CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

Technical Assistance Response Plan – Terms of Reference

Country	**Papua New Guinea**
Request ID#	**2021000023**
Title	**Developing a national policy for deploying and scaling up E-mobility and supporting sustainable infrastructure in Papua New Guinea**
NDE	Mr. Ruel Yamuna Managing Director Climate Change and Development Authority Papua New Guinea ryamuna959@gmail.com Phone: (675) 7411 2493
Proponent	Mr. Alfred Rungol General Manager and NDC National Focal Point Climate Change and Development Authority Papua New Guinea kaferinrin@gmail.com Phone: (675) 754 99951

Summary of the CTCN technical assistance

The summary should provide a brief description of the problem (barrier to climate technology deployment) and how the technical assistance will address it (brief summary of outputs and activities). Please also briefly indicate national actors involved and the anticipated timeline. Please note this summary will be used for public communication purposes so it is important that it is well written. (maximum 1250 characters including spaces)

PNG is among the most vulnerable countries to the impacts of climate change yet continue to be increasingly dependent on imported fossil fuels that dominates its Greenhouse Gas emissions. To reduce its energy reliance on the fossil fuel, PNG has enhanced Nationally Determined Contribution that has targets to implement low carbon transport measures through electric mobility. The Nationally Determined Contribution of PNG also mentions about the actions like feasibility study of interventions like electric buses and national policy on electric mobility and the action plan. The climate resilience of the supporting infrastructure for the low carbon transport is also a priority area for climate change adaptation under enhanced NDCs.

The world is moving towards efficient and low carbon transport including introduction of hybrid and electric vehicles. However, in PNG, the policies, legislations and regulations relating to low carbon or energy efficient land transport has not been made effective and focussed to encourage or incentivise the introduction of electric vehicle technologies into the country.

Hence, CTCN is requested to provide support under its Technical Assistance facility on developing national electric mobility policy and feasibility study on low carbon interventions. The technical assistance will help in conducting a market analysis for the promotion and implementation of low carbon transport through electric vehicles. The outcome of the market analysis will be used to develop draft policy and a roadmap of action plans for the implementation, from which selected action plans will be undertaken for feasibility study like electrification of the fleet of buses and supporting infrastructure in PNG. The TA will adopt a value chain approach with special attentions, made on augmenting the grid with adequate amount of renewable energy and battery management, at

end of batteries' life. The deliverables of the TA will be a report on market analysis, policy recommendations, a roadmap with proposed action plans, feasibility study for the selected action plans, input to leverage fund in future to support the concrete actions and capacity building. The maximum budget allocated for the TA is USD 187,770.

Agreement:

(If possible, please use electronic signatures in Microsoft Word file format)

National Designated Entity to the UNFCCC Technology Mechanism
Name: Mr. Ruel Yamuna

Title: Managing Director, Climate Change and Development Authority, Papua New Guinea

Date: 25th JUNE, 2021
Signature:

Proponent (signature of the Proponent is optional)
Name: Mr. Alfred Rungol

Title: General Manager and NDC National Focal Point, Climate Change and Development Authority, Papua New Guinea
Date: 25th June, 2021
Signature:

UNFCCC Climate Technology Centre and Network (CTCN)

Name: Rose Mwebazza
Title: CTCN Director
Date: 24/06/2021
Signature:

1. Background and context

Please provide a brief description of the background and context for the CTCN Response Plan. Please include national and sectoral information using recognized and publicly available sources. (maximum 2500 characters including spaces).

Papua New Guinea's economic development will require considerable growth in the coverage and quality of its state transport network. The total road network is 30 000 kilometres, of which 8460 km are state roads. Only 28% of the 8460 km of state roads were in a good condition as noted in 2010. A comprehensive program of rehabilitating existing roads and constructing new roads would expand the state road network to 25,000 km by 2035.

The transport sub-sector contributed approximately 2 Mt CO_2e (17 percent) of the total sectoral emissions in 2015[1]. It is expected that with expansion of state road network and urbanization, the use of land transport will increase substantially resulting in increased number of vehicles on road. The number of vehicles is expected to increase from approximately 155,000 in 2005 to more than 600,000 in 2030. It is also estimated that the demand for transportation fuel which is fossil fuel based in PNG could increase by a factor of three or four, resulting in emissions increasing to the range of 3.3–4.5 Mt CO2e by 2030[2].

The NTS notes the climate compatible development targets for PNG established by relevant authority and the sector will be encouraged to progress climate change mitigation and adaptation, including the targets in monitoring the NTS.

The enhanced Nationally Determined Contribution of PNG has mentioned that PNG will continue to review appropriate options and approaches to reducing emissions from the transport subsector. The transport sector critically linked with health and urban infrastructure is identified as a priority area in enhanced NDC.

Besides, GHG emissions from the land transport sector will result into congestions on road and adverse impact on the health due to tail pipe emissions. The land transport infrastructure will be vulnerable to the rising sea levels and coastal flooding, increased rainfall intensity, frequency and inland flooding. Furthermore, the NDC mentions that transport related infrastructure and assets to be built and/or rehabilitated will be in accordance to climate resilient codes and standards under adaptation targets.

The rapid development of electric and hybrid vehicle technology at a global level offers an opportunity to PNG to deploy electric vehicles. With the target of increasing the share of renewable energy as the source of electricity under NDC of PNG, deployment of electric vehicles is promising. The deployment of electric vehicles would result into substantial drop in oil consumption and offer a reduction of 22% in emissions in 2035.[3]

The National Transport Strategy (NTS) of PNG also includes provisions for climate change mitigation and adaptation along with cross-cutting issues like gender equity and women's advancement; prevention of disease transmission such as HIV/AIDS; consideration of those with disabilities; environmental protection.

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[1] Papua New Guinea First Biennial Update Report. (2019)
[2]Climate-compatible development for Papua New Guinea- https://www.unredd.net/index.php?option=com_docman&task=doc_download&gid=7734&Itemid=53
[3]APEC Energy Demand and Supply Outlook – 5th Edition for PNG https://aperc.or.jp/publications/reports/outlook/5th/volume2/EDSO5_V2_Papua_New_Guinea.pdf

2. Problem statement

Founded on the national and sectoral context as detailed in the section above, please include a brief problem statement clarifying the main problems and barriers for climate change mitigation and/or adaptation in terms of climate technologies that the CTCN Response Plan will address and overcome. (maximum 1250 characters including spaces).

As with many Pacific Island Countries, low carbon transport in PNG is new and many of the policy makers have very limited knowledge and understanding on the technology like electric vehicles and its benefits. A lot more education and awareness are needed to increase the introduction of hybrid and electric transport system in the country.

Furthermore, the promotion of low carbon transport in PNG faced following challenges:

- Governance challenges –Lack of clear policy and legislation hinders the promotion of the low carbon transport in the PNG. A lack of adequate technical information in the transport sector impedes the policy formulation and implementation.
- Financial barriers –A guiding policy and an implementation roadmap will rationalize the national budget allocations to make the shift towards low carbon transport developments, which is currently lacking in the PNG.
- Technical and Institutional challenges – There is limited capacity and skilled personnel in country to conduct technical assessments and feasibility study on the future of low emission transport sector in PNG. The institutional arrangements need to be assessed on its effectiveness and efficiency in addressing transport sector issues in PNG.
- Lack of education and awareness - The majority of the people need to be acquainted with the climate change impacts, environmental and economic benefits that derived from the use of low carbon transport systems in terms of both mitigation and adaptation with climate resilient infrastructure. Improved education and awareness on low carbon transport will help people to better appreciate the benefits of the shift towards low carbon transport.

The CTCN support is needed in two folds:

- Market analysis to recommend on national policy on Electric mobility and implementation roadmap on low carbon transport through electric vehicle.
- Feasibility study on selected interventions and capacity building on low carbon transport.

Overall objective

The overall objective of the TA is to conduct market analysis to introduce and promote low carbon transport complemented with policy, implementation roadmap, feasibility study and capacity building on electric vehicles.

Anticipated groups of activities to be performed by the technical assistance.

Under the TA, the following activities will be implemented:

- Assessment of the options available and barriers to the market adoption of electric mobility in PNG as an approach to low carbon land transport and draft the national policy on EV (Electric Vehicles) for land transport.
- Under the scope of proposed policy, recommend on the implementation roadmap for deployment and upscaling of the EV and supporting sustainable infrastructure with an integrated approach to

climate change mitigation and adaptation based on local context.

- Conduct detailed feasibility study on selected action plans to develop business case on procuring and deploying electric vehicles and sustainable supporting infrastructure.
- Facilitate capacity building and awareness of relevant stakeholders from government and EV value chain focusing on the gender gaps.

Anticipated products to be delivered by the technical assistance.

The anticipated deliverables from the TA would be the following:

- A policy document including the baseline assessment and barrier analysis to implement the policy, including the charging infrastructure required and battery management.
- Draft and final report on implementation roadmap and stakeholder consultation workshop
- Draft and final report on the feasibility study conducted.
- Draft GCF concept note
- Report on capacity gaps based on the assessment of the awareness of the stakeholders.
- Virtual sessions on capacity building and training with relevant materials
- Awareness raising factsheets, brief manuals and brochures

3. Logical Framework for the CTCN Technical Assistance:

(Guidance: Please note that multiple activities lead to one Output, and multiple Outputs lead to one Outcome. There can be several Outputs, but only one Outcome description capturing the CTCN technical assistance. Deliverables are the products or services to be delivered to the NDE/Proponent/CTCN based on the Activities and the Outputs.)

	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
***Objective**:* The overall objective of the TA is to conduct market analysis to introduce and promote low carbon transport, complemented with policy, implementation roadmap, feasibility study and capacity building on electric vehicles.												
Outcome: The outcome of the TA will be a clear implementation plan on low carbon transport through electric vehicles and on the other hand developed local capacities in PNG to leverage funds for supporting the implementation roadmap.												
Output 1: Inception meeting and development of implementation planning and communication documents												
Activity 1: *All implementers must undertake the following activities at the beginning and at the end of the CTCN technical assistance.* i) An inception meeting will be held virtually. ii) A detailed work plan of all activities, deliveries, outputs, deadlines and responsible persons/organisations and detailed budget to implement the Response Plan. The detailed work plan and budget must be based directly on this Response Plan; iii) Based on the work plan, a monitoring and evaluation plan with specific, measurable, achievable, relevant, and time-bound indicators used to monitor and evaluate the timeliness and appropriateness of the implementation. The monitoring and evaluation plan should apply selected indicators from the Closure and Data Collection report template and enable the lead implementer to complete the CTCN Closure and Data collection report at the end of the assignment (please refer to item iv below and section 14 in the Response Plan); iv) A two-page CTCN Impact Description formulated in the beginning of the technical assistance and update/revised once the technical assistance is fully delivered (a template will be provided); v) A Closure and Data Collection report completed at the end of the technical assistance (a template will be provided).												
Deliverable 1: i) Inception meeting report ii) Detailed work plan iii) Monitoring and evaluation plan iv) CTCN Impact Description v) Closure and Data Collection report	X											X

Output 2: Assessment of the options available and barriers to the market adoption of electric mobility in PNG as an approach to low carbon land transport and draft the national policy on EV (Electric Vehicles) for land transport. The output is to recommend on the relevant policies (policies on electric mobility or low carbon transport that are either existing or in work in progress) in a concise manner and providing all relevant information to set the way forward to an implementation roadmap (Output 3) for achieving the endorsement of the stakeholders for low carbon land transport through electric vehicles in PNG.												
Activity 2.1: *Conduct the market analysis, collect data on formal and informal modes of land transport.* This will include an infrastructure analysis and assessment of vehicle availability (type of vehicle and infrastructure type best suited to PNG) scale-up potential, barrier identification such as energy availability, financing gap analysis, reliability of the charging infrastructure. This will further include the collection of primary and secondary data to conduct background analysis of land transport sector in PNG focusing on public and private vehicles used in urban areas in the Islands. The data will be used to conduct GHG projection, accommodating the developmental plans for the land transport sector. An integrated climate approach to be adopted for data collection, also considering the potential interlinkages from climate change adaptation perspectives. An effort shall be made at the time of data collections to disaggregate the responses from the surveyors by gender, youth and vulnerable group and brief analysis on the data collected to be conducted, under this output.												
Activity 2.2: *Map out potential stakeholders in EV value chain ranging from policy makers, financiers, automobile manufacturers, part suppliers and the consumers.* While collecting data in Activity 2.1, effort should be made towards identifying the potential stakeholders using a value chain approach for land transport sector in PNG. Based on the data and information, a comprehensive list of stakeholders should be developed with detailed roles and responsibilities spanning over the complete technology life cycle of low carbon land transport such as Electric Vehicles. The list can be expanded by not limiting it within PNG, as potential players in the Pacific Region can also be included with appropriate justification on their support and engagement in PNG.												
Activity 2.3: *Assess and recommend on policy objectives, quantitative targets on the number of EVs with projected GHG emission avoidance, charging infrastructure and designated roles and responsibilities of the relevant authorities and relevant institutions.*												

This activity will be conducted with an objective of achieving clear, realistic, and measurable objectives and targets for low carbon transport through electric vehicles. This will be done in consultation with relevant authorities and institutions.												
Activity 2.4: *Identify barriers from the policy implementation perspective and recommend on viable instruments to promote EV.* Conduct the barrier analysis that are identified to impede the implementation of the policy objectives. Recommendations based on international experience to overcome the barriers to be made, if capacity gaps and barriers are found to be fed to Activity 5.2. It is imperative to assess the barriers using a value chain approach for the implementation of electric vehicles. The value chain approach will address the complex issues for island nations such as the energy requirements from the electric vehicles shall not add to the fossil fuels for electricity generation and there shall be environmentally sound management and disposal of electronic wastes like the batteries. Hence, following activities are to be carried out under the barrier analysis, as well. PNG's vehicle market outlook towards electric mobility can be an important input identify the barriers with the presence of leading vehicle manufacturers like Toyota, Nissan, Kia and Isuzu. **Activity 2.4.1** Analyze the total additional load on the grid due to introduction of EVs and barriers to its augmentation through the use of RE based systems. **Activity 2.4.2** Estimate the life of the battery systems and projected generation of discarded batteries at the end of each year for a time span of 10 years. Assess the barriers to the environmental sound management and disposal of such wastes generated from EV value chain.												
Deliverable 2: i) *A policy document also including the baseline assessment and barrier analysis to implement the policy, including the charging infrastructure required and battery management.*				X								
Output 3: Under the scope of proposed policy, recommend on the implementation roadmap for deployment and upscaling of the EV and supporting sustainable infrastructure with an integrated approach to climate change mitigation and adaptation based on local context A detailed implementation roadmap based on the international cases will be drafted to achieve the policy objectives proposed under output 2. Proposed action plans under the implementation roadmap will be												

supplemented with assessments on implementation time, required size of investment, potential financing source, link and refer back to- activity 2.4 on the potential barriers and solutions and activity 2.2 on the required institutional arrangements; and impacts in terms of no. of EVs to be deployed, charging infrastructure to be built, energy savings and GHG emission avoidance targeted at activities level. Recommendations will be made on the combination of potential business models, regulatory intervention and financial and fiscal incentives that will support the implementation roadmap. For example (for illustration purpose only), electrification of the fleet of buses and supporting charging infrastructure well integrated with RE based grid found to be the lowest hanging fruit to prioritize it as short or mid-term action with grant support from GCF or other financing mechanisms followed by substantial targets on electrification of other vehicles like 4-wheelers. The implementation roadmap will be developed in consultation with the relevant authorities and final draft will be presented to the stakeholders to achieve their comment, feedbacks and endorsement.												
Activity 3.1: *Consolidate and review transport plans and policies in the Pacific countries and other countries having similar transport landscape as PNG to recommend/develop the action plans for EV implementation.* The EV implementation roadmap will be categorized under short-, mid- and long-term action plans.												
Activity 3.2: *Recommend suitable business models/ regulatory support and investment plans to implement the actions based on blended approach of integrating international experiences and local context gathered based on transport sector assessment focusing on EV.* The recommended business models will also reflect on the requirement of strong cooperation between the key stakeholders in the power and transport sectors. Combined with digital innovations (e.g. internet of things) and the shift of vehicle ownership to shared modalities, e-mobility concepts open up opportunities for new business models, such as vehicle-to-grid (V2G) and grid-to-vehicle (G2V), in the long-term.												
Activity 3.3: *Review the institutional arrangements and capacity gaps for the for the identified players under 2.3, to implement the roadmap*												
Activity 3.4: *Engage relevant stakeholders to consult with an aim to validate and revised the draft implementation roadmap for the EV through physical or virtual mode.*												

Relevant research and academia community, identified in PNG like Department of Higher Education, Research, Science and Technology[4] (DHERST) or in Pacific Islands region to be engaged in consultation to gain RD&D perspectives on promoting the electric vehicles in Pacific Islands, as well.												
Deliverables 3: i) Draft and final report on implementation roadmap ii) Stakeholder consultation workshop and synthesized report on the same						X						
Output 4: Conduct detailed feasibility study on selected action plans to develop business case on procuring and deploying electric vehicles and sustainable supporting infrastructure. The action plan(s) from implementation roadmap will be selected for detailed feasibility study based on their assessed investment size and horizon that can be accommodated in the preparatory fund support.												
Activity 4.1: *Conduct detailed technical and economic feasibility analysis of selected action plan(s) with scalable business model.* The feasibility will be carried out for the EV as well as the supporting sustainable infrastructure (charging stations, climate proof bus stops etc.). Besides technical feasibility, the economic feasibility will be conducted using a social approach focusing on the development needs of communities in the PNG. The objective of the feasibility study is to provide input to conduct a detailed feasibility with a pilot demonstration with international financing support like GCF. The priority items identified in the roadmap and in the NDC of PNG like electrified bus rapid transit systems in urban centres and climate-resilient supporting infrastructure will be focussed of the feasibility study. The feasibility study will also serve as regional demonstration in Pacific Island for the countries with similar setup.												
Activity 4.2: *Develop input to the GCF concept note with technical specifications for priority items for example electrified bus rapid transit systems in urban centres and climate-resilient supporting infrastructure to further support to leverage financing for detailed feasibility, tendering and procurement of the electric vehicles and charging infrastructure.*												
Deliverables 4: i) Draft and final report on the feasibility study conducted. ii) Draft GCF concept note											X	
Output 5: Facilitate capacity building and awareness of relevant stakeholders from government and EV												

[4] https://web.dherst.gov.pg/

value chain focusing on the gender gaps												
Activity 5.1: *Relevant materials to be designed to facilitate capacity building and training of the relevant Government staff on the various aspects of EVs including basics of EV technologies, supporting policies and approach to piloting/ financing EV projects like procurement. Capacity building and training to be conducted on virtual mode.*												
Activity 5.2: *Conduct an assessment on the level of awareness and readiness among the relevant stakeholders to adopt EVs. Beyond the policy makers and other relevant players in the proposed EV value chain, an effort should made to assess the awareness and perception of the public consumers about EVs. One of the perspectives to be included is the gender gaps as the consumer of EVs.*												
Activity 5.3: *Meeting the needs arise from 5.1, develop brief factsheets on the basics of EV including three/ four wheelers, buses, trucks and charging infrastructures -as applicable for PNG and its impact will be developed for public awareness.*												
Activity 5.4: *The experiences from business case under output 4 will be archived in form of reference manual for the relevant stakeholders*												
Deliverables 5: i) Report on capacity gaps based on the assessment of the awareness of the stakeholders. A section to be included on gender gap analysis. ii) Virtual sessions on capacity building and training with relevant materials iii) Awareness raising factsheets, brief manuals and brochures											X	X

4. Resources required and itemized budget:

Please provide an indicative overview of the resources required and itemized budget required to implement the CTCN technical assistance, including for M&E-related activities, using the table below. Important to note that minimum 1% of the budget should explicitly target gender specific activities related to the technical assistance (please see section 10 for further information on gender). Once the Response Plan is completed, a Response Implementation partner(s) will be selected by the Climate Technology Centre (CTC). A detailed activity-based budget for the CTCN assistance will be finalized by the CTCN and selected Implementer.

Activities and Outputs	Input: Human Resources	Input: Travel	Inputs: Meetings/events	Input: Equipment/Material	Estimated Budget	
					Minimum	Maximum
Output 1: Inception meeting and development of implementation planning and communication documents	**2,900 - 3,470**				**2,900**	**3,470**
Activity 1.1: *Inception meeting report and formulation of i) Detailed work plan, ii) Monitoring and evaluation plan, iii) CTCN Impact Description, iv) Closure and Data Collection report.*	*2,900 - 3,470* *(TL-4, TE-2, LE-2, GE-1)*				2,900	3,470
Output 2: Assessment of the options available and barriers to the market adoption of electric mobility in PNG as an approach to low carbon land transport and draft the national policy on EV (Electric Vehicles) for land transport.	**34,750-41,770**	**15,000**			**49,750**	**56,770**
Activity 2.1: *Conduct the market analysis and baseline analysis through collecting data on formal and informal modes of land transport*	*13,350-15,860* *(TL-12, TE-15, LE-20, GE-1)*	*15,000 (1international mission to PNG and DSA cost for 1 week for data collection[5])*			28,350	30,860
Activity 2.2: *Map out potential stakeholders in EV value chain ranging from policy makers, financiers, automobile manufacturers, part suppliers and the consumers.*	*7,600-9,240* *(TL-8, TE-10, LE-6, GE-0)*				7,600	9,240
Activity 2.3: *Assess and recommend on policy objectives, quantitative targets on the number of EVs with projected GHG emission avoidance, charging infrastructure and designated roles and responsibilities of the relevant authorities and relevant institutions.*	*7,350-8,960* *(TL-7, TE-10, LE-5, GE-1)*				7,350	8,960

[5] The budget is indicative, and the actual cost will be based on the country from where the experts will travel for international missions.

Activities and Outputs	Input: Human Resources	Input: Travel	Inputs: Meetings/events	Input: Equipment/Material	Estimated Budget	
					Minimum	Maximum
Activity 2.4: *Identify barriers from the policy implementation perspective and suggest viable instruments to promote EV using a value chain approach with emphasis on grid augmentation with Renewable energy and EV waste management like discarded batteries.*	*6,450-7,710 (TL-7, TE-7, LE-8, GE-0)*				6,450	7,710
Output 3: Under the scope of proposed policy, recommend on the implementation roadmap for deployment and upscaling of the EV and supporting sustainable infrastructure with an integrated approach to climate change mitigation and adaptation based on local context	**32,400-39,270**	**15,000**	**7,000**	**5,000**	**59,400**	**66,270**
Activity 3.1: *Consolidate and review transport plans and policies in the Pacific countries and other countries having similar transport landscape as PNG to recommend/develop the action plans for EV implementation. The EV implementation roadmap will be categorized under short-, mid- and long-term action plans.*	*7,550-9,200 (TL-10, TE-08, LE-03, GE-1)*				7,550	9,200
Activity 3.2: *Recommend suitable business models and investment plans to implement the actions based on blended approach of integrating international experiences and local context gathered based on transport sector assessment focusing on EV.*	*13,050-16,050 (TL-15, TE-18, LE-5, GE-0)*				13,050	16,050
Activity 3.3: *Review the institutional arrangements and capacity gaps for the for the identified players under 2.3, to implement the roadmap*	*8,250-9,800 (TL-10, TE-7, LE-10, GE-1)*				8,250	9,800

Activities and Outputs	Input: Human Resources	Input: Travel	Inputs: Meetings/events	Input: Equipment/Material	Estimated Budget	
					Minimum	Maximum
Activity 3.4: *Engage relevant stakeholders to consult with an aim to validate and revised the draft implementation roadmap for the EV through physical or virtual mode*	*3,550-4,220 (TL-4, TE-3, LE-4, GE-1)*	*15,000 (1 mission to PNG Islands and DSA cost for 1 week for stakeholder consultation[6])*	*7,000 (1 day consultation workshop up to 30 participants)*	*5,000 (Venue, catering and logistic support to local officials)*	30,550	31,220
Output 4: Conduct detailed feasibility study on selected action plans to develop business case on procuring and deploying electric vehicles and sustainable supporting infrastructure	**37,100-45,050**				**37,100**	**45,050**
Activity 4.1: *Conduct detailed technical and financial feasibility analysis of selected action plan(s) with scalable business model. The feasibility will be carried out for the EV as well as the supporting sustainable infrastructure (charging stations, climate proof bus stops etc.).*	*19,100-23,250 (TL-20, TE-24, LE-12, GE-3)*				*19,100*	*23,250*
Activity 4.2: *Develop input to the GCF concept note with technical specifications to support the tendering and procurement of the electric vehicles and charging infrastructure.*	*18,000-21,800 (TL-20, TE-20, LE-12, GE-4)*				*18,000*	*21,800*
Output 5: Conduct capacity building and awareness of relevant stakeholders from government and EV value chain	**13,650-16,210**				**13,650**	**16,210**

[6] The budget is indicative, and the actual cost will be based on the country from where the experts will travel for international missions.

Activities and Outputs	Input: Human Resources	Input: Travel	Inputs: Meetings/events	Input: Equipment/Material	Estimated Budget	
					Minimum	Maximum
focusing on the gender gaps						
Activity 5.1: *Facilitate capacity building and training of the relevant Government staff on the various aspects of EVs including basics of EV technologies, supporting policies and approach to piloting/ financing EV projects like procurement.*	*4,950-5,900 (TL-5, TE-5, LE-6, GE-1)*				*4,950*	*5,900*
Activity 5.2: *Conduct an assessment on the level of awareness and readiness among the relevant stakeholders to adopt EVs. One of the perspectives to be included is the gender gaps as the consumer of EVs.*	*5,400-6,410 (TL-7, TE-4, LE-6, GE-1)*				*5,400*	*6,410*
Activity 5.3: *Meeting the needs arise from 5.1, develop brief factsheets on the basics of EV including three/ four wheelers, buses, trucks and charging infrastructures -as applicable for PNG and its impact will be developed for public awareness.*	*1,850-2,190 (TL-3, TE-1, LE-2, GE-0)*				1,850	2,190
Activity 5.4: *The experiences from business case will be archived in form of reference manual for the relevant stakeholders*	*1,450-1,710 (TL-2, TE-1, LE-2, GE-0)*				1,450	1,710
Total					**162,800**	**187,770**

There are travels proposed in Activity 2.1 and Activity 3.4 in the budget plan. The Response Plan is prepared when the world is facing the global pandemic of COVID-19. All the travels and face to face meetings will be planned and undertaken after a detailed assessment of the risks due to COVID 19 and following

the related advisory by the national and local government from the country where the project is located and the country where the implementer is located. This must be assured through a letter of undertaking provided by the authority of the entity requesting for travel and meetings before it is conducted.

In the scenario of continued lockdown and travel restrictions, there are uncertainties of travelling by the international consultant. To have the minimal impact of this risk on the timeline and workplan, the situation has to be monitored closely and alternate approaches may be suggested in discussion with the PNG's Government. In case the alternate approaches are to be adopted, the budget will be revised accordingly with revised plan, and the reasonable additional activities maybe suggested with the leftover budget. The revised plan will be agreed by CTCN and NDE before being adopted for implementation.

5. Profile and experience of experts

Based on the required Human Resources identified in section 4 (Resources required and itemized budget) please provide a description of the required profile of all involved experts for the implementation of the CTCN Response Plan.

Experts required	Brief description of required profile
Team Leader/ Project manager (TL)	The project manager shall have the following expertise and experience: • Demonstrated experience of leading and managing a team of experts from different cultural backgrounds and fields of expertise. • Have at least 15 years of experience in managing and conducting research and surveys, stakeholder engagements and developing policy recommendation, sectoral roadmaps for energy, technical programmes and financial proposals. • Prior experience of working in the land transport and / or energy sector of Pacific Island Countries and understanding of greenhouse mitigation through energy efficiency will be an added advantage. • Experience of working collaboratively with governments, regional and international organizations. • Have proficiency in reading, writing and speaking English and must be able to communicate with stakeholders effectively and to deliver on outputs in a timely manner.
Transport and Energy expert (TE)	The Transport and energy expert shall have the following expertise and experience: • An expert in the land transport sector of SIDS (Small Islands Developing States), both in the infrastructure / technical and engineering aspects as well as policy aspects too • At least 10 years of experience working for the land transport sector of a SIDS. • Knowledge of both civil and mechanical engineering would be an advantage. • Experience of developing transport related policies and roadmaps. • Familiarity with e-mobility and renewable energy–based transport systems and technologies. • Years of experience in stakeholder consultations and developing funding proposals. • Developing national programmes in the land transport sector.

Local Expert	The Local expert shall have the following expertise and experience: • Bachelor's Degree, or equivalent, in Social Science, Sustainable Development, Statistics or other related fields is required. • Relevant professional experience of data collection, conducting surveys and stakeholder engagement. • Experience in policy research, database management, socio-economic analysis will be an advantage. • Understanding of the local context, culture and diversity in Melanesia • Experience in energy and transport is desirable. • Excellent oral and written communication skills in English is essential
Gender Expert	The Gender Expert shall have the following expertise and experience: • Understanding and demonstrated ability to incorporate gender considerations in the removal of barriers to sustainable development in SIDS. • At least 10 years of field experience working with women, youths and rural communities. • Understanding of the culture and diversity in Melanesia. • Have proficiency in reading, writing and speaking English and must be able to effectively communicate with stakeholders.

6. Intended contribution to impact over time

Please provide a brief description of the intended contribution to impact over time of the outcome and outputs provided by this technical assistance on resilience to climate change and/or carbon abatement. To the extent possible, please quantify the intended impact contribution, for example by indicated estimated number of people potentially impacted over time, GDP contribution of the focus sector, carbon emissions by the focus sector, etc. This intended contribution to impact is what will happen if the objective (as articulated in section 3) is met. Please ensure relevant complementarity with text in sections 7 to 12. (maximum 1250 characters including spaces)

The TA will support in reducing the GHG emission from transport sector which is in Business-as-usual scenarios in PNG could increase to the range of 3.3–4.5 Mt CO2e by 2030. As per enhanced NDC of PNG, USD 20 million will be leveraged from various international funding sources like GCF to achieve the low carbon public transport services and related infrastructures in urban centres.

7. Relevance to NDCs and other national priorities

Please identify relevance and contribution from the technical assistance to the Nationally Intended Contributions (NDC) and other relevant national prioritized efforts (TNAs, TAPs, NAPs, NAMAs, etc.). (maximum 2500 characters including spaces)

The transport sector critically linked with health and urban infrastructure is identified as a priority area in enhanced NDC. Under land transport sector, the enhanced NDC of PNG mentions that national E-mobility Policy will enable the development and implementation of green transport in PNG. CTCN support to develop the e-mobility policy in PNG is also mentioned in the enhanced NDC. The enhanced NDC also emphasized feasibility study of electrified bus rapid transit systems in urban centres and climate-resilient supporting infrastructure.

Furthermore, infrastructure and assets built/rehabilitated according to climate-resilient codes and standards are emphasized under Adaptation target 2030 in the enhanced NDC.

8. Linkages to relevant parallel on-going activities:

Please identify relevant previous and ongoing public and private sector initiatives, projects or programmes that the CTCN assistance will specifically build on and contribute to. To the extent possible, please add practical and operational details on the linkages between existing activities and the CTCN assistance. (maximum 2500 characters including spaces)

The PNG has recently finalized the enhanced NDC and in the process of developing the NDC implementation plan which prioritizes the feasibility study of electric buses and supporting infrastructures in urban centers and national electric mobility policy in PNG.

9. Anticipated follow up activities after this technical assistance is completed:

Please describe the expected future use of the outputs and deliveries produced by this technical assistance, after the CTCN implementation is completed, towards contributing to the anticipated impacts over time articulated in section 6. For example, what organizations or stakeholders will use the outputs of the technical assistance after it is completed, for what purpose, at what scale and scope the outputs and deliveries will be applied, when and what will be the next steps undertaken, etc. (maximum 2500 characters including spaces)

The policy study, roadmap and feasibility study from this TA will provide concrete evidence to the PNG's Government for decision and action on transport sector. The recommendations from the

study report will assist the Government to appraise its current energy and transport policies and regulations to be inclusive of energy efficiency and also take immediate necessary steps to implementing the energy efficiency measures in its land transport sector. A deliverable from this TA will be the development of the funding proposal targeted at the Green Climate Fund (GCF) and other funding sources. Once funding is approved, the implementation of the barrier removal activities identified in the study can be implemented. This would create a transformation change in country's land transport sector, supporting its ambition and the global effort on reducing GHG emissions and achieving the Paris Agreement.

10. Gender and co-benefits:

Imbedded in design of the activities:	*A gender mainstreaming analysis is mandatory to include for all technical assistances. A gender expert will be assigned to carry out an assessment and evaluation regarding gender mainstreaming during the implementation of the TA.* *In addition, please describe all support to gender aspects, women's equality and other co-benefits embedded into the Response Plan (please include a reference to the actual activities and outputs as described in section 3).* The TA is designed with an imbedded intention to deal with the gender issues in the following ways as also reflecting in the request document: • The capacity building and training workshops planned under the TA will address the capacity gaps from gender perspectives.
Gender and co-benefits intended as result of the activities:	*Please describe all gender aspects, women's equality and other co-benefits expected as a result of the CTCN technical assistance.* • Likely generation of livelihoods as the positive developments from this TA will generate opportunities in vehicle maintenance and imports of more efficient vehicles, bicycles and hybrid and electric vehicles. • The TA will present opportunities for training and capacity building targeted at women on energy efficiency in the transport sector. • The TA will generate improved health not only from a cleaner air from more efficient vehicles but also from the promotion of walking and cycling as efficient means of transport.

11. Main in-country stakeholders in implementation of the technical assistance activities:

Using the table below, please list and describe the role of in-country stakeholders, participants and beneficiaries who will be involved in or directly consulted during implementation of the assistance.

In country stakeholder	Role in implementation of the technical assistance
National Designated Entity Department of Climate Change (Climate Change Development Authority)	Overall oversight of the TA

Department of Higher Education, Research, Science and Technology[7] (DHERST)	Provide input to the national electric mobility policy from research and capacity building perspective
Department of Works and Implementation of Papua New Guinea (DoW)	Institutional and policy support on low carbon transport infrastructure, information sharing and local coordination
Department of National Planning and Monitoring of Papua New Guinea (DNPM)	Provide facilitation and coordination support for policy and roadmap development on electric mobility

12. SDG Contributions:

*Instructions: Please complete the grey section below for **a maximum of three SDGs** that will be advanced through this TA. A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/.*

Goal	Sustainable Development Goal	Direct contribution from CTCN TA (1 sentence for top 1-3 SDGs)
1	End poverty in all its forms everywhere	
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	
3	Ensure healthy lives and promote well-being for all at all ages	The TA will introduce electric vehicles that will reduce air pollution and hence will promote healthy lives and promote well-being for all at all ages
4	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all	
5	Achieve gender equality and empower all women and girls	Promote equity in gender as the consumer of EVs.
6	Ensure availability and sustainable management of water and sanitation for all	
7	Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7)	
	7.1 - By 2030, ensure universal access to affordable, reliable and modern energy services	
	7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix	
	7.3 - By 2030, double the global rate of improvement in energy efficiency	Increase energy efficiency in land transport
	7.a - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	
	7.b - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	Promote integration of RE in the grid to support the energy requirements of EVs
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
10	Reduce inequality within and among countries	
11	Make cities and human settlements inclusive, safe, resilient and sustainable	
12	Ensure sustainable consumption and production patterns	
13	Take urgent action to combat climate change and its impacts	Reduce GHG in transport sector
	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	
	13.2 - Integrate climate change measures into national policies, strategies and planning	
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	
	13.a - Implement the commitment undertaken by developed-country	

[7] https://web.dherst.gov.pg/

	parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	
	13.b - Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities	
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	

13. Classification of technical assistance:

Please indicate primary type of technical assistance. Optional: If desired, indicate secondary type of technical assistance.

Please tick off the relevant boxes below	*Primary*	*Secondary*
☐ 1. Decision-making tools and/or information provision	☐	☐
☒ 2. Sectoral roadmaps and strategies	×	☐
☒ 3. Recommendations for law, policy and regulations	×	☐
☐ 4. Financing facilitation	☐	×
☐ 5. Private sector engagement and market creation	☐	×
☐ 6. Research and development of technologies	☐	☐
☒ 7. Feasibility of technology options	×	☐
☐ 8. Piloting and deployment of technologies in local conditions	☐	☐
☐ 9. Technology identification and prioritisation	☐	☐

Please note that all CTCN technical assistance contributes to strengthening the capacity of in country actors.

14. Monitoring and Evaluation process

Upon contracting of the implementing partners to implement this Response Plan, the lead implementer will produce a monitoring and evaluation plan for the technical assistance. The monitoring and evaluation plan must include specific, measurable, achievable, relevant, and time-bound indicators that will be used to monitor and evaluate the timeliness and appropriateness of the implementation. The CTCN Technology Manager responsible for the technical assistance will monitor the timeliness and appropriateness of the Response Plan implementation. Upon completion of all activities and outputs, evaluation forms will be completed by the (i) NDE about overall satisfaction level with the technical assistance service provided; (ii) the Lead Implementer about the knowledge and learning gained through delivery of technical assistance; and (iii) the CTCN Director about timeliness and appropriateness of the delivery of the activities and outputs.

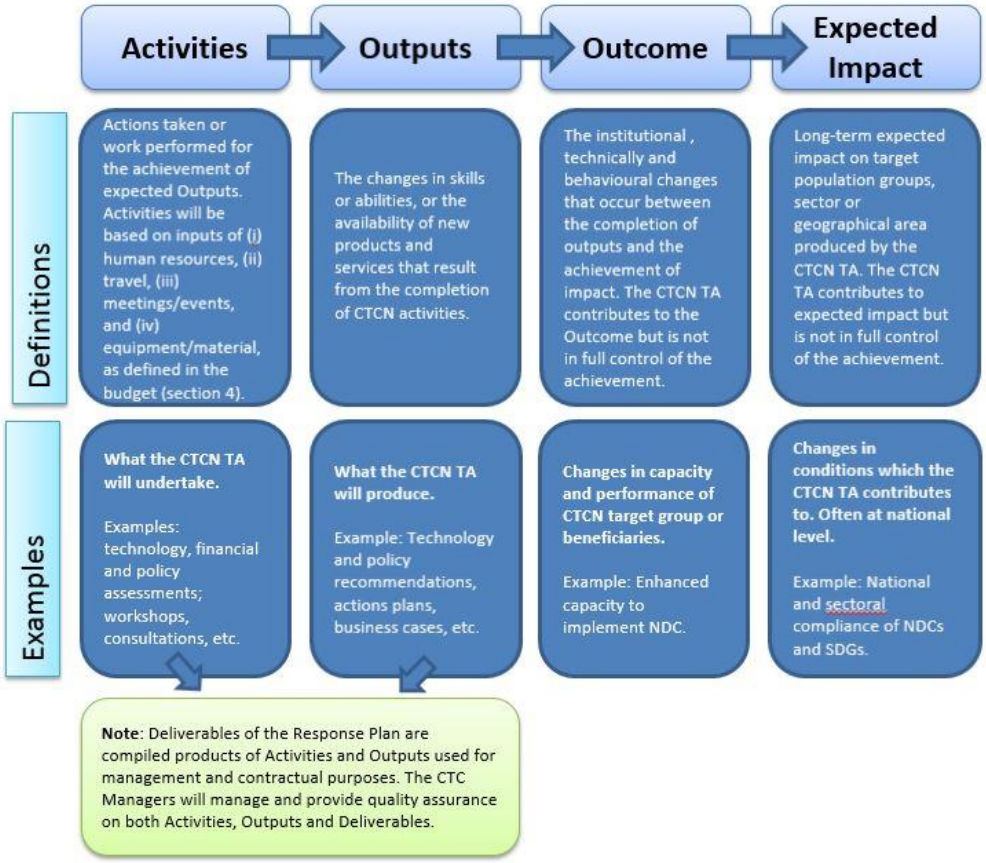
Annex 1: Guidance note for designing a Response Plan (to be deleted when submitting the Response Plan)

1. Objective of the Response Plan

The Response Plan is developed by CTCN specialists in response to a country request for technical assistance. It constitutes the Terms of Reference of the CTCN technical assistance that will be provided to the country and it provides the formulation of and subsequent basis for the monitoring and evaluation of the Response Plan implementation, as well as its expected outcomes and anticipated impacts.

2. Results chain and Logical Framework Approach to be defined in the CTCN Response Plan

The result chain is the causal sequence that stipulates the necessary flow of actions and processes to achieve desired objectives and results – beginning with inputs, moving through activities and outputs, and culminating in individual outcomes. The outcome will contribute to the desired impact in the society. The Logical Framework Approach is an analytical process used to support objectives-oriented project planning and management. It provides a set of pre-defined concepts which are used as part of an iterative process to aid structured and systematic analysis and management of the CTCN technical assistance.



3. Role of the Response Planning Design Team

The Response Planning Design Team is selected by the Climate Technology Centre (CTC). The composition of the team depends on each particular request but may include the National Designated Entity (NDE), the request Proponent, Climate Technology Manager of the CTCN, experts from the CTCN Consortium, UNIDO and UNEP experts from regional offices and other experts as needed.

The role of CTCN Consortium experts is to lead the design of the Response Plan. The NDE will provide overall guidance on national context and priorities whereas the request Proponent will provide more detailed information on the sector, barriers and requested assistance. The Climate Technology Manager of the CTCN will provide quality assurance of timeliness and appropriateness of the Response Plan.

The Response Planning Design Team will draft all sections of the Response Plan template building on the information contained in the CTCN Request, based on expertise on the given topic and potentially further data collection, as required. This will be done by the CTCN Consortium Experts in consultation with the NDE, request Proponent and relevant stakeholders. The Response Plan has to be agreed to and approved by the NDE and the CTCN Director. This Response Plan will serve as the basis to identify, select and engage an expert institution from the Climate Technology Network or Consortium to lead the implementation of the CTCN Response Plan in the requesting country.

To the extent possible, staff from UNEP and UNIDO Regional, Sub-Regional and/or National Offices should be involve in all stages of formulation of the Response Plan to maximize synergies and avoid overlap with ongoing initiatives, as well as ensure relevance to regional and national context.

4. Process for designing the Response Plan

The Response Planning process should be completed over a period of up to 60 working days (12 weeks). Indicative steps and related timelines are laid out below:

5. Design Considerations

Annex 1. Guidance Note for the Response Plan template

In order to maximize the impact of the technical assistance provided by the CTCN and provide an effective M&E process, the Response Plan should integrate as much as possible the considerations below:

Climate Technology focus: The Response Plan should have a clear focus on climate technologies, and identify activities that enable the identification, development, deployment or diffusion of one or several specific technologies (including equipment, techniques, knowledge and skills).

Barrier removal / Problem solving: The activities should contribute to address the specific problem statement identified in the Request. The barriers identified should be those hampering the identification, development, deployment or diffusion of one or several climate technologies or climate actions. Therefore, it may be necessary to limit the CTCN Response Plan to a set of activities for technical assistance commonly agreed with the NDE (and Proponent when needed) compared to the original request submitted. The CTCN will liaise with NDEs and Proponent in case the scope of the technical assistance deviates from the original request.

Use of the CTCN assistance by stakeholders: The Response Plan should identify clearly how the products of the CTCN assistance will be used in the short term once support is delivered, by who and when, to ensure it will lead to specific impacts in the country. The activities should engage the stakeholders that will use the concrete results of the assistance to deploy the technologies, including from the private sector, the public sector, research institutions, etc.

Within the scope of CTCN resources: The cost of the technical assistance provided by the CTCN cannot exceed USD 250,000 per Response Plan. Therefore, it may be necessary to prioritize activities and limit the CTCN Response Plan to a set of priority activities commonly agreed with the Proponent and the NDE to remain under this value. Under section 4 of the Response Plan template, an indicative activity based budget should be presented. The proposed budget is indicative and should present an estimated costing range per activity, output as well as a total costing range for the delivery of the Response Plan. Once the Response Plan is finalised and published for tendering, interested parties will provide competitive offer against the indicative budget.

CTCN activities and outputs should be linkable to monitoring and evaluation indicators: All proposed activities and outputs must be linkable to monitoring and evaluation indicators that are specific, measurable, achievable, relevant, and time-bound. The monitoring and evaluation process and corresponding indicators will be developed by the Lead Implementer as part of the work plan and will allow the CTCN technology Manager to monitor the timeliness and appropriateness of the implementation.

Synergies with existing efforts: The Response Plan should focus on activities that are not already being fully supported or that are in the process of being fully supported by another national, regional or international organization. Synergies and complementarity also require that the CTCN assistance is not duplicating past activities. It is possible in the Response Plan to indicate co-financing from the government, the Proponent or another stakeholder, that will maximize the effectiveness of the CTCN assistance.

Gender mainstreaming: The CTCN mission is to build or strengthen developing countries' capacities to identify technology needs, to facilitate the preparation and implementation of technology projects and strategies taking into account gender considerations. The Response Plan must therefore describe how gender considerations will be included and monitored within the proposed activities, and any gender co-benefits that will be gained as a result of implementing the CTCN technical assistance.