CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

Technical Assistance Response Plan – Terms of Reference

Country	**Eswatini**
Request ID#	**2021000035**
Title	Feasibility study for the utilization of solar energy for sugarcane irrigation pumping by emerging commercial small cane growers in Eswatini
NDE	Mr. Bafana Simelane Ministry Tourism and Environmental Affairs Meteorology Department bafanasim@gmail.com PO Box 2652, Mbabane, Eswatini
Proponent	Mr. Nelson Mavuso Director of Agriculture Ministry Agriculture Eswatini nelsonmavuso@ymail.com +268 7606 2612

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)

The economy of Eswatini is largely agro-based thus making it more vulnerable to climate change. Due to climate induced changes in rainfall patterns and increasing frequency of droughts farmers have turned to irrigation. The government of Eswatini has identified sugarcane as a strategic crop that can be utilized to alleviate poverty. To reduce the sugar sector's contribution to the country's Greenhouse Gas (GHG) status, a move to use solar energy to drive critical parts of the sector has been prioritised by the Eswatini Sugar Association. Solar powered irrigation systems are being opted for as opposed to using grid electricity which is derived from coal or diesel generated, thus contributing to GHG emissions.

The Ministry Agriculture requested CTCNs technical assistance with the objective to promote the use of solar energy for irrigation systems for emerging commercial small-scale cane growers in Eswatini to contribute towards the national goal of reducing GHG emissions from the use of carbon rich imported electricity. This will include the following activities: (i) undertaking a feasibility study of the opportunities to solarize the irrigation systems of small-scale cane growers in the Malkerns, KDDP and LUSIP cane farming areas; (ii) preliminary assessment of the solar energy needs for each farming company based on historical energy use profiles; (iii) undertaking a preliminary assessment of the solar energy needs for each farming company based on historical energy use profiles; (iv) developing policy guidelines for the Government of Eswatini to promote solarized irrigation systems for sugar cane growers; (v) preparing a funding proposal for solarized irrigation systems for the three areas. This TA is expected to take roughly 12 months. It is expected to engage major stakeholders such as the Eswatini Cane Growers Association (ECGA), Eswatini Sugar Association (ESA), ECGA Farmer Companies, Renewable Energy Association of Eswatini (REASWA), The Eswatini

Electricity Company (EEC), The Ministry of Natural Resources and Energy (MNRE) Energy Department and Eswatini Energy Regulatory Authority (ESERA).

The technical assistance is expected to provide the Eswatini sugar farming stakeholders with options of solar irrigation systems they can adopt in their farming practice as opposed to relying on grid electricity powered irrigation systems that are costly. It will support them in finding viable financing options available to enable them to adopt solar energy powered irrigation pumping and water application systems and it will also help in reducing their GHG emissions by adopting renewable energy options.

Agreement:

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

National Designated Entity to the UNFCCC Technology Mechanism
Name: Mr. Bafana Simelane
Title: Instruments Engineer
Date: 24 March 2022
Signature:

Proponent (signature of the Proponent is optional)
Name: Mr. Nelson Mavuso
Title: Director of Agriculture
Date: 25/03/2022
Signature:

UNFCCC Climate Technology Centre and Network (CTCN)

Name: Rose Mwebaza
Title: CTCN Director
Date: 04.04.2022
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).

- *What led the country to come up with this request*
- *Read through the request to get info*

The Kingdom of Eswatini is a landlocked country between South Africa and Mozambique. The country faces numerous challenges such as poverty, food insecurity, and climate-related disasters that include droughts, storms, and floods. The government has introduced a range of policies and strategies to mitigate and adapt to climate change in an effort to reduce the negative impacts of climate change.

According to Eswatini's Third National Communication to the UNFCCC[1], daily maximum and minimum temperatures between 1961 and 2010 reveal that temperature extremes show patterns consistent with warming over most of the country in the last decade. The data suggest that the last two decades (1990s and 2000s) have been warmer compared to the 70s and 80s. Rainfall trends in the country points towards a decrease in the number of rainy days which has an implication on the intensity of rainfall events, river flows and dry spell duration. Apart from changes in total or mean summer rainfall, certain intra-seasonal characteristics of seasonal rainfall such as onset, duration, dry spell frequencies, and rainfall intensity as well as delay of rainfall onset has changed over the years.

In an effort to reduce climate vulnerability and empower farmers with economically viable livelihoods that supports and builds upon an existing successful commercial sugarcane production agribusiness, the government of Eswatini established the Eswatini Water and Agricultural Development Enterprise (ESWADE) in 1999 to facilitate the planning and implementation of farmer owned and managed sugarcane farms. Since 1999, the Government through ESWADE has developed two major smallholder irrigation projects in the country, namely: (i) 6,500ha Komati Downstream Development Project (KDDP)[2] a US$ 142,857m irrigation project on the Komati River using water stored and made available from the Maguga Dam (funded by the ADB) and (ii) the 13,000ha Lower Usuthu Smallholder Irrigation Project (LUSIP)[3] a US$ 190,476m irrigation project using water diverted from the Usutu River and stored in the Lubovane Dam. These projects were developed with multi-donor funds from various international financial institutions including IFAD, EIB, and KwF. Several other small-scale growers have been established, for example Malkerns cane growers, who are scattered in other river basins with direct abstractions from rivers.

Sugar related production accounts for 10% of employment (17% of formal private sector employment) and produces 700,000 tonnes sugar/yr, accounting for 74% of its agricultural gross domestic project (GDP). Small-scale cane farmers clustered as Farmer Companies are all members of the Eswatini Cane Growers Association (ECGA), an organization established to serve and support cane growers through promoting, advocating and fostering their collective interests, sustainability

[1] https://unfccc.int/sites/default/files/resource/swznc3.pdf
[2] http://www.swade.co.sz/projects/kddp/index.php
[3] http://www.swade.co.sz/projects/lusip1/index.php

and progress. The ECGA and the Eswatini Millers Association are equal shareholders (50% shareholders each) in the Eswatini Sugar Association (ESA).

The ESWADE cane projects in KDDP and LUSIP were initiated in response to these climate changes and increasing threats to rainfed farming. Eswatini is a water scarce country. The development of the KDDP and LUSIP areas has had the effect of increasing the nations GHG emissions (from land conversions and increased energy demands) and placing a strain on the nation's natural water resources. Water is the key driver and a critical input to sustainable sugarcane production. All sugarcane produced in Eswatini is irrigated due to the lack of sufficient rain in the cane growing areas[4]. Irrigation is the major water user in Eswatini as it takes up to 96% of total water consumption. The projections of climate change on water, as an input for agriculture, are that river flows will decline by around 40%, particularly with a warmer climate, thereby increasing its demand and reducing availability.

To empower rural farmers and uplift them out of poverty, the ESA and the ECGA have been facilitating the establishment of 16,596 ha (as of March 2020) of farmer managed irrigated cane in the Malkerns, KDDP and LUSIP areas producing 213,282t sucrose generating in the order of US$5.6m from sucrose sales. Farmer owned sugarcane companies have lifted rural households out of poverty and has the potential to contribute further to poverty alleviation provided operating costs can be managed and create additional jobs, income and growth.

ECGA members have more than tripled their share of sugar production in 20 years from 8% to 25%, by registering as farmer companies (FCs). In FCs, farmers return their customary land rights to the local chiefs and get shares of a company over an irrigation area (on average an FC is 80 –100 ha, up to 650 ha, it gathers 50 shareholders led by a board of directors and a manager runs its operations). Most shareholders collect dividends that contribute to their livelihoods.

Majority of the farmer owned sugarcane companies are connected to the national electricity grid with a cumulative peak electricity demand over 50MW. The electricity requirement for cane farming is focused on pumping water that is applied to cane fields through pressurised irrigation systems such centre pivots, sprinklers and drip.

Combined with the increasing GHG emission tied to the carbon rich electricity from ESKOM, the ever-increasing cost of grid electricity means that the energy costs of cane farmers are averaging over 24% of total operational costs and rising steadily. Cane farmers with capacity to access finance have invested to protect their competitiveness. The majority of cane farmers (big and small) are looking for alternatives in the form of renewable energy to remain competitive whilst reducing their carbon footprint.

The geographic scope of the project is the core sugarcane growing areas of Eswatini encompassing the Malkerns area, the Komati Downstream Development Project (KDDP) area along the Komati River and the Lower Usuthu Smallholder Irrigation Project (LUSIP) along the Usutu River farmed exclusively by Eswatini Cane Growers Association member companies as shown in the map below.

2. Problem statement

[4] http://www.gov.sz/images/MNRE_PICS/National-Water-policy----Final--Document-Aug-2018-1.pdf

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).

- *Include the technology gaps, refer to the barrier analysis*

The economy of Eswatini is largely agro-based, making it more vulnerable to climate change. Climate change impacts in the agriculture sector are already being observed in the country. Livestock and crops production under rain-fed conditions have declined by over 30% on average over the last few farming seasons due to climate induced changes in rainfall patterns and increasing frequency of droughts. The draft Greenhouse Gas Inventory 2018 is currently under preparation, but preliminary data indicates that Eswatini's net GHG emissions in 2018 are estimated at 3240.10 $GgCO_2e$, where 48% of emissions come from the Agriculture, Forestry and Land Use (AFOLU) sector. The Energy sector contributes 40% of emissions, waste contributes 11% and Industrial Processes and Product Use sector provides the remaining 1%. Eswatini's total GHG emissions have been steadily rising since 1990 primarily driven by increasing emissions from the AFOLU sector. National obligations to reduce GHG emissions in line with the Paris Agreement and the Eswatini Nationally Determined Contributions (NDC), can be partially met by reducing the emissions linked with electricity usage for irrigation.

The government of Eswatini has identified sugarcane as a strategic crop that can be utilized to alleviate poverty and associated effects especially in the poverty-stricken areas of the Lowveld, with the necessary technical support to make viable businesses out of the endeavours. The sugar production sector is one economically vulnerable, it is most at risk from climate change induced changes to the climate and weather.

To reduce the sugar sector's contribution to the country's Greenhouse Gas (GHG) status, a move to use solar energy to drive critical parts of the sector has been prioritised by the Eswatini Sugar Association. According to the Sustainable Energy for All Country Action Plan (2014)[5] the country is geographically well located to take advantage of solar radiation with over 2,000 kWh/m^2/year available. ECGA members however face economic barriers to investment in new energy technologies and remain dependent upon electricity supplied by Eswatini Electricity Company (EEC) at a cost that increases annually. The Eswatini financial sector is not short of liquidity but banks are reluctant to take full risk exposure in renewable Agri-energy investments as they lack the information/expertise for investment appraisal, credit scoring and assessing technical market risks (carrying out the due diligence is seen as difficult as licenses, environmental permits, land rights documents are needed).

According to the Sustainable Energy for All Country Action Plan (2014)[6] there are untapped market opportunities (valued USD 13m in the sugarcane sector alone) for renewable energy investments (e.g. retrofitting of existing water pumps with Variable Speed Drives, adding solar power capacity and other power correction measures). Most ECGA members cannot directly invest in renewable energy for self-consumption or selling the surplus to the EEC as they cannot meet debt-equity requirements of banks to borrow the required capital and the modalities for selling excess power into the grid have yet to be legitimised by the Eswatini Energy Regulatory Authority. Stakeholders

[5] https://www.seforall.org/sites/default/files/Swaziland_RAGA_EN_Released.pdf
[6] https://www.seforall.org/sites/default/files/Swaziland_RAGA_EN_Released.pdf

identified most notably the relatively high cost of purchasing the equipment without supportive lending options from financiers and ensuring competent and reliable installers installed it correctly. Furthermore, the high interest rate for borrowing commercial money (15-17%) and need for collateral as asked for by banks, make it difficult for farmers to get loans to buy this technology out right. ECGA farmers and the ECGA management have limited capacity to secure international energy finance through the preparation of successful funding proposals. Local capacity in the private sector does exist but there are costs involved that the ECGA is unable to secure through its internal budgeting arrangements.

There is limited awareness about the advantages of solar power across the cane farming communities however with the ever-increasing news coverage and the uptake of some farmers with solar powered irrigation systems many more farmers would like to participate. Supporting farmers to change from grid derived electricity to solar is seen not only as a way in which farmers can reduce their operational costs whilst reducing the sectors contribution to GHG emissions thus contributing towards achieving the UNFCCC Paris Agreement target of keeping the plants temperature at 1.5°C. ECGA farmers however face the challenge of securing professional system design services nationally. Although some renewable energy companies have started operations in Eswatini such as WattsUp Solar[7] and SolSun[8], their capacity to evaluate and design systems for hundreds of potentially new customers is limited by human and financial resources. South African based companies operating in the country are emerging, e.g. the Renewable Resources Company (TRRC) and Repower Africa. These companies are backed by technical experts and finance to provide turnkey solutions using a variety of financing options.
Both the ECGA and ESA lack institutional capacity to manage the roll out of a geographically wide solarization of farms project. A dedicated turnkey solution provided by a system supplier or developer would benefit their institutional capacity whilst still allowing them to be involved and guide the project.

[7] https://wattsupsolar.co.sz/
[8] https://solsuncompany.com/

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**:* To promote the use of solar energy for irrigation systems for emerging commercial small-scale cane growers in Eswatini in order to contribute towards the national goal of reducing GHG emissions from the use of carbon rich imported electricity.												
Outcome: The main outcomes from this TA will be that the Eswatini sugarcane farmers will: (i) Have options of solar irrigation systems they can adopt in their farming practice as opposed to relying on grid electricity powered machinery that's costly; (ii) Reduce their GHG emissions by adopting renewable energy options; (iii) providing financing options available to enable them adopt solar energy powered systems.												
Output 1: Development of implementation planning and communication documents												
Activity 1: i) 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; ii) 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); iii) 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); iv) A Closure and Data Collection report completed at the end of the technical assistance (a template will be provided).												
Deliverable 1: i) Detailed work plan ii) Monitoring and evaluation plan iii) CTCN Impact Description iv) Closure and Data Collection report	X X X											X X
Output 2: Preliminary assessment of farming companies and their energy needs and potential savings												

Activity 2.1: Analyse the general landscape of small-scale cane growers in the Malkerns, KDDP and LUSIP cane farming areas and the solar irrigation context A general analysis on small-scale cane growers / growing communities in the Malkerns, KDDP and LUSIP cane farming areas will be conducted to understand general infrastructure / technology level, as well as territorial and production patterns. This will serve as an input to the general assessment of prioritizing individual solar plants versus few large-scale solar plants, including a review of the ESERA regulations and consultations with EEC and ESERA.												
Activity 2.2: Identify interested small-scale cane growers in the Malkerns, KDDP and LUSIP cane farming areas With the support of Ministry of Agriculture, ECGA and other stakeholders, about 5 interested small-scale cane growers / growing communities in the Malkerns, KDDP and LUSIP cane farming areas will be identified. For this purpose an information session on the opportunities of solar irrigated cane farming will be held.												
Activity 2.3: Assess the current infrastructure, activities, energy profiles and needs of interested cane growers The interested small-scale cane growers / growing communities will be formally introduced to the technical assistance and will be requested to share information on their current infrastructure, activities, energy profiles and needs. Where necessary, additional data will be collected through site visits.												
Activity 2.4: Prioritize and select a few small-scale cane growers from each cane farming area based on their fit for using solar irrigation systems The previously collected information on infrastructure, activities, energy profiles and needs will be analysed in order to prioritize a maximum of 2 small-scale cane growers / growing communities from each cane farming area. This prioritization will be based on their fit for using solar irrigation systems (as a result of the information analysed).												

The prioritization of the small-scale cane growers will be validated with the Ministry of Agriculture, ECGA and other stakeholders, and their availability and continued interested will be confirmed. Throughout the selection process, attention should be given to a gender balance.												
Deliverable 2: 1. Report on small-scale cane farming and solar irrigation landscape 2. List of interested small-scale cane growers by farming area, Information session report including list of attendees disaggregated by gender and institution 3. Report on the infrastructure, energy use profiles and needs of interested small-scale sugarcane growers 4. Report on prioritized small-scale cane growers including decision matrix		x	x	X X								
Output 3: Technical feasibility study												
Activity 3.1: Undertake a technical feasibility study to solarise the irrigation systems of selected small-scale cane growers A technical feasibility study to solarise the irrigation systems of the prioritized small-scale cane growers / growing communities will be conducted. This study will include a gap analysis between the existing and required infrastructure, a detailed evaluation of the energy demand and requirements, the assessment of feed-in possibilities into the electricity grid, as well as a detailed overview on required number of solar modules of specified generation capacity (W), inverter specifications, existing pump motor and pump changes.												
Activity 3.2: Develop a schematic design of an indicative system configuration for each small-scale cane grower A schematic design of an indicative solarised irrigation system configuration for each small-scale can grower / growing community will be designed.												
Deliverables 3: 1. Technical feasibility report 2. Schematic design of an indicative solar irrigation system				X	X							
Output 4: Identification of appropriate technologies and service providers												
Activity 4.1: Identify and consult with four local and three South African solar system developers												

Consult with at least four local and three international companies i.e. from South Africa, that offer solar system development[9].												
Activity 4.2: Present a summary of their services, conditions and financing plans for each of the selected small-scale cane growers Based on the results of the technical feasibility and schematic design of an indicative system for the selected small-scale cane growers / growing communities, request a summary of their services, conditions and financing plans for each grower / growing community.												
Activity 4.3: Identify the most suitable technology setup and service provider for each of the small-scale cane growers A comparative analysis of the previously received services, conditions and financing plans will be conducted in order to identify the most suitable technology setup and service provider for each of the small-scale cane growers / growing communities.												
Deliverables 4: Report of the most appropriate technology providers, the suitable technologies, the services provided and financing plan options								X				
Output 5: Economic feasibility study												
Activity 5.1: Conduct a cost analysis for each selected small-scale cane growers A cost analysis for each selected small-scale cane grower / growing community will be conducted, including total capital investment (equipment, installation, land), operation and maintenance costs, and cost per unit of electricity.												
Activity 5.2: Conduct a revenue / benefit analysis for each selected small-scale cane growers												

[9] For example locally: WattsUp Solar (https://wattsupsolar.co.sz/), SolSun (https://solsuncompany.com/), SolarXgen (http://solarxgen.co.za/solarxgen-eswatini-swaziland/), the Renewable Resource Company (https://renewableresources.co.za/), the Repower Africa (https://www.repowerafrica.co.za/)

A revenue / benefit analysis for each selected small-scale cane grower / growing community will be conducted, including benefits to current energy supply, potential feed-in possibilities and related revenues.												
Activity 5.3: Prepare a cost-benefit assessment for each selected small-scale cane growers A cost-benefit assessment will be prepared for each small-scale can grower / growing community, including net present value (NPV), internal rate of return (IRR), and payback period (PB). Furthermore, a sensitivity analysis related to current electricity source costs will be conducted.												
Activity 5.4: Identify and develop potential financing models for farmers Meet with local retail banks and other financial services providers to appraise them of financing models for agri-solar projects and how as national retail banks they can assist farmers transition to renewable energy to power their production activities.												
Deliverables 1. Economic feasibility report, including cost analysis, revenue / benefit analysis and cost-benefit assessment										X		
Output 6: Development of favourable conditions for solar-irrigated cane farming in Eswatini												
Activity 6.1: Develop Government-led policy guidelines and potential financing mechanisms Potential policies and financing mechanisms for the promotion of solar irrigation in small-scale cane farming will be identified through a review of international best practices and interviews with key stakeholders. The results will be discussed and most promising policies and financing mechanisms will be selected. Guidelines for a future policy and financing mechanisms will be developed.												
Deliverables 6: 1. Guidelines for policies and financing mechanisms on solarization of irrigation systems for the sugarcane growers												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** *(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**
Output 1: Development of implementation planning and communication documents	*IE1: 10 days* *NE1: 10 days*				**4,000 USD**	**4,400 USD**
Activity 1.1: Formulation of i) Detailed work plan, ii) Monitoring and evaluation plan, iii) CTCN Impact Description, iv) Closure and Data Collection report.						
Output 2: Preliminary assessment of	*IE1: 30 days* *IE2: 15 days* *IE3: 15 days*				**44,500 USD**	**48,950 USD**

farming companies and their energy needs and potential savings	*IE4: 5 days* *NE1: 35 days* *NE2:4 days*					
Activity 2.1: Analyse the general landscape of small-scale cane growers in the Malkerns, KDDP and LUSIP cane farming areas and the solar irrigation context		*Local travel for NE1 to small-scale cane growers and other stakeholders*			17,500 USD	19,250 USD
Activity 2.2: Identify interested small-scale cane growers in the Malkerns, KDDP and LUSIP cane farming areas					3,500 USD	3,850 USD
Activity 2.3: Assess the current infrastructure, activities, energy profiles and needs of interested cane growers		*Local travel for NE1 to small-scale cane growers*			15,000 USD	16,500 USD
Activity 2.4: Prioritize and select a few small-scale cane growers from each cane farming area based on					8,500 USD	9,350 USD

their fit for using solar irrigation systems						
Output 3: Technical feasibility study	*IE1: 10 days* *IE2: 5 days* *IE3: 25 days* *NE1: 10 days*				**22,000 USD**	**24,400 USD**
Activity 3.1: Undertake a technical feasibility study to solarise the irrigation systems of selected small-scale cane growers					13,500 USD	14,850 USD
Activity 3.2: Develop a schematic design of an indicative system configuration for each small-scale cane grower					8,500 USD	9,350 USD
Output 4: Identification of appropriate technologies and service providers	*IE1: 6 days* *IE2: 4 days* *IE3: 20 days* *NE1: 12 days*				**17,400 USD**	**19,140 USD**
Activity 4.1: Identify and consult with four local and three South African solar system developers					5,500 USD	6,050 USD

Activity 4.2: Present a summary of their services, conditions and financing plans for each of the selected small-scale cane growers					3,900 USD	4,290 USD
Activity 4.3: Identify the most suitable technology setup and service provider for each of the small-scale cane growers					8,000 USD	8,800 USD
Output 5: Economic feasibility study	*IE1: 14 days* *IE2: 35 days* *IE3: 20 days* *IE4: 2 days* *NE1: 11 days*				**37,100 USD**	**40,810 USD**
Activity 5.1: Conduct a cost analysis for each selected small-scale cane growers					6,400 USD	7,040 USD
Activity 5.2: Conduct a revenue / benefit analysis for each selected small-scale cane growers					6,400 USD	7,040 USD
Activity 5.3: Prepare a cost-benefit					10,400 USD	11,440 USD

assessment for each selected small-scale cane growers						
Activity 5.4: Identify and develop potential financing models for farmers					13,900 USD	15,290 USD
Output 6: Development of favourable conditions for solar-irrigated cane farming in Eswatini	*IE1: 10 days* *IE2: 15 days* *IE3: 15 days* *IE4: 20 days* *NE1: 15 days* *NE2: 5 days*				**34,000 USD**	**37,400 USD**
Activity 6.1: Develop Government-led policy guidelines and potential financing mechanisms					34,000 USD	37,400 USD
Estimated range of costing for the entire Response Plan					**159,000 USD**	**174,900 USD**

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
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	
Team leader and expert in water irrigation for agriculture (IE1)	• Team Leader and expert in water agriculture and irrigation • Master's in agriculture, water management, climate change adaptation, agriculture engineer, or similar • At least 10 years of experience in the nexus between climate change, agriculture, and water management/irrigation • At least 5 references demonstrating experience in the design and implementation and monitoring & evaluation of irrigation system in developing countries • Experience in capacity building, organizing workshops and capacity building • Experience in managing complex projects in the presence of various stakeholders • Previous experience in Africa or in Eswatini will be valued • Fluency in English is mandatory
Economist (IE2)	• Master or above in economy, finance, management of companies, international economics, agriculture economics, renewable energy economics, water economics • Minimum of 10 years' experience in designing business models • At least 5 references in the developing models for climate technologies, technologies used in the agriculture sector • At least 3 experiences in developing business models for the developing countries • Previous experience in Africa or in Eswatini will be valued • Fluency in English is mandatory
Expert in solar irrigation pumping system (IE3)	• Master or above in solar energy, solar irrigation system, water management, agricultural engineer, food production, or affiliate • Minimum of 10 years' experience in irrigation for agriculture purposes • At least 5 references in designing solar water pumping systems in developing countries • Experience in capacity building • Previous experience in Africa will be valued • Fluency in English is mandatory
Legal expert (IE4)	• A minimum of 10 years relevant work experience in drafting environmental policies, laws, frameworks • At least 5 demonstrated experience in drafting environmental laws, frameworks, policies in Africa • Excellent abilities to interact with local stakeholders, collect and evaluate data and transform the information into high quality documentation tangible to the target audience.

	• Excellent written and communication skills in English • Understanding of climate technologies is valued.
National experts	
Agriculture expert (NE1)	• Master or above in agriculture, food production, water management, agricultural engineer, or affiliate • Minimum 8 years' experience in agriculture and water management in Eswatini or Southern Africa. • Strong knowledge of climate change adaptation issues for smallholder farmers • At least 5 years experiences in irrigation in Africa. • Presence in Eswatini is desired or availability to travel frequently and for long periods of time • Fluency in English is mandatory
Gender expert (NE2)	• Sociologist, anthropologist, gender management graduate or affiliate • Minimum 8 years of experience in carrying out socio-economic surveys • Gender experience in the context of water management, food production, food safety, agriculture or similar • At least 5 references in Africa • Presence in Eswatini desired or availability to travel frequently and for long periods • Fluency in English is mandatory

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)

According to Eswatini National Inventory Report 1990 – 2018, the total emission from the energy sector is estimated at 1,303.81 GgCO2e, thus an intervention to solarise ECGA growers energy demand would represent an 11% saving nationally on energy use and 4.5% of national CO_2e emissions. As a co-benefit from displacing carbon rich electricity with clean electricity, ESGA farmers are expected to benefit from reduced electricity costs that currently account for around 24% of their annual operating costs and when net-metering is legitimised through statute or regulation, participating farmer companies could, in addition to sucrose sales, benefit from electricity sales to EEC.

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)

Revised Nationally Determined Contribution (NDC)

The 2021 Eswatini Revised Nationally Determined Contributions (INDC)[10] to global climate action under the UNFCCC has a set a relative GHG target of reducing emissions by 23% in 2030 compared to a baseline scenario through potential mitigation actions. While actions have been identified across supply and demand side, the major share of emission reductions shall be achieved through increasing the electricity generation from renewables to 50% and this involves considerable expansion of capacities from biomass, solar, hydro and wind.

The Government of Eswatini remains committed to the NDC and aware of the importance of making the energy sector more resilient to the impacts of climate change.

Within the NDC commitment the following contributions supporting this application (p78):

Sector	Mitigation Action	Aligning to national documents
Electricity generation	Achieve 50% generation from renewable energy by 2030 relative to 2010 levels through the following capacity addition plans: • biomass-based co-generation: 140-165 MW	• National Energy Policy of 2018 • Energy Master Plan 2034

10 https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Eswatini%20First/Eswatini%27s%20Revised%20NDC%2012%20Oct%202021.docx

	• hydro: +40-60 MW • Solar: +100-120 MW • Wind: +20-50 MW	
Sugar	15% reduction in electricity consumption by 2030	• National Energy Efficiency Strategy and Action Plan

- Increase the contribution of agriculture to economic development, to support both food security and exports

The Third National Communication to the UNFCCC

The Third National Communication to the UNFCCC[11] states on p139 that the major renewable energy targets of the Government are:

- The installation of solar water heaters in 20% of all public buildings by 2014;
- The development of solar water heater standards by 2012;
- The establishment of fiscal incentives to promote renewable energy by 2013; and

The establishment of a demonstration centre for renewable energy technologies by 2015.

Technology Needs Assessment (TNA)

Eswatini completed its TNA in 2016 and 2018. The TNA provided input into the development of Eswatini's NDC report, and all the technologies prioritized by the TNA were included in the NDC. The 2016 TNA prioritised solar water pumping as a technology (p20)

Table 6 of the TNA 2016 presents the criteria for prioritization for the power generation category in the energy sector. Solar energy was ranked 3rd in priority.

Several specific barriers are reported to keep Eswatini from fully achieving their low-emission energy goals. One is the lack of affordable access to financial resources by a developer (farmer) to afford to implement solar irrigation. A related barrier is the climate risk that extreme conditions have placed on some essential infrastructure exposing grid supplied electricity as vulnerable in the event of failure.

Eswatini Energy Masterplan

The MNRE published the Eswatini Energy Masterplan 2034[12] which was developed with support from the International Renewable Energy Agency (IRENA). The Energy Masterplan 2034 recognises that grid extension may not be the least cost solution for electrifying the entire country and communities and it will be necessary to establish distributed (off-grid) systems where they are suited and have sufficient demand. The Masterplan aims to reduce dependency on imported coal derived electricity from South Africa.

National Energy Policy Implementation Strategy (NEPIS)

In 2009 the Ministry of Natural Resources and Energy (MNRE) developed a NEPIS to address energy issues as they relate to all national energy development activities. The Strategy advocates for an enabling environment for the diversification of energy access and cost reductions, for large and small users. Amongst other things it called for the development of renewable energy action plans and targets.

The NEPIS relates with this TA in the following ways:

[11] https://unfccc.int/sites/default/files/resource/swznc3.pdf
[12] http://sera.org.sz/administrator/files/1550235366.pdf

- Government will support programmes promoting the utilisation of renewable energy resources for electricity production (3.3.5).
- Government will carry out investigations and promote efficient and environmentally sound technologies for the utilisation of indigenous resources for electricity production (3.3.5).
- Government will carry out investigations and promote efficient and environmentally sound technologies for the utilization of indigenous resources for electricity production (3.3.6).
- Government will develop a renewable energy information program and establish and maintain an appropriate renewable energy information system (3.4.4).
- Appropriate financing mechanisms will be investigated and facilitated (3.4.5).
- The capacities of development agencies, which promote and implement sustainable programmes on renewable energy, will be strengthened (3.4.6).
- Government will encourage a wider use of solar water heaters for residential and commercial buildings through promotional means and support for private sector initiatives (3.4.9).

Government will investigate opportunities for increased local power generation and will endeavour to take advantage of the availability of cheap power in the region through the SAPP (5.1.4).

National Climate Change Policy (NCCP)

In the 2016 National Climate Change Policy[13], under the section 4.1.3 Energy security, the following policy objectives are identified:

- Diversifying energy supplies and diminishing dependence on limited traditional energy sources.
- Enhancing research and development, innovation, diffusion and deployment of renewable energy technologies.

Accelerated deployment plans and incentives for renewable energy such as mini hydro, solar, wind and geothermal.

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)

To support the goal to reduce GHG emissions amongst others, Eswatini has adopted the following policy frameworks: the National Climate Change Strategy and Action Plan (2014), the National Energy Policy (2003)[14], the National Energy Efficiency Policy (2019)[15], the National Energy Implementation Strategy (2009) and the Eswatini Energy Master Plan of 2018 – 2034[16] to scale up energy access through consideration of off-grid solutions and to introduce energy efficiency interventions which will support the country's drive towards industrialisation. An Independent Power

[13] https://info.undp.org/docs/pdc/Documents/SWZ/Swaziland%20Climate%20Change%20Policy%202016%20Final.pdf

[14] http://www.gov.sz/energy%20policy.pdf

[15] https://www.energycharter.org/fileadmin/DocumentsMedia/Other_Publications/EE-Eswatini2019.pdf

[16] http://sera.org.sz/administrator/files/1550235366.pdf

Producer Policy (2016)[17] and Short-Term Generation Expansion Plan (2018)[18] were put in place to promote the use of renewable energy and most notably, it promotes the introduction of Small-Scale Embedded Generation (SSEG) and policy position 15 calls on government to "create a conducive investment environment taking cognisance of the particular needs associated with the financing approach and/or institution".

Eswatini has established a regulatory authority for the energy sector called the Eswatini Energy Regulatory Authority to ensure sustainable access to affordable, reliable and modern energy. The ESA went ahead and undertook an energy use survey of ECGA growers to determine their electricity linked GHG contributions. It was found that 16,596 Ha of small cane growers consuming an average of 8,552 kWh/ha/yr the total electricity consumed amounts to some 141,928,992 kWh. With an emissions factor supplied from ESKOM of 1.03 kgCO2/kWh, GHG amount to around 146,186,861.76 $kgCO_2$/year. By converting the primary electricity source for the farm's electricity needs to solar, the potential emissions saved from using carbon rich electricity from ESKOM, would be 146.186 $GgCO_2e$.

Members of the ECGA reported that electricity costs are the biggest production cost for sugarcane farmers accounting for about 24% of total cost. The main reason is cost escalations that have exceeded 70% over the last 6 years. This has prompted the ECGA to seek technical support for the introduction of renewable energy systems for members of the ECGA, through an assessment of solar power as a core daytime electricity supply and examining the various approaches that could be taken to provide cheaper and emissions free electricity to growers.

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)

Anticipated follow-up activities after this technical assistance include:

- Formalization of government-led policies and financing mechanisms to support the uptake of solar irrigated cane growing
- Submission and implementation of GCF project
- Distribution of knowledge material and lessons learned to other small-scale cane growers and growing communities
- Continuous monitoring of benefits of transitioning to solar-based irrigation in cane farming

10. Gender and co-benefits:

[17] http://www.sera.org.sz/administrator/files/1578991946.pdf
[18] http://sera.org.sz/administrator/files/1559738321.pdf

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 ECGA, ESA, REASWA and Department of Energy concur that the overall project objective of introducing solar irrigation pumping to emerging sugarcane farmers under the ECGA family will not have any inequities with respect to gender. Farmer company representation of women is strongly encouraged by the ESA, ECGA and ESWADE to ensure inclusivity of important members of rural farming societies to earn an income or contribute through labour or other farming tasks. Currently within the solar sector in Eswatini, there are very few women participating in installing or maintaining solar systems. The project will raise awareness of solar and service suppliers will be required to support greater women's participation. Women farmers and entrepreneurs will, through the development of a gender action plan during writing of funding proposals, be encouraged and targeted to participate in the project.
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.* Solarization of the electricity needs for the farmer companies will benefit women as some 1,997 women participate in cane farming, often as part of a larger group or company. There are 2,919 male members. ECGA reports that the individual farmer companies' membership consists largely of women who are always actively engaged in sugarcane business as most men are employed either in local industries or in the South African mining sector. Any resulting funded project must ensure that this gender dynamic is strengthened and supported to achieve gender equity with the cane growing sector Solar energy is beneficial for improving the profitability of cane farming by resource poor farmer companies as well as contributing towards reducing the GHG footprint irrigation pumping currently includes whether they are men or women. The project objective would ensure gender equity by involving men and women equally

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 Mr. Bafana Simelane	Observatory role of ensuring the TA implementation goes on well and the countries needs are met. will be

Ministry Tourism and Environmental Affairs Meteorology Department Eswatini	involved in the major stakeholder meetings and review the final reports.
Project Proponent Mr. Nelson Mavuso Director of Agriculture Ministry Agriculture Eswatini nelsonmavuso@ymail.com +268 7606 2612	An active member of the TA steering committee. The vision bearer of the TA on behalf of the country. Their approval and contribution to the deliverables is crucial. Facilitates the smooth implementation of the TA, i.e. with the relevant country stakeholders
Dr Sipho Nkambule The Chief Executive Officer The Eswatini Cane Growers Association (ECGA) PO Box 273 Mbabane, Eswatini T: +268 2404 3561 W: ecga.co.sz E: drsipho@ecga.co.sz	As the Request Applicant, the ECGA will provide support to the CTCN implementors and facilitate any assistance they maybe require. The ECGA as representative of the core beneficiaries can arrange farmer visits and provide interpreter services if needed. The ECGA can provide information and data related to all its members.
Dr Phil Mnisi The Chief Executive Officer The Eswatini Sugar Association (ESA) PO Box 445 Mbabane, Eswatini T: +268 2411 7600 W: esa.co.sz E: mnisip@esa.co.sz	Eswatini Sugar Association (ESA), The ESA is the main administrative body representing all cane growers (large scale to small scale) and millers in the country. The ESA will provide technical and logistical support to the TA implementation team to ensure they are able to travel to and meet with ECGA growers. The ESA possess all the production data of the sugar sector and can provide relevant data as needed by the implementation team.
ECGA Farmer Companies	The Farmer Companies (beneficiaries), represented by the ECGA, can support the CTCN TA implementors with the collection of relevant data regarding farm operations and technical details on energy use, financial statements, irrigation systems and any other data requested.
Renewable Energy Association of Eswatini (REASWA)	REASWA is the designated entity mandated to support renewable energy deployment in the country. They can facilitate the TA implementors access to relevant government and civil society stakeholders.
The Eswatini Electricity Company (EEC)	The EEC is the country's main provider of grid electricity. The EEC can provide support to the TA implementor on technical issues related to the introduction of solar

	and any potential grid-tied solutions the TA implementor may propose.
The Ministry of Natural Resources and Energy (MNRE); Energy Department	The MNRE Energy Department is responsible for policy and overall oversight of the electricity supply industry. In 2018, the MNRE promulgated the National Energy Policy 2018 (NEP). The policy sets out the following objectives: (a) Ensuring access to modern energy services for all; (b) Enhancing employment creation; (c) Ensuring security of energy supply; (d) Stimulating economic growth and development; (e) Support the development of renewable energy resources for a target of 50% of the electricity generation mix; and (f) Ensuring environmental and health sustainability. The NNRE Energy Department can provide the TA implementors with policy and legal information relating to the introduction of renewable energy to ECGA farmers.
Eswatini Energy Regulatory Authority (ESERA)	The ESERA are the mandated institution to oversee and regulate the energy mix in the country. They actively encourage renewable energy projects. The ESERA can provide the TA implementor with support and background information relating to their regulations and mandate regarding renewable energy development.

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	Sugarcane farming has been identified as strategic in alleviating poverty and boosting the economy in an agricultural dependent economy
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	Sugarcane farming will boost food security. Increased harvest and sale of the crop will avail income to promote other agricultural activity. The will also be surplus income for purchase of food to ensure food security and improved nutrition
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)	This TA is promoting the use of solar energy in Eswatini. Not only in the agriculture sector but it will also spill over to other economic uses and domestic uses. This will promote energy security and increase the use of renewable energy
	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	
	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	By adopting solar energy for irrigation as opposed to grid electricity or diesel powered generators, the GHG emissions from the agriculture sector reduce. Thus contributing to the countries goal to reduce GHG emissions from the Agriculture, Forestry and Land Use (AFOLU) 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 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	☐	☐X
☐ 4. Financing facilitation	☐	☐X
☐ 5. Private sector engagement and market creation	☐	☐
☐ 6. Research and development of technologies	☐	☐

☐ 7. Feasibility of technology options	☐X	☐
☐ 8. Piloting and deployment of technologies in local conditions	☐	☐X
☐ 9. Technology identification and prioritization	☐	☐

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.

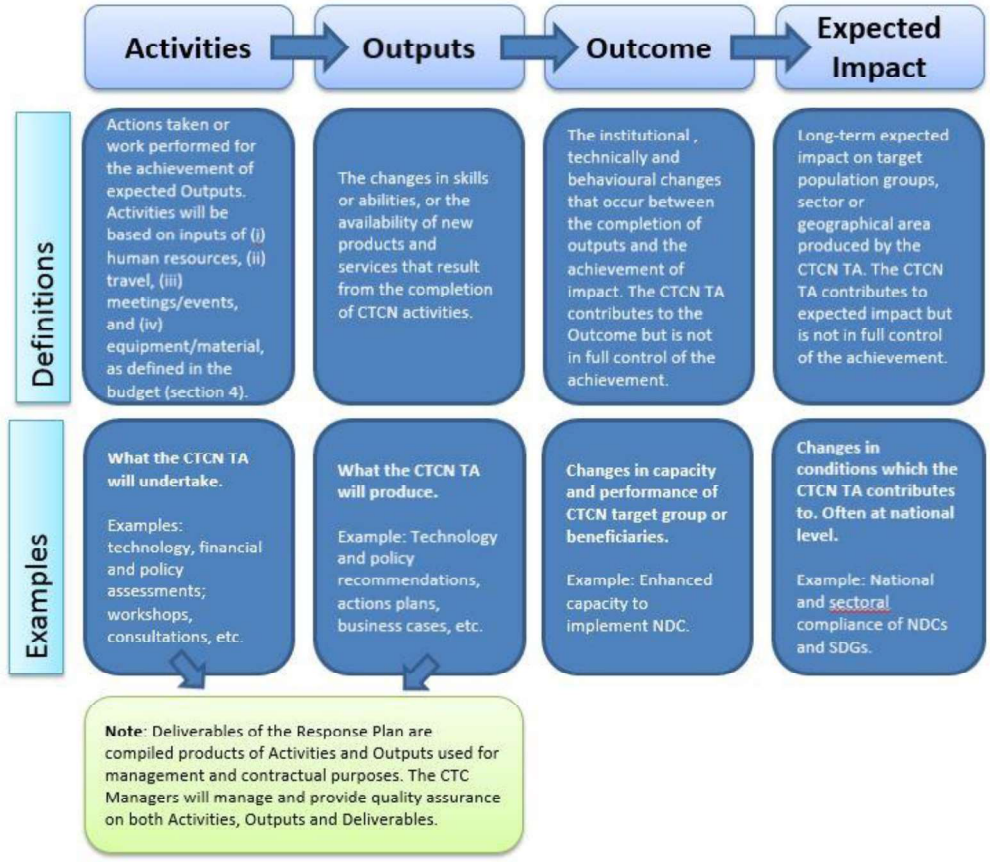
Annex 1: Guidance note for designing a Response Plan (to be deleted when submitting the Response Plan)

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.