renews

SEIAPI
Sustainable Energy

Newsletter of the Sustainable Energy Industry Association of the Pacific Islands Issue 1 • MARCH 2023

ROP'S FIRST INDEPENDENT POWER PRODUCER (IPP) SOLAR FARM

The Palau Public Utilities Corporation (PPUC) remains committed in achieving Palau's target of 45% renewable as contemplated under the Nationally Determined Contributions (NDCs) declared in 2015. At nearly 94% of energy generation deriving from diesel, PPUC consumes approximately 6,000,000 US gallons of diesel per year. Despite the unanticipated challenges of COVID-19, PPUC continues to engage in efforts to reduce its dependency on fossil fuel and integrate more renewable energy. Presently, PPUC and the Republic of Palau (ROP)is on the verge of launching Palau's first Independent Power Producer (IPP) focused on the Koror – Babeldaob grid to raise the renewable energy generation levels from the current 6% to a minimum of 20%. This partnership between the PPUC and Solar Pacific Energy Corporation (SPEC) aims to construct a 13.2-Megawatt (MW) solar PV facility with a 10.2 MW energy storage system to generate a minimum of 20 Gigawatt hours (GWh) per annum for twenty (20) years with the possibility of an extension of an additional five (5) years. The project is now more than 50% complete with an anticipated completion date for April 2023. The Project is made possible through the support of the Australian Government.

NEW ONLINE SHORT COURSES AT USP PACIFIC TAFE

Article by: Geoff Stapleton

One key feedback from the workshops that were conducted by SEIAPI/PPA in 2018-2020 through funding from the Sustainable Energy Industry Development Project (SEIDP) was the need for more training being available throughout the Pacific. SEIAPI has been working with SEIAPI member, GSES, to improve access to training in the Pacific region. To meet this aim, SEIAPI is pleased to announce that USP Pacific TAFE has launched 12 new online short courses.

The new short courses, the expected duration for undertaking each of the online course and the fees are shown below. These courses are self-paced so people can sign up and undertake the course at their own pace. Most courses do include online assessment and a certificate is provided on successful completion of the course.

Course Title	Duration	Fee (FJD)
AS/NZS 5033:2021 Updates – Online Short Course	3 hours	$ 49.00
Solar Hot Water Systems	3 hours	$ 49.00
Communications, Monitoring and Control	4 hours	$ 299.00
Fault Current Analysis for Commercial Solar	2 hours	$ 369.00
Introduction to PV Syst: Grid-Connected PV Systems	6 hours	$ 499.00
Operation and Maintenance of PV Systems	3 hours	$ 369.00
Power Cable Selection for PV Systems	5 hours	$ 369.00
SketchUp for Solar PV Systems	6 hours	$ 369.00
Solar Battery System Fundamentals	4 hours	$ 369.00
Solar Sales Essentials	2 hours	$ 369.00
Utility Scale Solar Projects	8 hours	$ 499.00
Solar Power System Fundamentals	20 hours	$ 499.00

USP and GSES representatives during a recent meeting

ATMOSPHERIC WATER MAKER FOR MAU COMMUNITY, FIJI

Article By: Victron Energy

The community of *Mau* and its 100-student school in the Namosi district of Fiji have just taken delivery of an atmospheric water maker. The device condenses water vapour from humid air to produce clean charcoal-filtered drinking water. The installed unit can supply up to 450 litres per day.

Mau has a population of around 500 people whose water supply is currently either rainwater – which must be boiled if it is for consumption – or else it comes from a borehole, the level of which has been falling recently.

The water-making device collects water produced through condensation and works most efficiently in conditions where the humidity is typically above 46%, the ambient temperature is around 25°C, and where there is a reliable power source.

The company behind the atmospheric water-maker, Waiea water, asked Fiji Victron installer, Solar Fiji to design a three-phase off-grid solar energy power plant to provide the unit with its 4kWh – 5kWh power demand.

The installation was funded by the Branch family who are also Mau residents.

The System comprises an 8.9kW array with 29kWh of lead acid battery storage and following Victron Energy Equipment:

- 3 x MultiPlus-II Inverter/Chargers 48V 5000W configured for off-grid supply of three-phase electricity.
- 2 x SmartSolar Charge Controller MPPT 250/100
- 3 x Lynx Power in DC busbar for tidy power distribution
- 2 x Smart Solar MPPT 250/100-Tr VE. Can
- 1 x Color Control GX communication device.

SOLAR TIPS

by: Solar Fiji

A grid-connected solar system is an excellent way for Phama Plus and Road King Farms in Taveuni, Fiji Islands to meet their energy needs while reducing their reliance on fossil fuels. Here are some steps that could be taken to implement such a system:

1. **Conduct a feasibility study**: A feasibility study should be conducted to assess the suitability of the site for a grid-connected solar system. This study will take into account factors such as the available space for solar panels, the amount of sunlight the site receives, and the existing infrastructure for connecting to the grid.
2. **Determine the system size**: Based on the energy needs, the system size should be determined. This will involve calculating the total amount of energy the system needs to generate to meet the site's demand.
3. **Select solar panels and inverters**: High-quality solar panels and inverters should be selected to ensure the system is reliable and efficient. The choice of panels and inverters will depend on the site's specific needs and requirements.
4. **Obtain necessary permits**: The project will require permits and approvals from the local authorities. This may include building permits, electrical permits, and approvals from the utility company.
5. **Install the solar system**: Once all necessary approvals and permits have been obtained, the solar system can be installed. This will involve installing the solar panels, inverters, and other necessary equipment, as well as connecting the system to the grid.
6. **Commission and test the system**: After the system is installed, it will need to be commissioned and tested to ensure it is functioning properly. This will involve testing the solar panels, inverters, and other equipment to ensure they are generating the expected amount of energy.
7. **Monitor and maintain the system**: Regular monitoring and maintenance will be required to ensure the system continues to operate at peak efficiency.

Overall, a grid-connected solar system is an excellent way for site to meet their energy needs and help reduce the reliance on fossil fuels. By following the steps outlined above, a reliable and efficient solar system can be installed to provide clean, renewable energy for years to come.

20.80kWp Jinko & Fronius Commercial Grid Connect System

Solar Fiji designed and installed a premium quality 20.80kWp Jinko 400W Solar Panel system using Fronius Symo 20kW 3-phase inverter on a factory roof top called Pacific Global Australia in Taveuni, Fiji Islands.

SOLAR POWER AND AGRICULTURE CAN WORK TOGETHER TO IMPROVE YIELD EFFICIENCY

Fermin Koop

Extracted from: (https://www.zmescience.com/science/solar-power-and-agriculture-can-work-together-to-improve-yield-efficiency/)

The world needs to produce more food and clean up its energy grids.

Increasing our solar energy capacity will be a big part of solving the climate crisis. At the same time, global food demand is expected to increase by 50% by 2050. This can create a conflict of interest between food and solar energy production. Agrivoltaics suggests using the same area of land to produce food while rolling out more solar power.

The concept has been discussed for decades, but it's only in recent years that it has become relevant to develop projects on a larger scale. Agrivoltaics technology can now be found in almost all regions of the world, from the US to South Korea. This has increased interest among researchers in better understanding the crop yield outcomes of using this approach.

Researchers at Cornell University have found growing commercial crops on solar farms can increase food production while improving solar panel performance and longevity. They created a tool to test the costs and benefit of placing solar panels on agricultural land and tested it on soybean crops, finding positive results that reinforce the role of agrivoltaics.

"There is potential for agrivoltaic systems to provide increased passive cooling through taller panel heights, more reflective ground cover and higher evapotranspiration rates compared to traditional solar farms," senior author Max Zhang said in a statement. "We can generate renewable electricity and conserve farmland through agrivoltaic systems."

TESTING SOLAR PANELS IN AGRICULTURE

Using solar panel temperature data and a climate model, Shang and his team evaluated solar panel height, the light reflectivity of the ground and rates of evapotranspiration (the process where water vapor rises from the plants and soil). They found solar panels set up over vegetation had surprising cooling effect, enhancing the solar panel lifespan and agricultural productivity.

"As you decrease the solar panel operating temperature, you can increase efficiency and improve the longevity of your solar modules," Henry Williams, lead author said in a statement. "We're showing dual benefits. On the other hand, you have food production for farmers, and on the other hand, we've shown improved longevity and conversion efficiency."

The researchers also make recommendations for placing the panels: panel should be placed higher above the soil. Solar Modules mounted 13 feet(3.9 metres) above the ground resulted in temperature reductions of up to 50F(10C), compared to solar farms mounted just 1.6 feet(0.45 metres) over bare soil.

The study was published in the journal Applied Energy.

INTERESTING USE OF SOLAR MODULES

Solar modules can always be put to good use – Defective solar panel beings used as table tops

SAVE THE DATE

Asia Pacific Solar Research Conference (ASPRC)

The APSRC organising committee is pleased to announce that the dates for the 10th APSRC have been set – please block out your diary for **December 5-7, 2023.**

APSRC will be held in Melbourne at RMIT University in the centre of the city, convenient to transport and accommodation options. The conference will follow the usual format of plenary sessions with invited speakers and breakouts with submitted presentations. There will be poster sessions and lots of opportunities for networking at coffee and lunch breaks, and a conference dinner.

Abstract submissions will open on May 1, and will close on Friday August 25. The list of themes is:

- PV Devices
- Renewable Energy Deployment & Integration
- Solar Buildings and Solar Heating and Cooling
- Concentrating Solar Thermal & Process Heat & Chemistry

The organising committee is excited to invite you to join us in Melbourne in December for what promises to be an exciting and engaging conference. Up-to-date details will be available on the conference website:
https://apvi.org.au/solar-research-conference/

Tell us what important technical topics you wish to see in the next newsletter and we will try to get them to you.

Email your topics on secretariat@seiapi.com or info@seiapi.com or admin@seiapi.com