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## TERMS OF REFERENCE (TOR)

**Title: Technical Assistance for piloting rapid uptake of industrial energy efficiency and efficient water utilization in the industrial sector in Zimbabwe**

CTCN request reference number: 2015000081

Country: Zimbabwe

### **1 BACKGROUND INFORMATION**

The Climate Technology Centre and Network (CTCN) is the operational arm of the United Nations Framework Convention on Climate Change (UNFCCC) Technology Mechanism and hosted by the United Nations Environment Programme (UNEP) in collaboration with the United Nations Industrial Development Organization (UNIDO) and supported by 11 partner institutions with expertise in climate technologies. The mission of the CTCN is to promote accelerated deployment and transfer of climate technologies at the request of developing countries for energy-efficient, low-carbon and climate-resilient development.

These requests for Technical Assistance (TA) are being submitted to the CTCN by the National Designated Entity (NDE) of the respective country. The scope of services under these Terms of Reference shall be executed based on a restricted solicitation process. By mandate, only accepted Members of the CTC Network are eligible to submit proposals and execute the required services to implement the response. Should the bidder partner with another institution to deliver a minor part of the services described in these Terms of Reference, it is expected that the partner institution also joins the CTC Network.

**In case you are not a CTCN network member yet, you may bid for implementation of the technical assistance, subject to the condition that you submit your completed application for CTC Network membership before the bid closure and the same is acknowledged by the CTCN. Furthermore, the contract award – should your bid be selected – is conditional to your network membership application having been successfully approved by the Director of CTCN. Should the bidder partner with another institution to deliver the services described in these Terms of Reference, it is expected that the partner institution also joins the CTC Network.**

The maximum estimated budget for this contract is 200,000 USD.

### **2 CONTEXT OF THE ASSIGNMENT**

Zimbabwe is struggling with the adverse effects of climate change on the country's water supply, while at the same time the energy supply often cannot meet the industry's demand, thus creating a strain on the power grid. Previous studies, indicating a high resource efficiency improvement potential in key industries in the country, have triggered various policy initiatives. However these initiatives could not be



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implemented successfully due to a number of barriers. To mitigate these challenges the Government of Zimbabwe has approached the Climate Technology Centre and Network (CTCN) for Technical Assistance.

To address these challenges the CTCN has developed these Terms of Reference that outline an intervention that will produce the outputs listed below and that will be implemented within a period of nine months. The overarching goal is to create and showcase examples of successful resource efficiency improvements, which can be replicated by local technical staff to benefit industries nationwide.

- Identification and selection of ten pilot companies for energy and water efficiency audits
- Execution of energy and water efficiency audits in the ten selected pilot companies
- Analysis of renewable energy supply side opportunities for each pilot company and development of recommendations
- Awareness raising on the benefits of resource efficiency, from a sustainable business perspective, and hands-on training of technical staff to identify and implement resource efficiency processes and technology improvement opportunities
- Development and sharing of guiding material, and communication of recommendations to key stakeholders

The target sectors have been broadly identified as food and beverage processing, leather tanning and processing, and chemicals production. Specification of the sectors and identification of companies will be part of this assignment. The full text of the request submitted to the CTCN can be found here: <https://www.ctc-n.org/technical-assistance/requests/technical-assistance-piloting-rapid-uptake-industrial-energy>

### 3 OBJECTIVE OF THE CONTRACT

The objective of this contract is to identify energy, water efficiency and management improvement potential in ten selected demonstration companies and create capacities to replicate and implement such interventions autonomously in companies across Zimbabwe in the future. In the medium term it is expected that this will lead to a reduction of energy and water consumption as well as greenhouse gas emissions of the ten demonstration companies. At the same time, the expected gains from the increased profitability will and strengthen the competitiveness of the respective industries.

#### **Scope and activities of the proposed contracted services**

Once this contract is signed, the CTCN will organize a kick-off call among all relevant parties involved in the request to introduce the Contractor to the NDE and Proponent, to present the activities, their timeline and clarify roles and responsibilities. The Contractor is expected to undertake the following activities:



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### Output 1: Development of implementation planning and communication documents

- Activity 1:** i) A detailed work plan of all activities, deliverables, outputs, deadlines, responsible persons/organizations and 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 (will be provided) to enable the lead implementer 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.

- Deliverable 1:** i) Detailed work plan
- ii) Monitoring and evaluation plan
- iii) CTCN Impact Description
- iv) Closure and Data Collection report

### Output 2: The 10 demonstration companies have been identified and prioritized to undertake the preliminary industrial energy and water audits

**Activity 2.1:** Organize an inception meeting to discuss the project plan, align understanding and expectations amongst all stakeholders, and develop criteria to identify the demonstration companies. In cooperation with local stakeholders information will be collected in order to inform the mapping of the industries in terms of target sectors as well as company specifications (energy/water consumption, number of employees, turnover, etc.).

The final selection shall, in addition to the above mentioned indicators, ensure balance and inclusion of different key industries that are important to the economy and GHG emission reductions of Zimbabwe, selection of companies that are cooperative and committed, and availability of data and human capacities for a comprehensive water and energy audit. The discussion about human capacity should also address the purpose, format and selection of recipients for the training.

**Activity 2.2:** Approve and formalize the selection of target companies based on the criteria discussed in Activity 2.1. This includes discussions about the objective of the CTCN intervention with the senior management of each company, raising of awareness regarding the importance of energy and water efficiency, both from an environmental and business perspective, as well as agreeing on the selection of training participants, considering their qualifications and gender criteria. Finally, the activity includes the



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collection of formal confirmations of the management's commitment to support the project implementer in carrying out the audits efficiently.

**Activity 2.3:** Establish an audit methodology and energy and water consumption baselines, in compliance with ISO 50001, and by building on Activity 2.1 and 2.2. The methodology will ensure a consistent approach to the review and evaluation of energy and water consumption and performance data for all involved companies. The company selection process ensures that participating companies have relevant data available and accessible to the auditors. The methodology will include Water and Energy Performance Indicators (ENPIs) and defines tools to assess and illustrate resource use and efficiency (such as material flow analysis, process flow charts, etc.). Furthermore, it should outline in detail the equipment categories and processes targeted in the audit, to create a clear scope. This will be aligned with the training (Output 5) to ensure matching of theoretical and practical training components.

**Deliverable 2:** Report on the criteria, identification, justification and prioritization of the 10 demonstration companies, including selection of personnel identified for technical capacity development. This report will contain letters of commitment from the senior managements of each of the 10 companies, as well as the audit methodology that will be applied.

### **Output 3: Assessment of the energy and water efficiency improvement potential of each company**

**Activity 3.1:** Audit each company's energy and water consumption based on equipment and process specific on site analyses and review of available consumption data, including time-of-use tariffs, load profiles and related information, as defined by the audit methodology. The water audits will focus on opportunities for recycling and reducing the overall throughput of water to decrease dependency on large water resources in arid regions and the need for heating, cooling and pumping. Management and treatment of chemicals and wastewater is not part of the audit.

**Activity 3.2:** Collate and analyze the energy and water consumption and load profiles for each of the companies in comparison with international benchmarks to identify and prioritize high-impact energy and water efficiency and demand-side management options. Compare the costs and benefits of different process and technology improvement options, to prioritize implementation of energy and water efficiency and demand-side energy management options with the highest potential benefits. This includes recommendations on the application of ISO 50001.

**Deliverable 3:** Report on each of the 10 companies' energy and water assessments and efficiency improvement potentials including process and technology improvement recommendations. The recommendations will highlight in particular no- and low cost options for improvement that can easily be implemented through behavioral change and process adjustments ("low hanging fruits").



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### **Output 4: Selected energy supply side options based on renewable energy resources assessed**

**Activity 4.1:** Collate and review information about Zimbabwe's renewable energy resources to create a map that informs companies interested in investing in renewable energy (including, solar, wind, biomass and potentially water) which technologies are most promising across different regions in the country. This activity is to be conducted as a desk study assessing available data. It involves no measuring and collection of data.

**Activity 4.2:** Establish a preliminary costs-benefit-analysis of renewable energy utilization options for each of the 10 companies. Based on Activity 4.1 each company will receive technology recommendations, considering their specific energy needs, and opportunities to meet these with renewable energy technologies using the resources available in the region. The recommendation will include a basic assessment of expected energy savings and costs analysis of renewable energy investments. The output from this activity will be part of Activity 6.1.

**Deliverable 4:** A section on the opportunities to utilize renewable energy to be included in the case studies for each of the 10 companies as part of Deliverable 6.

### **Output 5: Selected company staff and external consultants have been trained on ISO 50001 and the identification of energy and water efficiency improvement opportunities in industries**

**Activity 5.1:** Prepare and conduct a theoretical training on ISO 50001, identifying energy and water efficiency improvement opportunities in selected industries. This training conveys background understanding of methodology, process, purpose and benefits of industrial resource efficiency. Target recipient groups are: (1) 1-2 selected employees from each of the selected companies who will be involved in Activity 5.2,(2) 3-5 unaffiliated external consultants who will participate in all audits of Activity 5.2, and (3) representatives from key stakeholders that will be specified during the exception meeting . The total number of training participants shall not exceed 40. This training will be carried out in advance of the audits of Activity 3.1 in two 1-day sessions.

**Activity 5.2:** This staff capacity development component will be carried out as a hands-on training, job shadowing the external auditors during the activities of Output 2 and building on the theoretical knowledge acquired in Activity 5.1. The aim is to complement theoretical knowledge with actual on-site experience. The selected company employees will participate only in the audit of their respective company, while the external consultants will participate in all 10 audits to gain a broader understanding. The company staff will gain experience on how to implement technical measures which will help them serve as the company's resource efficiency focal point. The external consultants will have the chance to participate in several audits in different industries, which will qualify them to replicate energy and water efficiency measures in other companies across the country.



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**Deliverable 5:** Training workshop reports and feedback and complementary training materials for energy and water managers in industrial companies, if the results of the assessments suggest that existing material is not sufficient.

**Output 6: Recommendations on how to best exploit cost-effective opportunities of integrated water and energy efficiency improvements with renewable energy integration (including metering and monitoring of energy and water use)**

**Activity 6.1:** Assess deliverables 3 and 4 and prepare a list of most cost-effective opportunities for an integrated management system for Water and Energy Efficiency Improvement, Demand Side Management and Renewable Energy utilization for each of the 10 companies in form of case studies.

**Activity 6.2:** Present the findings of Activity 6.1 at a selected BCSDZ conference (if suitable in terms of timing, otherwise other event) to the senior management of each pilot company as well as the larger industrial sector audience.

**Deliverable 6:** Prepare a report on each company, presenting economically viable options for an integrated Water & Energy Efficiency improvement and renewable energy utilization management system, as well as a manual for water and energy management in industrial enterprises in Zimbabwe, complementary to existing materials, as necessary. (b) A main/side event at the respective BCSDZ conference, or separate event.

**4 GENERAL TIME SCHEDULE**

The activities under this contract have an expected duration of nine (9) months from the contract signature.

	Months								
	1	2	3	4	5	6	7	8	9
<b>Output 1:</b> Development of implementation planning and communication documents	█								█
<b>Output 2:</b> The 10 demonstration companies have been identified and prioritized to undertake the preliminary industrial energy and water audits	█	█							
<b>Output 3:</b> Assessment of the energy and water efficiency improvement potential of each company		█	█	█	█	█	█		
<b>Output 4:</b> Selected energy supply side options based on renewable energy resources assessed		█	█						
<b>Output 5:</b> Selected company staff and external consultants have been trained on ISO 50001 and the identification of energy and water efficiency improvement opportunities in industries		█	█	█	█	█	█	█	



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<b>Output 6:</b> Recommendations on how to best exploit cost-effective opportunities of integrated water and energy efficiency improvements with renewable energy integration (including metering and monitoring of energy and water use)									
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All drafts and final deliverables are subject to approval by the CTCN Climate Technology Manager, before these can be considered as completed.

### 5 PERSONNEL IN THE FIELD (PROFESSIONAL EXPERIENCE AND QUALIFICATIONS)

The Contractor is expected to provide the services of a team that should ideally comprise the following competencies:

- Graduate degree in environmental or industrial engineering, energy technologies or similar
- A minimum of 15 years relevant work experience in industrial energy efficiency and management
- A minimum of 15 years relevant work experience in industrial water efficiency and management
- Demonstrated experience in carrying out audits in industrial resource efficiency in relevant industries (e.g. food and beverages, leather tanning and processing and chemical industries)
- Demonstrated experience with resource efficiency work in industries in Africa, particularly Zimbabwe
- Demonstrated experience with developing and delivering trainings on industrial energy and water efficiency in Africa, particularly Zimbabwe
- Demonstrated experience with the integration of renewable energy technologies in an industrial energy efficiency context
- Demonstrated experience with the development, implementation and management of projects in a climate change mitigation technology context.
- Excellent ability to interact with 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.

The CVs of the respective experts assigned to this assignment by the Contractor must be provided.

### 6 LANGUAGE REQUIREMENTS

The working language for the purposes of this assessment is English, thus an excellent command of English is required for the proposed personnel. Proficiency in relevant local languages considered an asset.

All delivered documents must be of such a quality, that no further editing shall be required.