

Requesting country or countries:	Mozambique
Request title:	Development of Energy Efficient Appliance and Equipment Strategy
NDE	Mr. Antonio Jorge Raul Uaissone Ministry of High Education, Science and Technology Mozambique Phone: +258 822 425530 Emails: antonio.uaissone@mct.gov.mz
Request Applicant:	Ministry of Mineral Resources and Energy, National Directorate of Energy. Name: Mr. Pascoal Alberto Bacela Position: National Director of Energy E-mail: Pbacela1@gmail.com Tel: +258 82 3108870; +258 84 3108870 Additional emails that need to be copied on correspondences: mmataveia@yahoo.com ; miseriobanze@gmail.com ; cirio.muarapaz@gmail.com ; olga.utchavo@edm.co.mz ; amilton.alissone@edm.co.mz ; Full office address: Av. 25 de Setembro 1218 2 nd floor, POBox 1381, Telf: 21302112, fax 21329661, Maputo, Mozambique

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

Mozambique has the second highest electricity production of the SADC countries, largely based on its hydropower capacity. Hydropower currently accounts for 92% of Mozambique's generation mix of installed capacity, mostly provided by the Cahorra Bassa dam (HCB) in the northwestern province of Tete and 3 small hydro dams. The remaining generation is from natural gas turbines, and numerous diesel generators. Yet, in 2015, about 97% of total household energy needs were still met by traditional

biomass fuels such as wood and charcoal, with only about 20% of households having access to electricity. LPG consumption is limited to higher income households in a few major cities. Mozambique is a net exporter of electricity, with more than 60% of the electricity generated by HCB being exported to South Africa. Given the abundant resources in Mozambique this is a concern and is due to the country's lack of transmission capacity.

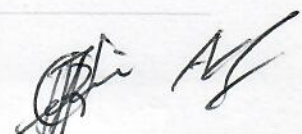
While Mozambique has significant generation potential, the distribution of power to Mozambique's population is extremely expensive due to the large size of the country and its dispersed settlement patterns. Due to poor connectivity and inadequate transmission network within the country, part of Mozambique exports power to Eskom, which in turn sells the power back to southern Mozambique at an increased rate and incurring serious technical, financial and national security implications. Furthermore, generation capacity should be increased to meet demand. Additional legislation is needed to attract private sector investment in power generation and transmission infrastructure. On the demand side, coordinated policies and programs are needed at the national and regional level to help encourage the adoption of energy efficiency products to ensure that expanded electric uses are efficient.

Regulations to govern energy efficiency have been in the pipeline since 2013 but have not been approved due to the complex relationships among multiple stakeholders. Reducing the sales of electricity through promotion of energy efficiency effectively reduces potential revenue for the utility. Current lack of sufficient capacity results in regular power outages, so reduced consumption could be redistributed. Since the utility is state owned, this enables the state to use the utility to drive energy efficiency roll outs despite the apparent conflict.

Due to poverty in general in Southern Africa, the markets are extremely price sensitive. Energy efficiency typically comes at a cost and any additional costs have large impacts on short-term cashflows. For example, additional costs for a higher efficiency refrigerator must be secondary to filling the existing one. Africa also forms a small market. The entire African continent consumes less than 5% of all electricity in the world. Therefore, it is understandable that manufacturers have little interest in spending time and resources to invest in, let alone track, the African market, and even less to looking at specific countries.

Subsidized (therefore lower) tariffs result in longer payback periods for energy saving projects or energy efficient technologies, which negatively impacts the sales of these units compared to their cheaper but less efficient competitors. Unfortunately, the low average incomes prevent the state-owned utilities from increasing the tariffs to be more fully reflective of costs. Many people would then not be able to afford electricity, which in turn has a negative impact on both the economy and the uptake of electrification.

Despite the limitations noted, including low population density and low incomes, Mozambique has much to gain by adopting energy efficient standards and technologies. This TA will thus provide much needed insight into the five product categories of primary energy-consuming appliances and equipment covered (lighting, air conditioning, refrigerators, motors and transformers).



Past and on-going efforts to address the problem:

Regulations to govern energy efficiency have been in the pipeline since 2013 but have not been approved due to the complex relationships among multiple stakeholders. Reducing the sales of electricity through promotion of energy efficiency effectively reduces potential revenue for the utility. Current lack of sufficient capacity results in regular power outages, so reduced consumption could be redistributed. Since the utility is state owned, this enables the state to use the utility to drive energy efficiency roll outs despite the apparent conflict.

Mozambique is part of the World Bank Energy Sector Management Assistance Program (ESMAP) titled “Africa Renewable Energy Access Program (AFREA I & II)” that promotes increased access to energy, with an emphasis on renewable energy, energy efficiency and energy access.

The country is also part of the Clean Technology Fund (CTF), an initiative that has highly concessional resources to scale up the demonstration, deployment, and transfer of low carbon technologies in renewable energy, energy efficiency, and sustainable transport.

Mozambique is 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. Mozambique also joined the International Renewable Energy Agency (IRENA) - a global initiative to promote and reduce barriers to the uptake of renewable energy.

Mozambique benefitted from CTCN Technical Assistance along with other 9 SADC countries: CTCN developed detailed country assessments for the five priority products (i.e. lighting, refrigerators, air conditioners, electric motors and distribution transformers). This assistance was required in order to more accurately define the current situation and the future objectives for climate-related policy actions. Each country report contains information on the status/trends of energy-efficient products, status of policies and potential savings of energy efficient products.

	GWh savings (2025)	GWh savings (2030)	MUSD savings (2025)	MUSD savings (2030)	GHG savings (2025)	GHG savings (2030)
DNV GL Projected MEPS						
Lights	820	1 219	190	454	745	1 107
Aircon	14	41	1	4	13	37
Refrigeration	221	640	51	239	200	581
Motors	34	100	2	10	31	91
Transformers	137	242	9	25	125	220
Total	1 227	2 242	253	733	1 114	2 036

Specific technology¹ barriers:

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

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)



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 (ies) 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).

Mozambique's has done estimation on targeted GWh savings per product type by 2030 as identified and proposed by United4Efficiency (U4E), to achieve these targets by successful implementation of the various energy efficiency strategies need requires adoption of relevant technology in the primary energy-consuming appliances and equipment (lighting, air conditioning, refrigerators, motors and transformers).

Sectors:

Please indicate the main sectors related to the request:

- | | | | |
|---|---|---------------------------------------|--|
| <input type="checkbox"/> Coastal zones | <input type="checkbox"/> Early Warning and Environmental Assessment | <input type="checkbox"/> Human Health | <input type="checkbox"/> Infrastructure and Urban planning |
| <input type="checkbox"/> Marine and Fisheries | <input type="checkbox"/> Water | <input type="checkbox"/> Agriculture | <input type="checkbox"/> Carbon fixation |
| <input checked="" type="checkbox"/> Energy Efficiency | <input type="checkbox"/> Forestry | <input type="checkbox"/> Industry | <input checked="" type="checkbox"/> Renewable energy |
| <input type="checkbox"/> Transport | <input type="checkbox"/> Waste management | | |

Please add other relevant sectors:

Cross-sectoral enablers and approaches:

Please indicate the main cross-sectoral enablers and approaches

- | | | | |
|--|--|--|--|
| <input type="checkbox"/> Communication and awareness | <input type="checkbox"/> Economics and financial decision-making | <input type="checkbox"/> Governance and planning | <input type="checkbox"/> Community based |
| <input type="checkbox"/> Disaster risk reduction | <input type="checkbox"/> Ecosystems and biodiversity | <input type="checkbox"/> Gender | |

Technical assistance requested:

In coordination with similar CTCN projects in neighbouring countries, this project will prioritize energy-efficient lighting and refrigerators in order to meet these challenges.

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 efficient lighting equipment and refrigerators.



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 energy efficient appliances and refrigerators (building off the United for Efficiency Model Regulations)
- Assist decision makers and stakeholders to put the draft MEPS for energy efficient lighting and refrigerators.
- Gather information on financing lines and business models for financing energy-efficient appliances and refrigerators.
- Develop proposal for financial/market-based mechanism on energy-efficient lighting and refrigerators.

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.

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Key stakeholders:

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	Ministry of Mineral Resources and Energy, National Directorate of Energy



<ul style="list-style-type: none"> • The Ministry of Mineral Resources and Energy • The Energy Fund (Fundo de Energia /FUNAE) • The Academy and Ministry of High Education, Science and Technology • Instituto Nacional de Normalizacao e qualidade (INNOQ) • Ministry of Land, Environment and Rural Development (MITADER) • The Ministry of Economy and Finance • The Ministry of Industry and Trade • Private sector 	<p>These agencies are the main authority for energy matters in the countries and will take the lead on the project development as a Project Proponent.</p> <p>The Academy will be responsible for conducting technical assistance and awareness companies nationwide. Will also contribute in technology dissemination;</p> <p>They INNOQ will contribute in developing the national strategies and development of minimum energy performance standards and labelling.</p> <p>The MITADER in coordination with MIREME is developing action plan regarding to eliminating HCFC's equipment and introducing no depleting ozone layer and efficient equipment in refrigeration and air conditioning</p> <p>The Ministry of Economy and Finance through the Customs Agents in collaboration with the Ministry of Industry and Trade through the National Directorate of Commerce will be responsibly for restricting or banning the importation of non-efficient equipment.</p> <p>The Private sector will contribute in a successful implementation and quick dissemination of the program nationwide.</p>
<p>National Regulator Authority (ARENE)</p>	<p>This is the main energy regulator and will have input in developing regulations on energy efficient products</p>
<ul style="list-style-type: none"> • Electricidade de Mocambique (EDM) • Hidroelectrica de Cahora Bassa (HCB) • MOTRACO – Mozambique Transmission Company • IPP 	<p>These are mainly the Electric Supply Authorities and main entities in the electricity market. They will contribute in 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.</p>

Alignment with national priorities :

Through the Nationally Determined Contribution to the United Nations Framework Convention on Climate Change's (UNFCCC's) Paris Agreement Mozambique has committed to reduce its greenhouse gas emissions by laying out strategies that will see a transition from business as usual scenario. Energy sector is a priority action in order to meet the mitigation commitments.

Regulations to govern energy efficiency have been in the pipeline since 2013 but have not been approved due to the complex relationships among multiple stakeholders. However, the Energy Sector Strategy, revised 2000 plays a key role in governing the energy sector.

Reference document
(please include date of document)

Extract (please include chapter, page number, etc.).



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	Technological Needs Assessment Report <ul style="list-style-type: none"> • Pg. 11. Low carbon development mitigation measures.
National Adaptation Plans	National Strategy for Adaptation and Mitigation of Climate Change 2013-2025 <ul style="list-style-type: none"> • 4.6.2.1.1. Improving access to renewable energies • 4.6.2.1.2. Increase energy efficiency • 4.6.2.1.4. Promoting low carbon urbanization
Nationally Appropriate Mitigation Actions	Nationally Determined Contribution (NDC) of Mozambique <ul style="list-style-type: none"> • Promotion of the production and sustainable use of charcoal (NAMA)
Add others here as relevant	

Development of the request

As a member of the SADC Mozambique 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. Mozambique and other participating countries reviewed the use, future trends and energy efficiency savings of the five leading energy consuming products and prioritized refrigerators and distribution transformers as focus products (besides lighting) to engage funding agencies for the development of policy framework.

Background documents and other information relevant for the request:

- EDM Energy Efficiency and Demand Side Management Strategy (attached)
- EDM Energy Efficient Lighting Strategy (attached)

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 Mechanisms².

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.

² Please see:

https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf



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: Albano Manjate

Date: 09 August 2019

Signature: *Albano Manjate*

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.

Signature:

NDE name: António

Jorge Raúl Uaissonne

Date: 09 August 2019

Signature: *António Jorge Raúl Uaissonne*

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.