



Renewable Energy and Energy Efficiency Technology Applications Training

Concept Note

1.0 Background

The Department of Energy (DoE) with support from the United Nations Development Programme (UNDP) are currently implementing a Global Environment Facility (GEF 6) funded project referred to as the Barrier Removal for Achieving National Energy Road Map Target of Vanuatu (BRANTV) Project for the Vanuatu Government to address the National Energy Road Map (NERM) rollout. The project is managed by the Project Management Unit (PMU) which sits under the DoE.

The project's objective is to enable the achievement of the energy access, sustainable energy, and green growth targets of Vanuatu, as represented in the country's National Energy Road Map (NERM). Central to the approach is BRANTV's implementation of Vanuatu's Rural Off-Grid and EE Promotion Program which includes demonstrations¹ on: pico-/micro hydropower mini-grid system,; pico-/micro hydro PV hybrid mini-grid system, community-scale solar PV systems, family compound-scale PV nano solar systems; and applications of EE cook stoves, and productive, livelihood-enhancing uses of RE and EE.

The BRANTV project Outcome 1 is to improve capacity and awareness on sustainable energy, energy access, and low carbon development in the energy, public, private, and residential sectors.

While Vanuatu has substantial baseline programs efforts to install RE systems in off-grid areas, training is very limited and generally consists of one-time training upon installation of systems. The department of Energy through BRANTV PMU addresses lack of capacity by delivering training program to the communities to become local operators of PV solar systems. These Local Operator Trainings (LOT) are delivered at the local village communities which have been identified for implementation of Community Scale PV Solar systems and Family Compound nano-grid systems across 18 islands of Vanuatu. Training covers installation, operation and maintenance and repair of solar systems. BRANTV has a target to train 300 individuals by end of the Project term (2022) of which at least 30% trained are women.

Similarly, the BRANTV PMU will conduct a training program in the making of the Energy Efficient (EE) cook stoves and crop dryer. Training will cover sourcing of materials, production of stoves, and sales and distribution approach. About 30 person will be trained. A test to assess mastery will be prepared and administered after training is completed. Artisans achieving a high level of mastery and showing commitment to promote the stoves will be provided necessary tools for making the stoves. Artisans will include those from Port Vila and at least one from each of the project's village scale community PV sites,

¹ Demonstrations are actual hardware implementations. There are 4 different demonstrations of which 19 are either Pico or Micro hydroelectric systems with its mini-grid, 1 hybrid system which is made up of a Pico hydro and solar, community based standalone solar system approximately 5 to 6 kW without any grid and compound based Nano grid system usually ranging from 700W to 2 kW designed to connect up to 5 households through its mini-grid.



where power will be available for them to fabricate EE cook stoves to serve the local market on their respective islands.

The Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE) is part of the Pacific Community (SPC) and its mission is to promote private sector participation in the renewable energy and energy efficiency market and transition the countries to low carbon and resilient economies. In 2019, the PCREEE jointly with the DoE conducted a National Energy Dialogue in Vanuatu to assess progress and identify means of accelerating its progress towards the NERM targets. Following from the Dialogue, the Sustainable Energy Association of Vanuatu (SEAV) was established with the support of the PCREEE. The SEAV has a mission to represent the interests of the sustainable energy industry, promote RE&EE technologies including aid in electrification of off-grid areas, support training on sustainable energy and promote and maintain high standard of professionalism in the industry.

The Second Operation Phase (SOP 2021 - 2025) of the PCREEE has four strategic priority programmes and are: i) Local RE&EE Business Start-Up and Entrepreneurship Support, ii) RE & EE For Sustainability Mobility, iii) RE Mini-grids and iv) Energy Efficiency Investments. Capacity Building and Trainings is an integral and cross-cutting component of delivering the four strategic priority programmes.

The BRANTV Outcome 1 and the RE&EE training is therefore aligned with PCREEE's strategic priorities of promoting local business startups and entrepreneurship through the productive utilization of renewable energy and thereby enhancing livelihood of rural communities.

2.0 Introduction

The BRANTV through the Department of Energy (DoE) has requested co-financing support from the PCREEE Sustainable Energy and Energy Entrepreneurship Support (PSEEF) in 2019. The co-financing support was to support trainings and RE&EE hardware installation costs in the rural and remote communities of Vanuatu. PCREEE reviewed the request and responded positively to the DoE in the later part of 2019. Due to some technical difficulties and COVID-19 pandemic restrictions, the collaboration between PCREEE and DoE/BRANTV has been stalled.

In 2020, the Department of Energy through BRANTV PMU project hired the Pacific Vocational Training Centre (PVTC) a local training institution to deliver on Local Operator Training. PVTC is registered with Vanuatu Qualification Authority (VQA) offering accredited training programs in Vanuatu. It is the only institution that conducts accredited solar PV training as part of the Certificate IV in the Electrical Engineering (Installation and Maintenance). The Director of the PVTC is currently the co-chair of the SEAV.

The contract is signed to deliver 6 training programs on off-grid rural RE PV solar systems. Training runs for five days and consist of a theoretical session and a practical session with an assessment held on the last day. The training module is accredited by VQA - EEPA0811 on Solve basic problems in photovoltaic energy apparatus and systems.

However, training on Energy Efficient (EE) cook stove and crop dryer is pending validation of a design. It is important for DOE to validate several or one design that will best suit Vanuatu context, be robust and



able to manufacture by communities in the rural areas. Planning to hire a consultant is envisaged in the annual work plan.

3.0 Overview

While other training programmes have rolled out general training and awareness on the RE power systems across the country, the BRANTV PMU has emphasised on rolling out a training programme that is certified by VQA. This is to ensure that repairs and maintenance on RE power systems are attended by certified individuals and vendors who have been accredited through a recognised training provider.

In October 2019, 21 participants from private sectors, vendors, Vanuatu rural training centres and stakeholders went through a Sustainable Energy Association of the Pacific islands (SEAPI) training module on PPA/SEAPI Off-Grid Designer Certification Level II & PPA/SEAPI OffGrid Installer Certification. All 21 participants were awarded with Certificate of Attainment in the following VQA accredited unit standards (Partial completion of Certificate IV in Electrical Engineering Installation and Maintenance), Demonstrate knowledge of photovoltaic technology and Install standalone photovoltaic power systems.

Beginning of 2020, another 10 participants from DOE and private sectors went through in-house training on design, install, repair and maintain a pico-hydro power systems. Training was conducted by a Consultant from Germany, Dr. Christophe Schroeder, an expert on pico-hydro power systems.

PMU had started to deliver local operator training on VQA accredited unit standard: EEPA0811 in July 2020. Since then, 35 people in the communities of demonstrating off-grid RE community-Scale PV solar power systems have been awarded with Certificate of Attainment unit standard: EEPA0811 on Solve basic problems in photovoltaic energy apparatus and systems. Training was conducted on the islands of Pentecost, Tonga and Nguna.

PCREEE has been a strong supporter of accredited trainings on sustainable energy since it improves the professionalism of the private sector, support better quality energy services and improve the durability and reliability of energy installations. It has supported Tonga Energy Office in the development of a National Certificate in Sustainable Energy (NCSE), Level 1 and Level 2, accredited by the Tonga National Qualification and Accreditation Board (TNQAB).

PCREEE is therefore pleased to partner with the DoE/BRANTV project in rolling out the RE accredited trainings in Vanuatu.

4.0 Objective

The overall BRANTV Project objectives is to enable the achievement of the energy access, sustainable energy, and green growth targets of Vanuatu. More specifically, the objectives of conducting trainings are to:

- i) Complete technical capacity building programs in off-grid RE technology and EE cook stove applications.
- ii) To ensure adequate number of personnel is available at the community level to support each of the community demo site to repair operate and maintain RE PV solar systems.



- iii) To ensure adequate number of personal available at the community level to fabricate EE cook stove and crop dryer.
- iv) To retain technical skills on RE technology and EE applications at the community level.
- v) Promote Renewable Energy and Energy Efficiency in rural and remote communities
- vi) Empower rural communities through RE&EE trainings and promote business start-ups and entrepreneurship
- vii)

5.0 Expected Outcomes

The outcome expected to derive from conducting these trainings are:

- i) Number of individuals with at least 30% are women in Vanuatu that are newly involved in designing, installing, operating, maintaining and repairing, off-grid rural RE power systems as one of their main source of income.
- ii) Number of artisans in Vanuatu fabricating EE cook stoves as their main source of income.
- iii) Increased understanding on renewable energy and energy efficient systems by future entrepreneurs
- iv) Increased interests on the establishment of sustainable energy business and productive utilisation of renewable energy.

6.0 Target Outputs

- i. Number of communities trained on RE & EE design, installation, operation, maintain and repair
- ii. Number of trainings conducted for Local Operators on off-grid RE PV solar systems and fabrication of cook stoves and crop dryers.
- iii. A total number of trainees certified as Local Operators to design, install, operate, maintain and repair PV solar systems and Artisans to fabricate cook stoves and crop dryers.
- iv. Training materials and manuals “how-to-guidebook” are designed, produced and shared with participants and communities.
- v. A report from training provider/consultant of each training conducted at each location.

7.0 Training Content

The Local operator Training delivered by Pacific Vocational Training Centre is certified by the Vanuatu Qualification Authority (VQA). Training will be based on Unit Standard: EEPA0811 on Solve basic problems in photovoltaic energy apparatus and systems. It takes 5 working days to cover the training manual. Three days is allocated towards learning on theory and this is delivered in house. While the other two days is for practical sessions. The Project has procured four PV solar systems purposely for practical sessions. Each stations can hold up to 6 participants.



Training manual was published by Pacific Vocational Training Centre (PVTC) in July 2020. The manual has three main elements to:

- i. Prepare to work on photovoltaic energy apparatus and systems.
- ii. Solve problem in photovoltaic energy apparatus and systems.
- iii. Complete work and document problem solving activities.

With regards to training on cook stove and crop dryer the PMU with the assistance of an expert who will be recruited to design the preferred cook stove and crop dryer will develop the training manual that will be used to train Artisans to fabricate cook stoves and crop dryers.

The training programme will include a session on the SEAV and business start-up support from the PCREEE.

8.0 Possible Partners

Training on RE technologies and EE applications will be made possible by the GEF/UNDP funding through component 1 of the BRANTV Project, the Government of Vanuatu through Department of Energy and the Pacific Community (SPC) through Pacific Centre for Renewable Energy and Energy Efficient (PCREEE).

Other partners are the training service providers, PVTC and the Vanuatu Institute of Technology (VIT). The PVTC and the VIT are members of the SEAV. It is anticipated that through increased training and awareness promotions as such, business start-ups and entrepreneurship in RE&EE will increase. Consequently, these businesses will be added members to the SEAV.

The communities are acknowledged for hosting the trainings.

9.0 Planning

In order for PMU to achieve its targets under Component 1 to train 300 individuals, DoE will conduct two Local Operator Training in 2021 in two locations, Luganville and Port Vila. Training in Luganville is scheduled for 12th – 16th April 2020 and will bring together participants from villages of Community Scale PV solar systems from the islands of Mota Lava, Hiu, Loh and Toga in TORBA Province, Sara, Lelek, Lathi, Kole and Saufeli Youth Centre from Santo and Malo island, Betara from Maewo island, Olal and Nepul from Ambrym and Vinmavis from Malekula .

Another one week session for participants from part of central region and Southern region of Vanuatu. These are participants from the island of Paama, Emae, Tanna, Erromango, Aniwa and Aneityum to be trained in Port Vila tentatively scheduled for 12th – 16th July 2021.

Attached is the RE and EE training schedule and activities schedule for year 2021/2022.

10.0 Estimate Budget

Training in Luganville

Description of Activities	QTY	COST (VUV)							Total Cost (VUV)
		Course Fee 10,000vt/person	Return trip on Boat	Return trip on Airfare	Return Trip on Vehicle	DSA Participants	Catering	Venue	
Participants: Hiu	1	10,000	5,000	30,780		2,500	5,000	2,500	55,780
Loh	1	10,000	5,000	30,780		2,500	5,000	2,500	55,780
Toga	1	10,000	5,000	30,780		2,500	5,000	2,500	55,780
Nerengniman Mota Lava	2	20,000	5,000	22,960		5,000	10,000	5,000	67,960
Betarara Maewo	2	20,000		16,290	5,000	5,000	10,000	5,000	61,290
Saufeli Youth Malo	2	20,000	10,000		5,000	5,000	10,000	5,000	55,000
Vinmavis Malekula	2	20,000		12,610	5,000	5,000	10,000	5,000	57,610
Olal/Nepul Ambrym	2	20,000		17,670		5,000	10,000	5,000	57,670
Sara Santo	2	20,000			5,000	5,000	10,000	5,000	45,000
Lelek Santo	2	20,000			5,000	5,000	10,000	5,000	45,000
Lathi Santo	2	20,000			5,000	5,000	10,000	5,000	45,000
Kole Santo (Host)	2	20,000				5,000	10,000	5,000	40,000
DOE Staff	1			33,460					33,460
DSA for 6 nights	6								30,000
Impress	1								50,000
TOTAL		210,000	30,000	161,870	30,000	52,500	105,000	52,500	755,330

Budget/Cash Allocation (VUV)

DOE/PMU		492,830
SPC/PCREEE		315,000

Anticipating a total of 21 participants to be trained in Luganville. The impact of this training will cost an average of VT35,970 for each participant to receive a certificate of attainment on Unit Standard: EEPA0811 on solving basic problems in photovoltaic energy apparatus and systems.

END

Annex 1: Draft Training Programme