with a new solar farm in the Rangitīkei District.

Why here?

Marton has a lot going for it when considering solar generation:

- Marton has great solar irradiation (similar to sunshine hours).
- Transpower's high voltage 220kV transmission lines run through the area.
- Generally flat land.
- Easy access to State Highway 1 for construction deliveries.
- Progressive district and regional councils that promote growth and infrastructure resilience (like energy infrastructure).

What are we proposing?

The proposed 400ha solar farm has the potential to power the equivalent of approximately 55,000 homes, or to power approximately 250,000 electric vehicles.

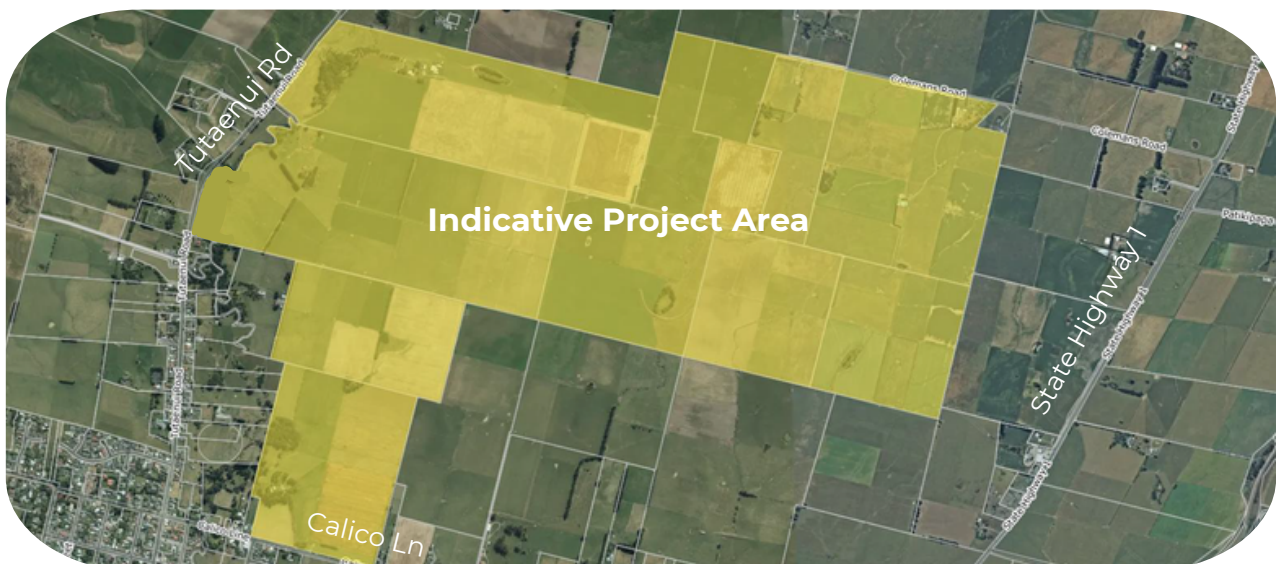
The proposed facility will consist of solar panels arranged in rows around 5m apart, with grass growing underneath. There will also be other electricity related equipment such as inverters and transformers, with most cabling located underground.

A new substation and battery energy storage system will be located near the middle of the site to export renewable electricity into the national grid lines running overhead.

What stage is the project?

FRV is currently engaging with the community ahead of lodging the resource consent application late 2026.

Ecological, visual, noise, glare and stormwater studies will help inform the final layout, with the aim of minimising potential impacts on the environment and local community.



Location of proposed Rangitikei Solar Farm

Social and economic benefits

Jobs

It will take approximately two years for the solar farm to be constructed. There will be a lot of jobs generated during this period.

Employment opportunities will be created during civil works, mechanical installation, electrical works, grid connection, commissioning, fence building and tree planting, with job numbers on projects like this reaching up to 250 full time equivalent roles during the peak of construction.

Once the solar farm is operational there will be 4 to 6 full time employees on site. In addition to this permanent workforce, there will be ongoing demand for contracted seasonal services which may include vegetation maintenance, panel cleaning, electrical testing, equipment servicing and civil maintenance.

Offering work to local people is a priority for FRV and wherever possible we will use local services and labour to bring benefits to the local economy.

Other benefits

The project will add more renewable electricity to the national grid. As we electrify our economy and our demand for electricity grows, projects like this will help households and businesses to decarbonise.

Having an economy underpinned by renewable energy helps our exporters to compete in the global market with low carbon products (meat, dairy, wool, honey).

Adding more low-cost electricity (like solar) to the network also puts downward pressure on electricity prices for kiwis.

New solar generation enhances the flexibility and resilience of our energy system by complimenting existing hydro and wind generation, effectively saving water in our hydro lakes until it's needed in the middle of winter and we don't need to burn gas or coal to get through.



Lauriston Solar Farm in Canterbury, a joint venture between FRV and Genesis Energy

The technology

How do solar panels work?

Solar panels work by letting sunlight knock electrons loose inside a thin layer of silicon, creating a flow of electricity that is then converted into usable power.

Some solar farms have panels that follow the sun across the sky. This is called tracking. Some solar farms have solar panels fixed in place and do not follow the sun. FRV is in the process of making a call on which technology is best suited for this project.



FRV worker standing next to solar panels that track the sun

How high will the panels be?

If a sun tracking system is used, usually the highest tip of the solar panels would not exceed 4.5m above natural ground level at any time of day.

If a fixed angle system is used, the highest point of the solar panels would also be lower than 4.5m.

Do solar panels cause glare?

The purpose of solar panels is to absorb sunlight, not reflect it.

The cells in solar panels are covered with an anti-reflective surface so they only reflect a small amount of the sunlight that falls on them compared to most other everyday objects, such as water surfaces and windows on your home.

FRV is currently conducting technical assessments with industry experts to assess any impact of glint and glare on neighbouring properties and roads.

How do solar farms work?

The solar panels are connected to either lots of small inverters or fewer larger centralised inverters. The inverters convert DC power from the solar panels into AC power which is used within the wider electricity network and eventually your home. Transformers then step up the voltage as the electricity passes into the solar farm substation.

The substation is the connection point between the solar farm and the national grid and also includes a transformer. The substation makes sure the voltage is suitable to go into the power lines and functions like a gate to the national grid which can be opened and closed.

FRV is including provision for a battery energy storage system, commonly referred to as a BESS. The BESS would store energy generated during the sunny part of the day and allow that energy to be exported to the national grid during times of higher demand, like dinner time.



Transformer Station at Lauriston Solar Farm

Construction activities

How long will construction take?

Once construction contractors are appointed, the build is expected to take approximately 18 to 24 months.

What are the construction activities?

As part of the site development, you may expect to see the following activities:

- Site preparation works including but not limited to earthworks, removal or trimming of existing trees, addition or removal of existing vehicle accesses, delivery hardstand area being built.
- Site perimeter planting and security fencing being built.
- Installation of underground electrical cables via trenching.
- Delivery and installation of the solar panels and frames.
- Delivery and installation of containers containing the inverter units.
- Delivery and installation of the substation components including transformers and gantry.
- Traffic movements and road control measures related to the above activities.

During construction there will be Management Plans in place to control and minimise effects such as traffic, dust and noise. This could include traffic management, water spraying for dust suppression and restricted construction hours to minimise disturbance to neighbours.



Trenches for cabling at Lauriston Solar Farm during construction

How will vehicles access the site during construction?

The project is still in development with site access points still to be confirmed.

However, FRV is currently investigating accessing the site off Calico Line given the road already functions as a heavy vehicle bypass route (built to handle trucks) and is easily accessible from State Highway 1.

How much traffic will there be?

FRV's preliminary investigations suggest that at the peak of construction (5 month period) the project would add approximately one additional truck every 7 minutes, averaged across the day.

Traffic volumes will fluctuate, and lower volumes are expected during most of the construction period.

A Construction Traffic Management Plan will also be in place, which will manage impacts from construction traffic on surrounding local roads.

How noisy will the construction be?

Construction noise is likely to be limited to 7:30am – 6:00pm Monday to Saturday, or as directed by Rangitikei District Council.

Technical assessments are being undertaken to check that proposed construction noise and vibration will comply with the relevant standards.



Solar farm with some panels installed and some yet to be installed

Operational activities

How visible will the solar farm be?

There is a lot of existing vegetation along the boundaries which will largely be retained and will partially screen the solar farm.

FRV intends to plant a combination of additional continuous and pocket vegetation along the boundaries that do not already have vegetation in order to help break up views of the solar farm.

FRV is also investigating riparian planting along the larger overland flow paths to enhance ecological outcomes as well as break up views of the solar farm.

How are the solar panels cleaned?

Solar panels need to be periodically cleaned to maintain their efficiency.

They are typically cleaned using a tractor mounted brush and water with a softener added to remove build-up of calcium and magnesium in dust deposits.

No detergents are used as these can interfere with solar panel performance.

Will there be sheep onsite?

Sheep grazing has mutual benefits with the solar panels offering shelter to the animals and the sheep helping to manage grass growth.

This dual use of land also means that the project participates in the local agricultural sector, requiring the same goods and services that any other sheep farm would require.

FRV has sheep grazing at multiple existing solar farms around the world, highlighting the economic feasibility and practicality of doing this.

The Joint Venture solar farm in Lauriston, Canterbury built by FRV and Genesis Energy has sheep currently grazing around the solar panels.

As the project progresses, FRV will be working with the landowners and local community to make it as feasible as possible to graze sheep at the project site given the multiple benefits.

FRV is hoping that the project delivers renewable electricity for a long time (at least 35 years), but at the end of its operational life the infrastructure can be removed, recycled (currently around 95% of solar panels can be recycled) and the land returned to agricultural use.

How noisy will the solar farm be?

Solar farms generally do not create significant levels of noise.

Some solar farm components, such as the inverters, the battery energy storage system (BESS) and the substation do produce some noise. FRV generally locates these as far away from property boundaries as practicable in order to internalise any noise.

FRV is undertaking noise modelling to understand how the solar farm can be designed to comply with relevant noise standards.



FRV has sheep grazing at multiple solar farms

Other questions

Is solar technology safe?

Yes. Many homes, businesses, airports, schools and hospitals have solar panels on their roofs.

However, solar farms are 'live' electrical systems, so the FRV staff who operate our solar farms are trained in order to keep themselves safe when working in and around solar panels, similar to an electrician working on the wiring in your home.



Over 63,000 kiwi homes already have solar panels installed (EECA)

What about electro magnetic fields (EMF)?

There are EMFs everywhere in our modern world. The EMFs generated at a solar farm are similar in strength and frequency to those of toaster ovens and other household appliances (Columbia Law School, 2024).

The EMFs associated with solar farms decrease rapidly with distance and would be indiscernible from other background sources at the solar farm boundary.

FRV solar farms are built in accordance with the World Health Organisation and Health New Zealand guidelines.

Are solar panels toxic?

No. The solar panels that will be used are the same technology that you would find on roofs all across New Zealand.

There are no chemical reactions happening inside the solar panel to generate electricity, therefore there are no toxic chemicals involved.

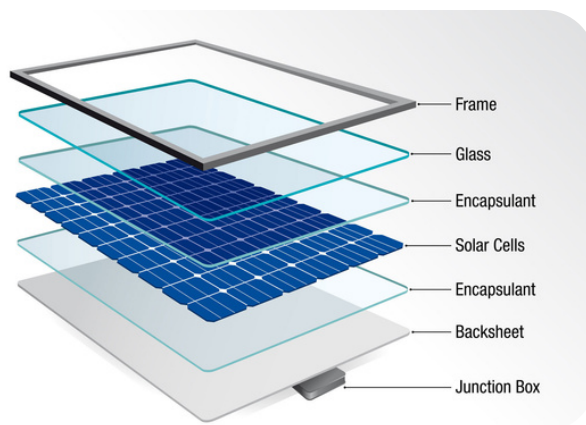
Each solar panel contains upwards of 60 solar cells. These cells are very thin wafers made from highly purified silicon, which is derived from silicon dioxide (the main component of sand and quartz, also used to make glass).

The cells are coated with anti-reflective materials (commonly silicon nitride, and sometimes other oxides such as titanium dioxide) to maximise the amount of sunlight they can absorb.

Strips of tin-plated copper are used to connect each cell to the neighbouring cell, to form the electrical circuit inside the panel.

The cells are laid out and sealed under glass to form the solar panel. Most solar panels are finished with a sturdy 4cm aluminium frame.

Solar panels undergo ballistic testing from their manufacturers and are built to withstand hail stones. If cracking occurs, FRV is incentivised to replace the affected panels quickly and get the solar farm up and running again.



The layers inside a solar panel



dion.cowley@frv.com



www.frv.com