

MINI-GRIDS DEVELOPMENT IN THE PACIFIC

Pacific Centre for Renewable Energy and Energy Efficiency



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Background

- The Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE) has been established to play a key role in promoting and supporting private sector investment in renewable energies (RE) and energy efficiency (EE) in the Pacific region.
- Hosted by the Pacific Community (SPC) based in Nuku'alofa, Tonga
- Funded and support by the United Nations Industrial Development Organisation (UNIDO) and the Austrian Development Agency (ADA).
- Part of the Global Network of Regional Centres (GN-SEC)
- PCREEE was officially launched in April 2017

Launching of the PCREEE in Tonga,

26 April 2017



PCREEE's Mission and Objectives

Mission:

To create, educate, and facilitate the increased awareness and development of the RE&EE Agenda in the Pacific region, with special emphasis on the private sector and local industries.

Objectives:

- To improve access to modern, affordable and reliable energy services, energy security and mitigation of negative externalities of the energy system (e.g. local pollution and GHG emissions)
- To promote renewable energy and energy efficiency investments, markets, and industries in Pacific Island Countries and Territories (PICTs).

PCREEE BUSINESS PLAN 2020-2030 STRATEGIC PROGRAMMES

1. Programme 1. RE&EE Business Start-Up and Entrepreneurship Support
2. Programme 2. RE&EE for Sustainable Mobility
- 3. Programme 3. RE Mini-grids**
4. Programme 4. Energy Efficiency Investment

3. PCREEE Programme Area 3. RE Mini-grids

Output 3.1 Market Intelligence: Enhanced awareness of mini-grid market and strengthen market knowledge through market intelligence development.

Indicator

Database of Mini-grid projects in PICTs

Baseline and Targets

Baseline: Little data available

Target: (i) Design of database, data format, data collection, (ii) Training of operational staffs at project sites for data collection and communication, (iii) Construction and operation of web-based data communication platform, (iv) Staffing of database operation and update

What is a Mini-grid?

- Mini-grid is defined as a series of electricity generators and energy storage systems connected to an electrical distribution network which provides electricity to customers in a specific geographic area.
- Mini-grids, also known as “**isolated grids**” or “**micro-grids**” are usually **small scale (10kW to 10MW)** and operate separately from national electrical transmission networks. Mini-grids are a cheaper option in rural or isolated areas where connecting to the national grid is cost prohibitive.
- Some systems may be designed so that they connect with existing networks so that they can assist in the maintenance of power quality.

Mini-grids in the Pacific Island Countries



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- Tonga
- Samoa
- Vanuatu

TONGA

- **Name:** Min-Diesel Genset
- **Location:** Nomuka, Ha'afeva, Uiha. Ha'ano, Niuatoputapu
- **Power system:** Solar PV, Battery Energy Storage System, Diesel Generators
- **Year of installation:** 2002
- **Entity responsible for O&M:** Cooperative Society



- **Nomuka Min-Diesel Genset**
- **Location:** Nomuka, Ha'apai
- **Number of households:** 162
- **Solar PV:** 100 kWp
- **Battery Energy Storage System:** 210 kWh
- **Diesel Generator:** 1) 41 KVA; 2) 63 KVA
- **Year of installation:** 2002
- **O&M:** Nomuka Island Electricity Society



Way forward

- The need of smart grid for a remotely monitoring and control of the system
- Telecom reception to be available at all sites and software packages to use online

SAMOA

- **Name:** Apolima Hybrid (PV-battery and diesel genset)
- **Location:** Apolima Island, Samoa
- **Number of households:** 10
- **Solar PV:** 13.44 kWp
- **BESS:** 3000 Ah
- **Diesel Generator:** 22 KVA
- **Year of installation:** 2007
- **O&M:** Electric Power Cooperation (EPC)



Challenges

- Switching between the Diesel and PV-Battery power sources is done via mechanical switch
- Generator is stored outside with partial housing. The rain can still reach the generator as evident by rusting.



VANUATU

- **Name:** Solar PV Micro-grid
- **Location:** Wintua & Lorlow Communities, Malekula, VANUATU
- **Number of households:**
Wintua: 60
Lorlow: 42
- **Solar PV:** 51 KW & 73 KW
- **BESS:** 400 kWh
- **Year of installation:** 2020
- **O&M:** Cooperative Society



VANUATU



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Challenges and Way forward for Wintua and Lorlow Communities

- Establishing a sustainable business model involving relevant stakeholders
- On-going Training and Capacity building for the community
- A workable technical and commercial model for long term operation and maintenance of the project needs to be completed before the project commissioning
- A working group involving DoE, URA, Utilities, DLA, Cooperatives, Education and community could be a way forward in identifying a viable business model.



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Thank you



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SE4ALL Centre of Excellence to Promote Sustainable Energy Markets, Industries and Innovation