



*Discover*

# Maama Mai

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**Tonga's first solar farm**

# How it all started

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The Maama Mai Solar Farm is an alliance between Meridian Energy Ltd, Tonga Power Ltd and the governments of New Zealand and The Kingdom of Tonga. The project is funded by the New Zealand Aid Programme.



*Groundbreaking ceremony, November 2011*

In 2009, Meridian presented a proposal on a Pacific Island solar strategy to the New Zealand Aid Programme. The strategy identified Samoa, American Samoa and The Kingdom of Tonga as having suitable electricity systems for the integration of a megawatt-scale solar photovoltaic facility. Solar development proposals were presented to the respective state-owned electricity companies.

For Tonga, the proposal was timely as it coincided with the Government's development of the Tonga Energy Road Map (TERM), which is focused on reducing the Kingdom's reliance on fossil fuel.

# The alliance

In 2011, the New Zealand Government offered full funding for the Tonga solar farm project.

Meridian provided its solar expertise as lead developer and continues to provide asset management support to Tonga Power until 2017.

Tonga Power is responsible for operating and maintaining the facility. In 2017, full legal ownership of the solar farm transfers to Tonga Power.

By the time the groundbreaking ceremony took place in November 2011, the alliance partners had invested a huge amount of time and effort in the project. The committed and collaborative approach of all the alliance partners was critical leading up to, and during, the construction phase, and remains so now that the solar farm is operational.



# Tonga's renewable energy target

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Before the solar farm, electricity generation in the Kingdom of Tonga was solely dependent on the costly importation of diesel fuel.

The Government of Tonga has a target in its Energy Roadmap 2010-20 to produce 50% of its electricity from renewable sources by 2012.

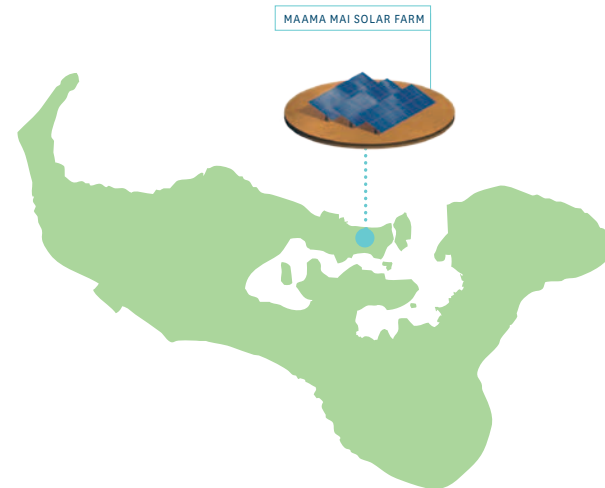
The Maama Mai solar farm provides around 4% of Tongatapu's total electricity demand.

## Did you know?

The Maama Mai solar farm reduces the country's use of diesel by approximately 470,000 litres and decreases carbon emissions by over 2,000 tonnes per annum.

# The location

The Maama Mai solar farm is located next to Tonga Power's Popua Power Station, south east of Nukuálofa, Tongatapu, The Kingdom of Tonga.





# Meridian Energy the lead developer

Meridian is an integrated renewable energy company; the largest generator in New Zealand, with a strong pipeline of development options in Australasia; and an electricity retailer throughout New Zealand.

Meridian supplies approximately thirty percent of New Zealand's total electricity needs. In New Zealand, the company owns and operates seven hydro stations, six within the Waitaki Hydro Scheme, and wind farms throughout New Zealand.



## Did you know?

Meridian gained expertise in solar energy developing its 5-megawatt solar farm CalRENEW-1 in Mendota. This was California's first grid-connected solar facility and has been operating since 2010.

# About Tonga Power

Tonga Power Limited is a small vertically integrated utility, with approximately 20,000 connections. The company operates in four main island networks in the Kingdom with over 148 staff members.

As the only electricity provider in Tonga, Tonga Power is solely owned and operated by the government. The company has been given the right to generate, distribute, and sell electricity to customers connected to the grids.

Tonga Power is committed to providing safe, reliable and affordable service to the people of Tonga. The core purpose for the energy sector is to reduce Tonga's vulnerability to oil price shocks, and achieve an increase in quality access to modern energy services in an environmentally sustainable manner.



## The construction

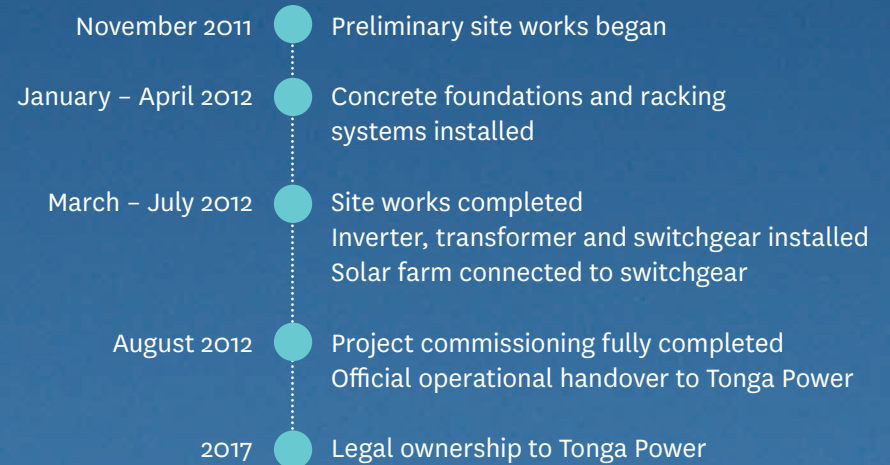
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The farm comprises 5,760 photovoltaic solar panels, manufactured by Solarworld, giving a total peak direct current (DC) capacity of 1.32 megawatts.

The panels are mounted on 240 Conergy Solar Giant III frames laid out across the site and connected via DC cabling to a central Emerson inverter.

Meridian engaged Reid Technology as the main contractor for delivering the project and Fletcher provided civil works under subcontract. Northpower were contracted by Meridian to connect the facility to Tonga Power's network.

## Project timeline





## Did you know?

The Maama Mai solar farm is designed to withstand wind loads of up to 200 km/hour.





## Converting to electricity

The inverter converts the DC electricity from the solar panels to alternating current (AC) and the transformer steps up the voltage to 11kV for connection to the electricity network.

The solar farm's AC capacity is approximately 1 megawatt.

At an expected capacity factor of about 20%, the farm is expected to generate an average of 1,880 megawatt hours of electricity per annum.

# About the New Zealand Aid Programme

The New Zealand Aid Programme is the New Zealand Government's international aid and development programme. Its mission is to support sustainable development in developing countries in order to reduce poverty and contribute to a more secure, equitable prosperous world. It is managed by the Ministry of Foreign Affairs and Trade.

To deliver its mission, the aid programme focuses on stimulating sustainable economic development. It has a geographic focus on New Zealand's own region, the Pacific.

**New Zealand's development assistance to Tonga is focused on the following areas:**

- Energy
- Small to medium enterprise development
- Tourism development
- Education and training
- Policing



## TO FIND OUT MORE

**Meridian Energy**  
**meridian.co.nz**

**New Zealand Aid Programme**  
New Zealand Ministry Of Foreign Affairs & Trade  
**aid.govt.nz**

**Tonga Power**  
**tongapower.to**

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### *Main contractors on the project*

**REID  
TECHNOLOGY**

**Northpower**  
"safe, reliable, hassle free service"

 **Fletcher®**

### *Alliance partners*

  
**meridian**

  
**TONGA POWER LIMITED**

  
**NEW ZEALAND  
FOREIGN AFFAIRS & TRADE  
Aid Programme**



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