Guidelines:

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

Requesting country or countries:	Zimbabwe
Request title:	Upscaling the pilot reliable solar powered drying facility for mopane worms in the Gwanda Rural District of Matabeleland South in Zimbabwe.
NDE	Ministry of Environment, Climate and Wildlife Climate Change Management Department Ms Munashe Mukonoweshuro NDE Focal Point munamuko@gmail.com 11th Floor, Kaguvi Bulding, Cnr 4th/Central Avenue, Harare, Zimbabwe.
Request Applicant:	Off & Tie Grid Solar Company Kudakwashe Pedzisai Director Research and Development kydpedzie@gmail.com 07 Kuwirirana House, George Silundika Avenue Harare, Zimbabwe Ministry of Energy and Power Development. Dr Sosten Ziuku: Director – Energy Conservation and Renewable Energy. 5th Floor, John Boyne Building, Cnr Speke/ Innez Terrace St, Harare. sostenziuku@gmail.com

Climate objective:

☐ Adaptation to climate change

☐ Mitigation of climate change

☒ Combination of adaptation and mitigation of climate change

Geographical scope:

☐ Community level

☐ Sub-national

☒ National

☐ Multi-country

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

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

While the pilot solar-powered Mopane worm processing facility in Gwanda has proven technically successful, scaling it into a fully sustainable and commercially viable rural green enterprise requires targeted support. The community still needs a robust business model validation, including real-market testing to confirm profitability and investor readiness. Capacity-building is essential so beneficiaries can independently operate, grow, and maintain the facility, manage financial systems, and reinvest for self-sufficiency. Critical processing upgrades such as automated degutting equipment and bakery tools for diversified productive energy use all year round of Mopane Worm season are required to increase efficiency and revenue streams. Structured supply-chain studies and circular-economic strategies are needed to convert waste into useful bio-products like bio-fertilizer. Hence, professional branding, packaging, and a data-driven monitoring system is needed so as to develop a sound and an efficient tracker for its environmental impact, production growth, improvement of community lifestyles in alignment with the business model.

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

The **Pilot Solar-Powered Mopane Processing Facility** in Garanyemba, Ward 13, represents the **most significant, integrated ongoing effort** to address both deforestation and livelihood problems simultaneously:

- **Direct Mitigation of Deforestation:** The facility directly tackles the primary driver of deforestation in the area the use of huge volumes of **firewood for traditional Mopane worm drying**. By transitioning to clean solar energy, it provides a measurable climate mitigation solution.
- **Improved Livelihoods and Adaptation:** It transforms the Mopane worm value chain from a subsistence activity into a **climate-resilient green enterprise**. The facility enhances food safety, guarantees food security, increases product quality, and creates **green jobs** by leveraging solar power for value addition (e.g., milling, baking), ensuring year-round income stability that past efforts lacked.
- **Scalable Model:** Unlike localized planting efforts, this pilot is designed as a **bankable, replicable model** for all Mopane-rich areas across Zimbabwe, offering a sustainable alternative to the destructive cycle of biomass reliance.

Specific technology[1] barriers (up to one page):

Scaling the solar-powered Mopane Worm processing facility in Gwanda faces several critical technology barriers that prevent the transition from a small pilot operation to a high-volume commercial enterprise. These barriers span the entire value chain, from harvesting to final processing capacity.

1. Processing Bottlenecks and Throughput Limit.
Manual Degutting: The reliance on slow, manual hand methods for degutting Mopane Worms severely limits the daily throughput. This is the single biggest operational constraint, highly laborious and time-consuming that limits the volume of fresh Mopane Worms that can be processed and dried, preventing the facility from meeting the targeted 5-tonne commercial feedstock volume per season.
Required Fix: The project needs investment in **automated degutting technology** to dramatically increase throughput and efficiency.

2. Missing Productive Uses of Energy (PUE) Infrastructure: to fully deliver the processing facility intended benefit of year-round income, the facility needs to be integrated with versatile PUE appliances that operate effectively outside the two short Mopane Worm harvest seasons. This includes confectionery and fortified foods, equipment to bake bread, buns etc.

3. **Waste Management:** The current process lacks the technology to implement a **circular economy model**. There is no system to process Mopane Worm frass (waste) into a valuable resource like **biofertilizer**, missing an opportunity for revenue diversification and environmental benefit.
4. **Inadequate Storage equipment:** The absence of standardized, hygienic handling equipment leads to significant post-harvest losses and quality degradation:

- **Lack of Perforated Crates/Carriers:** Without proper, washable containers, fresh Mopane worms are often transported using makeshift methods, leading to crushing, contamination, and spoilage before they reach the facility.
- **Inadequate Storage Solutions:** The lack of hygienic, temperature-controlled storage at the processing facility and collection points compromises quality and limits flexibility in processing schedules.

Contribution to Programme of Work 2023-2027:

As per 3rd Programme of Work of the CTCN[2], please indicate the system transformation area, key enablers and cross-sectoral themes related to the request:

System transformation areas (mandatory)

☒ Water-Energy-Food Nexus
☐ Sustainable Mobility
☐ Energy Systems
☐ Buildings and Infrastructure
☐ Business and Industry

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

[2] https://www.ctc-n.org/resources/ctcn-third-programme-work-2023-2027

Key enablers (optional)

☒ National Systems of Innovation ☐ Digitalization

Cross-sectoral themes (optional)

☒ Gender ☒ Youth ☐ Indigenous Peoples

Sectors:

Please indicate the main sectors related to the request:

☐ Coastal zones ☐ Early Warning and Environmental Assessment ☐ Human Health ☐ Infrastructure and Urban planning

☐ Marine and Fisheries ☐ Water ☒ Agriculture ☐ Carbon fixation

☐ Energy Efficiency ☒ Forestry ☐ Industry ☒ Renewable energy

☐ Transport ☐ Waste management

Please add other relevant sectors:

Technical assistance requested (up to one page):

Below is a description of how the TA will contribute to overcome the specific technology barriers.

Overal objective:

The successful pilot of the Mopane Worm solar drying facility in Garanyemba Ward 13 provides a compelling model for ward, district to regional level expansion. The overarching goal is to transform this single-ward success into a sustainable, regional wide solution that simultaneously addresses environmental degradation and economic vulnerability.

The primary objective is to replicate and expand the pilot project's success across the Mopane Worm-rich provinces, transforming a traditional, environmentally damaging practice into a commercially viable, sustainable, and climate-resilient enterprise.

Anticipated groups of activities to be performed by the Technical Assistance:

1. Engineering & Automation Design: design and fabricate the **Automated Degutting Technology** to solve the capacity mismatch and labor bottleneck.

2. Financial Modeling & Market Analysis: to develop a robust, bankable **Business Model Validation** based on pilot data, providing the proof of revenue assuarance and risk assessment required to attract

follow-on blended finance and private investors.

3. Product Development & Energy Planning: to guide the integration of **Productive Use of Energy (PUE)** equipment for value-added products, confectionery and fortified foods to ensure full utilization of the facility during the Mopane Worm season.
4. **Sustainability & Logistics Study:** to conduct the essential supply chain study and design the **Circular Economy Model** (e.g., converting Mopane Worm waste into biofertilizer), and creating new revenue streams from waste.
5. Capacity Building & Training: to provide specialized coaching on the management of the co-operative, investment planning, equipment maintenance and quality control. This enables the institutional capacity for growth and long-term self-dependency of the members of the community.
6. Core Product Development.

Identification of some of the products that can be realized are;

i. **Mopane Worm Feedstocks.**
   a. Production of **high-protein animal and aquaculture feeds** from dried worm meal and processing residues.
ii. **Organic Fertilizers and Soil Conditioners.**
   a. Conversion of **gut by-products and frass (insect waste)** into organic compost and bio-fertilizers.
   b. Enhances soil fertility, improves moisture retention and supports climate-smart agriculture practices.
iii. **Nutraceutical and Health Products.**
   a. Extraction of **essential amino acids, micronutrients, and oils** from Mopane worms for use in dietary supplements.
   b. Potential development of protein powders and fortified food blends targeting nutrition-sensitive markets.
iv. **Agro-processing By-products.**
   a. Development of **flavoured snacks, protein bars, and ready-to-cook worm-based products** for local and export markets.
   b. Expands consumer choice and builds on the growing global demand for insect-based proteins.

7. Skills Transfer: Implement a comprehensive training program for new beneficiaries, covering solar technology maintenance, hygiene standards, processing techniques, and basic business management (bookkeeping, marketing, and co-operate governance).

Expected timeframe:

12 months.

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

Please describe the activities with gender linkages as well as the anticipated gender and other co-benefits (e.g. biodiversity, economic, social, cultural) that are likely to be generated as a result of the technical assistance.
Activities with Gender Linkages:
Activity 1
Automated Equipment Training.

Gender Linkage and Focus:

Women-Led Operation: Provide specialized training for women on operating and maintaining the **Automated Degutting** thus transitions women from manual, low-value labour to skilled, high-value technical operators, challenging traditional gender roles.

Activity 2
Productive Use of Energy (PUE) Setup.

Gender Linkage and Focus:
Entrepreneurial Control: Establish and train women's cooperatives to diversify on other productive use of energy off mopane worm season such as confectionery and fortified foods to ensure all year-round revenue streams.

Activity 2
Baseline Monitoring.

Gender Linkage and Focus:
Equity Tracking: Ensure the monitoring system tracks key indicators disaggregated by gender, including **income increase, time savings** from reduced firewood collection, and rate of ownership/control over assets.

1. Gender and Social Co-benefits

- **Women's Economic Empowerment:** Creating **100+ direct green jobs** (up to 61% targeting women) in processing and value-added manufacturing. Women gain access to year-round income from PUE activities, increasing their control over household finances.
- **Reduced Time Poverty:** Eliminating the need to collect firewood and automating laborious tasks like degutting thereby significantly reducing the **time and ergonomics.**
- **Improved Health and Safety:** Eliminating smoke exposure from firewood processing thereby reducing respiratory illnesses among women and children.
- **Enhanced Food Security:** Increased processing efficiency and reduced post-harvest losses thereby guaranteeing food security.

2. Environmental and Climate Co-benefits.

- **Deforestation Mitigation:** The primary benefit is the direct elimination of **firewood use** for Mopane Worm drying, halting the single largest driver of deforestation in the Mopane woodlands of the Gwanda Rural District.
- **Climate Adaptation:** Securing the viability of the Mopane Worm value chain—a drought-resilient food source, hence strengthening the community's capacity to **adapt** to climate variability and traditional crop failures.
- **Biodiversity Protection (Environmental):** Reduced pressure on the Mopane woodland ecosystem and invariably protecting the habitat necessary for the Mopane moth.

3. Economic and Cultural Co-benefits

- **Economic Diversification and Circular Economy Integration:** The integration of PUE equipment allows the cooperative to develop **high-margin value-added products** (fortified flour, snacks,

biofertilizer), diversifying revenue and increasing the unit value of the Mopane Worm.

- **Skills Transfer:** Training in solar PV O&M creates a new class of **green entrepreneurs** within the community which fosters self-dependency and local job creation.

Anticipated follow-up activities after this technical assistance are completed:

Please describe the expected future use of the outputs and deliveries produced by this technical assistance, after the CTCN implementation is completed. 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, what options exist to scale up the results, what funding could be leveraged, etc.

Output:
Automated Degutting Technology Design & PUE Integration Plans.
Stakeholder:
Local Technical Colleges and Universities.

Purpose:
Used as the **replicable engineering standard** for all future processing facilities. Enables local workshops to fabricate the automated machinery, increasing local employment and reducing reliance on imports. Infusion of content into curriculum development of course programmes.

Scale:
National.

Output:
Supply Chain & Circular Economy Study.

Stakeholder:
Local Farmers, Agribusinesses, Environmental Agencies.

Purpose:
Used to formalize new **co-product development** techniques (e.g. biofertilizer) and improve local agricultural practices. Transition from chemical fertilizers to bio-degradable soil enhancers which also enhances local food resilience.

Scale:
District/Local: Applied by local agribusiness organizations; especially in the nurturing of seedlings and nurseries through integration and adoption into the local ecosystem.

Output:
Bankable Business Model & Financial Validation Report

Stakeholder:
Private Investors, e.g. local banks.

Purpose:
Used to **de-risk investment** and secure follow-on financing, providing proof concept for upscaling.

Scale:

National/Regional: Applied for financing replication across all Mopane woodlands in Zimbabwe and potentially the SADC region.

Next Steps and Scaling Options.

Replication.

Next Steps.
The Immediate launch of a phased replication plan across multiple wards of Gwanda Rural District (targeting 5 sites by Year 3).

Funding to be Leveraged:
Blended Finance: Utilize the TA to validate business model focusing on scaling proven adaptation technologies.

Commercialization.

Next steps:
Immediate: Enter negotiations with national retailers and wholesalers in the food chain and begin processing Mopane Worms and confectionery using new PUE equipment.

Collaborate with local colleges and universities on equipment fabrication utilising local value creation.

Key stakeholders:

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

Stakeholders	**Role to support the implementation of the technical assistance**
National Designated Entity: (Ministry of Environment, Climate and Wildlife)	Technical assistance coordination, stakeholder engagement, data provision.
Request Applicant: (Off & Tie Grid Solar Company)	Technical assistance coordination, stakeholder engagement, Research and Development, Techno-innovation strategies, Technical Performance Measures development, support implementation of the TA.
Ministry of Energy and Power Development.	Technical assistance coordination, formulating and implementing effective Policies and Regulatory Frameworks, Data and research input.
Rural Electrification Fund.	Rural Electrification Master Plan implementation, data and research input, training of stakeholders.
Rural District Councils	Project enablers, bye-laws regulators, action planning and operationalization

Forestry Commission.	Technical skill in forest management and forest technologies, facilitating community-based natural resources management, regulatory compliance, data and research input.
Rural Infrastructure Development Agency.	The development and maintenance of essential infrastructure standards in rural areas to improve living standards, foster economic growth, and reduce poverty.
Tertiary Institutes/Universities.	For research and development, quality standardization and curriculum development.

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

Please describe how the technical assistance is consistent with national climate priorities such as: Nationally Determined Contribution, national development plans, poverty reduction plans, technology needs assessments (incl. whether this request refers to any technologies prioritized within Technology Action Plans), Long-term Low Emission Development Strategies, National Adaptation Plans, GCF Country Programme, sectorial strategies and plans, etc.

Reference document (please include date of document).	**Extract** (please include chapter, page number, etc.).
Nationally Determined Contribution (NDC).	Zimbabwe's Nationally Determined Contribution Under Adaptation measure 1 Chapter 3.4 of page 15 Section 4, aims to promote the use and roll-out of gender-sensitive climate-smart agriculture technologies and practices such as sustainable mechanization, agro-ecology, renewable energy, agro-forestry. Zimbabwe's Nationally Determined Contribution Under Adaptation measure 3 Chapter 3.4 of page 20 Section 4, aims to implement Priority Adaptation measure; pg. 3; which is to "Ensure climate-resilient infrastructure and design".
Gender and Climate Change Action Plan.	The gender and climate change action plan seeks to support the country' 2030 vision towards a transformed; more effective; inclusive; resilient and sustainable economy that does not leave anyone behind. It will provide a conducive environment to increase gender responsive strategies and programs in climate change response; pg. 2 paragraph 3.
Zimbabwe Forestry Policy.	Reverse the loss of the forest cover through sustainable forestry management, including protection, restoration, afforestation, and increase efforts to prevent forest degradation and contribute to the global effort of addressing climate change, to enhance forest-based economic, social and environment benefits, inclusive of improving the livelihoods of the forest-dependent people. Goal 1 and 2; pg. 3 and 6 respectively.
National Adaptation Plans.	The National Adaptation Plan (NAP) seeks to enhance Zimbabwe's resilience to the impacts of climate change, recognizing the vulnerability of the country while mainstreaming climate change in all socioeconomic sectors underpinning the economy; pg. 5. 4.6.3 Agriculture, Forestry and Other Land Use (AFOLU) mitigation measures, Nº 15 Table 7 aims to reduce area deforested through veld fires and other anthropogenic activities by 500,000 hectares, between 2020 and 2025 inclusive of

	agricultural production landscapes, with % GHG reduction baseline projected at 27.75% by 2030.
Zimbabwe Renewable Energy Policy.	The Renewable Energy Policy aims to improve the share of RE in the overall energy mix and addressing issues of climate change, focusing on obtaining cost-effective implementation of productive energy sources, social upliftment through community involvement, gender equality and employment.
Long-term Low Emission Development Strategies.	Zimbabwe has set mitigation measures for reduction of deforestation under AFOLU sector by setting up policies and initiatives to reduce net deforestation to 0.5% by 2035 which included: the use of dedicated energy plantations for tobacco drying and other agro-processing products; pg. 25.
Zimbabwe Vision 2030.	The Zimbabwe Vision 2030 aims to foster inclusive economic growth and address poverty resolutely, thereby transforming Zimbabwe into an industrializing, knowledge-based upper middle-income country that provides a high quality of life to all its citizens by 2030. Part of it is to prioritize the attainment of optional generation of power through renewable energy; pg. 33.
Zimbabwe' National Development Strategy 1.	The objective under the NDS1 is to improve access to modern energy by expanding and reinforcing the transmission grid to ensure system stability and security of supplies. Some of the strategies to achieve this would be to build capacity for local manufacture of Renewable Energy Products Creation of an Independent System and Market Operator (ISMO) to assist in Generation Resource Planning and buying of power from Independent Power Producers (IPPs).
National Climate Change and Mitigation Response Strategy.	Zimbabwe's mitigation plan on energy is to strengthen energy planning, research, and development as well as promote low-carbon energy provision and use; pg. 46.

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

The implementing partner and the project proponent successfully completed the pilot project, originally funded by the **CTCN**, in establishing **Zimbabwe's first solar-powered Mopane Worm processing facility in Garanyemba Ward 13, Gwanda Rural District**.

The project's strategic purpose is to leverage this single-ward success story to **attract private sector collaboration** for national replication. However, a critical **resource gap was identified which included commercial business model validation, product branding and packaging, Economic Diversification integration through Productive Use of Energy (e.g. confectionery and fortified foods) and Circular Economy to build a strong business model are inevitable** steps in de-risking the project for private investment into a fully self-dependent green enterprise.

In response, the implementing partner and project proponents consulted with the National Designated Entity (**NDE**) and the CTCN regarding the **AFCIA II** initiative. Recognizing that the project requires targeted, small-scale additional support to transition from pilot to commercial scale, this led to the

development of the current **Upscaling Technical Assistance request.**
This request is specifically designed to provide the missing financial and operational capacity needed to fund **resource gap as highlighted** and unlock **private sector collaboration** for nationwide replication.

Background documents and other information relevant for the request:

- Please list all relevant documents that will help the CTCN analyze the context of the request and national priorities. Please note that all documents listed/provided should be mentioned in this request in the relevant section(s), and that their linkages with the request should be clearly indicated. For each document, please provide web-links (if available) or attach to the submission form. Please add any other relevant information as required.
- Please indicate if this request has been developed with the support of the CTCN Request Incubator.

OPTIONAL: Linkages to Green Climate Fund Readiness and Preparatory Support.

The CTCN is collaborating with the GCF in order to facilitate access to environmentally sound technologies that address climate change and its effects, including through the provision of readiness and preparatory support delivered directly to countries through their GCF NDA. These actions are in line with the guidance of the GCF Board (Decision B.14/02) and the UNFCCC, particularly paragraphs 4 and 7 of 14/CP.22 and paragraph 4, 7 and 8 of 14/CP.24 that addresses Linkages between the Technology and the Financial Mechanisms[3].

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

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

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

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

NDA name:

Date:

Signature:

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

Monitoring and impact of the assistance:

By signing this request, I affirm that processes are in place in the country to monitor and evaluate the technical assistance provided by the CTCN. I understand that these processes will be explicitly identified in the CTCN Response Plan and that they will be used in the country to monitor the implementation of the technical assistance following standard CTCN procedures. This includes the active engagement as NDE together with the key project proponent / beneficiary in regular project steering meetings.

I understand that, after the completion of the requested assistance, I shall support CTCN efforts to measure the success and effects of the support provided, including its short, medium and long-term impacts in the country. This includes the completion of NDE feedback and post-implementation forms.

Signature:

NDE name:	Munashe Mukonoweshuro
Date:	13 November 2025
Signature:	

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

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