

# Workshop on Sustainable Electricity Access in Pacific Island Countries: From Targets to Implementation

29<sup>th</sup>-30<sup>th</sup> August 2019 – Pacific Harbour, Fiji

Pacific Island nations have ambitious renewable energy targets, and have been making significant recent progress towards these goals. There are, however, a number of challenges arising, both in serving remote dispersed off-grid end-users, and as variable renewable energy (VRE) penetration levels increase on what are often relatively small grids.

UNSW Institute for Global Development, the Australian Renewable Energy Agency's Knowledge Sharing Program (Mission Innovation Challenge 2) and Clean Energy Solutions Centre have provided funding for UNSW, USP and partners CSIRO, ITP Renewables and GSES to engage with stakeholders to map out goals and progress towards high RE targets in Pacific Island countries and identify key challenges and opportunities to support the transition from assessment and planning to implementing effective solutions.

With a diverse range of projects, country contexts and challenges, standardization of designs and solutions has been challenging to date, while many capacity building and planning efforts have remained project-based.

The aim of the workshop is to identify and kickstart a set of promising collaborative initiatives for regional approaches, standardisation and scaling up. Particular areas of focus include the following areas:

- Training and Capacity Building
- Grid Integration of RE
- Utility management with high RE penetration
- Role for the Private Sector
- Off-grid access
- EE and other distributed energy resources
- Electrifying transportation
- Opportunities for collaboration and support for such initiatives.



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## Process for the Workshop

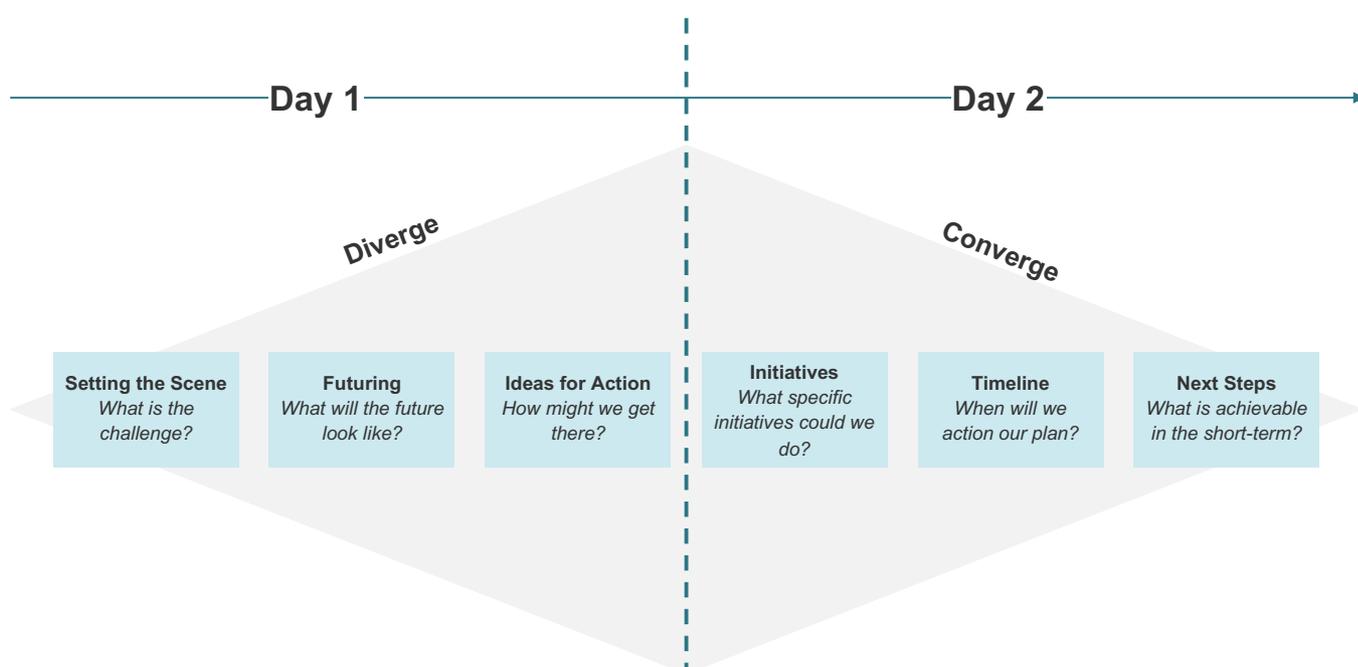
Stakeholders from key groups including Regional Government, Regional utilities and development partners and representatives from existing regional initiatives in the energy space participated in the workshop (see Appendix). A design thinking approach was adopted, based on principles of (i) first creating a divergence of ideas before converging down on a solution, and (ii) the value of collaborative thinking.

### Objectives for Day 1:

- Create a vision for the future
- Understand where each country is at, and how energy may help broader SDG objectives for each country
- Explore different regional initiatives that may deliver the vision for the future, and resources available through development partners

### Objectives for Day 2:

- Define a set of promising collaborative initiatives for regional approaches, standardisation and scaling up
- Roadmap and kickstart initiatives and collaborations



## Outcomes of the Workshop

During day 1, The following questions were developed by clustering the ideas that emerged from Day 1:

1. How might we do off grid projects at scale while still ensuring community engagement?
2. How might we balance tariff setting and cost recovery - barrier to private investment – what is the role for private sector?
3. How might we choose what is appropriate for rural electrification (on grid vs off grid)?
4. How might we achieve sustainable transport?
5. How might we enable distributed energy incl. EE, while ensuring utility financial sustainability?
6. How might we facilitate utility integration of RE?

Facilitators clustered actions that had been proposed on Day 1 into these themes as a starting point, and six tables of participants focussed on one issue, taking a 'regional approach' lens to the challenges. Participants selected their preferred table to work on and had the opportunity to rotate through a maximum of three tables. After the three rotations, facilitators shared the proposed initiatives with the larger group, and a panel of regional government and utility participants provided feedback on the proposals, noting existing initiatives or experience and improvements or contributions. The following is a summary of the key initiatives proposed.

### *1. How might we balance tariff setting and cost recovery. Noting barriers to private investment, what is the role for the private sector?*

The group noted that utilities face significant barriers to soliciting and assessing IPP proposals, and that we should be realistic about role of IPPs – there is a mixed track record. Data and transparency were identified as key to unlocking the benefits of a distributed energy future.

The following initiatives were suggested:

1. Regional coordination for IPPs
  - Aggregation to obtain economies of scale, improved financing and insurance
2. Standing regional technical assistance /capacity development for utilities assessing private sector involvement
  - Capacity building, templates and on-request assistance for:
    - Contract negotiation and distribution modelling
    - How to run solicitations
    - Assessment of IPP proposals, due diligence
    - Regulatory frameworks
  - Transparency, benchmarking - how well have IPPs worked - data collection
3. Regional coordination for net metering (or export feed in tariffs) to liberate small private sector investment
  - A study with consultation to be conducted to document costs/benefits, issues and to create consumer engagement
  - A survey of experiences where net metering has been in place, best practices, regulation
4. Improved retail interface to consumers - "Understand your bill"
  - On bills and other utility communications, break down and explain underlying costs, including those relating to new technologies, exchange rates, the weather, IPP costs, and the ability of consumers to influence their bill via their demand side actions
  - Tariff setting to be a public process (lessons from other sectors)
  - Regional templates (build on other examples, best practices, starts with survey).
  - Can sandpit cost transparency with new minigrids, excellent opportunity to explore this

issue and broader tariff design with high community engagement

Comments:

\*It was noted that FLAMMA is working with Fiji Rural Electrification Fund on an off grid project including efforts to explain how the tariff works to community

\*It was noted that care must be taken experimenting on communities

\*There was consensus around the value of writing up and sharing experiences with different tariff designs

## 2. How might we do off grid projects at scale while still ensuring community engagement?

Key challenges identified at the table included poor O&M, lack of capacity building, lack of data to understand energy access and successful models. Community knowledge sharing and empowerment was seen as key.

1. Off grid community projects
  - Off grid system for community with flexible business model to suit community.
2. Better data on energy access
  - Include more energy data in census
  - NGO Coordination
    - Health + NGO frequent islands w offgrid systems. Coordinate them to periodically check on systems and check if they are working

### 3. Community knowledge sharing for growth

Collate best practices in a centralised repository to understand what works and what doesn't

- Ongoing monitoring, surveys and data collection (could involve universities)
- Ongoing engagement
- Coordinate with existing channels
- Make learnings available

Will lead to:

- Better information for donors and project developers
- Knowledge on business models
- Coordination with other information databases (utilities, disaster relief) and national energy roadmap
- Better managed expectations

### 4. Improved operation and maintenance (aid, subsidies, business models)

- Develop O&M standards - Standardising training for O&M across the region
- Identify capacity building opportunities -> Barefoot solar - targeting the right community members for capacity building
- Bundling installation with O&M
- Smart meter data monitoring (as a way to to share knowledge - lab to onsite)
- - modular and flexible
- Building energy (or broader) resilience instead of installing PV systems

Comments:

\*Current pilot in Melanesian countries - tap into women who stay in the community, work with local power structure (Barefoot Solar)

\*Kiribati example – local training was largely ineffective, but having a trained technician sent in

periodically was successful

\*Green Growth (holistic) involves capacity building and income generation -> people are more likely to stay (incl. O&M trained people)

\*Through PPA benchmarking data from utilities is available

### 3. *How might we choose what is appropriate for rural electrification (on grid vs off grid)?*

The table noted that there is not enough data most of the time to answer the grid vs off grid question. This includes technology assessments, but also a broader understanding of the impact of energy access interventions. Specifically, there is a lack of energy demand estimates before and after a project -> what is the reality? There is little good data on how much people are spending on energy and the impacts of projects. Do people become poorer after they gain access to electricity? The following initiatives were generated:

1. Collect data to map energy demand, cost, income across the pacific to:
  - o inform goal setting and tracking,
  - o understand impact – e.g. energy expenditure and income pre and post electrification, local needs pre and post electrification
  - o predict load growth over time as access is gained

Questions

- o How to create a system to govern and monitor the data platform
  - o How to achieve regional coordination?
2. Resource assessment and modelling of generation and electrification costs for on grid and off-grid solutions, including:
    - o GIS mapping of resources (RE resources etc.), infrastructure (mobile coverage, roads, grid etc.), land ownership, geography and demographics (population etc.)
    - o Cost estimates for equipment, logistics (at different locations)
    - o Models for generation and electrification costs for on grid and off-grid solutions
    - o Must be open source and easy to accessIn order to:
    - o Allow technology assessment
    - o Allow all projects to provide comparable costings

Comments:

\*Logistics costs make planning extremely difficult

\*Off-grid important in PNG due to remoteness, GIS mapping exercise planned

### 4. *How might we achieve sustainable transport?*

The table noted that sustainable transport involves huge numbers of stakeholders - transport, economics, environment ministries, electricity utilities, tourism – and therefore poses a huge coordination challenge. Initiatives developed included:

1. Sustainable transport in Viti Levu

It was proposed to:

- o Create a roadmap for Viti Levu to adopt sustainable electric transport (communications/infrastructure plan)
- o Options for private and commercial land fleet
- o Government policy
- o Launch commercial pilot projects with private/public partnership

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- First step – PCREEE develop an e-transport and mobility framework
- 2. Pacific regional program for sustainable mass transport for sea and land (interisland transport)
  - To facilitate the development of more sustainable transport for sea and land within the Pacific
  - 1-3yr policy and incentives.
    - Need to coordinate and pick low hanging fruit
    - Requires lots of studies and pilots
    - Capacity building
  - 3-6yr demonstrated pilot projects
    - Must work across all ministries
  - 6-10yr wide uptake
    - Regional centre that can provide info and support across the region (this has already been committed to across the Pacific)
- 3. Adoption of personal transport EV, scooters and bikes across Pacific
  - Encourage adoption of personal electrical least cost transport
  - Create incentive mechanisms e.g. designated bike lanes, bike only days
  - Special consideration for electric fleet
- 4. Recommended first step: Desktop study of existing e-mobility projects initiatives in pacific.
  - Recommendations and lessons learned for the rest of pacific.

### Comments:

\*Samoan example of retrofitted vessels with solar panels

\*FLAMMA is supporting return to traditional boats - especially during festivals

\*USP - working on electric shipping

- Improving efficiency of exiting boats

\*Pacific Blue shipping initiative is a collaboration between MI, Fiji, Samoa, Vauatu, Solomon Islands and Tuvalu. Aiming to raise \$500m for sustainable shipping.

\*Also note activities of Micronesian centre for Sustainable Transport

### 5. *How might we facilitate utility integration of RE?*

1. RE master plan and reverse auctions for RE capacity
  - Identify areas of grid suitable for an IPP
  - Hold a reverse auction on a \$/MWh basis
  - Potentially set up new IPP operated, utility owned mini/microgrids on more remote locations

Would achieve:

- Strategic upgrades of grid
- RE capacity installed according to a plan
- More remote access to RE generation

2. Integrated RE programs

- Broadens projects implementation to include support for complimentary projects
- Prevents the trap of just focusing on technical integration
- Data collection - improve data collection to integrate high VRE

Would achieve:

- Support for tariff reform

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- Regionalisation of skillsets, tools, standards
  - Support for EE/DSM as complimentary for RE + optimized operation
  - Capacity building on system planning, skills for RE + BESS (market reform)
3. Standards committee within an existing regional organisation
    - Establishes a set of common regional standards/guidelines that country governments adopt
  4. Donor and development partner harmonization
    - Coordination to support the utility to integrate RE
    - Capacity building
  5. Pacific Battery R&D Centre
    - R&D for batteries designed for PIC applications and scale, including disposal
    - Could also do Hydro R&D
    - Product testing, compliance, standardisation
  6. Data collection for planning + operations to integrate RE
    - Identification of data needs
    - Surveys and data collection
    - New metering equipment
    - Data collection + maintenance plans
    - Data governance and standards
  7. Dynamic planning for resilience
    - Planning as a tool rather than a goal
    - Forward looking scenarios, identifying future goals
    - Infrastructure development plan
    - Always being updated

### Comments:

- \*Already a lot of CROP (regional) agencies - strengthen existing organisations, rather than build a new ones
- \*USP could host a battery lab
- \*For pumped hydro - quite a lot of expertise in Melanesian countries and Fiji
- \*PPA provides support for modelling scenarios of high RE - by request support + training for modelling and utility training, but PPA is small and has limited capacity

### 6. *How might we enable distributed energy incl. EE, while ensuring utility financial sustainability?*

The table discussed the challenges of achieving regulatory models that can allow utilities and private investment to thrive. The discussion identified the need for transparency in decision making and regulatory and tariff reform to assist consumers in understanding underlying costs and to better incentivise efficient investment in distributed energy resources such as PV and batteries. The group noted that joint ventures with the private sector may be more sustainable, but challenging, and that capacity building is required around contract negotiation and distribution system modelling.

1. Regulatory change to enable distributed energy resources
  - Market restructuring with the aim of derisking and attracting private investment
  - Introduction of an independent regulator

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- Transparency in operations
  - Tariff review
  - Energy efficiency and incentives
  - Could be undertaken through OPERA (office for pacific energy regulators alliance)
  - First steps to undertake a study of best practices then sandbox to test reforms
2. Investment models to promote sustainable investment in distributed energy
- Grow utility business models with new models, new technology and by incentivising private investment.  
To implement:
    - Need to understand how private sector sees risk in DER projects
    - Assess current business models
    - Case studies and lessons learned
      - Collect data on installed systems, start collecting on new installs
    - Build business models on data
    -

Challenges were noted, including:

\*Private providers in the informal sector charging a premium to those that cannot access the grid

\*Safety issues associated with unregulated private providers

## Appendix: Workshop Participants

Vanda Faasoa Chan-Ting	Ministry of Natural Resources & Environment, Samoa
Gary Erick	Vanuatu Department of Energy
Tiaon Aukitino	Kiribati Public Utilities Board
Pesalili Tohi	Tonga Power
Karunesh Rao	Energy Fiji Limited
Joji Wata	Fiji Department of Infrastructure
Alu Alu	Department of ICT & Energy, PNG
Andrew Daka	Pacific Power Association
Frank Vukikomoala	SPC (Pacific Community)
Sandip Kumar	GSES
James Hazelton	ITP Renewables
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Kamleshwar Khelawan	World Bank
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Clara Mazzone	ITP Renewables
Bruce Clay	Sunergise
Amit Singh	CBS
Batui	Yanuca Island community representative
Isimeli	Yanuca Island community representative
Turaga	Yanuca Island community representative
Viliame Kasanawaqa	Pacific Islands Development Forum
Niranjwan Chettiar	Fiji National University
Manu Rawali	University of PNG / UNSW
Jane Romero	Pacific Region Infrastructure Facility (PRIF)
Peter Johnston	PRIF / ADB consultant
Charles Bennett	US Embassy