CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

Instructions to lead Implementers for drafting the Technical Assistance Closure and Data Collection Report

Objective of the technical assistance (TA) Closure Report and Data Collection Report:

- To communicate publicly in one synthesis document a summary of progress made and lessons learned under the technical assistance (TA) towards the anticipated impact (main template).
- Compile TA-specific information required for internal use in donor and UN reporting (annex 1).

Steps for completing the TA Closure report:

1. The lead TA implementer drafts the report at the end of the assignment as a final deliverable /product. The TA Closure report will capture all activities conducted under the TA hence it is expected that duplication of information will occur from earlier documents. Please copy and summarise relevant material from previous TA outputs/deliverables and the Response Plan, as relevant.
2. A CTCN Manager will review and revise the report before final approval by the CTCN Director.

Important note on public and internal use of the closure report:
Once approved by the CTCN Director, the TA Closure and Data Collection Report will be a public document available on the CTCN website. Annex 1 is for internal use only and will not be publicly available.

Closure and Data Collection Report for CTCN Technical Assistance

1. Basic information

Title of response plan	Technical Assistance for piloting rapid uptake of industrial energy efficiency and efficient water utilization in the industrial sector in Zimbabwe
Country / countries	Zimbabwe
NDE focal point and organisation	Elisha N. Moyo Principal Climate Researcher, Climate Change Management Dept. Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement
Proponent focal point and organisation	Tawanda Collins Muzamwese Executive Director Business Council for Sustainable Development Zimbabwe
Sector(s) addressed	Energy Efficiency, Industry (Agrochemical, Cables, Cement, Food & beverages and Mining), Renewable Energy
Technologies supported	Mitigation: Water efficiency, Lighting, Water purification, EE Water pump, Solar PV, Solar water heater, Biogas for heating, EE Induction furnace, EE burner, Veneering insulation, VFD screw air compressor with Permanent Magnet Synchronous Motor, Electric forklift, Boiler automation (Oxygen

	analyser, VFD, Pressure sensor), Boiler, Compressed air utilization, Chiller, IE3 motor, Auto star-delta controller, Transformer load management, Energy monitoring system, Cogged V-belt for coupling, Precalciner for kiln, Closed loop cement mill, Bucket elevator system, Screw compressor for refrigeration system, Occupancy sensor for lighting control,
Implementation period and total duration	Start: February 2018; End: January 2019 Duration: 10 months
Total budget for implementation	USD 158,656
Designer of the response plan	Council for Scientific and Industrial research (CSIR, lead developer) UNEP-DTU Partnership (support)
Implementer of response plan	PricewaterhouseCoopers Private Limited, India (PwC India)

2. Summary of all activities, outputs and products that contribute to the expected impact of the technical assistance.

Description of delivered outputs and products as well as the activities undertaken to achieve them. In doing so, review the log frame of the original response plan and refer to it as appropriate	• Report on criteria, identification, justification and prioritization of 10 demonstration companies along with audit methodology • 3-day classroom training programme on Energy and water efficiency with focus on ISO 50001. The training workshop covered the following: ▪ Energy performance assessment ▪ Water use efficiency and conservation ▪ Renewable resource assessment and potential estimation ▪ ISO 50001 basics and implementation process ▪ Successful case studies on energy efficiency, water efficiency and ISO 50001 • Hands-on-training on conducting detailed energy and water audit • Training workshop report (classroom and hands-on-training) & feedback and complimentary training material for energy and water managers of industries • Report of 10 companies for energy efficiency, water efficiency and recommendation on application of ISO 50001 • Section on opportunities to utilize renewable energy for each of the 10 companies • Manual on energy and water management for industry sector in Zimbabwe • Presentation at BCSDZ National conference presenting TA findings, Closure and Data Collection Report
Partners organisations	• Ministry of Environment, Water and Climate Change (NDE) • Ministry of Energy and Power Development (MEPD) • Ministry of Industry (Environment Development Office) • Business Council for Sustainable Development Zimbabwe (BCSDZ) • Standards Association of Zimbabwe • Zimbabwe Electricity Supply Authority • Zimbabwe Electricity Transmission and Distribution Company
• Beneficiaries	• 42 participants of the classroom training: 12 government agencies, 17 industries and 13 local consultants • 27 participants of the Hands-on-training: 14 government officials, 10 industry personnel and 3 local consultants

	• 10 demonstration industries: Energy & water audit report and Renewable Energy potential report • Government of Zimbabwe: Key findings from TA for policymakers
Methodologies applied to produce outputs and products	Specific methodologies were developed for unit selection, training programme and detailed energy and water audit. The same is attached separately as Appendix 1.
Deviations	A delay of 2 months was caused in execution of TA. This was due to violence in the country during the months of August and September 2018, which were a result of the general elections.
Achieved or anticipated gender benefits from the TA	The participation of women was promoted throughout the TA. Training workshop and hands-on-training was well attended by women candidates. During energy and water audit, the women participation from demonstration companies was ensured. Moreover, the benefits of the TA have no gender bias.
Achieved or anticipated co-benefits from the TA	• Improve the competitiveness of industries in selected sectors and increase their profitability as a result of resource savings. • Other benefits include the improved occupational health and safety due to improved housekeeping of factories and minimization of water spillages. • The project will ensure that a positive impact on human health, water and sanitation due to increased water availability is achieved in a mutually reinforcing manner.
Anticipated follow up activities and next steps	• Publication and dissemination of findings of the TA in the media • Publication and dissemination of manual on energy and water management for industry sector in Zimbabwe through BCSDZ • Monitoring and Evaluation of implemented energy and water efficiency recommendations • Identification of funding opportunities for implementing supply side renewable energy recommendations • Capacity building programmes to generate awareness among the industries and government agencies • Low Carbon Technology Transfer projects to support implementation of pilot technologies to showcase benefits • Follow-up TA for covering other sectors including Small Scale Industries • Information from the TA will also assist in informing policy makers, standards bodies and regulators on the practicable levels of air emission regulations based on the lessons. • A Green Industry Networking Facility (GINF) will be established to facilitate exchange of climate change adaptation & mitigation knowledge amongst different industrial stakeholders. This will be key to sustain emission reduction and water saving measures.

3. Lessons learnt

	Lessons learnt	**Recommendations**
Lessons learnt for this TA. Describe essential factors contributing to successful implementation, as well as specific challenges. Recommendations include considerations on what would need to be in place	Involvement of local industry association is of prime importance for successful TA. Under the TA, we worked closely with BCSDZ but linkages with other associations such as Confederation of Zimbabwe	Continue to engage with the local associations and foster dialogue between NDE and industry associations. But, at the same time ensure that the beneficiaries are not just members of one association but the entire sector.

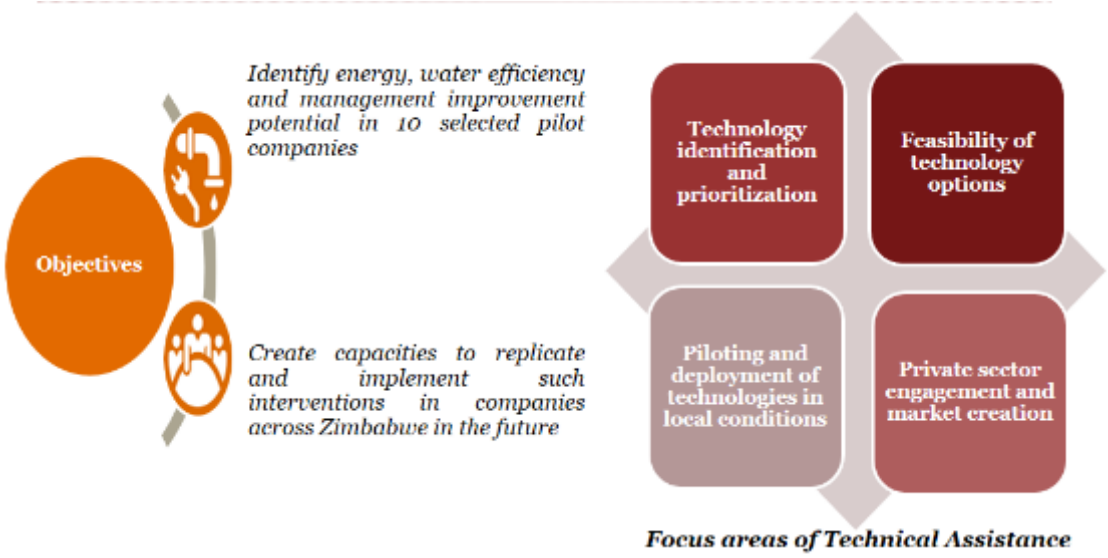
for increasing success of similar efforts (i.e. regulatory, legal, stakeholders, communication, etc.)	Industries (CZI) and other small scale industry associations were missing. Involvement of key ministries for communication is pivotal.	Continue to involve other ministries along with the NDE. Also, ensure active participation of other ministries for providing ease of access to information and assisting execution of TA.
Lessons learnt related to climate technology transfer Describe opportunities, challenges and barriers for the use and deployment of the technology or technologies supported by the TA. The objective is to identify specific success factors for technology transfer	The TA was focussed broadly on 10-demonstration industry where energy and water audit study was conducted. The coverage was of five sectors which is broad but penetration within each sector was thin. Capacity building and awareness generation is necessary for the industry sector on energy efficiency (EE), water use efficiency and renewable energy (RE) to achieve resource efficient production and sustainable growth. Under the presented TA there was one 3-day training programme to impart knowledge on EE, RE, water use efficiency and ISO 50001. The TA focussed on identification of energy and water saving recommendations along with supply side renewable energy opportunities.	The future TA may follow a sector specific or cluster specific approach, thus ensuring a significant penetration of mitigation technologies. The participants of training programme requested more training programmes with much deeper coverage of specific technologies and pilot studies. There is potential for follow-up TA with focus on capacity building and awareness generation on EE, RE and Water use efficiency. The capacity building programme could be targeted towards three focus sectors Government agencies, industries and local service providers separately. Low carbon technology transfer projects may be demonstrated on pilot basis to showcase benefits in future TAs. This will create greater impact.
Lessons learnt related the CTCN process for TA	The liaison officer from CTCN has been supportive throughout the TA. The coverage of TA was very wide including energy efficiency (EE), water efficiency (WE), renewable energy (RE) and ISO 50001.	CTCN should continue to offer professional assistance during the TA. CTCN may consider focussed TAs i.e. only EE and RE or EE and ISO 50001 or EE and WE with deep dive into the topics.

4. Illustration of the TA and photos

For communication purposes, please provide 2-4 Power Point slides with illustrations or charts showing the TA process, applied methodology, activities, outputs and achieved results. The illustrations must be copied into the TA Closure report but must also be delivered as power point files. Also, please provide at least five high-resolution pictures in

jpg format, capturing technical assistance. The pictures should illustrate how the TA has impacted the lives of the beneficiaries in particular and the communities in general.

Objectives of the assignment



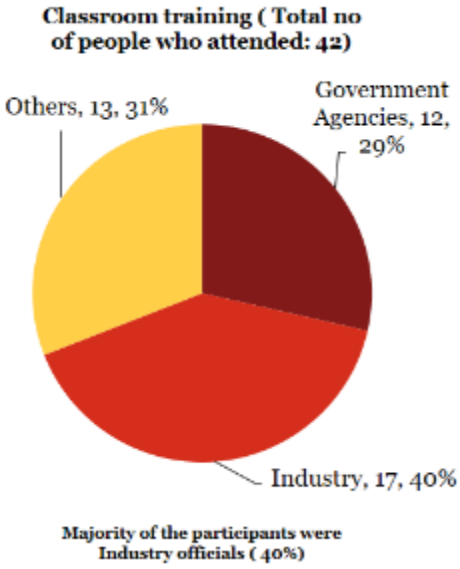
Focus areas of Technical Assistance

Applied methodology

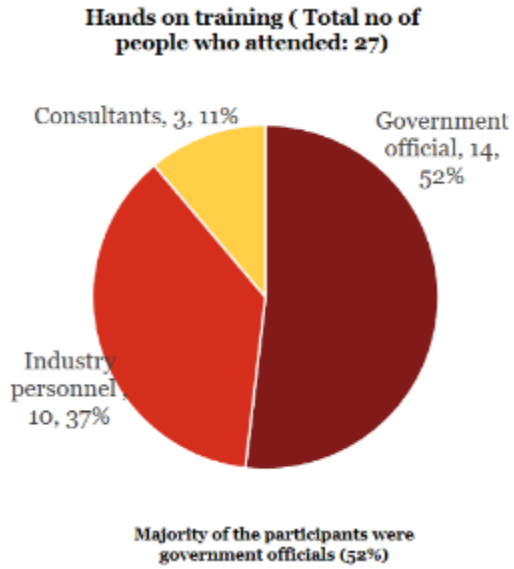
1. Unit Selection for energy and water audit	• **Preliminary rating criteria**: Preliminary screening of industries based on capacity utilization, energy & water use intensity, Management willingness • **Desirable criteria**: Secondary rating based on affiliation to recognized industry association and willingness to co-invest in implementing proposed options
2. Training of company staff and external consultants	• **Classroom training**: Engaging training which included case studies, role playing, group exercise, brainstorming and demonstration. • **Hands on training**: First hand experience in execution of energy and water audit covering aspects like electrical, thermal, water & RE assessment and data collation.
3.Execution of Energy and Water audit	• Initial preparatory work and inception meeting • Collection and analysis of time series data • Field study • Data analysis and measures for improvement • Report preparation and presentation
4. Training manual for energy & water management	• Secondary research (desk research) on status of industry sector in Zimbabwe • Drawing learnings from the field studies conducted throughout the TA • Numerous stakeholder interactions to understand present situation • Leveraging our experience in field of energy and water use efficiency

Pictures of classroom training programme

Training demographics



Majority of the participants were Industry officials (40%)



Majority of the participants were government officials (52%)

Pictures of Hands-on-training

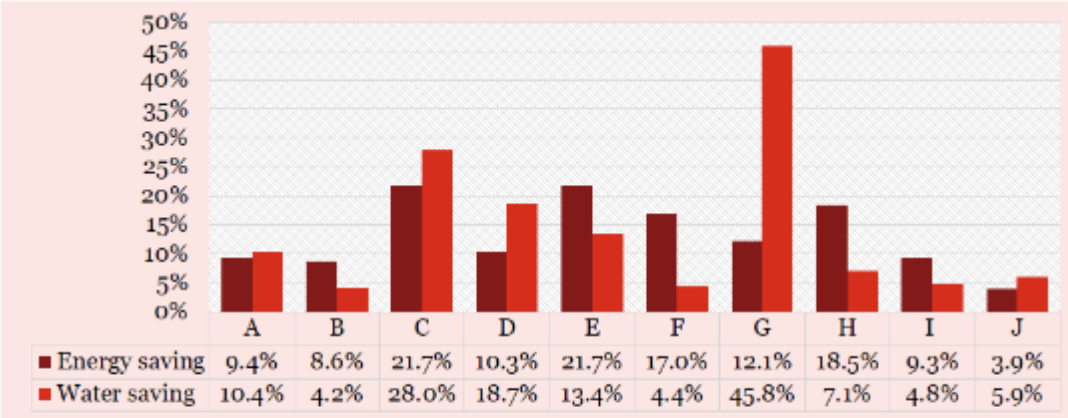



Pictures of field visit





Results of TA

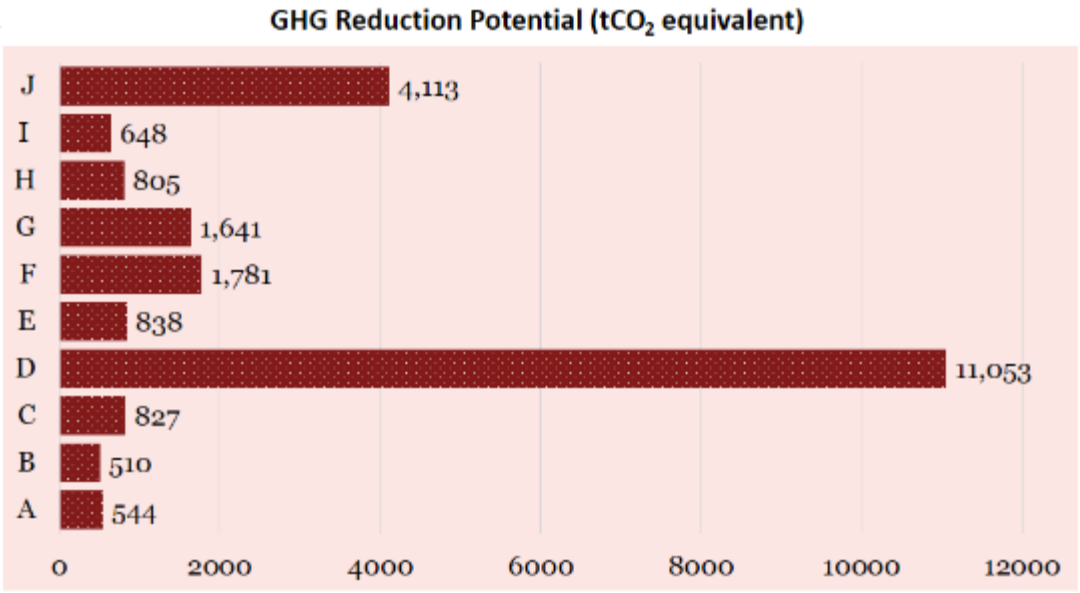


Average Saving	Agrochemical	Cables	Cement	Food & beverages	Mining
Energy	8.9%	21.7%	10.3%	15.5%	9.4%
Water	5.1%	28.0%	18.7%	28.8%	5.3%

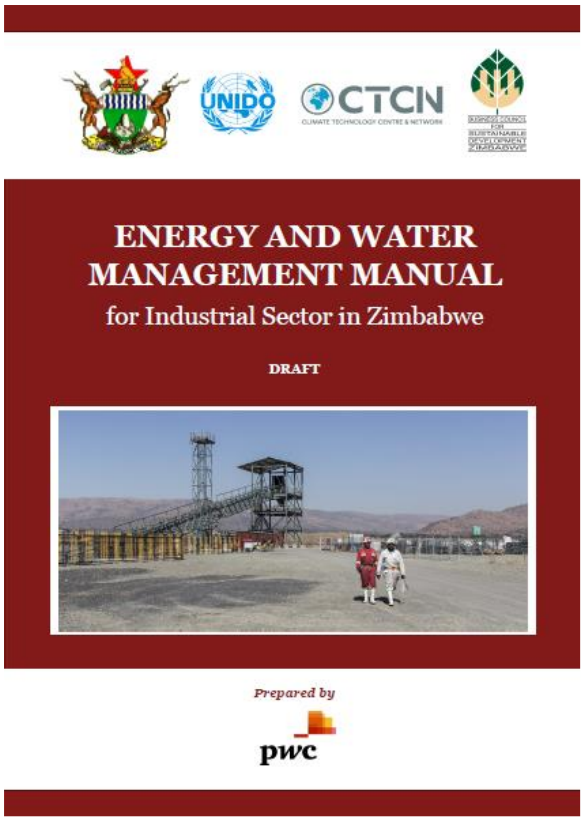
Total energy saving identified: 6,245 toe/year

Total water saving identified: 0.61 million m^3/year

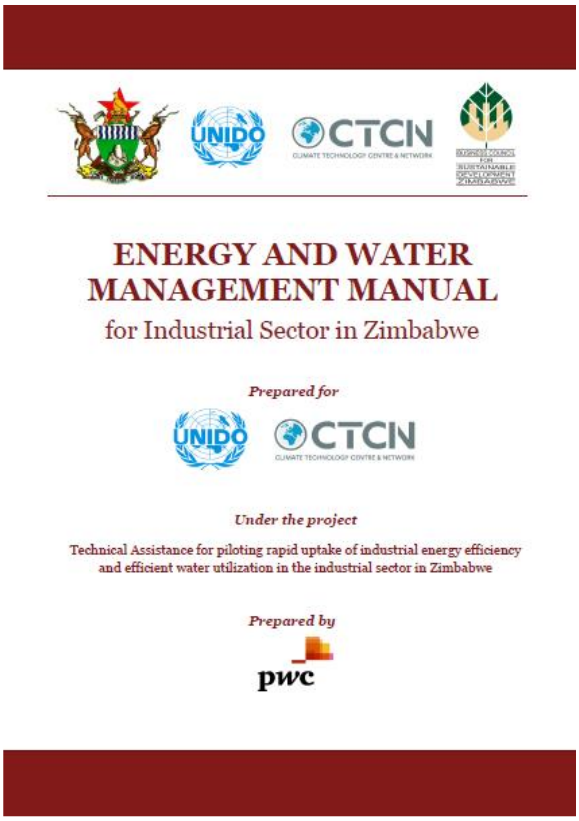
Total GHG reduction potential: 22,760 t $CO_{2\text{-}e}$ per year



Manual on Energy and Water Management for Industrial Sector in Zimbabwe



Cover Page



Inside cover page

5. Information for TA impact description

The information in the table below will be used to produce the CTCN TA Impact Description. The TA Impact description is a 2-page summary document for communication purposes. Please copy information from sections above and technical delivery reports as required.

Challenge: Approx. 500 characters with spaces	Zimbabwe is facing challenges to manage its water resources because of the adverse effects of climate change on the country's water supply. At the same time the energy supply often can't 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 couldn't be implemented effectively due to numerous barriers.
CTCN Assistance: 2 to 4 bullet points. Approximately 450 characters with spaces	The CTCN technical assistance is aimed at addressing the barriers mentioned above. It envisages to provide: 1. Support with conducting energy and water efficiency audits in ten pilot companies 2. Capacity building and awareness generation on energy and water efficiency and ISO 50001 Energy Management System of the benefits of such measures for industries.
Anticipated impact: 2 to 4 bullet points to summarise anticipated impact. Approximately 250 characters with spaces. As a minimum, please include one of the following: i) Quantity of greenhouse gas emissions reduced, avoided or sequestered; or ii) Number of people with increased capacity to adapt to the impacts of climate variability and change.	• Increased capacity of industries on EE, water use efficiency, RE • Enhance competitiveness of 10 demo industry • Identified GHG mitigation potential 22,760 tCO_{2e} per year • Created investment pipeline of US$4.53million for energy & water efficiency
Linkages and contribution to NDC: 2 to 4 bullet points. Approximately 350 characters with spaces	The TA contributes to Zimbabwe NDC's mitigation target by: • Identifying low carbon technology options, retrofits and best operating practices for industry sectors • Building capacity and generating awareness among stakeholders (industries, government agencies, service providers) on energy efficiency and renewable energy
The narrative story: Approximately 1200 characters with spaces	Zimbabwean industries have several inefficiencies such as obsolete technologies, limited capacities, inhibited investments in new technologies and lack of compliance with energy & water management systems. NDE sought technical assistance through CTCN to address these barriers. In response to TA request, CTCN collaborated with NDE and Business Council for Sustainable Development Zimbabwe to execute the TA through PricewaterhouseCoopers India. 3-day classroom training aimed to build capacity & generate awareness on energy efficiency, water use efficiency, supply side renewable options and ISO 50001 Energy Management Systems. 42 candidates attended the training, representing

	industry, service providers and government offices. Hands-on-training followed it, wherein 27 candidates were trained. Detailed energy & water audit was conducted in 10 pilot industry representing 5 sectors (Agrochemical, Cables, Cement, Food & beverage and Mining). It identified recommendations to reduce specific energy and water consumption by 10.8% and 12.1% respectively, with GHG mitigation potential 22760 tonnes CO_2 equivalent per year. Manual on energy and water management for industry sector was developed.
Contribution to SDGs: Always include contribution to SDG 13, and to the extent possible, please include contribution to 2 other SDGs, describing the contribution with a few sentence for each SDGs concerned. A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/	**SDG 6: Clean Water and Sanitation** TA provided training and built capacity on water use efficiency improvement and water audit of 10 demonstration industries identified a cumulative water conservation potential of 0.61 million m^3 per year. **SDG 7: Affordable and Clean Energy** TA provided training and build capacity on energy efficiency and supply side renewable energy opportunities and renewable potential assessment of 10 demonstration industries identified a cumulative solar potential of 22.33 MW_p **SDG 9: Industry, Innovation and Infrastructure** TA provided training and build capacity on IS 50001 energy management system for industry. **SDG 13: Climate Change** TA strengthened the mitigation capacity and identified annual energy saving of 6,245 toe, leading to 22,760 tonnes of CO_2 equivalent GHG mitigation potential in 10 demonstration industries.

Note: Please see example of a TA Impact Description at the following link: https://www.ctc-n.org/sites/www.ctc-n.org/files/benin_a_ag_forestry.final_.pdf

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Annex 1 (for internal use in donor and UN reporting)

A. Standardised CTCN performance indicators for donor and UN internal reporting

Please add quantitative values for indicators relevant to the particular TA in the list below. Non-relevant indicators should be left blank. Please only fill in the table for activities and outputs conducted or produced directly by the CTCN assistance.

CTCN standardised performance indicators	**Quantitative value**	**Qualitative description** *List the various elements corresponding to the quantitative value*
1. Overview		
Number of active person-days (not full duration) of technical assistance provided to counterparts or stakeholders by international experts and consultants	**221**	PwC India
Number of active person-days (not full duration) of technical assistance provided to counterparts or stakeholders by national experts and consultants	**95**	PwC Zimbabwe Hazvinei Munjoma Canisius Matsungo
Number of for external communication and outreach activities conducted to showcase the assistance (news release, newsletters, articles on website, etc.)	**01**	The details of TA/training was covered in CTCN website https://www.ctc-n.org/news/ctcn-zimbabwe-energy-and-water-efficiency-audits-10-selected-pilot-companies
2. Events (other than trainings) held as part of the assistance		
Number of international and multi-country (at regional or sub-regional level) technology and knowledge sharing events	**01**	Side event at the BCSDZ National Conference 2018
Number of participants in the events above	**67**	Participants and speakers from 5 countries
Number of national technology and knowledge sharing events		
Number of participants in the events above		
Number of public-private events related to technologies		
Number of participants in the events above		
3. Training and capacity building activities conducted during the assistance		
Number of training sessions and capacity strengthening activities	**11**	**One** 3-day Training and capacity building activity **10** Hands-on-training during energy and water audit, each 3 days
Number of people who received the training	**42**	42 people trained in 3 day Classroom training, out of which, 27 people attended Hands-on-training during energy and water audit
Number of men	**35**	
Number of women	**07**	
Total number of organisations trained	**33**	
Number of research organisations, laboratories and universities	**01**	Scientific and Industrial Research and Development Centre
Number of private companies	**25**	

Number of cities and local government		
Number of communities		
Number of ministries	**03**	• Ministry of Energy and Power Development • Ministry of Environment, Water and Climate • Ministry of Industry and Commerce
Number of specialised governmental institutions	**03**	• Zimbabwe Electricity Transmission and Distribution Company • ZIMSTAT • Standards Association of Zimbabwe
Number of non-profit organisations	**01**	BCSDZ
Level of satisfaction of participants after the training (from training feedback form). Categories include: From very satisfied, satisfied, partly not satisfied, not satisfied at all	**Very Satisfied**	Feedback collected and submitted
Percentage of participants that increased their capacities thanks to the training (from training feedback form). Categories include: Significantly, very, moderately, to none.	**Significantly**	79% rated the training EXCELLENT 21% rated the training GOOD 0% rated the training AVERAGE and POOR
Percentage of men	**100%**	Based on feedback received, all candidates stated their capacities increased in one aspect or the other
Percentage of women	**100%**	Based on feedback received, all candidates stated their capacities increased in one aspect or the other
4. Tools, technical reports and information material supported by the assistance		
Total number of tools, technical reports and information material supported by the assistance (excluding mission, progress and internal reports)	**32**	06 - Progress reports 14 - Training modules 10 - Energy and water audit reports 01 - TA findings presentation 01 - Manual on energy and water management
Number of tools strengthened, revised or developed	**N/A**	
Number of technical reports strengthened, revised or created	**10**	10 - Energy and water audit reports
Number of other information materials strengthened, revised or created	**22**	14 - Training modules 01 - TA findings presentation 01 - Manual on energy and water management 06 - Progress reports (consisting of Detailed work plan, applied methodology for TA, minutes of inception meeting, Monitoring and evaluation plan, CTCN impact description and closure and data collection report)
5. Policies, laws and regulations supported by the assistance		

Number of policies, strategies, and plans drafted addressing climate change adaptation		
Number of policies, strategies, and plans drafted addressing climate change mitigation		
Number of documents developed to inform other policies, strategies, and plans on climate change adaptation (sectoral strategies, national development plans, etc.)		
Number of documents developed to inform other policies, strategies, and plans on climate change mitigation (sectoral strategies, national development plans, etc.)		
Number of laws, agreements, or regulations drafted addressing climate change adaptation		
Number of laws, agreements, or regulations drafted addressing climate change mitigation		
Number of documents developed to inform laws, agreements, or regulations on climate change adaptation		
Number of documents developed to inform laws, agreements, or regulations on climate change mitigation		
6. Institutional strengthening supported by the assistance		
Number of institutional arrangements in place to coordinate near and long-term national adaptation plans (NAPs)		
Number of organisations with increased technical capacity to advance near and long term national adaptation plans (NAPs) which integrate EbA		
Number of organisations with increase awareness and knowledge among countries to better own and drive national adaptation planning processes		
7. Partnerships and cooperation		
Number of private companies directly engaged in the assistance (that partnered with the proponent, the beneficiaries or the CTCN to implement the assistance)	**10**	1. CAFCA Limited 2. Schweppes Zimbabwe Limited 3. Windmill Private Limited 4. ZFC Limited 5. Muriel Mines Processing Unit 6. Murowa Diamonds Processing Unit 7. Mimosa Mining Company 8. Lafarge Cement Zimbabwe 9. Delta Beverages 10. Hippo Valley Estates Limited
Number of South-South collaboration enabled during or through the assistance, when stakeholders from other countries were involved in the assistance	**05**	1. Ghana 2. India 3. South Africa 4. Uganda 5. Zimbabwe
Number of North-South collaboration enabled during or through the assistance, when		

stakeholders from other countries were involved in the assistance		
Number of Triangular collaboration enabled during or through the assistance, when stakeholders from other countries were involved in the assistance		

B. Indicators of anticipated impacts that may occur after the TA is completed

CTCN standardised performance indicators	**Quantitative value** Insert the request value and unit	**Content** List the elements included in the number provided	**Expected timeline** Indicate when the indicator and value are expected to be achieved	**Responsible institution** Indicate the institution(s) that will play leading role in enabling the indicators and anticipated values to be achieved
16. Anticipated finance mobilised				
a) Anticipated amount of public/donor investment mobilised (in USD) from the beneficiary country for climate change activities as a result of the TA				
b) Anticipated amount of public/donor investment mobilized (in USD) from international and regional sources for climate change activities as a result of the TA	USD 4.53 million investment pipeline identified	Energy and water saving recommendations identified	2020-21	
c) Anticipated amount of private investment mobilised (in USD) from the beneficiary country for climate change activities as a result of the TA				
d) Anticipated amount of private investment mobilised (in USD) from international and regional sources for climate change activities as a result of the TA				
17. Policies				
a) Anticipated number of policies, strategies, plans, addressing climate change mitigation officially proposed, adopted, or implemented as a result of the TA				
Anticipated number of policies, strategies, plans, addressing climate change adaptation officially proposed, adopted, or implemented as a result of the TA.				

b) Anticipated number of laws, agreements, or regulations addressing climate change mitigation officially proposed, adopted, or implemented as a result of the TA.				
Anticipated number of laws, agreements, or regulations addressing climate change adaptation officially proposed, adopted, or implemented as a result of the TA.				
c) Anticipated laws, policies, regulations, strategies and plans where climate change mitigation will be mainstreamed as a result of the TA				
Anticipated laws, policies, regulations, strategies and plans where climate change adaptation will be mainstreamed as a result of the TA				
18. Anticipated number of public-private partnerships created				
19. Anticipated twinning arrangements created as a result of the TA				
20. Anticipated number of technology projects prepared and implemented to support action on low emission and climate-resilient development	127	Identified Energy conservation measures, includes: low carbon technology, retrofits and operating practice improvement	2020-21	• 10 demonstration industries • Donor agencies • Government of Zimbabwe • BCSDZ
21. Anticipated number of strengthened National Systems of Innovation and technology innovation centres in recipient country				
22. Anticipated Clean Energy Generation Capacity Clean supported by the TA that has achieved financial closure				
23. Anticipated and projected GHG reductions. Quantity of greenhouse gas (GHG) emissions, measured in metric tons of $CO_{2\text{-}e}$, anticipated to be reduced or sequestered as a	22,760 tonnes of $CO_{2\text{-}e}$ per year	Energy conservation measures	2020-21	• 10 demonstration industries • Donor agencies

result of projects supported by the TA				• Government of Zimbabwe • BCSDZ
24. Anticipated clean energy generation capacity supported by the TA that has achieved financial closure				
25. Anticipated and projected greenhouse gas emissions reduced or avoided through 2030, in metric tons of $CO_{2\text{-}e}$, from adopted laws, policies, regulations, or technologies related to clean energy/sustainable landscapes as a result of the TA				
26. Anticipated number of people improving their livelihood as co-benefits as a result of the TA				
27. Anticipated technology types effectively deployed in the country				
28. Anticipated UNFCCC processes implemented as a result of the TA (NAMA, NAPA, NDC, etc.)				
29. Anticipated Technology Needs Assessments (TNA) and technology Action Plans (TAP) as a result of the TA				
30. Anticipated cooperative research, development and demonstration programmes within and between developed and developing country Parties facilitated as a result of the TA				
31. Anticipated improved climate change observation systems and related information management in developing country Parties.				