REPORT OF THE FINAL REVIEW WORKSHOP

ON THE

TONGA ENERGY EFFICIENCY MASTER PLAN: 18TH - 20TH FEBRUARY 2020

NUKU'ALOFA, TONGA

Introduction

At the request of the Tonga Government to the Climate Technology Centre Network (CTCN), the Pacific Community's Pacific Centre for Renewable Energy and Energy Efficiency was contracted to hold a stakeholder consultation meeting to obtain the inputs and comments that can be incorporated for revising the TEEMP and provide support for the Cabinet approval and launch of the TEEMP. The draft TEEMP is attached as **Annex 1**.

In close consultation with DOE (Department of Energy) and MEIDECC (Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communication), the PCREEE is required to design and hold an effective stakeholder consultation workshop with an aim to obtain the comments and inputs on the TEEMP. The incorporation of the comments and inputs in the stakeholder consultation will result into the finalization of the TEEMP for Cabinet submission and approval for launching.

The objectives of the Review Workshop were to:

- Engage the key stakeholders of the TEEMP and collect feedback from them on the policy initiatives and the projects proposed under the draft TEEMP.
- Discuss with the key stakeholders on any other proposed Energy Efficiency (EE) initiatives that may have not been captured in the TEEMP.

- Gauge support from the key stakeholders of the TEEMP for the implementation of the TEEMP once approved by Cabinet

Two preparatory meetings were held between DoE and the PCREEE on 6th and 7th February to agree on the logistics, agenda and the methodology for the workshop. A preparatory meeting was held with the key stakeholders on 12th February to share the agenda, methodology and expectations for the workshop.

The final workshop was conducted from 18th – 20th February 2020 at the Tanoa International Hotel, Nukualofa, Tonga. The Agenda is attached as **Annex 2**.

Participants

The participants attending the workshop were senior managers from the Government Sector, the Private Sector and the Civil Society Organisations and to name a few were; Ministry of Infrastructure (MOI), Ministry of Education and Training (MET), Ministry of Trade and Economic Development, Ministry of Agriculture, Tonga Power Limited (TPL), Pacific Energy , Chamber of Commerce , Association of Registered Electrical Contractors, Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications (MEIDECCC). The workshop was facilitated by the representative from the Pacific Community's Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE). The participants list is attached as **Annex 3**.

Methodology

The workshops began with an analysis of the recommended projects and policies for transportation and electricity and the estimated impacts in terms of the GHG emissions and their recommended lead agencies. Each of these were presented separately. The first opportunity to comment on each was the suggested lead agencies. They assessed the projects / policy, provided an update of where they are with these, mentioned past, on-going and future activities in the space and any other related matters they would like to discuss. Following the lead agencies, the rest of the group were given an opportunity to provide their comments. **Annex 4** is a compilation of the comments made on each of the projects / policies.

Based largely on Annex 4, a logframe matrix for the TEEMP was drafted. While the current draft of the TEEMP is based mainly on two key result areas (KRAs) – transport and electricity, it was felt appropriate that 2 additional KRAs be added as follows:

- Improved institutional, policy, legislative and governance frameworks for coordinating and managing the implementation of the TEEMP
- Improved awareness and funding support and strengthened local technical capacity to plan, implement and monitor low carbon projects in the transportation and electricity sectors

The workshop was then divided into 4 groups, each group dealing with a KRA. Each group then reported back to a plenary and for a general discussion.

The workshop also discussed the financing of the TEEMP as well as its governance structure. The TEEMP has a budget of about USD 27 million for its first 10 years. If there are funding available to the TEEMP then it should be spend according to the prioritisation made.

Outcomes as per Agenda Items

Tonga's Energy Sector Overview

The TEEMP is an integral part of the Tonga Energy Roadmap (TERM). It contributes to the specific objective of the TERM on Energy Efficiency and contributes to the overall objective of the TERM which is to reduce Tonga's vulnerability to fuel price shocks and increase quality access to modern energy services in a financially and environmentally sustainable manner.

The TEEMP also plays a central role in achieving Tonga's NDC objectives

Proposed Transportation Policies and Projects

The comments on each policy/project can be found on **Annex 4**. The information obtained here were incorporated into the Log frame Matrix, **Annex 5**

The participants recommended to include Collaborative Agencies under each Leading Agency on the Policies/Projects outlined in the TEEMP, pages 34 to 38. Collaborative Agencies are those who will play a major role in the implementation of the Transportation policies/projects.

The TEEMP Log frame Matrix

The TEEMP log frame matrix was reviewed and updated and attached as Annex 5. The matrix provides clarity on what the TEEMP Objective is, its purpose, key result areas, objectively verifiable indicators, means of verification and key assumptions. This is something that is absent in the current TEEMP draft.

The discussions on the log frame matrix alluded to the following key points:

i) The general objective and purpose of the TEEMP should be more specific towards EE, for example: objective should be "To Reduce GHG Emissions from both EE in Transportation and Electricity" and the Purpose should be "To Provide TERM with the strategic direction to reduce GHG emissions and achieve SDGs"
ii) The quantifiable TEEMP objective to reduce 106k metric tonnes of CO2 equivalent per year by 2030 in both transport and buildings (2 para, page iii of TEEMP) should be based on a reference year (eg. 2020) as the many assumptions under the goal of 10k metric tonnes of CO2 is not known. The use of percentage (50% on page 43) maybe preferred over the actual numbers.
iii) The Energy Efficiency Bill must be incorporated into the existing Tonga National Energy Bill (TNEB) and it is important that this be done asap. The regulations of MEPSL can be enforced once the TNEB is passed including its associated education and awareness campaigns.
iv) That the TEEMP reactivate and use the same Committee/Task Force as that of TERM to coordinate and manage the implementation, monitoring and reporting of the TEEMP.
v) TEEMP to be launched at the national level coinciding with a major national event in Tonga (eg. World Environment Day) before it can be launched at the international level (COP26). This is important for the support of the national key stakeholders
vi) The incorporation of EE into school curriculum at all levels and have it accredited by the TNQAB is quite important for education and awareness purposes. Importantly, the conduct of training of trainers (teachers) on EE is paramount for sustainability.

vii) Most of the policies/projects listed under the draft TEEMP lacks feasibility study to justify its costs and benefits, design, plan etc and thus the need to conduct proper Feasibility Studies on each key policy/projects before the actions can be implemented. These are classified as enabling activities before actual investments.
viii) While feasibility studies and EE audits are important, the actual implementation of the recommendations from these studies is important. Thus, the Government may consider providing seed funding for implementation
ix) TPL recommended that Distributed Generation is recommended over Net Metering
x) The activities under the logframe is allocated some indicative costs. The costs may not be perfect but provides some guidance on cost of implementing each activity.

Prioritisation of Policies/Projects

After a close look at the policies/projects under the draft TEEMP, the workshop felt that a re-prioritisation of the projects are needed including the new policies/projects identified during the consultation. Five key criteria were identified to be used to classify each policy/project intervention in terms of High, Medium and Low. The five criteria were:

i) Government Priority – is the project a high priority for the Government?
ii) SDG Goals – projects contributing to more SDGs has a higher priority
iii) GHG Emissions – projects with higher reduction of emissions has higher priority
iv) Other Co-benefits – projects with many other co-benefits has higher priority
v) Available Funding – projects with funding already available for implementation has higher priority

Even though it was not a clear-cut exercise given that one cannot apply equal weights to the criteria, it turned out to be a lively and thought provoking undertaking. The participants then went through the prioritisation exercise whereby the high priority activity were to be carried out with the first three years of the TEMMP, the medium priority activities were to be conducted in between the 4^{th} – 7^{th} year and the low priority ones were to be conducted during the 8^{th} – 10^{th} year. During the plenary and reporting back time, it was clear that the groups gave the most weight to the government's priority and the ease of implementation and the practicality of the suggested project / policy (i & v). Such that activities that are related to an on-going activity were considered easy to be implemented and were labelled as priority. For instance, the drafting of an EE Regulation to be attached to the Energy Bill (on-going), the extension of the PALS Programme (on-going) and the changing of the street light to LED were considered high priorities compared to introducing lanes for bicycles. The SDG goals, the GHG reduction and the co-benefits of the suggested projects and policies were considered important but not as the determining factor in their priority ranking.

The prioritisation exercise was done by the participants in groups and were presented. **Annex 6** has the prioritisation exercise.

TEEMP Monitoring and Implementation Plan

The outcome of the prioritisation exercise was then incorporated into the Monitoring and Implementation Plan. **Annex 7** has the Monitoring and Implementation Plan. The TEEMP has a duration of 10 years (2020 to 2030) and so the M&I Plan is for 10 years but is a living document which must be updated regularly.

Projects having the higher priorities over others as identified by the participants are earmarked to have an earlier startup compared to those of lower priorities.

A clean Monitoring and Evaluation tool

Annex 8 is a revised integrated log frame which is an attempt to capture the revised projects and policies and their GHG mitigation, budget and timeframe.

The Missing Link

The workshop highlighted the missing link which is the Energy Efficiency in the Agriculture Sector. The Agriculture sector contributes to 21% of the GHG emissions, a 2% lower than the Electricity sector (23%). Addressing the emissions under the Agriculture sector would adequately address more than 70% of Tonga's total emissions.

Recommendation and Way Forward

As an outcome of the report, we recommend the following to be included in the draft TEEMP:

i) Title – Given the TEEMP only address 55% of Tonga's emission (in ground transportation and electricity generation only), perhaps it should be mentioned somewhere that emission from agriculture, waste and marine and aviation are not included).
ii) GHG Emissions – While the projects and policies may have been modified and 2 more KRAs have been added, the workshop (and this revision) does not attempt to modify nor to add anything to what NREL has already modelled. Certainly the total GHG reduction would certainly be more that those estimated by NREL. Any attempt to modify or add new numbers to the GHG would not make sense if not calculated and modelled with NREL's methodology and assumptions.
iii) If DoE agrees with i & ii above as well as the clean logframe in Annex 8 then we will review the TEEMP accordingly, including attaching the Logframe as Appendix B. It would be best to do this on a Word version of the document.
iv) We note the inconsistency in the numbers used, e.g on page 31 [4.3 Combined Wedge Analysis] and page 43 [6 Conclusion] and we will try to revise these.

Annexes:

Annex 1: Draft TEEMP

https://www.pcreee.org/event/ctcn-consultancy-finalise-tonga-energy-efficiency-master-pan

Annex 2: Workshop Agenda

DRAFT WORKSHOP AGENDA

FINAL CONSULTATION WORKSHOP

ON THE

TONGA ENERGY EFFICIENCY MASTER PLAN

TANOA CONFERENCE ROOM, NUKU'ALOFA

18th to 20th February 2020

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DAY 1 – 18TH FEBRUARY 2020

TIME	ACTIVITIES	PRESENTER	FACILITATOR /comments
0830-0900	**REGISTRATION**		
SESSION 1	**OPENING SESSION**		
0900 - 0910	**Opening Prayer**	Reverend	DoE
	Welcome Remarks	CEO MEIDECCC	
	Opening Key note Address	Minister of MEIDECC	
	Group Photos	MEIDECCC Communication	
SESSION 2	**TONGA'S ENERGY SECTOR TARGETS AND ACHIEVEMENTS**		
0910 - 0930	TERM Overview and Update on Progress	DoE	
SESSION 3	**THE TEEMP**		
0930 - 1000	TEEMP Overview and Status	DoE	
1000 - 1030	**MORNING TEA**		
SESSION 4	**PROPOSED TRANSPORTATION POLICIES AND PROJECTS**		

1030 – 1230	1.Use a Platform such as NextBus to track and coordinate busses 2. Enact a bicycle passing law for drivers passing cyclists or pedestrians 3. send a mechanic to HEV/EV maintenance training in Japan or New Zealand 4. Provide pedestrians (particularly schoolchildren) and cyclists with **safety reflectors and lights** **5.** Install **rumble strips** and painted lines demarcating lane boundaries to increase pedestrian and biker safety 6. Limit idle time with the help of fleet partners and idle reduction technologies 7. Set vehicle registration fee and/or import tariff according to fuel consumption 8. Blend 10% biodiesel into all diesel fuel 9. Develop a water taxi in the laguna 10. Build a strategic parking lot and bus stop at intersection of Taufa'ahau Rd. and Loto Rd. **11.** Introduce fuel economy and fuel cost labeling requirements	MCCTIL MOI MET/MOI MET/MOI MOI/Police MOI/MEIDECC Ministry of Revenue and Customs MEIDECC MOI MOI MOI/MEIDECC	*Presenters should be able to elaborate on the relevance of the policy interventions, suggest other best alternatives and confirm the practicality of achieving the target.*
1230 - 1400	**LUNCH**		
SESSION 5	**PROPOSED ELECTRICITY POLICIES AND PROJECTS**		
1400-1600	1. Implement **building standards** for resilience and energy efficiency (e.g.passive ventilation and daylighting with appropriate external shading) 2. Implement a **public awareness campaign** on EE and conservation 3. Establish a demand-side management **revolving loan or rebate program** to aid in financing more efficient equipment (residential, commercial, and industrial) 4. Work with TPL to create an **IRP** to incorporate RE, EE, and more efficient reciprocating engines that can be dual fuel 5. Perform Energy Audits of buildings to create baselines and implement energy conservation measures 6. Data collection exercise/database to manage energy data by sector	MEIDECC MET/MEIDECC/TPL Tonga Development Bank TPL /MEIDECC MEIDECC MEIDECC	*Presenters should be able to elaborate on the relevance of the policy interventions, suggest other best alternatives and confirm the practicality of achieving the target.*

1600-1630	**AFTERNOON TEA**
END OF DAY 1	

DAY 2 – 19TH FEBRUARY, 2020

TIME	ACTIVITIES	PRESENTER	FACILITATOR
SESSION 6	**INCORPORATING ENERGY EFFICIENCY TARGETS AND ACTIVITIES OF RELATED STAKEHOLDERS IN THE TEEMP**		
0900 - 0930	Recap Day 2		PCREEE (Participants will be required to work on the policy/project logical framework matrix)
0930 – 1000	GROUP BREAKAWAYS Group 1 – Electricity Sector Group 2 – Transport Sector		
1000-1030	**MORNING TEA**		
1030 - 1100	GROUP BREAKAWAYS Group 1 – Electricity Sector Group 2 – Transport Sector		PCREEE (Participants will be required to work on the policy/project logical framework matrix)
1100 - 1130	Group Presentation – Electricity Sector	TBC	
1130 – 1200	Group Presentation – Transport Sector	TBC	
1200 - 1230	Plenary Discussions		
1230 - 1400	**LUNCH**		
SESSION 7	**FINANCING THE TEEMP**		
1400-1430	Accessing the multilateral environment funds	Climate Finance Advisor-MEIDECC	DoE
1430-1500	National Processes for Accessing Project Funds	Ministry of Finance	
1500 - 1530	Plenary Discussions		
1530 - 1600	**AFTERNOON TEA**		
END OF DAY 2			

DAY 3 – 20TH FEBRUARY 2020

TIME	ACTIVITIES	PRESENTER	FACILITATOR
SESSION 8	**A MONITORING AND EVALUATION FRAMEWORK FOR THE TEEMP**		
0900 - 0930	A draft M & E for the TEEMP	PCREEE	DoE

0930 - 1000	How the draft TEEMP M & E link to the overall Energy Sector M & E	DOE	
1000-1030	**MORNING TEA**		
SESSION 9	**THE INSTITUTIONAL AND GOVERNANCE STRUCTURE FOR THE TEEMP**		
1030 – 1100	How the TEEMP will be assisted by the draft Tonga Energy Sector Bill	DOE	PCREEE
1100 - 1130	The draft MEPS	DOE	
SESSION 10	**WAY FORWARD & WRAP UP**		
1130 – 1200	The final draft TEEMP	PCREEE	DoE
1200 - 1230	Cabinet submission paper and The draft programme for the launch of the TEEMP	DoE	
1230-1400	**LUNCH**		
END OF DAY 3 & END OF WORKSHOP			

Annex 3: Participants List

Final Consultation Workshop on the Tonga Energy

Efficiency Master Plan

18th – 20th Feb 2020

Venue: Tanoa International Hotel

	Name	Organization	Role	Contact/email	M/F
1	'Eliate Laulaupea'alu	MEIDECC	Energy Planner	tuhamoelotu@gmail.com	M
2	Sione Misi	PCREEE	EE Officer	sione.misi@pcreee.org	M
3	Samiuela Matakaiongo	MEIDECC	Energy Planner	Sam.matakaiongo@gmail.com	M
4	Jese T	Total	CM	jese.tikomailepanoni@total.com	M
5	Edwina Tangitau	MTED	Sen. Price Control Officer	edwinat@mted.gov.to	F
6	Katalina Lui	MEIDECCC	Energy Technician	Linalui129@gmail.com	F
7	Tupou Tevi	MEIDECCC	Energy Ext Asst	tevitupou@gmail.com	F
8	Sarel Steirauner	PCREEE	Intern	18853784@student.curtin.edu.au	M
9	Emma Carle	PCREEE	Media/Comms	emmacarle@yahoo.com	F
10	Meleseini Folau	Electricity Commission	Sec/Admin	m.folau@electricitycommission.to	F
11	Koli M Kakala	AMREC		kolimoak@yahoo.com	M
12	Manatu Maile	Fisheries	SFO	manatumalie@gmail.com	F
13	Manaia Halafihi	MAFF	Head CSD	mhalafihi@gmail.com	M

14	Sipola Halafihi	MET	A/DCEO	shalafihi@edu.gov.to	F
15	Ma'u Havea	NFC		mau.havea@gmail.com	M
16	Sione Tausinga	MEIDECC	Principal Energy Planner	Sl_tausinga@yahoo.com	M
17	Murray Sheerin	TPL	Generation/Manager	Msheerin@tongapower.to	M
18	Paula Taufa	Pacific Energy	Country Manager	paula.taufa@p.energy	M
19	Nikolasi Fonua	TPL	Strategy	nfonua@tongapower.to	M
20	Kipola Sootanga	MEIDECC	P. Energy Planner	kipolasootanga@gmail.com	M
21	Nauli Tufui	MEIDECC	Energy Tech	Tufui2019@gmail.com	F
22	Mele Lupe	MEIDECC		fokikovitovo@gmail.com	F
23	Silesa Taumoepeau Pousima	TDB	EA/ Climate change finance officer	spousima@tdb.to	F
24	Elizabeth Fineanganofo	TDB	Loans Officer	efineanganofo@tdb.to	F
25	Lakai Fonua	TCCI	CEO	ceo@tongachamber.org	F
26	Sam Vea	TCCI	Vice President	samintonga@me.com	M
27	Andrea Taliauli Tora	Transport Project Dev. Facility	Dep. Project Coordinator	Andreatora13@gmail.com	F
28	Sau Niulala	Customs	Senior Officer	saun@customs.gov.to	M
29	'Ofa Sefana	MEIDECC	Energy Specialist	ofasefana@yahoo.com	M
30	Hemaloto Tupou	MOI	Env Officer	Likewater83@gmail.com	M
31	Lemoto K Piliu	Tonga Police	Chief Inspector	Lemoto.piliu@police.gov.to	M
32	Sailosi Faivailo	Tonga Police	Inspector	sailosifaivailo@gmail.com	M
33					

Annex 4: Proposed Transportation And Electricity Policies and Projects

REVISITING THE TRANSPORTATION POLICIES AND PROJECTS (P.34 – P38)

Key Discussions: SMART Indicators and Other Alternatives

1. Use a Platform such as NextBus to coordinate buses

- **Leading Organisation: MTED (Ministry of Trade and Economic Development)**
- **Collaborating Agencies: MEIDECC, MOI, Chambre of Commerce, Bus Owners Association**
- **Model Impact: 12,700 metric tones of CO2 per year**

Comments: Depends very much on the internet access which may be that good in some rural areas. MTED does not issue license to buses with a condition on their service delivery, like routes, punctuality, etc.

In Fiji's case, it is a simple board at the bus station showing the bus schedule and its works well with minimum costs.

2. Enact a Safe Bicycle Passing Law for Drivers passing cyclists or pedestrians

- **Leading Organisation: MOI**
- **Collaborating Agencies: Police, AGO**
- **Model Impact: 2,700 metric tonnes of CO2e per year.**

Comments: The idea makes sense but a lot of questions to be answered on its practicality. Road is currently too narrow. Sidewalks are being built putting a limit on the width of the road. Certain areas (e.g Tofoa – Pea) still don't have sidewalks and govt is now trying hard to have 2 lanes in this stretch of road coming into town in the morning and two lanes when returning in the afternoon in order to ease the traffic during peak hours.

3. Send a Mechanic to HEV/EV Maintenance Training in NZ or Japan

- **Leading Organisation: MET**
- **Collaborating Agencies: MEIDECC, Motor Traders, eg. Asco Motors**
- **Model Impact: 300 metric tonnes of CO2e per year**

Comments: The suggestion will probably benefit 1 or 2 trainees who may be trainers to come back and train the others. The other option would be to bring the trainers to Tonga and maximize the number of local participants and trainers participating in the workshop.

4. Provide pedestrians (particularly schoolchildren) and cyclists with safety reflectors and lights

- **Leading Organisation: MET**
- **Collaborating Agencies: MOI, Police**
- **Model Impact: 2,700 metric tonnes of CO2e per year**

Comments: It is a question of saving energy against one's own safety. Driver education, improving visibility of the pedestrians' crossings to schools and public awareness are also supporting activities.

5. Install Rumble Strips and Painted Lines Demarcating lane boundaries to increase pedestrian and biker safety

- **Leading Organisation: MOI**
- **Collaborating Agencies:**
- **Model Impact: 12,700 metric tones of CO2 per year**

Comments: Linked to the comments on #2 above.

Promotion of walking and cycling would be more effective if done from a Healthy Lifestyle perspective.

6. Limit Idle time with the help of Fleet Partners and Idle Reduction Technologies

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: MOI**

- **Model Impact: 10,300 metric tonnes of CO_2e per year.**

Comments: Later vehicle models do come with buttons for switching off the engine and quickly switching it on again.

Most of idle times are happening when vehicles queue up to drop schoo children off and pick them up after school. The promotion of the use of school buses

7. Set Vehicle Registration fee and/or Import Tariff According to Fuel Consumption

- **Leading Organisation: Ministry of Revenue and Customs**
- **Collaborating Agencies: MOI**
- **Model Impact: 5,700 metric tonnes of CO_2e per year**

Comments: Duty on vehicle imports are presently based on a fixed rate per engine size range, progressively paying more for the bigger engines regardless of the age of the vehicle. New cars pay more on other charges based on their landed costs.

8. Blend 10% Biodiesel into all Diesel Fuel

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: MOI, Chamber of Commerce**
- **Model Impact: 4,500 metric tonnes of CO_2e per year**

Comments: The copra industry is a declining industry, farmers, and landowner need to replanting fast growing species that also produce more nuts and oil. Unless the price of copra increase significantly, biofuel would face stiff competitions from the production of virgin oil and cosmetic purposes.

9. Develop a Water Taxi in the Laguna (which requires associated dredging)

- **Leading Organisation: MOI**
- **Collaborating Agencies: Private sector**
- **Model Impact: 12,700 metric tones of CO_2 per year**

Comments: This is a possibility but risky to travel over a polluted lagoon as compared to travelling on the soon-to-be-built bridge. It may become a possibility if the road tariffic in the future becomes a major problem. It may be an added water exploration and leisure activity for tourists but dredging must be carried out and the lagoon must be flushed to significantly improve on the quality and cleanliness of the water.

10. Build a Strategic Parking lot and Bus Stop at Intersection at Taufa'ahau Rd. and Loto Rd

- **Leading Organisation: MOI**
- **Collaborating Agencies:**
- **Model Impact: 12,700 metric tonnes of CO_2e per year.**

Comments: Similar to what is done overseas but may not work in here. People would like to take their cars with them all the way to where they are going.

11. Introduce Fuel Economy and Fuel Cost Labelling Requirements

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: MOI, Motor Traders**
- **Model Impact: 5,700 metric tonnes of CO2e per year**

Comments: This is currently being carried out in places like NZ where motor traders provide info about cars being sold, in terms of engine size, km travelled and fuel efficiency in terms of fuel consumed per 100 km travelled.

While this is not carried out at the moment in Tonga, this is more of a consumer affairs matter to be dealt with by the Consumer Affairs Division of the MTED.

ADDITIONAL PROJECTS / POLICIES WITH NO MODELLED IMPACTS IN TERMS OF GHG REDUCTION.

12. Implement Motorcycle/Scooter safety program and vest requirements

- **Leading Organisation: MOI**
- **Collaborating Agencies: Police**
- **GHG Reduction: Med**

Comments: Looks OK and tourists would love this.

13. Incentivise Tuktuks to que at major bus stops in the countryside to complete the last mile travelled

- **Leading Organisation: MOI**
- **Collaborating Agencies: Taxi Association, Bus Association**
- **GHG Reduction: Med**

Comments: There is growing car ownership in Tonga and while bus services are still required, the suggested use of the tuk tuks for the last mile may not be a practical option. It may be more worthwhile to promote tuk tuks only at the centre of town thereby promoting cleaner cities.

14. Introduce Rebates on HEVs and EVss, including low-speed electric vehicles such as GEMs and EV Scooters

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: MOI**
- **GHG Reduction: Med**

Comments: Looks like a practical option.

15. Rebates on the installation of public EV charges with timers, then smart meters to sooth the load of 50% renewables

- **Leading Organisation: MEIDECC**

- Collaborating Agencies: TPL, Ministry of Finance
- GHG Reduction: High

Comments: Looks like a practical option.

16. Construct a toll bridge across the top of the lagna with parking lots at either end

- Leading Organisation: MOI
- Collaborating Agencies:
- GHG Reduction: High

Comments: This is an on-going project to be funded by the ADB. It would make sense to have parking lots at both ends.

17. Coordinate Taxis (with a common dispatch and/or coordination apps such as Flywheel) to increase the convenience of not owning a vehicle

- Leading Organisation: MOI
- Collaborating Agencies: Taxi Association
- GHG Reduction: Med

Comments: This suggestion is against the key social developments that is happening throughout the world in terms "convenience" in saving time as well as "independence / flexibility" to do what one likes to do within the boundaries of the law.

18. Construct Left hand turn lanes at key intersections to improve traffic flow

- Leading Organisation: MOI
- Collaborating Agencies: Police
- GHG Reduction: Med

Comments: A good suggestion that would obviously be dependent on space noting that what is being used at the major intersections now are roundabouts (4), which may be a more practical option given the available space.

19. Construct bus pull-offs to improve traffic flow

- Leading Organisation: MOI
- Collaborating Agencies: Bus Association, Police
- GHG Reduction: Low

Comments: Pull-off refers to the bus stops. There are existing bus stops along the maoin roads in particular but these are not clearly marked and seen and therefore bus drivers stop wherever they want.

The absence, the failure to clearly mark the bus pull offs and bus drivers not observing these stops have not really affected traffic flows in a negative way but they would obviously help with improving the flow during the peak hours.

REVISTING THE ELECTRICITY ENERGY EFFICIENCY POLICIES AND PROJECTS (P.39 – P41)

Key Discussions: SMART Indicators and Other Alternatives

1. Implement Building Standards for Resilience and EE (eg. Passive ventilation and daylighting with appropriate external shading)

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: MOI, AGO**
- **Model Impact: 1,100 metric tons of CO2 per year**

Comments: OK. There is an existing building code and is probably due for review.

2. Implement a Public Awareness Campaign on EE and Conservation

- **Leading Organisation: MET**
- **Collaborating Agencies: MEIDECC, TPL/MIA**
- **Model Impact: 600 metric tonnes of CO2e per year and 10,100 metric tonnes of CO2e through MEPS**

Comments: This activity can include incorporating EE into the education curriculum for schools so that students can be educated at an early age on EE/Conservation.

3. Establish a Demand-Side Management Revolving Loan or Rebate Program to aid in financing more efficient equipment (residential, commercial and industrial)

- **Leading Organisation: Tonga Development Bank**
- **Collaborating Agencies: MEIDECC, MOI, Supplers/Retailers of electrical equipments**
- **Model Impact: NA**

Comments: For this to work, MOI needs to incorporate the EE into the building code and have it enacted.

4. Work with TPL to Create an IRP to incorporate RE, EE and more Efficient Reciprocating Engines that can be Dual Fuel

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: TEC and TPL**

- **Model Impact: Med**

Comments: IRP should be inclusive of all plans and containing supply and demand side management. TPL is already working on it with its outer islands RE projects

5. Perform Energy Audits of Buildings to Create Baselines and Implement Energy Conservation Measures

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: AGO (develop building regulations), MOI for enforcement of building codes**
- **Model Impact: 700metric tones of CO2 per year**

Comments: Capacity building is needed for EE auditors as there is lack of capacity in that area to conduct EE auditing in buildings. Its important to integrate EE into building codes and enforce it for new buildings in Tonga.

6. Data Collection Exercise/Database to Manage Energy Data by Sector

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: TPL, PCREEE, PRDR, Statistics Office**
- **Model Impact: Med**

Comments: Its important to have data backups and therefore the need for other sectors to have their own database is also important. The database of PCREEE and PRDR is also noted.

8. MEPS for Equipment and Appliances

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: AGO**
- **GHG Reduction: High**

Comments: The MEPSL regulation is hinged on the passing of the Tonga Energy Bill by Parliament. It's important to have the MEPSL adopted asap.

9. Set Packaging and Recycling Standards to Limit the Amount of Waste Imported in Tonga

- **Leading Organisation: MEIDECC (Department of Environment)**
- **Collaborating Agencies: Waste Authority**
- **GHG Reduction: High**

Comments: OK

10. Prioritise On-Site RE with Islanding Controls and Energy Storage within Critical Infrastructures

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: TPL**
- **GHG Reduction: High**

Comments: OK

11. Implement Distributed Energy Generation Projects that Incorporate RE and Fossil Fuels to Enhance Resilience and Reduce Emissions Associated with Diesel Generation, Particularly When Electrifying New Areas or Islands

- **Leading Organisation: TPL**
- **Collaborating Agencies: MEIDECC**
- **GHG Reduction: High**

Comments: OK

12. Work with TPL to Ensure Underground Lines along the Coast that are Susceptible to Cyclone Damage

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: TPL and TEC**
- **GHG Reduction: Med**

Comments: OK

13. Work with TPL to Ensure Grid Hardening is Adequately Carried Out (eg. Pole depth and composition can impact survival rate of T&D lines During Cyclones)

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: TPL and TEC**
- **GHG Reduction: Med**

Comments: OK

14. Continue to Reduce T&D Losses

- **Leading Organisation: TPL**
- **Collaborating Agencies: TEC and MEIDECC**

- **GHG Reduction: Med**

Comments: OK

15. Create or Implement a Certification Process for Sustainable/Green Hotels for the Tourism Industry

- **Leading Organisation: MIEDECC**
- **Collaborating Agencies: Ministry of Tourism**
- **GHG Reduction: Med**

Comments: The need to incorporate EE into building standards is also important. Environmental Star rating can have positive impact on the hotels occupancy rate.

16. Continue the Street Lighting Upgrade Program and Using Roundabouts rather than Traffic Lights

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: TPL and MOI**
- **GHG Reduction: Med**

Comments: Using roundabouts could be more effective than using street lights and reduce waiting time and contributing to lower emissions

17. Create a Cool Roof Program to Reflect Heat from Rooftops and Save Energy on Air Conditiong loads where Buildings are Air Tight and have AC Units installed

- **Leading Organisation: MEIDECC**
- **Collaborating Agencies: MOI**
- **GHG Reduction: Med**

Comments: Again the use of building standards is important in this regard.

18. Explore Waste-To-Energy Options to Reduce the Landfill Capacity Challenges

- **Leading Organisation: MEIDECC (Department of Environment)**
- **Collaborating Agencies: Waste Authority**
- **GHG Reduction: Med**

Comments: OK

Annex 5: TEEMP Working Logframe Matrix

Draft Logical Framework for the Tonga Energy Efficiency Master Plan: (2020 – 2030)

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
General objective	The general objective is 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 (TERM's Objective)* *2 suggestions:* • *Consistent with the TERM plus objective* • *Replace with the Project Purpose*	• % growth rate of Tonga's dependence on fossil fuel is reduced • % improvement in Tonga's energy intensity • % share of RE in Tonga's total energy supply	• Annual Report of MEIDECC, Min. of Trade and Economic Development as well as TPL.	•
Project purpose	The purpose of the TEEMP is to reduce GHG emissions from both transportation and electricity To provide a set of strategic direction & systematic activities to assist in reducing GHG emission …..	• A reduction of 106,000 metric tonnes of CO2 equivalent per year by 2030 in both transport and buildings (see top of 2nd para on page iii) Express the indicator / target as a %, as in TERM's 50% RE target, and based on 2020 projections … Note that the target was set	• Annual Report of MEIDECC, Min. of Trade and Economic Development as well as TPL.	•

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
		during the 500 ppm diesel era but it is now 10 ppm		
Results	**Result 1: Improved institutional, policy, legislative and governance frameworks for coordinating and managing the implementation of the TEEMP**	• The Tonga Energy Efficiency Bill is enacted by 2025 • Tonga adopts Minimum Energy Performance Standards and Labelling by 2022 merge the EE Bill with the Energy Bill and have the MEPSL as a Regulation under the Energy Bill • The Building Code is reviewed to incorporate EE by 2023 • A multi stakeholder setup is approved by Cabinet to coordinate and manage the implementation, monitoring and reporting of the TEEMP Suggestion for TEEMP and TERM to use the same Committee/Tasforce coordinate Implementation, monitoring and reporting	• Report of the Attorney General's Office & minutes of Cabinet meetings	•
	Result 2: Improved awareness and funding support and strengthened local technical	• TEEMP is launched at a key local and international event and is promoted jointly with RE nationally,	• Annual reports of the MEIDECCC and Ministry of Education and Training	•

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
	capacity to plan, implement and monitor low carbon projects in the transportation and electricity sectors	regionally and internationally • Amount of budget allocated to EE initiatives from the National Budget • TEEMP projects are promoted for funding at annual energy investment forums and other relevant national, regional and international events • No. of people trained on energy auditing in transportation and electricity • EE is incorporated in the primary, secondary and TVET school syllabus • A national qualification on EE is adopted by the TNQAB and accredited • No. of trade fairs completed & No. of public appearances, etc	• Ministry of Finance Annual Report	
	Result 3: Reduced greenhouse gas emissions in the transportation sector	1. 20% reduction in VKT of light duty vehicles through walking, biking, public transit, ridesharing and telecommuting 2. 30% improvement in fuel economy for new LDVs through registration fees, import tariffs, or	• Tonga National Communication & reports on the progress with its NDC implementation.	•

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
		fuel economy standards 3. HDV idle time reduced by 1 hr per day 4. All road transportation diesel contains 10% biodiesel 5. 10% of new LDVs are hybrid and electric by 2030 6. No. of GPS fish locator and VMS deployed in fishing (see the Transportation Wedge Analysis on bottom of page 28 and top of page 29)		
	Result 4: Reduced greenhouse gas emissions in the electricity sector	1. 100% adoption of Minimum Energy Performance Standards by 2022 2. MEPSL awareness and enforcement at the national level 3. Achieve the 50% RE by 2020 and 70% by 2030 4. Reduce line losses to the lowest feasible amount by 2030 5. Implement new EE and cyclone-resistant building standards, perform energy audits on all large customers and commence	• Tonga National Communication & reports to the UNFCCC COP on the progress with its NDC implementation. • TPL Annual Reports • Ministry of Tourism Annual Reports • Tonga Development Bank Annual Reports • MEIDECC Annual Reports	•

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
		implementation of audit recommendations by 2025 6. Promote the use of solar water heaters 7. Replace 100% of streetlights with LED bulbs, and use LED bulbs in government facilities by ??? 8. Establish a Green Hotel Accreditation Programme and leverage Ministry of Tourism's existing accommodation guide to review hotels based on these standards 9. Implement a revolving loan programme through the TDB to assist private entities in financing EE and distributed generation projects 10. Develop an integrated resource plan through a sector-wide approach to identify how EE and RE targets will be met in specific details (see the Electricity Wedge Analysis on bottom of page 30 and top of page 31)		

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
		11. Include EE in science curriculum by 2025 and MET to enforce EE & audits in classrooms 12. Training of Trainers (Teachers) on EE		
	Activities: **Result 1:** 1.1 Draft and conduct consultations on an EE Bill Include the EE Bill in the Energy Bill and have the MEPSL as a Regulation 1.2 Draft and conduct consultations on a MEPSL for Tonga () 1.3 Review the Building Code to incorporate EE by 2023, seek Cabinet approval and support its awareness and enforcement 1.4 Establish a cabinet-approved multi stakeholder Committee / Task Force to	**Means:** Consultancy, workshops and meetings, training and awareness, etc Consultancy, workshops and meetings, training and awareness, etc Consultancy, workshops and meetings, training and awareness, etc Meeting and awareness	**Costs (in USD):** 300,000 500,000 200,000 5,000	**Responsible Lead Agencies:** MEIDECCC MEIDECCC MoI MEIDECCC

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
	coordinate and manage the implementation, monitoring and reporting of the TEEMP Use TERM's and note institutional structure proposed in the Energy Bill **Activities** **Result 2:** 2.1 Launch of the TEEMP locally and at COP 26 on 9-19 November 2020, in Glasgow, UK 2.2 Conduct annual energy investment forums and other relevant forums to sell the TERM+, TEEMP, etc 2.3 Conduct practical training workshops on energy auditing in transportation and electricity and implement the findings 2.4 Incorporate EE in the primary, secondary and TVET school syllabus	**Means** Travel, publications, catering, etc Travel, publications, catering, etc Consultancy, equipments and tools, venue and catering, seed funding, etc Consultancies, meetings and workshops, equipments and tools, venue and catering, etc Consultancies, meetings and workshops, equipments and	**Sub-total: 1,005,000** **Costs (in USD)** 100,000 500,000 500,000 + plus seed funding for implementation 350,000 400,000 **Sub-total: 1,850,000** **Costs (in USD)** 500,000 400,000 200,000 400,000	**Responsible Lead agencies:** MEIDECCC MEIDECCC MEIDECCC with TPL and MoI MEIDECCC with MET

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
		tools, venue and catering, etc		MEIDECCC with MET / TNQAB
	2.5 Develop a national and accredited qualification on EE		250,000	
	2.6 Secure a local budget to support funding of the TEEMP	**Means**	400,000 **Sub-total: 2,150,000**	
	Result 3:	Consultancy, meetings and workshops, publications, radio and TV programmes, etc	**Costs (in USD)** See Activity 4.8 below	**Responsible Lead agencies:**
	3.1 Implement a programme (including physical structures) to promote the safety and health benefits of walking and cycling	Consultancy, meetings and workshops, etc	100,000 500,000	MoI, MoH, Police, etc
	3.2 Study the feasibility of forming a national bus company to improve service delivery and profits to members	Consultancy, meetings and workshops, publications, radio and TV programmes, etc	1,000,000 100,000	Chamber of Commerce and MTED
	3.3 Strengthen and encourage the use of school buses to ease the road congestion while improving on students' safety	Consultancy, meetings and workshops, etc	250,000 **Costs (in USD)** 300,000	MET & MoI
	3.4 Study the feasibility of introducing strategic parking lots and bus pull offs, public transit, ridesharing,	Consultancy, meetings and workshops, etc	**Sub total: 2,250,000** **GRAND TOTAL: 7,255,000**	MoI

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
	telecommuting as well as water taxi in the Fanga'uta lagoon	Consultancy, meetings and workshops, etc		
	3.5 Study to identify appropriate fiscal and financial incentives to promote HEVs, EVs and fuel economic vehicles, tuks-tuks, etc	**Means**		MoI
	3.6 Conduct feasibility study on biodiesel & e-mobility and develop a biodiesel / e-mobility programme with supporting policies, if feasible.	RE hardwares including battery storage Consultancy		MoI & Oil Companies **Responsible Lead Agencies**
	Result 4: **Activities**	Consultancy, travels, meetings and trainings, equipments		
	4.1 Support pursuing the 50% RE by 2020 and 70% by 2030 targets	Consultancy, travels, meetings and trainings, equipments		MEIDECCC and TPL
	4.2 Study to identify optimum line losses levels and to design a programme for pursuing that level	Consultancy, travels, meetings and trainings, equipments		TPL
	4.3 Conduct energy audits and commence implementation of audit			

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
	recommendations on all large customers by 2025 ~~4.4 Reduce the uptake of electric hot water heaters~~ Promote solar water heaters 4.5 Replace 100% of streetlights with LED bulbs, and use LED bulbs in government facilities 4.6 Incorporate RE and EE in the Ministry of Tourism's accommodation guide and standards 4.7 Support to raise capital for targeted products at the local banks to assist private entities in financing EE and distributed generation projects **Activities** 4.8 Develop an integrated resource plan / NDC roadmap / NDC Investment to identify the least cost approach for meeting Tonga's	Consultancy to develop funding proposals, meetings and trainings **Means** Consultancy, meetings, workshops, travels, etc		AMREC – Association of the Members of Registered Electrical Contractors. TPL and AMREC Ministry of Tourism Banks and MEIDECCC **Responsible Lead Agencies** MEIDECC and TPL

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
	how EE and RE targets			

- Indicative Operational Timetable. This Timetable is subject to be changed based on an annual review of the progress with the TEEMP
- Proposed institutional set up for coordinating the implementation and monitoring of the TEEMP
- Financing the TEEMP

Annex 6: Prioritisation Exercise

Prioritisation of the TEEMP Activities

Criteria 1. Meets govt's priorities or Manifesto 2. No. of SDGs addressed 3. Impacts on GHG Reduction 4. Other co-benefits 5. Available support	
GOAL 1: No Poverty GOAL 2: Zero Hunger GOAL 3: Good Health and Well-being GOAL 4: Quality Education GOAL 5: Gender Equality GOAL 6: Clean Water and Sanitation GOAL 7: Affordable and Clean Energy	GOAL 10: Reduced Inequality GOAL 11: Sustainable Cities and Communities GOAL 12: Responsible Consumption and Production GOAL 13: Climate Action GOAL 14: Life Below Water GOAL 15: Life on Land GOAL 16: Peace and Justice Strong Institutions GOAL 17: Partnerships to achieve the Goal

GOAL 8: Decent Work and Economic Growth GOAL 9: Industry, Innovation and Infrastructure	

ACTIVITIES BY RESULT	CRITERIA				
	1	2	3	4	5
Result 1					
1.1 Draft and conduct consultations on an EE Bill include EE Bill in the Energy Bill and have the MEPSL as a Regulation under the Energy Bill	H	SDG 7 & 13	L	H	H
1.2 Draft and conduct consultations on a MEPSL for Tonga					
1.3 Review the Building Code to incorporate EE	M	H	L	H	H
1.4 Establish a cabinet-approved multi stakeholder Committee / Task Force to coordinate and manage the implementation, monitoring and reporting of the TEEMP	H	H	L	H	H
Result 2					
2.1 Launch of the TEEMP (& TERM Plus) at COP 26 on 9-19 November 2020, in Glasgow, UK	H	H	L	H	L
2.2 Conduct bi-annual energy investment forums to promote TERM+, TEEMP, etc	H	H	L	H	L
2.3 Conduct practical training workshops on energy auditing in transportation and electricity	M	H	L	H	L
2.4 Incorporate EE in the primary, secondary and TVET school syllabus	H	H	L	H	L
2.5 Develop an accredited national qualification on EE	H	H	L	H	M
Result 3					
3.1 Implement a programme (including physical structures) to promote the safety and health benefits of walking and cycling (2)	H	H	H	H	M

ACTIVITIES BY RESULT	CRITERIA				
	1	2	3	4	5
3.2 Study the feasibility of forming a national bus company to improve service delivery and profits to members(4)	L	H	H	H	L
3.3 Strengthen and encourage the use of school buses to ease the road congestion while improving on students' safety (1)	L	H	H	H	L
3.4 Study the feasibility of introducing strategic parking lots and bus pull offs, public transit, ridesharing, telecommuting as well as water taxi in the Fanga'uta lagoon (5)	M	H	H	M	L
3.5 Study to identify appropriate fiscal and financial incentives to promote HEVs, EVs and fuel economic vehicles, tuks-tuks, etc (3)	L	H	H	H	L
3.6 Conduct feasibility study on biodiesel & e-mobility and develop a biodiesel / e-mobility programme with supporting policies, if feasible. (6)	L	H	H	L	L
Result 4					
4.1 Support pursuing the 50% RE by 2020 and 70% by 2030 targets (2)	H	H	H	M	M
4.2 Study to identify optimum line losses levels and to design a programme for pursuing that level (3)	H	H	IM	H	M
4.3 Conduct energy audits on all large customers by 2025 (7) ~~4.4 Reduce the uptake of electric hot water heaters~~	H	H	H	H	L
4.5 Replace 100% of streetlights with LED bulbs, and use LED bulbs in government facilities (1)	H	H	DM	DH	H
4.6 Incorporate RE and EE in the Ministry of Tourism's accommodation guide and standards (4)	H	H	IM	IH	M
4.7 Support to raise capital for targeted products at the local banks to assist private entities in financing EE and net metering projects (5)	H	H	IM	IH	L
4.8 Develop an integrated resource plan / NDC roadmap / NDC Investment to identify the least cost approach for meeting Tonga's how EE and RE targets (6)	H	H	IH	IH	L

Annex 7: Monitoring and Implementation Plan

INDICATIVE OPERATIONAL TIMETABLE. THIS TIMETABLE IS SUBJECT TO BE CHANGED BASED ON AN ANNUAL REVIEW OF THE PROGRESS WITH THE TEEMP

ACTIVITIES BY RESULT	YEARS									
	1	2	3	4	5	6	7	8	9	10
Result 1										
1.1 Draft and conduct consultations on the National Energy Bill (containing EE)										
Enact the National Energy Bill (containing EE) by Parliament and gazetted by His Majesty the King										
Enforcement of the National Energy Act										
1.2 Draft and conduct consultations on a MEPSL for Tonga (will address electric water heaters in 4.7)										
Enact the MEPSL by the Cabinet										
Awareness and Enforcement										
1.3 Review the Building Code to incorporate EE										
Enact the Building Code by the Cabinet										
Awareness and Enforcement of the Building Code										
1.4 Cabinet approval to use TERM Committee/Task Force to coordinate and manage the implementation, monitoring and reporting of the TEEMP										
Result 2										
Cabinet endorsement of TEEMP and Pre-Launch of TEEMP in Tonga										
2.1 Launch of the TEEMP at COP 26 on 9-19 November 2020, in Glasgow, UK										
2.2 Conduct annual energy investment forums and use other high level events to sell the TERM+, TEEMP, etc										
2.3 Conduct practical training workshops on energy auditing in transportation and electricity and implementation of findings										
2.4 Incorporate EE in the primary, secondary and TVET school syllabus										
Conduct Training of Trainers for Science Teachers										
2.5 Develop a national qualification on EE										
Accreditation of EE qualifications through TNQAB										
Result 3										
3.1 Implement a programme (including physical structures) to promote the safety and health benefits of walking and cycling										

ACTIVITIES BY RESULT	YEARS									
	1	2	3	4	5	6	7	8	9	10
3.2 Study the feasibility of forming a national bus company to improve service delivery and profits to members										
3.3 Strengthen and encourage the use of school buses to ease the road congestion while improving on students' safety										
3.4 Study the feasibility of introducing strategic parking lots and bus pull offs, public transit, ridesharing, telecommuting as well as water taxi in the Fanga'uta lagoon										
3.5 Study to identify appropriate fiscal and financial incentives to promote HEVs, EVs and fuel economic vehicles, tuks-tuks, etc										
3.6 Conduct feasibility study on biodiesel & e-mobility and develop a biodiesel / e-mobility programme with supporting policies, if feasible.										
Conduct study to identify fuel saving opportunities in the fishing industry through use of fish finders, Fish Aggregating Devices (FADs), sails and solar boats										
Result 4										
4.1 Support pursuing the 50% RE by 2020 and 70% by 2030 targets										
4.2 Study to identify optimum line losses levels and to design a programme for pursuing that level										
4.3 Conduct energy audits on all large customers by 2025 ~~4.4 Reduce the uptake of electric hot water heaters~~										
Support Implementation of Energy Audit Recommendations through seed funding										
4.5 Replace 100% of streetlights with LED bulbs, and use LED bulbs in government facilities										
4.6 Incorporate RE and EE in the Ministry of Tourism's accommodation guide and standards										
Awareness and Enforcement of the Guidelines and Standards										
4.7 Support to raise capital for targeted products at the local banks to assist private entities in financing EE and distributed generation projects										
4.8 Develop an integrated resource plan / NDC roadmap / NDC Investment to identify the least cost approach for meeting Tonga's EE and RE targets										
Study to identify fiscal and financial incentives to increase Uptake of solar water heaters in Tonga										

ACTIVITIES BY RESULT	YEARS									
	1	2	3	4	5	6	7	8	9	10

Annex 8: The Integrated Logframe

Draft Logical Framework for the Tonga Energy Efficiency Master Plan: (2020 – 2030)

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
General objective	The general objective is to *Reduce Tonga's Vulnerability to Oil Price Shocks and Achieve an Increase in Quality Access to, and use of, Modern Energy Services in an Environmentally Sustainable Manner (modified TERM's Objective but need to be consistent with the TERM Plus objective)*	• % growth rate of Tonga's dependence on fossil fuel is reduced by 2030 • % improvement / increase in Tonga's energy intensity by 2030 • 70% of the electricity generation is from RE by 2030	• Annual Report of MEIDECC • Annual Report of TPL • Progress reports of the TERM Plus & NDC	•
Project purpose	**The purpose of the TEEMP is to reduce GHG emissions from both transportation and electricity by 50% from the BAU by 2030.**	• A reduction of at least 106,000 metric tonnes of CO2 equivalent per year by 2030 in both transport and buildings Or • A 50% reduction in CO2e per year by 2030	• Annual Report of MEIDECC • Progress report on the NDC	•
Results	**Result 1: Improved institutional, policy, legislative and governance frameworks for coordinating and managing the implementation of the TEEMP**	• The Tonga Energy Efficiency Regulation on MEPSL becomes a part of the Energy Act by 2025	• Report of the Attorney General's Office & minutes of Cabinet meetings	•
		• The Building Code is reviewed to incorporate EE by 2023	• MoI annual report	•
		• The TERM institutional structure is activated in 2020 to coordinate and manage the implementation, monitoring and reporting of the TEEMP	• Cabinet Decision	•
	Result 2: Improved awareness and funding support and strengthened local technical capacity to plan, implement and monitor low carbon projects in the transportation and electricity sectors	• At least 1 international and 1 local launch of the TEEMP by end of 2021	• MEIDECCC launch reports	•
		• 50% of the TEEMP budget gets confirmed funding by 2025	• MEIDECCC launch reports • Ministry of Finance Budget Reports	•

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
		• 20% of the TEEMP budget comes from the National Budget by 2025	• MEIDECCC budget • Ministry of Finance Budget Reports	•
		• TEEMP gets promoted in at least 5 investment forums by 2024	• Annual reports of the MEIDECCC	•
		• 200 people trained on an accredited energy auditing course in transportation and electricity by 2025	• Annual reports of the MEIDECCC and Ministry of Education and Training	•
		• EE is incorporated in the primary, secondary and TVET school syllabus by 2025	• Annual reports of the MEIDECCC and Ministry of Education and Training	•
		• An accredited national qualification on EE is adopted by the TNQAB by 2025	• Annual reports of the MEIDECCC and Ministry of Education and Training	•
		• No. of trade fairs completed & No. of public appearances	• MEIDECCC reports	•
	Result 3: Reduced greenhouse gas emissions in the transportation sector	• 20% reduction in VKT of light duty vehicles through walking, biking, public transit, ridesharing and telecommuting by 2023	• Tonga National Communication & reports on the progress with its NDC implementation.	•
		• HDV idle time reduced by 1 hr per day by 2030	• MoI vehicle registration	•
		• All road transportation diesel contains 10% biodiesel by 2030	• MoI vehicle registration	•
		• 10% of new LDVs are hybrid and electric by 2030	• MoI vehicle registration	•
		• 20 GPS fish locator and VMS deployed in fishing by 2024	• Ministry of Fisheries reports	•
	Result 4: Reduced greenhouse gas emissions in the electricity sector	• At least 10 major electricity consumers are audited and recommendations are implemented by 2026.	• AMREC and contract reports	•
		• 3 additional appliances are included in the MEPSL regulation by 2026	• Regulations and government gazette	•
		• At least a 5% decrease in line losses and a 5% increase in underground cables by 2030	• TPl reports	•

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
		• At least 6 MW of RE mini-grids plus battery storage are installed by 2030	• TPL & MEIDECCC reports	•
		• 100% of all street lights and government premises are on LED lights by 2030	• AMREC & MoI reports	•
		• 100% of the tourism accommodation premises comply with the hotel guide by 2030	• Ministry of Tourism reports	•
		• At least USD 5 M is secured for a EE revolving fund / rebate by 2030	• Energy sector reports	•
		• A very effective public awareness programme reach out to 90% of the population by 2027	• Media reports	•
		• At least USD 2 M is secure to kick start a cool roof programme by 2027	• Energy sector reports	•
		• An IRP for TPL and a data base programme for the energy sector is adopted by 2025	• TPL and Statistics reports	•

ACTIVITIES:	**MEANS:**	**COSTS (IN USD):**	**RESPONSIBLE LEAD AGENCIES:**	**Modelled GHG Impacts (annual CO2e reduction by 2030)**	**Year 1 - 3**	**Year 4 - 7**	**Year 8 -10**
					High	Medium	Low
Result 1: 1.1 Draft and conduct consultations on a MEPL Regulation to be added to the Energy Bill	Consultancy, workshops and meetings, training and awareness, etc	300,000	MEIDECCC		300,000		
1.2 Review the Building Code to incorporate EE by 2023, seek Cabinet approval and support its associated awareness and enforcement activities	Consultancy, workshops and meetings, training and awareness, etc	200,000	MoI			200,000	

ACTIVITIES:	MEANS:	COSTS (IN USD):	RESPONSIBLE LEAD AGENCIES:	Modelled GHG Impacts (annual CO2e reduction by 2030)	Year 1 - 3	Year 4 - 7	Year 8 -10
					High	Mediu m	Low
1.3 Reactivate the TERM institutional structure in 2020 to coordinate and manage the implementation, monitoring and reporting of the TEEMP	Cabinet submission and consultation meetings	5,000 Sub-total: 505,000	MEIDECCC		5,000		
Result 2: 2.1 Launch of the TEEMP locally and at COP 26 on 9-19 November 2020, in Glasgow, UK	Travel, publication, promotional materials, venue, catering & equipments	100,000	MEIDECCC		100,000		
2.2 Conduct annual energy investment forums and other relevant forums to promote the TERM+, TEEMP, etc	Travel, publications, promotional materials, venue, catering & equipments	500,000	MEIDECCC			500,000	
2.3 Conduct accredited energy auditing course in transportation and electricity and implement the findings	Trainers, training materials, tools & equipment, venue, catering	250,000	AMREC supported by MEIDECCC & TPL			250,000	
2.4 Incorporate EE in the primary, secondary and TVET school syllabus	Consultancy, workshops, training of trainers, teaching materials and equipments	300,000	MET			300,000	
2.5 Develop a national and accredited qualifications on EE	Consultancy, workshops, training of trainers, teaching materials and equipments	300,000	MET			300,000	
2.6 Promote local funding for the TEEMP during the budget preparation process	Promotional materials, meetings, displays and site visits	10,000 Sub-total: 1,460,000	MEIDECCC		10,000		
Result 3: 3.1 Implement a programme (including physical structures) to promote the safety and health benefits of walking and cycling	Consultancy, equipments, trainings and workshops a. Enact safe bicycle passing law b. Distribute safety reflectors and lights c. Install rumble strips	400,000	MoI & MET	a. 12,700 b. 12,700 c. 12,700		400,00 0	
3.2 Implement a programme to improve efficiency of buses and limit vehicle idle time	Consultancy, equipments, trainings and workshops	500,000	Chamber of Commerce, MoI & School PTAs	a. X b. X c. 12,700			500 ,00 0

ACTIVITIES:	MEANS:	COSTS (IN USD):	RESPONSIBLE LEAD AGENCIES:	Modelled GHG Impacts (annual CO2e reduction by 2030)	Year 1 - 3	Year 4 - 7	Year 8 -10
					High	Mediu m	Low
	a. Study and Establish national bus company b. Increase number of school buses c. Use platform for coordinating buses d. Build strategic parking lot and bus stops at bottlenecks e. Introduce technologies to reduce idle time			d. 12,700 e. 10,300			
3.3 Introduce water taxi in the Fanga'uta lagoon	Consultancy, Dredging, testing & promotion	250,000	MoI	12,700			250,000
3.5 Adopt appropriate fiscal and financial incentives to promote HEVs, EVs and fuel economic vehicles, tuks-tuks, etc	Consultancy, workshops, training and demonstration	200,000	MEIDECCC & Finance and National Planning			200,000	
3.6 Promote biodiesel & e-mobility	a. Consultancy, testing 10% biodiesel, demonstration, equipments and training b. Training of trainers on e-mobility	350,000	MoI & Agriculture	a. 4,500 b. 300		350,000	
3.7 Set vehicle registration and import tariff according to fuel consumption engine size and improve customer awareness	a. Consultancy, consultation meetings and workshops b. Introduce fuel economy labels, consultancy, training and consultation workshops	250,000 Sub-total 1,950,000		a. 5,700 b. 5,700 Total for Transport 102,700	250 ,00 0		
Result 4: **Activities** 4.1 Implement building standards (see 1.2).	Consultancy, workshops, training, equipments, demonstration, etc	300,000	MoI	1,100	300,000		
4.2 Conduct energy audits and implement the recommendations	Consultancy, workshops, training of trainers, equipments, demonstration, etc	500,000	AMREC supported by TPL and MEIDECC	700		500,000	
4.3 Extend the PALS programme to include other appliances and promote use of solar water heaters	Consultancy, workshops, training, equipments, demonstration, etc	250,000	MEIDECCC, Chamber of Commerce, Consumer Division MTED	10,100	250,000		
4.4 Reduce TPL line losses to the identified optimum level, implement grid hardening measures & extend the Village Network and the underground cabling works	Consultancy, workshops, training, equipments, demonstration, etc	10,000,000	TPL			10,000,00 0	

ACTIVITIES:	MEANS:	COSTS (IN USD):	RESPONSIBLE LEAD AGENCIES:	Modelled GHG Impacts (annual CO2e reduction by 2030)	Year 1 - 3	Year 4 - 7	Year 8 -10
					High	Mediu m	Low
4.5 EE Public awareness campaigns	Promotional materials, publicity and visibility events and promotions, transport, etc	250,000	MEIDECCC, TPL, NGOs	600	250,000		
4.6 Install mini-grid projects and RE systems with storage	Consultancy, equipments, trainings, meetings and workshops, awareness and promotion	10,000,000	TPL & MEIDECCC			10,000,00 0	
4.7 Change all streetlights and light at government premises to LED	Equipments, training, demonstration, awareness and visibility, etc	500,000	AMREC		500,000		
4.8 Implement a certification process for sustainable / green hotels	Consultancy, equipments, trainings, meetings and workshops, awareness and promotion	200,000	Ministry of Tourism			200,000	
4.9 Implement a cool roof programme	Consultancy, equipments, trainings, meetings and workshops, awareness and promotion	250,000	MoI				250,000
4.10 Establish a DSM revolving loan or rebate programme	Consultancy, trainings, meetings and workshops, awareness and promotion	500,000	Banks				500,000
4.11 Strengthen the planning and data collection and analysis capacity in the energy sector	Consultancy to draw up a IRP for TPL, workshops, equipments, training	250,000 Sub-total 23,000,000 **GRAND TOTAL 26,915,000**	TPL & MEIDECCC	Total for electricity 12,500 **TOTAL** **115,200**	1,965,000	250,000 23,450,00 0	1,500,000