



Tonga's first grid-connected renewable energy generation facility.

# Popua Solar Farm

The project involves an alliance between Tonga Power Ltd, the Government of Tonga and renewable energy developer Meridian Energy, with the support of the New Zealand Ministry of Foreign Affairs & Trade.



Solar panels mounted on a SolarGiant racking system

## Renewable energy target

Electricity generation in the Kingdom of Tonga is currently solely dependent on the costly importation of diesel fuel. The Government of Tonga has set a target in its Energy Roadmap 2010-20 to produce 50% of its electricity from renewable sources by 2012.

The Popua Solar Farm will provide around 4% of Tongatapu's total electricity demand. This will reduce the country's use of diesel by approximately 470,000 litres and decrease carbon emissions by over 2000 tonnes per annum. The project will also have a positive effect on reducing the electricity tariff.

## Site information

The Popua Solar Farm is being built at Tonga Power's Popua Power Station, south east of Nuku'alofa, Tongatapu.

Tonga Power will operate the farm, leasing it from the developer Meridian Energy for the initial five years and then taking over ownership.

## The developer

Meridian Energy, a leading New Zealand developer in renewable energy, will develop the solar farm. 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 April 2010.

## Construction

The farm will comprise 5,760 photovoltaic solar panels, manufactured by Solarworld giving a total peak direct current (DC) capacity of 1.32 megawatts. The panels will be mounted on 240 Conergy SolarGiant III frames laid out across the site and connected via DC cabling to a central Emerson inverter and transformer.

The inverter will convert the DC electricity from the solar panels to alternating current (AC) and the transformer will step the voltage up to 11kV for connection to the electricity network. The solar farm's AC capacity will be 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.

The overall system is designed to withstand wind loads of up to 200 km/hour.

The construction project will generate 10-15 employment opportunities, giving locals the opportunity to develop their expertise in renewable energy project construction.

## Construction timeline

Construction at the site begins in November 2011 and the farm is expected to start generating electricity by July 2012.

## Key dates

Nov 2011

## Milestones

Preliminary site works begin

Jan-Apr 2012

Concrete foundations and racking systems installed

Apr-May 2012

Solar panels and wiring installed

Mar-Jun 2012

Site works completed

Inverter, transformer and switchgear installed

Solar farm connected to switchgear

Jul 2012

Fully commissioned – starts generating electricity



Aerial view simulation of the Popua solar farm

## Contractors involved

The contractors involved in building the solar farm are:

- Reid Technology (Head contractor)
- Kordia (Civil design & engineering)
- Fletcher Royco Joint Venture (Civil works, concrete foundations & panel installation)
- SolarWorld (Solar panel supply)
- Conergy (Racking system supply)
- Emerson-Control Techniques (Inverter/transformer supply)
- Northpower (11kV Interconnection)
- Sinclair Knight Merz (Electrical design & commissioning).

## Project funding

Project funding has been provided to the Government of Tonga by New Zealand's Ministry of Foreign Affairs & Trade Aid Programme.

## FURTHER INFORMATION

**Meridian Energy Ltd**  
[www.meridianenergy.co.nz/popuasolarfarm](http://www.meridianenergy.co.nz/popuasolarfarm)

**New Zealand Aid Programme (New Zealand Ministry of Foreign Affairs & Trade)** [www.aid.govt.nz](http://www.aid.govt.nz)

**Tonga Energy Roadmap 2010-2010**  
[www.tonga-energy.to](http://www.tonga-energy.to)

**Popua Solar Farm Project updates**  
[www.facebook.com/popuasolarfarm](http://www.facebook.com/popuasolarfarm)

