Country	**Mauritius**
Request ID#	**2024000044**
Title	**Pre-Feasibility Study on Seawater Intake Infrastructure for Project Samurai Blue-The Savanne Regional Model** (Ocean Thermal Energy Conversion "OTEC" and Deep Seawater "DSW" industries development)
NDE	Ministry of Environment Solid Waste Management and Climate Change, Ken Lee Tower, c/r Barracks and St. George Str, Port Louis, Mauritius
Proponent	St. Felix Smart City Ltd on behalf of all stakeholders in Project Samurai Blue-The Savanne Region Model c/o The Chief Executive Officer St Felix Smart City Ltd Saint Felix 60422, Mauritius

Summary of the CTCN technical assistance

With the ultimate goal of implementing seawater intake infrastructure, OTEC, and DSW industries development in the Savannae District of Mauritius (Project Samurai Blue-Savanne Regional Model) via a future application to the Green Climate Fund (GCF), this CTCN Technical Assistance has the following objectives:

1. To confirm the optimal site, routing, design, and installation methods for the seawater intake infrastructure
2. To estimate the costs of installing the seawater intake infrastructure and explore business models, including costs (CAPEX and OPEX) and economic returns for financial viability
3. To identify high potential new DSW industries demand (revenue), such as for cooling, aquaculture, agriculture, and other industries
4. To develop a concept note for Green Climate Fund

Agreement:

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

National Designated Entity to the UNFCCC Technology Mechanism
Name: Sarita Meeheelaul
Title: Director of Climate Change, Ministry of Environment, Solid Waste Management, and Climate Change, Mauritius

Date: 12/11/2024

Signature:

Proponent (signature of the Proponent is optional)
Name: Frederic Robert
Title: Chief Executive Officer, St. Felix Smart City Ltd.

Date: 14/11/2024

Signature:

SAINT FELIX SMART CITY LTD BRN: C16142867 OFFICIAL SEAL

UNFCCC Climate Technology Centre and Network (CTCN)
Name: Jonathan Duwyn
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Date:

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Ministry of Economy, Trade, and Industry, Japan
Name: Norihiro Kimura (Mr.)
Title: Senior Negotiator for Climate Change

Date: 12 November 2024

Signature: 木村 範寻

1. Background and context

Mauritius is in efforts to implement its Nationally Determined Contribution (NDC) under the Paris Agreement. Mauritius' recent mix of energy supply consists of 61% of oil, 25 % of coal and others, and 14 % renewables (IRENA, 2019). The National Greenhouse Gas (GHG) Inventory in 2016 shows the energy sector with 4,182.62 Gg CO2e (80.26%) as the largest source of national GHG emissions (National Inventory Report to the UNFCCC, Ministry of Environment Solid Waste Management and Climate Change 2021). In the first updated Nationally Determined Contribution (NDC) from 2021, Mauritius commits to a quantified mitigation target equivalent to 40% reduction of GHG emissions by 2030 compared to the BAU scenario. In particular, the government decided that the production of 60% of energy would need to come from green sources by 2030, the total phasing out of the use of coal should take place by 2030, and energy efficiency should be increased by 10 % based on the 2019 baseline.

Mauritius updated the National Climate Change Adaptation Policy Framework (NCCAPF) in 2021, where the government policy focuses on the potential of nature-based solutions (NbS) for adaptation, as well as green job creation, managing the impacts of the COVID-19 pandemic, while addressing some of the most pressing issues regarding biodiversity and sustainable resource management. In alignment with the National Biodiversity Strategy and Action Plan 2017-2025, the updated NCCPAF promotes Ecosystem-based Adaptation (EbA) which harnesses biodiversity and ecosystem services to reduce vulnerability and build resilience to climate change. As the scarcity of water resources has posed extra challenges on Mauritius' key industries such as agriculture and tourism, as well as other parts of national economy, the government puts this issue as a matter of higher priority. According to the Drought Resilience Profile (CIWA & World Bank 2020), rainfall trends show an increase in the frequency of dry years after the 1990s with the most severe dry spells experienced in 1999, 2009 and 2011. In 2009, the country observed a dry spell, and the contribution of agriculture to GDP remained negative for the four consecutive years thereafter. Also, recent statistics show below-average rains in early 2021 undermined production prospects of 2021 food crops, estimated at below-average levels compared to 2020.

In this regard, increasing the access to renewable energy and resilience to negative climate change impact in its key industries are the matter of priorities for Mauritius in the context of the Paris Agreement and Sustainable Development Goals. Ocean Thermal Energy Conversion (OTEC) is seen as a promising solution which harnesses the temperature difference between warm surface seawater and cold deep seawater (DSW) to generate electricity. Its benefit lies in providing a continuous, clean energy source, particularly in tropical regions, while also offering potential by-products like desalinated water.

This CTCN Technical Assistance supports the Pre-Feasibility Study on DSW intake infrastructure in Savanne Region, which would address needs and challenges emanating from climate change in achieving sustainable development. In Savanne Region, a southern part of Mauritius, there a local development plan for construction a smart city for tourism, and the OTEC and DSW infrastructure is expected to provide non-CO2 electricity as a baseload energy, and increase access to carbon neutral cooling services and clean, nutrient rich water, that can be used for sustainable agriculture and aquaculture industry.

Mauritius initiated a demonstration study on Ocean Thermal Energy Technology (OTEC) plant in 2022, supported by New Energy and Industrial Technology Development Organization (NEDO), Ministry of Economy, Trade, and Industry (METI), Japan. This study will build upon the past cooperation and further elaborate the potential introduction of OTEC and DSW in Mauritius.

1. Problem statement

The introduction of the DSW infrastructure, combined with OTEC can provide Mauritius a stable access to low temperature, clean, as well as nutrient rich water, which can be utilized both for mitigation and adaptation purposes: for mitigation, baseload power generation without GHG emission, and cooling service; and for adaptation, water resource supply for drinking, aquaculture, agriculture and other industrial use.

However, Mauritius does not have experiences in developing and implementing DSW infrastructure so far, and the following barriers exist:

- **Knowledge and capacity of key stakeholders for introducing DSW and OTEC technologies**
  Knowledge on DSW and OTEC is new to key stakeholders, including the government departments as the regulator, local businesses as potential off-takers and service users, and residents as the indirect beneficiaries (e.g. though increased employment and public infrastructure service). To prepare for investment into DSW infrastructure, the stakeholders need to understand the complex technological, economic, and social aspects. Moreover, for the designing and construction stage, relevant national offices and local business developers need capacity building for adopting these technologies, such as providing authorization, licensing as well as business planning.

- **Technical expertise for designing/routing DSW infrastructure and data collection**
  OTEC and DSW require a comprehensive technical design and execution. A large-diameter seawater intake pipe infrastructure is required to introduce OTEC and DSW-led industrial development. An optimal site and appropriate routing/design is critical to contain capital cost. An optimal site must provide short distances to access cold DSW, appropriate year-round surface seawater (SSW) temperatures, and land availability onshore for new DSW industries development. The Savanne Region is considered to be an optimal area, however it is necessary to obtain accurate data of bathymetric, sea water temperature, ocean current, in order to confirm the location, to develop DSW design, as well to elaborate construction methods.

- **Detailed cost analysis and cost recovery model**
  Associated with the above technical assessment for designing/routing, a detailed cost analysis, including options construction design and methods should be elaborated. Also, cost recovery models need to be elaborated, integrating the plan to develop a smart city with a focus on sustainable tourism industry, taking into consideration of electricity and water demand for the above mentioned industries.

- **Preparation for robust environmental and social impact assessment in line with national and international standards**
  As DSW and OTEC technologies will be introduced with a relatively large-scale infrastructure, concerns of potential environmental and social impacts must be carefully and appropriately addressed. As it would be the 1st case in Mauritius, preparation with reference to domestic laws and international standards vis-à-vis those technology infrastructure, along with avoiding potential impacts will be required.

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2. 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: To conduct a Pre-Feasibility Study on Deep Sea Water (DSW) Intake for Ocean Thermal Energy Technology (OTEC) and Sustainable Deep Sea Water Utilization in Mauritius												
Outcome: Increased readiness for the investment project toward OTEC and DSW Intake installation, through a thorough technical and economic analysis, and mobilization in finance including the Green Climate Fund												
Mandatory Output: Project management *All implementers must undertake the following project management activities at the beginning of, during and at the end of the CTCN technical assistance.*												
Activity A: Pre-implementation 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; Based on the work plan, a monitoring and evaluation (M&E) 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). This M&E plan also includes a CTCN Impact Description formulated in the beginning of the technical assistance which will be revised in the Closure and Data Collection report once the technical assistance is fully delivered (templates will be provided). Furthermore, a gender evaluation and gender action plan (GAP) will be prepared and followed throughout the technical assistance (a template will be provided).[1]												

[1] Additional information is available under Section 10 of the response plan.

Activity B: Implementation A project steering committee will be formed, consisting of the implementing team (international and local consultants), the NDE, the project proponent(s), and CTCN. This project steering committee will meet at least on a bi-monthly basis in order to report project progress and discuss any questions and challenges.												
Activity C: Post-implementation A Closure and Data Collection report completed at the end of the technical assistance (a template will be provided). Project-end communication and dissemination activities will be conducted in collaboration with the CTCN Secretariat, which will include: • Development of a press release • Delivery of a knowledge sharing webinar • Organization of a dialogue with financial institutions for potential follow-on support												
Mandatory deliverables: Deliverable A: Detailed work plan; M&E plan; gender assessment and gender action plan Deliverable B: Project Steering Committee meeting reports Deliverable C: Closure and Data Collection report; press release, webinar, dialogue with financial institutions	x x		x		x		x		x		x	 x
Output 1: Stakeholder engagement through a Project Working Group												
Activity 1.1: Introduction of a Project Working Group A Project Working Group (PWG) will be established involving experts from key stakeholders in Mauritius, including relevant government ministries and stakeholders in the Savanne Region, as appropriate (approximately 5-8 members). A list of members and Terms of Reference (TOR) of the members will be developed.												
Activity 1.2: Inception workshop and regular PWG meetings An inception workshop will be held convening NDE (Mauritius and Japan), key line ministries of Mauritius, as well as local stakeholders in the Savanne Region. The inception workshop will share the concept of introducing DSW and OTEC technology and infrastructure development, potential benefits for climate mitigation and adaptation, as well as SDGs in the local context, and share a roadmap of the project. Also, the inception report												

serves as an opportunity to receive inputs by key stakeholders, The meeting will be held in a hybrid manner of in-person and online participation. Regular PWG meetings will be held every 4 months to share the progress, receive inputs from PWG members and approve the deliverables. The meetings are expected as in-person ones to the extent possible within availability of schedule and budget, and online/hybrid format will be applied, as appropriate. The cost will be covered, and logistical support will be provided by the project.													
Deliverable 1: 1.1. List and ToRs of PWG members 1.2. Inception workshop material and report (incl. list of participants disaggregated by gender and type of institution); PWG meeting material and report (incl. list of participants disaggregated by gender and type of institution)	x x			x				x				x	
Output 2: Context analysis for seawater intake infrastructure													
Activity 2.1: Review of the Samurai Blue-Savanne Regional Model and OTEC study to identify requirements toward DSW intake infrastructure To provide a robust framework for the technical analysis in the below Output 3, a review of the Samurai Blue-Savanne Regional Model and OTEC study to identify requirements toward DSW intake infrastructure is conducted. This review will entail establishing criteria for selecting a project site, key data for collection such as geospatial, meteorological and oceanographic data, marine biology, risks for fouling, pollution and navigation, etc. Data collection will be facilitated by the St. Felix Smart City Ltd., the Ministry of Environment Solid Waste Management and Climate Change, key government agencies, and other stakeholders. Also, through the review, analytical steps will be elaborated and shared in order to facilitate necessary data sharing. Project team members stationed in Mauritius will be in communication constantly with the counterparts in the St. Felix Smart City Ltd., and the relevant Ministries and Agencies.													
Activity 2.2.: Identification of demand sectors for DSW A survey on demand sectors for DSW will be conducted, together with a survey on demand for renewable power generated by OTEC. To start stocktaking activities on a document basis, a review to relevant national and local development plans will be conducted. Furthermore, as a primary target group generating demand for electricity and DSW, land developers and tourism industries engaged in the smart city development in the Savanne Region will be invited to in-depth discussion. Based on its business development plan, interviews and consultations with key stakeholders on expected sectors and subsectors will be conducted to identify source of demand for DSW use (e.g. for cooling, agriculture, aquaculture, food production etc.).													

Also, based on the interviews and consultations, information will be further elaborated as to estimated amount, volume and other key aspects (e.g. future tariffs in comparison with current price from other sources).												
Deliverables 2: Report on context analysis, incl. summary of interviews and consultations			x									
Output 3: Technical assessment to define the optimal site, routing, design and installation methods for DSW infrastructure												
Activity 3.1: Mapping and evaluation of sites for seawater intake pipe The optimal site for seawater intake infrastructure in the Savanne district will be identified. Key requirements for seawater intake technology will be grouped to set site selection criteria for the evaluation of different site options. These parameters may include the targeted water quantity intake, discharge, bathymetry, seawater temperature, required space, terrain conditions, and biodiversity aspects. Different sites will be evaluated on the basis of the requirements, and the optimal site will be selected.												
Activity 3.2: Development of the engineering concept and design of the seawater intake infrastructure An engineering and design concept of the DSW intake infrastructure will be developed. First, desk reviews on previous OTEC/DSW construction cases, such as the ones in Kumejima (Japan), Hawaii (USA), and those planned in the Pacific Island region will be conducted. Then, key data on the location based on Activity 3.1, as well as data necessary for appropriate installation (construction methods, ocean current, seasonal climatic conditions, requirement of vessels for construction, etc.) will be analyzed. This engineering concept and design is also related to the results of the survey on water demand under 2.2 in the downstream industries, and recommendations for options in a suitable scale will be made. The design will include the location, size, and orientation of the seawater intake system, ensuring minimal impact on marine ecosystems and efficient water flow. The engineering concept will include specifications for screens, pumps, and pipelines, incorporating corrosion-resistant materials and advanced filtration systems to prevent marine life entrainment and ensure operational reliability.												

Lastly, initial information and data will be collected for the preparation of an Environmental and Social Impact Assessment (ESIA), including studying relevant procedures in Mauritius and other applicable standards (e.g. that of the GCF).												
Activity 3.3: Considerations for installations and maintenance In addition to 3.1 and 3.2, a technical review on installation and maintenance will be conducted. DSW infrastructure for OTEC has a characteristic that it requires less maintenance work compared with other power generating technologies. However, the study will summarize what are expected maintenance activities, with reference to other precedent cases in Kumejima and Hawaii. Clear guidelines for installation and maintenance will be developed.												
Deliverables 3: 3.1. Site mapping and evaluation 3.2. Engineering concept and design 3.3. Report on optimal site, routing, design and guidance on installation methods for DWS infrastructure, as well as maintenance measures.					x		x x					
Output 4： Financial Assessment and business models for DSW intake infrastructure												
Activity 4.1: Financial assessment of seawater intake infrastructure Based on data collected on Output 2 and 3, a financial assessment of seawater intake infrastructure will be conducted. First, the assessment will classify cost categories for different components in CAPEX and OPEX, and estimate them including variables and conditions, as well as cost mitigation measures. Indicatively key components of CAPEX include cost to purchase infrastructure units, installment, land acquisition, excluding necessary investments for potential revenue sources further “downstream” as mentioned in Activity 4.2. The OPEX assessment will include ongoing costs such as energy consumption, maintenance, repairs, labor, and environmental monitoring. It will also evaluate variables like energy price fluctuations and explore cost-optimization strategies, such as energy-efficient technologies. As actual price of sales of electricity and water are decided by negotiation by different parties, estimation will be based made from existing cases of tariffs, taking into consideration of cost/service revenues from existing sources.												

Activity 4.2: Evaluation of revenue streams under different scenarios Depending on the scope of investment (power generation, cooling services, supply for aquaculture farm, supply of desalinized water for drinking and agriculture etc.), the target for investment and revenues vary. Revenue sources may be classified as "upstream business" and "downstream business" in terms of the supply flow of DSW. Upstream businesses include the revenue from power and electricity generation through DSW as well as cooling services. This generally includes the participation of the public sector, including power and water authorities. Downstream businesses include the supply of (desalinized) water for aquaculture farms, agriculture or drinking water. These options usually are developed at a later stage of the project as they required a lead time for which investment would be made mostly in industries related to tourism, food production, and others. An analysis and survey will identify upstream and downstream businesses, key participants (investors, operators), and potential economic values to be produced, in different revenue streams in the short-, medium- and long-term. A long list of different business models and scenarios with different scopes of investment and timelines of business development will be prepared.												
Activity 4.3: Development of optimal business models Building on the outcomes of Activity 4.2, this activity will identify the most viable business models for investment, tailored to the specific needs of the Savanne Region, Mauritius, and beyond. For the upstream business, one approach could involve leveraging the existing capabilities of public entities, such as power and water authorities, or establishing a new entity responsible for managing the distribution of power and water resources, as well as overseeing sales revenue and debt management. In this case, financing through Public-Private Partnerships (PPP) could be a viable option, especially when coupled with the mobilization of concessional finance, such as from the Green Climate Fund (GCF), given the large scale of the required investment in deep-sea water (DSW) and ocean thermal energy conversion (OTEC) infrastructure. On the downstream side, private sector investment will be prioritized, particularly for sectors like tourism, aquaculture, and desalinated water supply for drinking and agriculture, which offer clear opportunities for local economic growth. The survey will identify business models for both upstream (e.g., potential water supply authorities/utilities) and downstream (e.g., aquaculture, desalination) sectors, with a focus on sustainability and co-benefits. This process will include engaging with local and international businesses in initial consultations to foster collaboration and business development. The modelling will focus on evaluating a maximum of 1-2 of the most promising business models identified through the analysis. This financial modelling will include key metrics such as Net Present Value (NPV) to												

assess long-term profitability and the breakeven point to determine when the initial investment will be recouped. These models will provide a clear understanding of the financial viability and risks associated with each business option, helping to guide investment decisions and strategic planning.													
Deliverables 4: Financial feasibility report, including expenditures (CAPEX, OPEX), revenue streams, and business models										x			
Output 5: Development of a Concept Note for the Green Climate Fund													
Activity 5.1: Drafting GCF Concept Note A GCF Concept Note will be developed to support the development of DSW e.g. through infrastructure development, creation of enabling conditions and capacity building, and/or the implementation of business models as identified under Output 3 and 4. The GCF Concept Note will detail the prioritized project, its' size and duration, the expected outcomes, as well as detailed budget plan, specifying the funding requirements and how GCF support will be allocated. Additionally, it will describe the monitoring and evaluation framework to assess the pilot project's effectiveness and impact. As required under the GCF's investment criteria, the below elements will be detailed in the Concep Note: • Impact potential • Paradigm-shift potential • Sustainable Development potential • Needs of the recipient • Country ownership • Efficiency and effectiveness. Public-Private-Partnership (PPP) is a likely financial option, and an initial consideration for financial structure will be conducted.													
Activity 5.2: Finalization of the GCF Concept Note Through consultation with key stakeholders, including the NDE and the National Designated Authority (NDA), as well as potential Accredited Entities, the concept note for the project would be finalized for submission. In addition, the ESIA will be prepared on the basis of the GCF ESIA process. Based on the desk review in 3.2, the experts will hold pre-consultations with relevant national authorities to establish a common understanding on applicable category, timelines, and stakeholders, etc.													

Deliverables 5: Draft GCF Concept Note; Consultation report for ESIA process												x
Output 6: Capacity building and communication												
Activity 6.1: Preparation of communication material on seawater intake and utilization Communication materials will be developed to explain the characteristics and benefits of DSW and OTEC infrastructure targeted at the national government officials, as well as local community in the Savanna region.												
Activity 6.2: Delivery of a capacity building workshop on seawater intake and utilization 2 capacity building workshops (combined with PWG meetings) will provide opportunities for national key stakeholders to learn about the DSW and OTEC infrastructure, including its climate and SDGs benefits and key requirements in terms of managing environmental and social impact. The meeting will be organized in-person / hybrid, unless the national circumstances may require that an in-person meeting should be avoided. The first workshop aims to establish a general understanding on DSW and OTEC infrastructure in terms of technology background, climate and SDGs benefits and general infrastructure requirements. The final workshop will build capacities on the development of DSW and OTEC infrastructure and implementation of business models in Mauritius based on the results of the technical and financial feasibility. Indicative participants are national and local government officials, key stakeholders in the Savanne Region (such as tourism industries, workers association, etc.), approximately 50 people. The cost, including meeting venue and other miscellaneous will be borne by the project, and logistical support for participants are provided.												
Deliverables 6: 6.1. Communication materials 6.2. workshop report (incl. a list of participants disaggregated by gender and type of institution)	:		x	x								x

3. 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 5% 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** *(Title, role, estimated number of days)*	**Input: Travel** *(Purpose, national vs. international, number of days)*	**Inputs: Meetings/events** *(Meeting title, number of participants, number of days)*	**Input: Equipment/Material** *(Item, purpose, buy/rent, quantity)*	**Estimated cost** *Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan*	
					Minimum	**Maximum**
Mandatory Output: Project Management						
Mandatory Activities: A: Pre-implementation B: Implementation C : Post-implementation	*A: **PM: 500*2=1,000*** *B: **PM: 500*2=1,000*** *C:**PM 500*1=500*** *D:**GE 500*1=500***	*None*	*Online meeting, as appropriate*	*None*	*3,000 USD*	*3,000 USD*
Output 1: Stakeholder engagement through a Project Working Group						
Activity 1.1: Introduction of a Project Working Group	***2,500USD*** *PM: 500*2=1,000* *PDC: 300*5=1,500*		*Online participation in Preparatory meeting* *Kick-off meeting*	*None*	***2,500 USD***	***2,500 USD***

Activity 1.2: Inception workshop and regular PWG meetings	***12,600 USD*** *PM: 500*4=2,000* *DSW1: 500*4=2,000* *ETS: 500*4=2,000* *PDC:300*20=6,000* *GE: 300*2=600*	***14,000USD*** *Travel Cost for the PM (combined with other activities): 6,000* *Travel Cost for the ETS (combined with other activities): 6,000* *1,500* *(meeting package @15 USD *100 pax 0.5+0.5 day as shown in the next box) Indicative cost provided by the Mauritius NDE(Options at Caudan Arts Centre, Le Labourdonnais Hotel, St Georges Hotel)* *500USD* *Local traveling support (Port Louis – Savanne) for government participants @50 USD*10 pax =500USD*	*Preparatory Online meeting by NDEs, 10 pax, 0.5 day* *Kick-off Meeting by government officials (in person + online), 100 pax, 0.5+0.5 day*	*None* *Conference facility*1 day*	***12,600 USD***	***26,600USD***
Output 2: Context analysis for seawater intake infrastructure						
Activity 2.1: Review of the Samurai Blue-	***9,200USD*** *DSW1: 500*10=5,000* *DSW2: 300*14=4,200*		*Meeting via individual visits*	*None*	***9,200USD***	***9,200USD***

Savanne Regional Model and OTEC study to identify requirements toward DSW intake infrastructure						
Activity 2.2.: Identification of demand sectors for DSW	***18,000 USD*** *DSW1: 500*18=9,000* *ETS 500*18=9,000*		*Surveys conducted in combination with 2.1*	*None*	***18,000 USD*** *0*	***18,000 USD***
Output 3: Technical assessment to define the optimal site, routing, design and installation methods for DWS infrastructure						
Activity 3.1: Mapping and evaluation of sites for seawater intake pipe	***15,500USD*** *DSW1: 500*31=15,500*	***6,000 USD*** *DSW Travel Cost: 6,000*	*Travel cost included* *Home-based, online meetings as necessary*	*None*	***21,500 USD***	***21,500 USD***
Activity 3.2: Development of the engineering concept and design of the	***18,000 USD*** *PM: 500*5 =2,500* *DSW1: 500*5=2,500* *ETS: 500*2=1,000* *DSW2: 300*40=12,000*		*Home-based, online meetings as necessary*	*None*	***18,000 USD***	***18,000 USD***

seawater intake infrastructure						
Activity 3.3: Consideration for installations and maintenance	***18,000 USD*** *PM: 500*5 =2,500* *ETS: 500*4=2,000* *DSW1: 500*27=13,500*		*Home-based, online meetings as necessary*	*None*	***18,000 USD***	***18,000 USD***
Output 4: Financial Assessment and business models for DSW intake infrastructure						
Activity 4.1: Financial assessment of seawater intake infrastructure	***13,500 USD*** PM: 500*17=8,500 ETS: 500 *10=5,000	***12,000 USD*** *Travel Cost for the PM (combined with activities): 6,000* *Travel Cost for the ETS (combined with activities): 6,000*	*Bilateral consultation meetings with local power utilities, water authorities, as well as local tourism industries and financial institutions to elaborate business models, modes of engagement/participation, as well as PPP investment (which come across Activity 4.1 through 4.3)*	*None*	***13,500 USD***	***25,500 USD***
Activity 4.2: Evaluation of revenue streams under different scenarios	***13,500 USD*** PM: 500*21=10,500 PDC: 300*5=1,500 GE: 300*5=1,500		*Home-based, online meetings as necessary*	*None*	***13,500 USD***	***13,500 USD***
Activity 4.3: Development of optimal business model	***13,500 USD*** PM: 500*21=10,500 PDC: 300*5=1,500 GE: 300*5=1,500		*Home-based, online meetings as necessary*	*None*	***13,500 USD***	***13,500 USD***

Output 5: GCF Concept Note						
Activity 5.1 Drafting GCF Concept Note	***22,500 USD*** *PM :500*30=15,000* *ETS:500*15=7,500*			*Conference facility*0.5 days*	***22,500 USD***	***22,500 USD***
Activity 5.2 Finalizing GCF Concept Note	***19,000 USD*** *PM: 500*16=8,000* *ETS: 500*16=8,000* *PDC:300*5=1,500* *GE: 300*5=1,500*		*Regular meetings and information sharing*	*Local logistics*	***19,000 USD***	***19,000 USD***
Output 6: Capacity building and communication						
Activity 6.1: Preparation of communication material on seawater intake and utilization.	***2,100 USD*** *PDC: 300*7=2,100*			*Local logistics*	***2,100 USD***	***2,100 USD***
Activity 6.2: Delivery of a capacity building workshop on seawater intake and utilization	***3,000 USD*** *PDC: 300*10=3,000*	***8,500USD*** ***1,500USD*** *(meeting package @15 USD *100 pax 0.5+0.5 day as shown in the next box) Indicative cost provided by the Mauritius NDE(Options at Caudan Arts Centre, Le Labourdonnais*	*Separate meetings/consultation with stakeholders, 20 pax, 5days*	*Local logistics*	***3,000 USD***	***11,500USD***

		Hotel, St Georges Hotel) ***500USD*** *Local traveling support (Port Louis – Savanne) for government participants @50 USD*10 pax =**500USD*** *@50 USD*20pax*5days =5,000 USD* *Meeting venue package @15USD*20*5 =**1,500***				
Estimated range of costing for the entire Response Plan					**189,900 USD**	***224,400USD***

4. 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
Please use the same titles for all experts as applied in section 4.	*Please provide a short description of expertise and experience needed (education, sectors of expertise, years of experience, country experience, language requirements, etc.).*
International Experts	
Project Manager (PM)	● Master's degree or higher in climate science or equivalent field of specialization. ● A minimum 7 years of experience in leading, managing and delivering techno-commercial feasibility studies and socio-economic assessments for project development. ● Experience of designing and implementing the GCF concept notes and proposals. ● Demonstrated knowledge and understanding of climate modelling, mitigation and adaptation measures, and financing. ● Fluency in English.

DSW Project Manager (DSW1)	● Master's degree or higher in engineering or equivalent field of specialization. ● A minimum 7 years of experience in leading, managing and delivering techno-commercial socio-economic assessments for project development, with prior engagement experiences on DSW and OTEC. ● Demonstrated knowledge and understanding of mitigation and adaptation measures, and financing. ● Fluency in English
Energy Technology Specialist (ETS)	● Master's degree or higher in the field of engineering, applied science or equivalent field of specialization. ● A minimum of 7 years of experience of conducting energy related technical assessments for communities and industries. ● Demonstrated experience of analysing energy related data and conducting feasibility studies in the related field. ● Demonstrated experience of working in Mauritius ● Fluency in English.
Water Resources Analyst (WRA)	● Master's degree in water resource management or equivalent field of specialization. ● A minimum of 5 years of experience working on water resource management including socio-economic analysis and modelling. ● Fluency in English
National Experts	
DSW Project Developer (DSW2)	● Bachelor's degree or higher in engineering or equivalent field of specialization. ● A minimum 3 years of experience in leading, managing and delivering techno-commercial socio-economic assessments for project development. ● Based in Mauritius ● Fluency in English
Project Development Coordinator (PDC) / Communication Specialist	● Bachelor's degree in humanity or social science field. ● Demonstrated experience in managing and delivering stakeholder meetings. ● Experience of designing and implementing the GCF concept notes and proposals or other international programmes. ● A minimum of 5 years of experience working in environmental issues in Mauritius ● Demonstrated experience of working with communities in Mauritius ● Fluency in English.
Gender Expert (GE)	● Understanding and demonstrated ability of gender considerations ● A minimum of 5 years of experiences in working in development and gender issue ● Demonstrated experience of working in Mauritius ● Fluency in English

5. Intended contribution to impact over time

By introducing the technologies of OTEC and DSW, Mauritius will strengthen its basis for self-reliance on energy production from non-fossil fuel sources. Furthermore, the utilization of DSW will pave the way for development of new and sustainable industries such as more climate resilient agriculture and aquaculture, which will also be beneficial for more gender sensitives interventions, including green job creation, while spending on imported fossil fuels.

The OTEC and DSW will bring the Savanne Regions' development to the next level, by

- Increasing the energy and food security and self-sustaining economies
- Establishing local resources for local consumption (circular economy) and the creation of new and attractive industries
- Harnessing education and academic research for natural resource development in the next generation

As to the accumulated experience, the maintenance burden is far less than other types of power generation facilities, and operation of the facilities are quite simple.

6. Relevance to NDCs and other national priorities

Mauritius' recent mix of energy supply consists of 61% of oil, 25 % of coal and others, and 14 % renewables (IRENA, 2019). Along with the National Greenhouse Gas (GHG) Inventory in 2016 shows the energy sector represents 4,182.62 Gg CO2e (80.26%) of as the largest source of national GHG emissions (National Inventory Report to the UNFCCC, Ministry of Environment Solid Waste Management and Climate Change 2021).

In the first updated Nationally Determined Contribution (NDC), Mauritius commits the quantified mitigation target, equivalent to 40% reduction of GHG emissions by 2030 compared to the BAU scenario. In particular, the government decided that the production of 60% of energy would be needed from green sources by 2030, the total phasing out of the use of coal before 2030, increasing energy efficiency by 10 % based on the 2019 figures.

The outputs of the project have potential contribution to increase the mitigation and adaptation actions under the Paris Agreement, including National Adaptation Plan (NAP), which is currently under development.

7. Linkages to relevant parallel on-going activities:

Mauritius initiated a demonstration study on Ocean Thermal Energy Technology (OTEC) plant in 2022, supported by New Energy and Industrial Technology Development Organization (NEDO), Ministry of Economy, Trade, and Industry (METI), Japan. The study focuses on demonstration of OTEC, whose technology uses a turbine generator to create renewable energy from the temperature difference between cold, deep seawater circulating in the ocean and surface seawater warmed by the sun. In order to produce power with the low temperature range, a working fluid with low boiling point is used.

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

The investigation on the requirements for actual business implementation will be conducted by partnering with companies that already have commercial-level products in the market, and development of business model/stakeholder formation toward power generation, grid connection, DSW supply, including drinking water, as well as water for agricultural and aquacultural use. As follow up activities, the formulation of project financing is necessary, including seeking financing sources (such as preparation for GCF funding proposal as well identifying co-finance), implementing business model into practice, such as establishing an institutional framework for upstream and downstream model, elaborate for actual procurement, such as obtaining quotation from construction companies. In parallel, the possibility of applying to the GCF Project Preparation Facility in cooperation with CTCN and the Mauritian GCF NDA will be pursued. Application to the Project Preparation Facility will be coordinated with the GCF NDA. The outputs and deliveries will be used for project formation and gap and cost analysis for GCF application as a cross-cutting project.

9. Gender and co-benefits:

Each technical assistance must integrate gender mainstreaming activities and lead to gender and other co-benefits. At least 5% of the technical assistance budget need to be allocated to gender mainstreaming activities.

Imbedded in design of the activities:	The feasibility study will consider ways in which all, men and women as well as children and the disadvantaged, can contribute to and benefit from the project in order to achieve society for "Leaving no one behind" through gender analysis. This will be conducted at each stage of the study to ensure that gender perspective is included in project design and appropriately documented, and that women, as well as their male counterparts, will be benefiting from this project in terms of food/beverage security, employment/income and health. These aspects will be detailed in the Gender Action Plan.
Gender and co-benefits intended as result of the activities:	• Strengthen economic basis for female workers at tourism related industries, such as agricultural, aquacultural and food production industries. • Application for educational tourism for domestic and international touries, including students.

10. 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 (Ministry of Environment, Solid Waste Management, and Climate Change)	Overall oversight of the TA, day to day management and coordination of the TA, Facilitate communities and landowners' consultations Lead in coordination among line ministries
Ministry of Energy/ Mauritius Renewable Energy Authority (MARENA)	Renewable Energy business jurisdiction organization, which provide technical advice and support to the NDE and Request Applicant.

Ministry of Finance	Advice on preparation for the Green Climate Fund
Other line ministries	Participate in national/online consultations as appropriate
St. Felix Ltd	Development of Smart City and coordination with other local businesses
Local communities	Elaborating how to utilize the OTEC and DSW as the common asset of the community.

11. 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	OTEC and DSW technology promote the development of sustainable industry at local level, such as tourism, agriculture, aquaculture, food and cosmetic production, which increased income and employment of local population.
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	DSW technology introduction supports increasing new type of agriculture and aquaculture, which increases food production.
3	Ensure 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	
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	
	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	DSW and OTEC supports introduction of renewable energy as a baseload for Small Island Development States (SIDS)
	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	
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	*All TAs should indicate relevance to Goal 13 and at least one target below (13.1 to 13.b).*
	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	Increasing resilience against drought and water scarcity, by increasing access to DSW.
	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 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	Replication of DSW and OTEC can promote global partnership for and across SIDS.

12. 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.

13. 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; and (ii) the Lead Implementer about the knowledge and learning gained through delivery of technical assistance. Furthermore, the NDE together with the project proponent(s) will complete a periodic post-implementation form to track the impact of the activities beyond the technical assistance end date.