Mission Report

"Joint Mission for Business Skills, Productive Use of Energy (PUE), Technical Refresher Training, and Annual General Meeting in Niuafo'ou."

Niuafo'ou, Tonga | 4 – 9 June 2025

Group Photo taken after the training at Vahe-Hihifo

1. Introduction

The Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE), in collaboration with Infratec Ltd, conducted the final island-based mission of the Tonga Renewable Energy Project (TREP) in Niuafo'ou from 4–9 June 2025. This mission marked the completion of a series of capacity-building initiatives delivered across 8 outer islands [4 in Vava'u and 4 in Ha'apai) of Tonga under the TREP project.

The program in Niuafo'ou comprised three key components: Business Skills and Productive Use of Energy (PUE) training, Mini-grid Operators Training, and the Annual General Meeting (AGM) for the Niuafo'ou Island Sustainable Electricity Society (NOISES).

2. Mission Objectives

The objectives of the training and meeting were:

- To build on the business skills and capacity of the Niuafo'ou residents to engage in income-generating activity from increased electricity supply.
- Promote the adoption of Energy Efficiency measures and the productive use/utilization of energy
- Raising awareness of possible small-scale business opportunities and available subsidies to assist the establishment of sustainable energy businesses.
- To conduct refresher training for local mini-grid operators on the technical operation, maintenance, and daily management of the solar mini-grid systems, ensuring reliable service delivery and community accountability.
- To support governance and coordination by facilitating the Annual General Meeting (AGM) for the Niuafo'ou Outer Island Solar Electrification Societies.

3. Mission Methodology and Participants

1. Business Skills and PUE Training

Training Agenda is contained in **Annex 1**

The training sessions for Business Skills and PUE were conducted over 3-consecutive days, with each day dedicated to a different provincial division of Niuafoʻou. The objective was to ensure community-wide participation by targeting central locations accessible to surrounding villages. The schedule, including date, venue, and participating villages, is summarized in the table below:

DATE	PROVINCE	TRAINING VENUE	PARTICIPATING VILLAGES
WEDNESDAY 4TH JUNE 2025	Western province (Vahe Hihifo)	Catholic hall @ Kolofo'ou	'Esia and Kolofo'ou
THURSDAY 5TH JUNE 2025	Central province (Vahe Loto)	Wesleyan Hall @ Mata'aho	Kolofo'ou, Sapa'ata, Fata'ulua & Mata'aho
FRIDAY 6TH JUNE 2025	Eastern province (Vahe Hahake)	Wesleyan Hall @ Petani	Mu'a, Tongamama'o % Petani

All trainings were delivered through a power-point presentation (in Tongan translation) and a question-and-answer session was allocated after each session to address concerns and questions from the participants. However, the English version of the power point is also available for reporting purposes etc.

Resource people

The following were the training co-facilitators, each covering specific topics during the training:

Mr. Sosefo Tofu from PCREEE:

- Introduce PCREEE and its roles and to share experiences with their support provided to Pacific Island Countries (PICs).
- Presentation on Business Skills and Productive Use of Energy
- Provided some tips on energy efficiency

Mr. Kipola So'otanga from Tonga Department of Energy

- Overview of Tonga Energy Sector – existing energy policies, roadmaps and targets
- Brief on Renewable Energy technologies and applications – solar water pumps & freezers, wind and solar farms, biogas
- Share some of the main existing RE projects and some insights on the established cooperatives solar societies at the outer islands in Tonga – highlight of TREP, OIREP etc.

Participants /Attendees

Over 70 participants benefitted from this 3-days training and participant list for each training day can be accessed through here.

Provinces	Male	Female	Total
Western (Hihifo)	9 (38 %)	15 (62 %)	24
Central (Vaheloto)	11 (39%)	17 (61 %)	28
Easter (Hahake)	5 (27%)	13 (73%)	18
	25 (36%)	**45 (64%)**	**70**

--Participants analysis

2. NOISES AGM and Mini-grids Operators Training

The mission was concluded with an annual general meeting for the NOISES and mini-operators training the was facilitated by Mr. Kipola So'otanga – a renewable energy expert from the Department of Energy. The operator's training session focused on enhancing the operators' technical capacity in system monitoring, basic maintenance, and troubleshooting to ensure continued and sustainable operation of the energy systems

4. Summary of sessions

1. Business Skills and PUE Training

As outlined in the program agenda, the topics covered in the training across the provinces in Niuafo'ou were broadly similar. The following is a summary of each session. To ensure the content was accessible and aligned with the level of understanding of the village residents, the training facilitators delivered their presentation in a bilingual manner i.e. both English and Tongan.

This section will summarize all the topics/agendas that have been presented to participants during the training.

All presentation slides can be accessed here.

Session 1: Overview of Tonga Energy Sector and existing RE projects

All presentation slides during this session can be accessed through here

Facilitator: Mr. Kipola So'otanga

Mr. So'otanga began the presentation by setting the scene with a brief overview of the Tonga Energy Sector:

- Who are we (Department of Energy)?
    - Objective of the work of the department is "to reduce vulnerability to fuel price fluctuations and increase security and quality access to modern energy services in an affordable, more coordinated, financially and environmentally sustainable manner.
- Tonga Energy Act 2021 signed into law by His Majesty in 2022, this legislation provides a comprehensive legal framework for the regulation, management, and development of Tonga's energy sector.
- Key various energy sector plans or policies were then presented such as:
    - Tonga Energy Roadmap Plus (National Energy Policy)
    - Tonga Energy Efficiency Master Plan (TEEMP)
    - Low Emissions Development Strategy (LEDS)
    - Tonga 2nd NDC.

Further, he shared some of renewable energy programs and its practical uses in Tonga. He began by discussing various renewable energy technologies available globally, emphasizing those most suitable for Tonga's geographic location. While many options exist, he highlighted solar power, wind power, biomass, tidal power, and wave energy as the most viable for the country.

- Solar power, being the most dominant renewable energy source in Tonga, received particular attention. Mr. So'otanga shared examples of solar technologies implemented and monitored by the Department of Energy.
    - Solar Home Systems have been widely installed in the outer islands of Tongatapu, Ha'apai, Vava'u, and the two Niuas, providing essential energy solutions for rural households.
    - Solar freezer systems have been deployed in the outer islands of Ha'apai and Vava'u to support food preservation, while solar pump systems have been installed in rural areas of Tongatapu, Ha'apai, and Vava'u to improve access to water.
- He also noted recent advancements in mini-grid systems, which have been commissioned in 8 outer islands under the TREP project (4 in Ha'apai and 4 in Vava'u), representing a significant step toward expanding energy access and strengthening energy resilience in remote communities.

He concluded his presentation with sharing the institutional structure that currently exist for the established solar societies in Vava'u and Ha'apai outer islands as well as the two Niuas. He further elaborated on the roles of each from ministerial, regional, operational, customer service and users level.

Session 2: PCREEE Overview and Support for Renewable Energy, Business Skills Development and link between EE and PUE

Facilitator: Mr. Sosefo Tofu from PCREEE

Mr. Tofu began the presentation by providing an outline of the topics that have covered during the training. The topics that have been covered are categorized into three:

1. ***PCREEE's background – roles and experiences***
    - He provided an overview of the organization's background and its roles. PCREEE was formally established in April 2017 to promote and support private sector investment in Renewable Energy (RE) and Energy Efficiency (EE) in the Pacific region.
    - Key areas of support to PICs include:
        - ✓ Capacity Buildings Program
        - ✓ Energy Policy Development – (incl. guidelines /standards)
        - ✓ Energy Forum, Awareness
        - ✓ Funding subsidy [incentives]
        - ✓ Development/review of Concept Note and Project Proposal.

- He has introduced the 4 program areas within the PCREEE Business Plan 2020-2030, examples of supporting initiatives for PICTs were highlighted under each area.

    a. *Program 1: RE & EE Business Start-up and Entrepreneurship Support*
        - Supported the development of Sustainable Energy Certificate o In Tonga, NSCE Level 1 & 2 successfully started on the 12 September 2022 with 20 students (71% female, 29% male) registered under Level 1 and 30 students for Level 2 (21% female, 79% male).
        - Certificate Level 3 has successfully registered in Tonga 2023 while development of Certificate 4 is underway.
        - Introduced a subsidy scheme to increase RE&EE business opportunities – e.g. Vanuatu and Solomon Islands
        - Promoted RE Business Start-ups and Entrepreneurship in the Rural Areas of Vanuatu.
        - Provided internship opportunities for tertiary students to gain practical experience.

    b. *Program 2: RE & EE for Sustainable Mobility*
        - Supported the development of Regional E-mobility Policy – started rolling out in 2021.
        - Supported the demonstration of EV technologies and business services.
        - Supported the development of EV standards and guidelines.
        - Hosted both regional and national workshops on E-mobility.

    c. *Program 3: RE Mini Grids*
        - Supported with capacity programs and training on mini -grids maintenance and operation such as the mini-grids training that delivered in Ha'apai Vava'u outer islands.
        - Supported the development of standards and guidelines for Mini grids.
        - Conducted Feasibility Study and promoted national mini - grid awareness, information and promotion campaign.

    d. *Program 4: Energy Efficiency Investment.*
        - Supported the Pacific Island Countries with operationalizing the Energy Efficiency Legislations – such as the Minimum Energy Performance Standards and Labelling regulation.

- Supported the national energy events – forums/awareness etc.

2. *Basic Business Skills and Financial Management.*

- He began this session with providing a baseline information on the existing businesses that are currently operating at the outer islands such as Fisheries and agricultural products as well as handicrafts.
- Some of the potential income opportunities upon accessing 240 AC power supply were shared:
    a. Barber shop
    b. Retain shop
    c. Hired-DJ
    d. Restaurant and resort
    e. Tailoring
    f. Laundry
    g. Etc.
- Before starting a business, you might need to consider thinking about these key steps:
    a. Develop a business idea
    b. Create a simple business plan
    c. Register your business
    d. Open your bank account.
- Various ways of accessing start-up funds to establish businesses. Could be from:
    a. your personal saving
    b. Bank loan
    c. Microfinance loan – SPPD etc.
    d. Government grants/subsidy program.
- Some of the basics financial management were provided to participants/ residents as below:
    a. Cash flow – it refers to the movement of money in and out of a business. It is essential to understand how the business earns revenue and how that money is allocated to cover expenses on time, prevent cash shortages, and set aside savings for emergencies and future growth
    b. Budgeting – ***planning*** of how much $$ you expect to earn (income) and how much to spend (expenses).
       An example was provided to participants of how to do a simple budget for running/operating a barber shop.
    c. Record keeping – involved collecting, organizing, storing and maintaining information related to a business's financial and operational activities.

3. *Electricity Cost, energy efficiency initiatives/savings and PUE*

- This session introduced participants to:
    a. Understanding electricity costs and billing.
        - A copy of the monthly electricity bill from Tongatapu and Neiafu was shared, highlighting the importance of tracking power usage on a daily or weekly basis.
    b. Energy efficiency measures to reduce electricity consumption
        - The Minimum Energy Performance Standards and Labelling (MEPSL) program was introduced as one of the key initiatives

to promote the use of energy-efficient appliances across Tonga. As part of the MEPSL program, the energy star labels currently used in New Zealand and Australia were highlighted.

2. Mini-grids Operators Training.

The primary aim of this training was to build the capacity and confidence of the solar mini-grid operators in Niuafo'ou. The training was designed to ensure the reliable 24-hour operation of the solar mini-grid system, thereby supporting continuous electricity supply and improving services for the people of Niuafo'ou.

Training participants:

Name	Gender	Profession
Siokoe Fangatua	M	Niuafo'ou Electricity Society Technician
Malialupe Kuluka	F	Niuafo'ou Electricity Society Tresurer
Tangimausia Kalu	M	MEIDECC Niuafo'ou Energy Technician
Loisi Filiai	F	MEIDECC Niuafo'ou Energy Technician Trainee

Summary of topics covered in the training

1. Compliance: Safety Instructions and Site Rules
   - *Emphasized the importance of being mentally and physically prepared before starting work — no rushing.*
   - *Encouraged the use of appropriate safety clothing, including closed shoes or safety boots.*
   - *Stressed that no one is allowed on site without permission.*
   - *Prohibited playing or engaging in unsafe behavior on site due to the dangers of high voltage.*
   - *Reinforced the need to report any accidents immediately.*
2. Technical Skills: Understanding Mini-Grid Components and Functions
   Participants were introduced to the key components of the solar mini-grid and how they function:
   - *Solar Modules – Convert sunlight into direct current (DC) electricity.*
   - *Inverters – Convert DC electricity into alternating current (AC) for household and commercial use.*
   - *Battery Banks – Store energy for use during the night or on cloudy/rainy days.*
   - *Switchboards – Manage generation, storage, and distribution within the mini-grid system.*
   - *SCADA System – Software that enables system monitoring, data acquisition and analysis, and network communication.*
   - *Transformers – Step up the voltage output from the powerhouse for distribution across the network.*
3. Soft Skills: SCADA System Operation
   - *Provided a basic introduction to SCADA (Supervisory Control and Data Acquisition).*
   - *Explained the system's functions: data collection, presentation, system control, and network communication.*

- *Described system connectivity: wiring from mini-grid components and sensors to a laptop with internet access.*
- *Covered the key SCADA interface pages: Overview, Control, Solar PV, BESS (Battery Energy Storage System), Alarms, and Information.*
- *Hands-on session to view, practice, and become familiar with the SCADA system.*

4. Operators' Jobs and Responsibilities: Reporting and Logging
   - *Daily Tasks: Inspect all components to ensure proper functioning.*
   - *Bi-weekly Tasks: Clean the entire site area.*
   - *Monthly Tasks: Prepare and submit a monthly operational report.*
   - *Annual Tasks: Conduct structural performance checks of the power station.*
   - *Bi-annual Tasks: Perform earth tests, including both site and residential earth loop tests.*
5. System Diagnosis and Emergency Contact
   - *In the event of a technical issue, software malfunction, or blackout, operators were instructed to urgently contact the Tonga Department of Energy for further assistance.*

5. Training Evaluation

To assess the effectiveness of the training, evaluation was conducted using qualitative approaches. The evaluation aimed to gather insights into the training content, delivery, and overall impact on participants.

1. Evaluation Methods

The following approaches were used to evaluate the training:

- Interactive discussions & Q&A sessions: after each session, participants engaged in discussions and asked questions to clarify concepts, express concerns and share their perspectives on the topics presented.
- Observations by facilitators: the facilitators assessed participants' engagement, attentiveness, and level of understanding throughout the sessions, noting areas where additional explanations were required.

2. Key Evaluation Criteria.

- Participants' responses were assessed based on the following criteria:
  i. Relevance of the topics: usefulness of the training content in relation to business opportunities and basic financial management.
  ii. Presentation quality – clarity and effectiveness of the facilitators in delivering the sessions.
  iii. Practical Application – participants' confidence in applying the knowledge gained to improve their business activities (if already existed).
  iv. Overall Satisfaction – General feedback on the training experience and recommendations for further training sessions.

3. Summary of Evaluation Findings.

Participants expressed appreciation for the training, particularly on the key roles of the PCREEE and support provided to PICs, understanding basics financial management, identifying new business

opportunities, and learning about minigrids operation, management and maintenance. The interactive discussions were well received, and most participants highlighted the importance of ongoing support and follow-up training sessions.
The feedback gathered from this evaluation will help improve future training programs, ensuring they continue to address the needs of outer island communities effectively.

6. Conclusion

The Niuafo'ou training marked the 9th and final island-based activity under the Tonga Renewable Energy Project (TREP), successfully concluding a nationwide effort to strengthen remote community /village capacity in managing and benefiting from new centralized mini-grids system. The training equipped participants with foundational business knowledge, financial management skills, and technical understanding essential for the productive and sustainable use of energy. Over 70 participants gained valuable knowledge in financial literacy, business planning, and energy productivity, while mini-grid operators strengthened their skills for ensuring uninterrupted power supply.

Over the course of the TREP initiative, outer island communities have gained valuable tools to improve their economic resilience, energy awareness, and operational capacity. The success of the final mission in Niuafo'ou reinforces the importance of continued support, particularly in areas such as access to finance, technical follow-up, and business mentoring.

The collaborative efforts of PCREEE, Infratec Ltd, and the Ministry of MEIDECC have played a pivotal role in empowering Tonga's outer islands to fully benefit from the opportunities presented by renewable energy. Sustained engagement and future programs will be key to maximizing the long-term impact of TREP's achievements across the Kingdom.

Annex 1 –Business Skills and PUE Training Tentative Agenda 4 – 6 June 2025

Agenda items (proposed topics)	Facilitator /presenter
Brief overview of the training, its objectives and what will be covered. 5 mins	PCREEE
Tonga Renewable Energy Project – background & progress to date. 5 mins	DoE
Introduce PCCREEE and its roles and share experiences in brief with their support provided to Pacific Islands Countries including Tonga, in terms of: • Sustainable Energy Business Start-up includes sustainable Energy qualifications in Tonga • Sustainable E-mobility – EVs etc • Mini grids • Energy Efficiency Investment 5 mins Presentation on Business Skills and Productive Use of Energy • Identifying income opportunities – refrigeration for fisheries, tailoring, restaurants /cafes, handicraft etc. • Basic Financial Management – budgeting for startup /capital costs and operating expenses, understanding revenue, profit and cash flow. • Electricity costs and savings – how to read monthly bill and to understand electricity usage, rates and bills. • Strategies to minimize operational costs with energy efficiency – elaborate on Minimum Energy Performance Standards and Labelling. 20 mins	PCREEE
Operator's Training (Kipola will confirm the topics) 30mins	DoE
 Questions and Answers Session 20	Facilitated by PCREEE
Wrap Up and Close 5 mins	Facilitated by PCREEE
** Refreshments will be provided after each training	