

Government of Tonga: Capacity Building Opportunities

National Renewable Energy Laboratory
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Deliverables 5.1 Capacity Development Programme and 5.4 Summary Document of Capacity Building Needs

I Context

The Government of Tonga requested support with conducting a capacity development needs assessment. The assessment was intended to determine what is required by the Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications (MEIDECC) and key stakeholders to effectively implement the Tonga Energy Efficiency Master Plan (TEEMP), including identifying both near- and longer-term needs. Areas for urgent capacity development have been identified, along with training opportunities to enhance the capacity of MEIDECC. This document includes a preliminary summary of MEIDECC's needs for capacity development, modes of training, options for institutionalizing capacity building, and estimates of costs for said program, the purpose of which is to identify opportunities for long-term capacity building of the MEIDECC for implementation of the TEEMP.

1.1 Background

In 2009, Tonga issued the *Tonga Energy Road Map 2010-2020: Ten Year Road Map to Reduce Tonga's Vulnerability to Oil Price Shocks and Achieve an Increase in Quality Access to Modern Energy Services in an Environmentally Sustainable Manner*, known as the TERM.¹ The goal of the TERM was to create an approach to reduce Tonga's dependence on fossil fuels through cost-effective and sustainable efforts. The process to develop the TERM was a joint effort among the Government of Tonga, the electricity generator and distributor Tonga Power Limited (TPL), and other development partners. The TERM focuses on energy efficiency, improving supply chains to reduce price fluctuation of imported products, reducing greenhouse gas (GHG) emissions and improving national energy security. The TERM utilizes the following strategies to achieve this goal:

- 1) Improve the petroleum supply chain to reduce the price and price fluctuation of imported petroleum products;
- 2) Improve the efficiency of converting petroleum to electricity (i.e., increases in efficiency and reduced losses at TPL);
- 3) Improve the efficiency at which consumer electricity services utilize electricity (Demand Side Management measures); and replace a portion of current or future grid-based generation with renewable energy.²

A number of policies and initiatives have been implemented since the creation of the TERM. To implement the TERM and identify the most cost-effective solutions, the Government of Tonga requested technical support through the United Nations Climate Technology Centre and Network (CTCN). The TEEMP was created to establish a baseline of Tonga's energy usage for MEIDCC and identify opportunities for meeting national goals. The TEEMP also includes the transportation sector, which was not within the scope of the TERM.

In 2017, stakeholder interviews were held in Tonga to understand the needs for energy efficiency, resilience, and transportation improvements. The interviews were conducted to determine technical options developing the TEEMP as well as current roles and capabilities in implementing existing and potential new policies and programs in support of energy efficiency goals. A gap analysis was conducted on where capacity could be built to enhance the programs being considered and implemented by the Government of Tonga.

¹ "Tonga Energy Road Map 2010-2020" (Government of Tonga, June 2010), <https://sustainabledevelopment.un.org/content/documents/1330tongaEnergy%20Strategy.pdf>.

²Ibid.

1.2 Capacity building

Stemming from terms such as organizational development or institutional building, capacity building focuses on enhancing sectoral or technological knowledge. This process generally involves the implementation of sustainable development strategies and relevant skills. For the purposes of the TEEMP, capacity building incorporates implementation methods which allow Tongans to direct and take ownership of the plan and its associated tools to achieve the long-term goals outlined in the TERM.

This summary identifies opportunities for training, potential funds for implementation of projects, and systems or processes that can allow for better monitoring of project progress. Capabilities and skills can be enhanced at the

- Individual level (building knowledge and skills),
- Institutional level (modernizing systems or implementing policies, structures and methods of management), and
- Societal level (interactive processes and programs for public engagement).

This capacity building summary includes processes and training to help build knowledge, skills, systems and organizations that will enable Tonga to implement the TEEMP.

2 Opportunities

Key policy and program options identified within the TEEMP include creating the following:

- An energy and water database to monitor electricity, fuel and water consumption at the national level,
- Minimum energy performance standards (MEPS) for efficient appliances and equipment, conducting energy audits of all public-sector buildings by 2020,
- Energy efficient building codes,
- An official green hotels program, raising awareness of energy and water consumption.
- Policies to retain high pedestrian, carpool, and bus ridership rates,
- Requirements to encourage improved fuel economy from vehicle imports,
- Vehicle idling limitations,
- Incentives to produce and use local biodiesel.

Trainings were held in May and June 2018 in order to build capacity so that Tonga is equipped to pursue these opportunities. These policies and program options are described in greater detail in the following sub-sections.

2.1 Policy Changes

The following represents a list of institutional policy changes which could help Tonga realize the goals outlined in the TERM and harmonize with the projects outlined in the TEEMP. Many of these would require legislative action to implement, although some could be achieved through actions within Ministries.

2.1.1 Electricity

- Design and implement a new National Building Code to mainstream Category 4 cyclone resistance along with basic energy efficiency requirements.

- Design and implement MEPS and empower customs agents with the training and authority to identify and refuse non-compliant appliances.
- Utilize existing bodies created by the legislature to establish a body capable of conducting and enforcing energy audits on high use customers.
- Take steps to continue to enable a supportive environment for funding; this includes empowering the Department of Statistics with the resources to expand their operations and engaging with repositories like PRDRSE4ALL.
- Conduct internal economic analysis to consider the fiscal feasibility of subsidizing net metering or energy efficiency programs.
- Engage TPL in an Integrated Resource Planning process to gain transparency in long term planning, require the collection of better data (such as granular sectoral breakdowns), and consider revenue adequacy requirements when planning future renewable energy projects.

2.1.2 Transportation

- Design and implement fuel economy-related vehicle import tariff or registration fee.
- Design and implement policy requiring the blending of biodiesel in all diesel fuel.
- Adopt policies restricting idle time of vehicles and spreading awareness among relevant users (especially buses, delivery, and construction).
- Adopt policies providing right-of-way to pedestrians and cyclists, and properly train police on enforcement and relevant fines.
- Begin encouraging adoption of HEV and EV vehicles by ensuring that capability to repair these vehicles exists amongst mechanics, and that charging infrastructure can be made available (via qualified electricians) when demand becomes appropriate.
- Develop the capability to track and coordinate busses at the national level.
- Empower a Tonga government entity such as the Department of Statistics to serve as a central repository of fuel, vehicle, and transportation data.

2.2 Individuals

Individual capacity could be built among MEIDCC employees as well as other ministries. As part of the TEEMP project, MEIDCC staff participated in a training in New Zealand on MEPS, building codes, and efficient transportation. All MEIDCC staff could benefit from this knowledge to better understand how to implement policies and technologies related to energy management. Committing to an annual training of this type for two staff members will help build and maintain knowledge over time. Additionally, staff who do attend trainings – such as the recent training MEIDECC staff attended in May 2018 with the New Zealand Ministry of Foreign Affairs and Trade – could be requested to conduct a workshop for colleagues in MEIDCC and other relevant ministries who were unable to attend the training—thus helping to share the information from the training with others. The training agenda is shown in Appendix A.

The following types of degrees and trainings could be useful to staff who are designing and implementing measures under the TEEMP:

- Bachelors or Masters degrees in
 - Electrical Engineering or other Engineering
 - Business or Finance
 - Policy or Economics
 - Communications
- Professional trainings on
 - Auditing
 - Financial modelling

- Advanced Excel and database design
- Energy efficiency policy best practices
- Additional training on the following tools:
 - HOMER
 - RETScreen
 - AFLEET
 - EV Benefits
 - FLEET DNA

Other trainings that may be helpful for MEDICC staff include the following:

International Institute for Energy Conservation (IIEC): <http://www.iiec.org/>

The International Institute for Energy Conservation (IIEC) has expertise building in-country capacity for sustainable energy solutions in “commercial buildings, industrial, power, water and wastewater, infrastructure, and transport sectors and has local experience in many countries around its regional offices.” Because IIEC is involved in the Pacific Alliance for Sustainability program, working with the Asian Development Bank on the Promoting Energy Efficiency in the Pacific (PEEP) project these trainings may be aligned with the TEEMP and funding may be available for trainings. The IIEC has helped establish policy and implementation frameworks and been involved in implanting energy efficiency projects across the Pacific Developing Member Countries (of which, Tonga is one). Therefore, the goals and trainings of the IIEC align with Tonga’s TEEMP goals to save energy, reduce fossil fuel imports and reduce GHG emissions.

Energy Management Association of New Zealand: <http://emanz.org.nz/training/energy-management-training-new-zealand>

The Energy Management Association of New Zealand provides many courses on energy management, targeted for various audiences (students, residential, etc.) and some are available online.

UAE-Pacific Partnership Fund Renewable Energy Workshop and Training:

<https://www.mofa.gov.ae/EN/MediaCenter/News/Pages/11-01-2018-UAE-Pacific-Ocean.aspx>

Two workshops have already been conducted and a third training session is planned for October 2018 and will cater to project and technical managers responsible for utility operations and renewable energy project planning in the Pacific region.

Pacific Center for Renewable Energy and Energy Efficiency (PCREEE): <https://www.pcreee.org/>

The Pacific Center for Renewable Energy and Energy Efficiency (PCREEE) was established by the Pacific Ministers of Energy and Transport to assist Pacific Island Countries and Territories in addressing existing barriers and strengthen drivers for sustainable energy markets, industries and innovation. PCREEE is co-hosted by the Pacific Community (SPC) and the Government of Tonga. The center represents an innovative fusion of regional and international efforts and capabilities. Its design leverages a network of intra and extra regional partnerships, serving as a “hub” for knowledge and technical expertise on matters related to sustainable energy project development and implementation. UNIDO provides technical services and mentoring throughout the first operational phase of the center.

Sustainable Energy Industry Association of the Pacific Islands (SEIAPI):

<https://www.recep.org/projects/sustainable-energy-industry-association-pacific-islands-seiapi> The Sustainable Energy Industry Association of the Pacific Islands (SEIAPI) aims to establish a certification scheme for renewable energy and energy efficiency practitioners and may offer applicable trainings in the future.

Global Fuel Economy Initiative (GFEI): www.globalfueleconomy.org/

The Global Fuel Economy Initiative (GFEI) exists to assist governments and transport stakeholders with

promoting greater vehicle fuel economy. They do this by working with developing countries to design and enact policies that improve fuel economy, supporting research, and holding trainings. Their partners include the International Energy Agency (IEA), United Nations Environment Programme (UNEP), International Transport Forum of the OECD (ITF), International Council on Clean Transportation (ICCT), Institute for Transportation Studies at UC Davis, and the FIA Foundation.

Low Emissions Development Strategies Global Partners (LEDS GP): <http://ledsgp.org>

The LEDS GP transport working group focuses on supporting subnational integration and implementation of urban transport in LEDS and Nationally Determined Contributions (NDCs) through communities of practice, disseminating key resources, and providing technical assistance. The communities of practice bring together key stakeholders to advance specific transportation measures and promote peer-to-peer knowledge exchange. The LEDS GP provides no cost, easy access remote technical assistance on LEDS topics, including transportation.

Clean Energy Solutions Center: <https://cleanenergysolutions.org>

The Clean Energy Solutions Center provides no cost, easy access remote technical assistance to governments on clean energy policies and programs, at the country's request. The Solutions Center also hosts a vast library of high quality, recorded trainings on a variety of topics pertinent to the TEEMP and TERM.

International Energy Agency (IEA): <https://www.iea.org/topics/transport/>

The IEA conducts a broad range of transport research and analysis, focusing on ways in which countries can improve the sustainability of their transport systems. Policy advice is given to governments on the effectiveness of implementing advanced technologies, improving fuel efficiency and shifting to lower-carbon fuels and transport modes.

Asian Development Bank (ADB): <https://www.adb.org/sectors/transport/main>

The Asian Development Bank (ADB) funds projects that reduce GHG emissions from the transport sector, provides case studies on the projects, and holds sustainable transportation conferences.

2.3 Institutional

Institutional capacity building involves data and tools that organizations can use when developing and implementing efficient electric and transportation systems. There are a variety of databases and tools available. A key area for capacity building within institutions in Tonga for implementation of the TEEMP is to partner with the Tongan Department of Statistics to enhance and better organize data related to energy and transport sectors.

Portfolio Manager: <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager>

This free, web-based tool developed by the U.S. Environmental Protection Agency (EPA) can be used to track and manage energy and water use for one or multiple buildings. The Portfolio Manager can be used to benchmark buildings in any location in the world. For example, the Canadian Government is using Portfolio Manager as the platform for their national energy benchmarking program for existing commercial and institutional buildings.

Green Hotels Program: <https://www.epa.gov/p2/green-hotels-resources-ecolabels-and-standards>

The U.S. EPA also has a website with resources, ecolabels, and standards for green hotels. It includes a comprehensive listing of global green hotel programs.

Rightcar website and Program: <http://rightcar.govt.nz/>

This website reports the fuel economy rating and CO₂ emissions of most vehicles available in New Zealand and therefore Tonga. It is run by the New Zealand Transit Agency.

Alternative Fuels and Advanced Vehicles Data Center (AFDC): www.afdc.energy.gov/

The AFDC contains information on all market-available alternative fuels and a variety of energy-efficient vehicle technologies. This includes a listing of advanced vehicles available in the U.S., a searchable database of policies used to promote technology adoption, and case studies of fleets using advanced vehicles.

2.4 Engagement

Awareness, outreach, and engagement programs are important components of capacity building. Developing a comprehensive program encompasses a defined target audience (residential, government employees, tourists, commuters, fleets, etc.) and a clearly defined strategy for educating and informing the audience through brochures, email messages, posters, conferences or meetings, and other means. Additional creative mechanisms for outreach include competitions (amongst business units or offices, for example). Periodic conferences, such as annual energy and transportation events and workshops, can provide a platform for Tongans to engage with one another what they think is important, provide feedback to MEIDCC staff, and offer information to Tongans on how energy is being used/conserved. Ride-and-drive events where citizens get to try new efficient vehicles are a particularly effective way to increase the purchase rate of targeted vehicles. Outreach efforts should include a clearly defined goal (what is the main message you want to give the audience); a listing of actions you want your audience to take (turn off lights, close blinds/curtains, etc.); and an explanation of how the audience will benefit from doing the action (saving money, improving occupant comfort, etc.).

Carbon Trust: https://www.carbontrust.com/media/13089/ctg056_creating_an_awareness_campaign.pdf
The Carbon Trust has a resource entitled ‘Creating an Awareness Campaign’ that provides useful information to successfully develop and execute an awareness campaign to promote energy efficiency, sustainability, water use reduction, and other actionable measures to support the TEEMP.

PRDRSE4ALL: <http://prdrse4all.spc.int/>

A central data repository and information system to support pacific governments and their development partners in modeling the impact of policies and sharing knowledge between countries. Tonga should engage PRDR in learning best practices of database management.

3 Conclusion

The process of developing and enacting the TEEMP, with associated training, is a major step to energy-related capacity building in Tonga. Continued efforts need to be taken within MEIDCC and other ministries to share this knowledge between individuals. Additional trainings and resources are available to build upon this knowledge at both the individual institutional levels. This capacity will enable Tonga to achieve the TEEMP goals, set subsequent goals in the future, track progress, and improve the efficiency of their electricity and transportation sectors.

Appendix A

Outline of programme for Tongan Training visit to EECA

| DAY | ACTIVITY | WHO |
|-------|--|---|
| Day 1 | TRAVEL TO WELLINGTON | |
| Day 2 | <p>Appliance Minimum Energy Performance Standard & Labelling Compliance operations</p> <p>Overview of the Equipment Energy Efficiency (E3) programme in New Zealand. Training on Standards and Regulations function within our Energy Efficiency (Energy Using Products) Regulations 2002.</p> <p>Cover:</p> <ol style="list-style-type: none"> 1. EECA role in EE Standards and Regulations 2. What we do 3. How we do our job. <ul style="list-style-type: none"> • Policy & procedures • Monitoring, investigation, complaints, industry intelligence information. • Product verification and registration process (online demonstration) • Building a basic investigation file, Summary of facts for legal action | Senior compliance Officer |
| Day 3 | <p>Check testing</p> <ul style="list-style-type: none"> • Product and Test lab selection | Senior Compliance Officer |
| Day 3 | <p>Introduction to retail store monitoring.</p> <ul style="list-style-type: none"> • Visit 1 x large home appliance store and 1 x home improvement outlet, carry out labelling survey and review MEPS compliance. | Senior Compliance Officer |
| Day 4 | <p>Standards</p> <ul style="list-style-type: none"> • Developing and amending Energy Efficiency Standards • The difference between a MEPS Standard and a Test standard | Standards Development Technical |
| Day 4 | <p>E3 Programme Delivery</p> <ul style="list-style-type: none"> • Product registrations • Industry and Consumer information | Standards and Regulations Delivery Lead |
| Day 5 | Transportation Energy Efficiency Initiatives | |

| | | |
|---------------|---|---|
| | <p>Vehicle Fuel Economy programme delivery</p> <ul style="list-style-type: none"> • Intro to VFEL programme • System, processes and Information provided by vehicle importers • Challenges | Standards and Regulations Delivery Lead |
| Day 5 | <p>Vehicle Emissions Standards</p> <ul style="list-style-type: none"> • What they could look like • Feebate Schemes | Liz Yeaman |
| | <p>NZ's approach to Low Emission Vehicles</p> <ul style="list-style-type: none"> • Information Programme • Contestable Fund • Other Government Initiatives • Public Views (Market Research) • View Car share Scheme • Drive an EV | Liz Yeaman |
| Day 6/7 | WEEKEND (Wellington, Marlborough, Wairarapa?) | |
| Day 8 to 11 | Buildings Energy Efficiency Initiatives | |
| Day 8 | <p>Introduction to building players</p> <ul style="list-style-type: none"> • EECA role, information and activities • BRANZ (Visit) • MBIE (building code/tenancy services)(Visit) • EMANZ (Visit) • What approaches are being adopted in the NZ market across all building types | Christian Hoerning |
| Day 9 | <p>Housing – what is being done and by who</p> <ul style="list-style-type: none"> • Sustainability Trust/assessment process (Visit) • Wellington City Council (Housing W of F) (Visit) | Robert Linterman |
| Day 10 and 11 | <p>Travel to Auckland</p> <ul style="list-style-type: none"> • EECA Commercial Building Activity • Visit <ul style="list-style-type: none"> ○ NZ Green Building Council (their objectives and programmes) ○ Auckland City Council (their ambitions and programmes) ○ Vector/Ngati Whatua Development (practical application of solar and battery storage) ○ Auckland District Health Board (deployment of energy efficiency initiatives) | Drew Roberts |
| Day 12 | TRAVEL HOME | |