CTCN Technical Assistance

Request Submission Form

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:	Zambia
Request title:	Leapfrogging Zambia's market to energy-efficient refrigerators and distribution transformers
NDE	Mr. Ben Makayi Ministry of Higher Education Senior Science and Technology Officer Phone: +260 211 252073, +260 977 344993 Emails: benmakayi2004@gmail.com
Request Applicant:	Ministry of Energy, Mafayo Ziba, Acting Principle Energy Officer, mafayo.ziba@moe.gov.zm, mafayoziba@gmail.com. Please add name of organization, contact person, position, email and address of the organization requesting assistance from the CTCN.

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):

The major fuel source of energy used in Zambia is wood, which is mainly consumed by households, with only 28% of the population having access to electricity and 11 million people without access to electricity in 2014 [10]. Electricity, petroleum and coal are mainly used in commerce and industry. As per the IRENA document titled Southern Africa Power Pool: Planning and Prospects for Renewable Energy, 58% of consumed energy was imported. By 2030 this may drop to around 30%.

According to the World Bank, under one fifth of households (19%) in Zambia have access to electricity, with rural electrification as low at 3%, with electricity used primarily for lighting, biomass is readily available for another end uses. The adoption of energy efficient technologies beyond lighting has consequently been low in Zambia to date, where the focus in the residential sector is on first expanding access to electricity. Opportunities for adoption of efficient products has been limited due to a range of reasons that include high levels of poverty and cultural factors, particularly in rural areas. The design and construction of efficient buildings has been impacted by the limited existence and enforcement of regulations, as well as an informal property market.

The power sector challenges, such as electrification and the urgent need of system maintenance, mean that energy efficiency is a lower priority for the National Designated Entities (NDEs) in Zambia. More pressing is such basic issues as expanding access to electricity and improving food, water and housing conditions.

Due to high levels of poverty in Zambia and the Southern African region in general, the equipment markets are extremely price sensitive, with few consumers able to afford the first cost of equipment at all, let alone the incrementally higher cost of most energy efficient product options. Energy efficient products typically come at a higher initial cost and any additional costs have large impacts on short-term cashflows. The concept of lower operating and maintenance costs, which can result in attractive payback rates, is not widely promoted nor relevant due to limited capital for investment.

Africa constitutes less than 5% of all global electricity consumption. While there is significant growth potential, the expansion of the regional power sector, electrification and appliance and equipment markets are hampered by the number of independent countries with their own policies, regulations and economies, and by persistently high levels of poverty across much of the region. Research shows that appliance and equipment manufacturers are, therefore, understandably cautious in spending time and resources to invest in producing and shipping high efficiency products to the African market, which impacts availability to specific countries. In the absence of regional standards or harmonized policies to encourage energy efficiency, lower efficiency and lower cost units tend to dominate the markets in countries like Zambia, where first cost is the market driver.

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

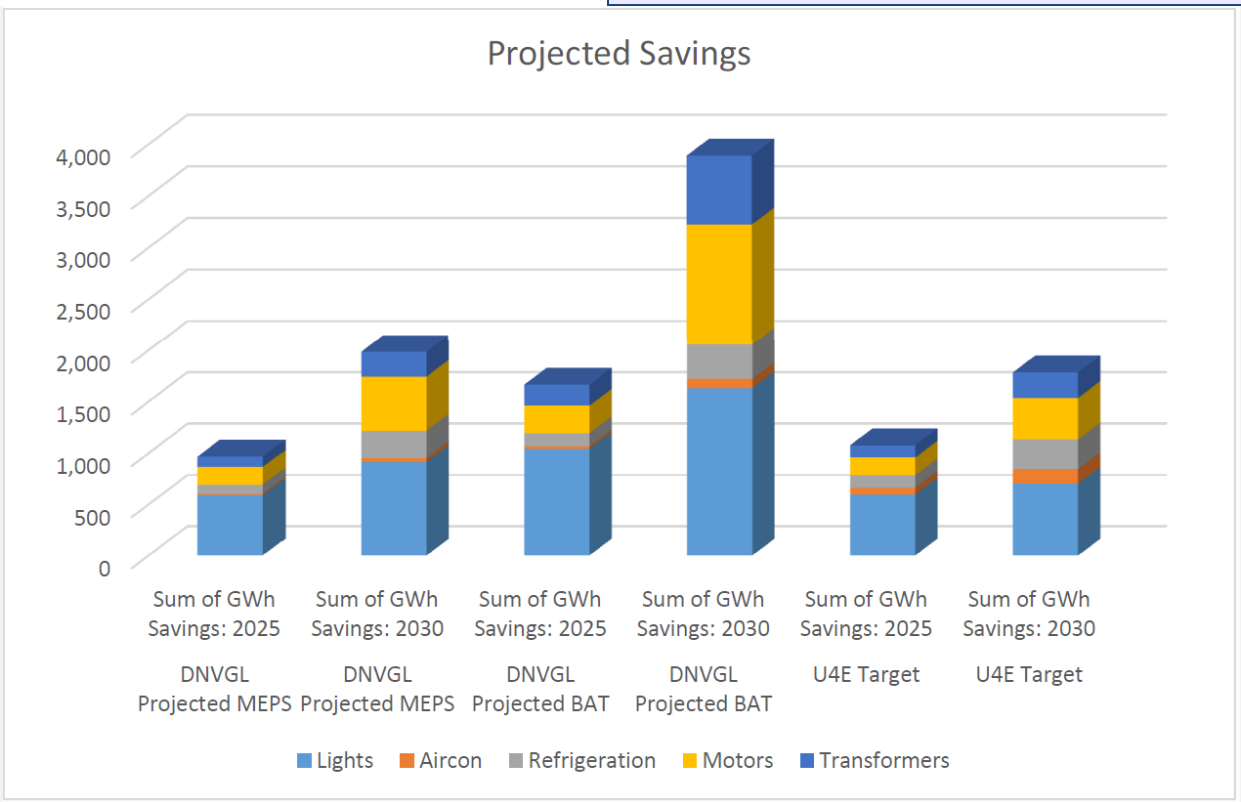
The goals for the energy sector within the Sixth National Development Plan (2011-2015) included increasing capacity by 1,000 MW and improving electrification to 15% for rural areas and 40% nationally. There are also plans for the following:

- Implement the Rural Electrification Master Plan (REMP)
- Build capacity in the engineering sector for energy efficiency
- Promotion and deployment of an Energy Efficiency Plan
- further develop the environmental technology industry in the country, with an incentive framework.

The Japanese government funded part of the National Energy Strategy (NES) (2009-2030) and the Rural Electrification Master Plan (REMP), which among other things, set targets for energy mixes of rural electrification that included grid extensions, mini grids, hydro and interconnections to the Southern Africa Power Pool (SAPP).

The Energy Regulatory Board of Zambia (ERB) was established to regulate the provision of energy services to the consumers, while implementation of the is driven by the REMP. Both are playing an important role in Zambia's energy sector.

Zambia joined various associations and global initiatives to promote and reduce barriers to the uptake of renewable energy. The country agreed to be part of the Renewable Readiness Assessment (RRA) roll-out project supported by the International Renewable Energy Agency (IRENA). The country is part of Power Africa's Beyond the Grid Initiative, launched in 2014 focused on unlocking investment and growth for off grid and small-scale energy solutions on the African continent. [10] Zambia is also a member of the Southern African Power Pool (SAPP), which began in 1996 as the first formal international power pool in Africa with a mission to provide reliable and economical electricity supply to consumers in SAPP member countries. ZESCO Limited acts as the operating SAPP member for Zambia.



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

This section should answer the questions "what are the technology barriers that hinder national efforts described above" and "how will the CTCN technical assistance complement these efforts?" Building upon the problem statement and taking into consideration the existing efforts described above, please describe the specific technology barriers encountered by the requesting applicant to identify, assess or deploy climate technology(is) in an effort to address the problem statement. The described barriers should be within the scope of the requested CTCN technical assistance (described in the section below).

Despite the limitations and context that it faces, Zambia has much to gain by adopting energy efficiency standards, regulations and technologies to ensure that, as it expands access to electricity, usage can be guided to be as efficient and affordable as possible. Ideally, such regulations and market levers would be harmonized with that of the larger Southern African region so as to have maximum impact on the technology market. This TA will help to project energy savings for Zambia, when moving from the current state of technologies to Minimum Energy Performance Standards (MEPS) or to the Best Available Technologies

The entire African continent consumes less than 5% of all electricity globally. Therefore, it is understandable that manufacturers have little interest in spending time and resources to invest into, let alone track the African market, and even less so if you look at specific countries.
markets are extremely price sensitive. Energy efficient products such as those being investigated through this TA typically come at a premium cost over standard models, and any additional costs have large impacts on short term cashflows. This TA therefore investigates technology approach that Zambia can address current lack of energy efficiency throughout the country through the assessment of the 5

[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)*

products; Aircons, Lighting, Motors, refrigeration and transformers.

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:

Cross-sectoral enablers and approaches:

Please indicate the main cross-sectoral enablers and approaches

☐ Communication and awareness	☐ Economics and financial decision-making	☐ Governance and planning	☐ Community based
☐ Disaster risk reduction	☐ Ecosystems and biodiversity	☐ Gender	

Technical assistance requested (up to one page):

In coordination with similar CTCN projects in neighbouring countries, will assess the potential for increasing the energy efficiency of products in Zambia by providing a technical market assessment of current conditions and policies. This targets two, refrigeration and transformers out of the five specific product categories: lighting, air conditioning, refrigerators, motors and transformers
The specific objectives of this technical assistance are to:

- Validate the data collected by the CTCN from stakeholders (e.g. manufacturers, retailers, suppliers, utilities) on the existing initiatives and use of refrigerators and distribution transformers.
- Undertake detailed market assessments and feasibility of implementation of technologies with highest efficiency.
- Develop a technology roadmap and action plan for promoting and adoption of efficient appliance in the country.
- Propose draft minimum energy performance standards (MEPS) and labelling for refrigerators (building off the United for Efficiency Model Regulations) and procurement specifications for distribution transformers.
- Assist decision makers and stakeholders to put the draft MEPS for refrigerators and procurement specifications for distribution transformers into practice.

- Gather information on financing lines and business models for financing energy-efficient refrigerators and/or distribution transformers.
- Develop proposal for financial/market-based mechanism on energy-efficient refrigerators and/or distribution transformers.

Expected timeframe:

18 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, etc.) that are likely to be generated as a result of the technical assistance.

The gender gap in access to inheritance and property rights, finance and information can limit the capacity of women home and business owners to invest in energy-efficient appliances. Energy use in the home may also be reduced by about 20 per cent through changes in behaviour. Women and men respond differently to policies encouraging behavioural changes. The success of these policies will depend heavily on how they affect the workload and well-being of both women and men. Energy efficiency policies and investment will be designed based on a gender-differentiated understanding of opportunities and constraints to optimize their social and climate impact.

The project will provide gender and other co-benefits, such as energy-efficient and higher quality refrigerators allowing users to save funds for other economic opportunities, reducing food waste from spoiled foods and providing increased economic opportunities by increasing the ability to store food instead of frequent trips to the market. In addition, distribution transformers and other energy-efficient products will result in reduced demand on the electricity grid provide more stable electricity distribution and economic opportunities for the entire population.

For more information, you can find guidelines on the CTCN's website here:
https://www.ctc-n.org/technologies/ctcn-gender-mainstreaming-tool-response-plan-development

Further reading on gender can be found on the CTCN website here:
https://www.ctc-n.org/technology-sectors/gender

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	The NDE will support in getting the commitment and participation of the relevant stakeholders within the process and also in exchanging of best practices regionally.
Request Applicant	

Please add as many stakeholders and lines as required.	
Ministry of Energy and Water Development (MEWD)	These are key agencies responsible for energy policies They take the lead on the project development as a Project Proponent. Particularly in developing the national strategies and development of minimum energy performance standards and labelling.
Energy Regulatory Board of Zambia (ERB)	This is the main Energy regulator in Zambia and will contribute reviewing draft regulations and specifications that could be used within their existing demand side management programs in order to incentivize the purchase of energy-efficient products. In addition, utilities are the primary owner of distribution transformers.
• Zambian Electric Supply Corporation (ZESCO) Limited • Copperbelt Energy Corporation (CEC) • Lunsemfwa Hydro Power Company Limited (LHPC)	Main entities in the electricity market will help in formulation regulation on energy efficient products

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, Low Emission Development Strategies, Nationally Appropriate Mitigation Actions, Technology Action Plans, National Adaptation Plans, sectorial strategies and plans, etc.

Zambia Nationally Determined Contribution to the United Nations Framework Convention on Climate Change's (UNFCCC's) Paris Agreement aims to reduce it greenhouse gas emissions with an ambitious 47% by 2030 compared to a business as usual scenario. The energy sector has been identified as one key areas in the mitigation strategy that calls for adoption of Renewable Energy and Energy efficiency.

Zambia goals for the energy sector within the Sixth National Development Plan (2011-2015) included increasing capacity by 1,000 MW and improving electrification to 15% for rural areas and 40% nationally. There are also plans for the following:
· Implement the Rural Electrification Master Plan (REMP)
· Build capacity in the engineering sector for energy efficiency
· Develop an Energy Efficiency Plan
· further develop the environmental technology industry in the country, with an incentive framework.

Zambia joined various associations and global initiatives to promote and reduce barriers to the uptake of renewable energy. The country agreed to be part of the Renewable Readiness Assessment (RRA) roll-out project supported by the International Renewable Energy Agency (IRENA). The country is part of Power Africa's Beyond the Grid Initiative, launched in 2014 focused on unlocking investment and growth for off grid and small-scale energy solutions on the African continent.

Reference document (please include date of	**Extract** (please include chapter, page number, etc.).

document)	
Nationally Determined Contribution (NDC)	Direct alignment and contribution to NDC implementation is required for all CTCN technical assistances. Please include a direct reference to the INDC/NDC document (chapter, page number, etc.).
Technology Needs Assessment	Multiple pages
National Adaptation Plans	Multiple pages
Nationally Appropriate Mitigation Actions	Multiple pages
Add others here as relevant	

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

Please describe how the request was developed at the national level and the process used by the NDE to approve the request before submitting it (who initiated the process, who were the stakeholders involved and what were their roles?) and describe any consultations or other meetings that took place to develop and select this request, etc.

Zambia was among the SADC countries which participated in a workshop organized by CTCN, United 4 Efficiency, and the Southern Africa Power Pool on Country Profiles on Leapfrogging to Energy Efficient Lighting, Appliances and Equipment. The country assessments developed in the framework of CTCN technical assistance were discussed. Zambia and other participating countries reviewed the use, future trends and energy efficiency savings of the five leading energy consuming products (besides lighting) to engage funding agencies for the development of policy framework. A need was identified to look at the potential for increasing the energy efficiency of products in Zambia by providing a technical market assessment of current conditions and policies. Five specific product categories have been looked at: lighting, air conditioning, refrigerators, motors and transformers.

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 that addresses Linkages between the Technology and the Financial Mechanisms[2].

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: Mainga Luvabelwa
Date: 21/1/2019
Signature:

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.
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.

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

NDE Name: Ben Makayi

Date:12th December, 2018

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.