CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

CTCN Technical Assistance
Request Submission Form

Guidelines:

- This Request Submission Form should be completed by the organisation requesting technical assistance from the Climate Technology Centre & Network (CTCN) in collaboration with the National Designated Entity (NDE) of the country in question
- The Form must be signed by the NDE. Please see updated contact list of NDEs here: http://unfccc.int/ttclear/support/national-designated-entity.html
- The Form can be submitted as a Word file containing a digital signature or as a signed and scanned PDF file in combination with an un-signed Word file
- For requests submitted by multiple countries, all the NDEs of the respective countries shall sign identical Forms before official submission to the CTCN
- NDEs have the opportunity to submit CTCN requests in collaboration with National Designated Authorities (NDAs) for the Green Climate Fund (GCF) if targeting the GCF Readiness Programme.

Requesting country or countries:	The Republic of Nauru
Request title:	Please reflect the objective of the technical assistance in the title (maximum 200 characters). Nauru Ocean Energy Technical Pre-Feasibility study. The objective of the technical assistance (TA) is to provide a pre-feasibility analysis for the implementation of an Ocean Energy technology on Nauru Island.
NDE	Please add name of organization, name of individual, position, email and address. MINISTRY OF COMMERCE, INDUSTRY AND ENVIRONMENT Mr. Reagan Moses Director of Climate Change +674 557 3133 reagan.moses@gmail.com
Request Applicant:	Please add name of organization, contact person, position, email and address of the organization requesting assistance from the CTCN. MINISTRY OF COMMERCE, INDUSTRY AND ENVIRONMENT Mr. Midhun Ajaykumar Director of Energy directorofenergycienauru@gmail.com

Climate objective:

- ☐ Adaptation to climate change
- ☐ Mitigation of climate change
- ☒ Combination of adaptation and mitigation of climate change

Geographical scope:

☒ Community level

☐ Sub-national

☒ National

☐ Multi-country

If the request is at a sub-national or multi-country level, please describe specific geographical areas (provinces, states, countries, regions, etc.).

Problem statement related to climate change (up to one page):

This section should answer the question "what is the problem?" Please summarize the problem related to climate change and/or the negative impacts of climate change in the country that the request aims to address.

Climate variability already affects the Republic of Nauru with El Nino-Southern Oscillation, which tend to bring warmer, wetter conditions and La Nina events, bringing drier conditions and resulting in extended drought. Droughts in Nauru frequently place severe stress on its limited groundwater resources and on vegetation.

Longer-term climate change is projected to alter rate and distribution of rainfall, increase the frequency of storm surges, increase the intensity of tropical cyclones, increase average air and sea surface temperatures and increase ocean acidification[1]. Moreover, sea level rise will become an existential threat to the Nauruan population because of the very low-lying characteristics of its coastal areas.
These climate variability and change impacts are heavily affecting the health, food and water security of its communities, and will continue to do so.

The main contribution of the Republic of Nauru to climate change mitigation is the implementation of Nauru Energy Road Map (NERM) 2018-2020 in order to achieve the government's Energy vision of providing a reliable, affordable, secure and sustainable energy supply to meet the socio economic development needs of Nauru, and also reduce the overall greenhouse gas emissions.
The specific targets of the NERM by 2020 are:

- 50% of grid electricity supplied from renewable energy sources.
- a 30% improvement in energy efficiency in the residential, commercial and government sectors.

At present, solar is the only viable renewable energy source identified in Nauru. In order to achieve the above objectives, as the Republic of Nauru is facing a land space issue due to former intense phosphate mining, alternative renewable energy options (such as ocean energy) need to be assessed and mapped.

This pre-feasibility study will collect data and assess the technical, socio-economic and financial potential of different ocean energy technologies (wave, tidal and thermal). A special focus will be given to ocean thermal energy conversion (OTEC) technology since it is expected to be the most viable option in the context of Nauru and may have significant water security co-benefits. Indeed, because of the absence of fresh water supply in Nauru, the major contribution of usable water is generated using electricity powered reverse osmosis systems and is delivered by diesel powered trucks. OTEC technology could also provide very valuable byproducts such as freshwater or nutrient rich cold water, improving marine life and supporting aquaculture practices.

[1] PCCSP, 2011. Climate Change in the Pacific: Scientific Assessment and New Research, Volume 2. Country Reports: Chapter 8 – Nauru. Available at: http://www.pacificclimatechangescience.org/wp-content/uploads/2013/09/Nauru.pdf

Past and on-going efforts to address the problem (up to half a page):

This section should answer the question "what has been done or is currently being done to address the problem?" Please describe past and on-going processes, projects or initiatives implemented in the country or region to tackle the climate problem as described above.

Nauru has nearly reached its target of having 50% of grid electricity supplied from renewable energy sources, highlighted in the Nauru Energy Road Map (NERM) 2018-2020. Along with this progress on increasing renewable energy penetration in the grid with just solar-based solutions, Nauru is ready to identify other renewable energy sources to contribute to the country energy mix.

Through ADB, NZ MFAT and European Union (EU) funding, Nauru has currently secured two solar farms of respectively 1MW and 6MW, which will provide 48% of renewable energy penetration in the grid by the horizon of 2022.

Ocean energy would be a good additional source of renewable energy since the country experiences land limitation constraints, creating difficulties to install more solar PV.

The world's first OTEC pilot plant was set up in Nauru by the Japanese Tokyo Electric Power company in 1981. It was the highest power OTEC plant ever operational and the first and last to feed power to an operating commercial grid. Due to extreme weather events, this OTEC plant is not operational anymore because of the damage made to the plant pipes. Construction techniques have now improved to become climate-proof.

Bathymetry data of the entire island shore have been gathered by SPC's GeoScience Division thanks to a European Union funded project in 2005. These data provide guidance and suitable area to collect data on ocean temperature, in order to identify the most suitable technology to put in place.

The Waves and Coasts in the Pacific (WACOP) project conduct by SPC in 2015 funded by European Union has quantified potential wave energy resources for Nauru and can be used as baseline data for this pre-feasibility study as well.

Specific technology[2] barriers (up to one page):

This section should answer the questions "what are the technology barriers that hinder national efforts described above" and "how will the CTCN technical assistance complement these efforts?" Building upon the problem statement and taking into consideration the existing efforts described above, please describe the specific technology barriers encountered by the requesting applicant to identify, assess or deploy climate technology(ies) in an effort to address the problem statement. The described barriers should be within the scope of the requested CTCN technical assistance (described in the section below).

Since the installation of the OTEC pilot plant in 1981, there have been significant improvements in OTEC technology and design, with side benefits such as the production of large amounts of fresh water. With the very rapid drop-off beyond the reef in Nauru, providing a good temperature differential, there is a potential opportunity for OTEC energy development in the country. However, the Republic of Nauru lacks technical and financial resources as well as in-country expertise to conduct a pre-feasibility study and assess the potential of OTEC in comparison to other ocean energy possible solutions. Therefore, Nauru is requiring external technical assistance to collect in-situ data and conduct a technical, socio-economic and financial analysis of an OTEC plant project in comparison to other ocean energy potential solutions.

[2] *"**any equipment, techniques, practical knowledge and skills** needed for reducing greenhouse gas emissions and adapting to climate change" (Special Report on Technology Transfer, IPCC, 2000)*

Sectors:

Please indicate the main sectors related to the request:

☒ Coastal zones	☐ Early Warning and Environmental Assessment	☐ Human Health	☐ Infrastructure and Urban planning
☒ Marine and Fisheries	☒ Water	☐ Agriculture	☐ Carbon fixation
☐ Energy Efficiency	☐ Forestry	☐ Industry	☒ Renewable energy
☐ Transport	☐ Waste management		

Please add other relevant sectors:

Cross-sectoral enablers and approaches:

Please indicate the main cross-sectoral enablers and approaches

☐ Communication and awareness	☒ Economics and financial decision-making	☒ Governance and planning	☐ Community based
☐ Disaster risk reduction	☐ Ecosystems and biodiversity	☐ Gender	

Technical assistance requested (up to one page):

Founded on the problem statement, past/on-going efforts and technology barriers, please describe the requested technical assistance. The technical assistance should clearly contribute to mitigation or adaptation to climate change as described in the problem statement and contribute to overcome the specific technology barriers.

Within a clearly defined scope, the description of technical assistance should be structured into the following:

- **Overall objective**

  The pre-feasibility study for Nauru Ocean Energy will collect scientific data to identify the most suitable site for different ocean energy technologies (wave, tidal or thermal). Then, it will suggest the most appropriate technology to provide both electricity and water security to the island. Particular attention will be given to OTEC technology since it is expected to be the most cost-effective solution for the Republic of Nauru.

- **Anticipated groups of activities to be performed by the technical assistance**

  - Activity 1. Technical data collection and assessment
    This activity covers the deployment of scientific equipment in pre-identified areas based on the existing bathymetry data from 2005. Pressure sensors, current meters, CTD (Conductivity, Temperature, Depth) instruments will be deployed in order to capture the water column temperature and identify the most appropriate technology to develop (wave, tidal or thermal energy) as well as the most appropriate sites.

  - Activity 2. Communities consultation
    This activity will cover consultations of landowners of the potential project sites as well as consultations of surrounding communities, regarding water and energy benefits of the different technologies (including OTEC) to their daily activities (fishing, agriculture, etc.). Gender issues will be addressed during these consultation processes.

  - Activity 3. Socio-economic and financial analysis
    This activity will cover a socio-economic analysis, weighing the socio-economic costs against the socio-economic benefits of each ocean energy technology (incl. distributive aspects). It will also include a financial analysis[3], assessing the viability and profitability of each technology as well as the different financing options. This analysis will also take into consideration environmental impacts of the development of ocean energy technologies.

  - Activity 4. Green Climate Fund (GCF) draft concept note
    Based on the results of the technical, socio-economic and financial analysis, as well as the consultation process, a Green Climate Fund concept note\proposal will be drafted in full collaboration with the GCF NDA, to request for funding assistance to perform an actual Feasibility Study on the potential Ocean Energy Technology identified by the Pre-feasibility study.

- **Anticipated products to be delivered by the technical assistance**

  i. Inception Report
  ii. Draft pre-feasibility study
  iii. Final pre-feasibility study
  iv. GCF draft concept note

The pre-feasibility will include a technical assessment of the different ocean energies (with a specific focus on OTEC technology), an environmental and socio-economic assessment, a financial viability assessment, as well as a stakeholders' analysis.

[3] For instance, by modelling the tariff rates in Power Purchase Agreements for the given technology against the interest rates of the loan and the upfront capital costs to develop a business case that can be used to bring together the development lender, the national government and the private sector companies, within the context of Nauru and its Energy regulation.

Expected timeframe:

Please indicate the expected duration period for the requested technical assistance. Please note CTCN technical assistance is limited to a maximum duration of 12 months.

- Activity 1. Technical data collection and assessment: 6 months
  - 2 weeks for equipment deployment, 3 months for data collection, 2 months for data processing
- Activity 2. Communities Consultation: 2 months
  - Tentatively based on community consultations
- Activity 3. Socio-economic and financial assessment: 3 months
  - In-country visit, data analysis and report processing
- Activity 4. GCF draft concept note: 2 months

For time saving, activities 1, 2 and 3 can be conducted in parallel and a total of 10 months should be sufficient to conduct the pre-feasibility study.

Anticipated gender and other co-benefits from the technical assistance:

Please describe the activities with gender linkages as well as the anticipated gender and other co-benefits (e.g. biodiversity, economic, social, cultural, etc.) that are likely to be generated as a result of the technical assistance.

For more information, you can find guidelines on the CTCN's website here:
https://www.ctc-n.org/technologies/ctcn-gender-mainstreaming-tool-response-plan-development

Further reading on gender can be found on the CTCN website here:
https://www.ctc-n.org/technology-sectors/gender

The consultation meetings planned under the TA will address the gender aspects of the project to ensure there is unrestricted access and participation in the project.

Indeed, the pre-feasibility study will look at ways in which both men and women as well as children and the disadvantaged can contribute to and benefit from the project.
Specific activities will be looked as part of the project, such as:

- Safeguards for a gender inclusive project employment
- Capacity building activities including local communities on the technologies
- A mechanism for project decision making, which includes women and targeted communities
- A gender strategy to improve gender awareness throughout the whole project chain

As a product of an OTEC plant, both energy, fresh water, aquaculture prospects, etc. will be delivered to the communities. These products will help improve their adaptation to times of drought and increase their resilience against food and water insecurity. Women will be primarily benefiting from this technology due to their strong involvement in the agricultural sector.

Key stakeholders:

Please list the stakeholders who will be involved in the implementation of the requested CTCN technical assistance and describe their role during the implementation (for example, government agencies and ministries, academic institutions and universities, private sector, community organizations, civil society, etc.).

Stakeholders	Role to support the implementation of the technical assistance
National Designated Entity	Overall oversight of the TA Mainstream the technical feasibility study with the Nauru Energy Road Map plan
Request Applicant	Day to day management and coordination of the TA. Facilitate communities, landowners and other stakeholder consultations
Pacific Community – Geoscience division	○ Technical advice and support to the NDE and Request Applicant. ○ Lead in coordination and conduct of national consultations and workshops. Supply bathymetry data, and, if selected by CTCN as a partner to deliver the technical assistance, participate in the data collection efforts and analysis for activities 1, 2 and 3. ○ Review the GCF concept note drafted in activity 4 (with input from SPC's Climate Finance Unit).
Statistics Department	Supply of existing data as appropriate
Nauru Utilities Corporation(NUC)	Supply of data, technical assistance and support as appropriate
Other line ministries	Participate in national consultations as appropriate

Alignment with national priorities (up to 2000 characters including spaces):

Please describe how the technical assistance is consistent with national climate priorities such as: Nationally Determined Contribution, national development plans, poverty reduction plans, technology needs assessments, Low Emission Development Strategies, Nationally Appropriate Mitigation Actions, Technology Action Plans, National Adaptation Plans, sectorial strategies and plans, etc.

Nauru is currently implementing its Nauru Energy Roadmap (NERM) 2018-2020. Part of the activities included in the roadmap are pre-feasibilities studies for renewable energy sources, such as OTEC.

A clear objective of Nauru's National Sustainable Development Strategy (2005-2025) is the development of alternative renewable energy sources for the country. It is also highlighted in Nauru's Intended Nationally Determined Contribution (iNDC) and its Framework for Climate Change Adaptation and Disaster Risk Reduction (RONAdapt) which advise to expand renewable energy capacity.

Finally, Nauru is on the process to include Ocean Energy as a priority in its Green Climate Fund (GCF) Country Programme.

Reference document (please include date of	**Extract** (please include chapter, page number, etc.).

document)	
Nationally Determined Contribution (NDC)	Nauru intended Nationally Determined Contributions (iNDCs) – 2015: "transition to untapped clean energy sources, such as renewable resources", page 2, 8 and 9.
Technology Needs Assessment	Nauru Technology Needs Assessment(TNA) 2020 Report[4] TNA have given OTEC a Rank 1 on the technology prioritization list and confirms OTEC as the next best possible mitigation technology option for the energy sector in Nauru. Page 39, Page 42 Bathymetry data from EU funded project - 2005 (SPC) Waves and Coast in the Pacific report – 2015 (SPC)
National Adaptation Plans	Republic of Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction (RONAdapt) - 2015[5]: "expand renewable energy capacity", page 7.
Nationally Appropriate Mitigation Actions	Nauru National Sustainable Development Strategy 2005-2025:[6] "increased use of renewable energy power (non-diesel generation i.e. OTEC and solar)", page 5.
Add others here as relevant	Nauru Energy Road Map (NERM) 2018-2020[7]: "undertake pre-feasibility studies for other renewable energy sources, such as waste-to-energy and OTEC", page 15.

Development of the request (up to 2000 characters including spaces):

Please describe how the request was developed at the national level and the process used by the NDE to approve the request before submitting it (who initiated the process, who were the stakeholders involved and what were their roles?) and describe any consultations or other meetings that took place to develop and select this request, etc.

The current request to CTCN has been developed with support from the Pacific Community (SPC) upon demand from the Nauru Department of Commerce, Industry and Environment, following several meetings and consultations between September 2019 and March 2020. The request idea was first initiated in a meeting between the Nauru Director of Energy and the SPC representative during the Ocean Energy Europe conference in Dublin in September 2019.

The Government of Nauru Cabinet had officially endorsed the updated NERM 2018 – 2020 in February 2018. During the inception stage of the NERM, there were rigorous consultations conducted with the key stake holders, who are also part of the NERM Coordination Committee. The action item to perform a feasibility study on other renewable energy sources, especially OTEC was discussed and approved as a

[4] TNA Report: https://tech-action.unepdtu.org/wp-content/uploads/sites/2/2020/04/nauru-final-tna-report-2020.pdf
[5] RONAdapt: https://pacificclimatechange.net/document/republic-nauru-framework-climate-change-adaptation-and-disaster-risk-reduction-ronadapt
[6] NSDS: https://pafpnet.spc.int/pafpnet/attachments/article/224/Nauru%20NSDS%202005-2025%20%20(2009)%20cobp-nau-2012-2014-oth.pdf
[7] NERM: http://prdrse4all.spc.int/sites/default/files/nerm_report_final.pdf

part of this activity. Given below are the committee members.

- Department of Commerce, Industry and Environment (DCIE)
- Department of Transport
- Nauru Bureau of Statistics, Department of Finance and Economic Planning
- PAD, Department of Finance and Economic Planning
- Nauru Utilities Corporation (NUC)

In addition to the above, there were discussions conducted by the Director of Energy, Nauru with the Secretory, DCIE (who is also the GCF NDA) & the Director Climate Change who is the CTCN NDE, as part of the submission of this CTCN application.

Background documents and other information relevant for the request:

- ✓ Please list all relevant documents that will help the CTCN analyze the context of the request and national priorities. Please note that all documents listed/provided should be mentioned in this request in the relevant section(s), and that their linkages with the request should be clearly indicated. For each document, please provide web-links (if available) or attach to the submission form. Please add any other relevant information as required.
  - ✓ Nauru intended Nationally Determined Contributions (iNDCs) – 2015
  - ✓ Nauru Energy Road Map (NERM 2018-2020)
  - ✓ Republic of Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction (RONAdapt) – 2015
  - ✓ Nauru National Sustainable Development Strategy 2005-2025
  - ✓ Nauru Technology Needs Assessment(TNA) Report 2020

Nauru is on the process to include Ocean Energy as a priority in the Green Climate Fund (GCF) Country Programme.

- ✓ Please indicate if this request has been developed with the support of the CTCN Request Incubator.

OPTIONAL: Linkages to Green Climate Fund Readiness and Preparatory Support

The CTCN is collaborating with the GCF in order to facilitate access to environmentally sound technologies that address climate change and its effects, including through the provision of readiness and preparatory support delivered directly to countries through their GCF NDA. These actions are in line with the guidance of the GCF Board (Decision B.14/02) and the UNFCCC, particularly paragraphs 4 and 7 of 14/CP.22 that addresses Linkages between the Technology and the Financial Mechanisms[8].

The CTCN is therefore implementing some of its technical assistance using GCF readiness funds accessed via the country's NDA. Any application for GCF support, including the amount of support provided, is subject to the terms and conditions of the GCF and should be developed in conjunction with the NDA.

[8] Please see:
https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf

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Please indicate whether this request has been identified as preliminarily eligible by the NDA to be considered for readiness support from the GCF.

☐ Initial engagement: The GCF NDA of the requesting country has been engaged in the design of this request and the NDA will be involved in the further process leading to an official agreement for accessing GCF readiness support.

☐ Advanced engagement (preferred): The GCF NDA of the requesting country has been directly involved in the design of this request and is a co-signer of this request, the signature indicating provisional agreement to use readiness national funds to support the implementation of the technical assistance.

NDA name:

Date:

Signature:

Monitoring and impact of the assistance:

By signing this request, I affirm that processes are in place in the country to monitor and evaluate the technical assistance provided by the CTCN. I understand that these processes will be explicitly identified in the CTCN Response Plan and that they will be used in the country to monitor the implementation of the technical assistance following standard CTCN procedures.
I understand that, after the completion of the requested assistance, I shall support CTCN efforts to measure the success and effects of the support provided, including its short, medium and long-term impacts in the country.

Signature:

NDE name: Mr. Reagan Moses, Director for Climate Change

Date: 14/5/20

Signature:

THE COMPLETED FORM SHALL BE SENT TO THE CTCN@UNEP.ORG

The CTCN is available to answer all questions and provide guidance on the application process.