CTCN Technical Assistance
Request Submission Form

Requesting region:	Southern African countries with National Designated Entities: Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, South Africa Tanzania, Zambia, Zimbabwe.

Request title:	Development of a Regional Efficient Appliance and Equipment Strategy in Southern Africa

Contact information:

	National Designated Entity	**Request Applicant**
Contact person:	*Elisha N. Moyo*	Mr Alison Chikova
Position:	*Principal Climate Change Researcher (TA Request Coordinating NDE)*	Acting Coordination Centre Manager
Organization:	*Climate Change Management Dept- Ministry of Environment, Water and Climate;*	Southern African Power Pool
Phone:	*+2634 701 681/3; +263775219592*	+263 4 335548
Fax:	*+263 4 252 673*	+263 4 307023
Email:	*enmoyo@gmail.com*,	alison.chikova@sapp.co.zw
Postal address:	*11th Floor Kaguvi Building, Harare, Zimbabwe*	24 Golden Stairs Emerald Hill, Harare, Zimbabwe

Technology Needs Assessment (TNA):

☒ The requesting country has conducted a TNA in 2008 (please insert date of TNA completion)
☐ The requesting country is currently conducting a TNA
☐ The requesting country has never conducted a TNA

Mozambique, Tanzania, Swaziland are conducting their TNA (TNA Phase II), Malawi conducted a TNA in 2003, Namibia conducted a TNA in 2005, South Africa conducted a TNA in 2007 and it is being updated and Zambia has conducted a TNA in 2012.

CTCN Request Incubator Programme:

☐ Yes
☒ No
Tanzania and Malawi are enrolled in the CTCN incubator programme.

Geographical focus:

☐ Community-based
☐ Sub-national
☐ National
☒ Multi-country

Theme:

☐ Adaptation to climate change
☒ Mitigation to climate change
☐ Combination of adaptation and mitigation to climate change

Sectors:

Energy Efficiency (residential, commercial, industrial, and public)

Problem statement:

Southern African countries currently face three main energy challenges which are: 1) a rising energy demand due to economic development and increase use of appliances, 2) limited access to electricity and 3) low availability of energy efficient household appliances on the market. As the region generates its electricity with approximately 75% from fossil fuels[1] this increasing electricity demand will also greatlyincreaseCO_2 emissions. The Region has also ambition to follow low carbon development pathway by its development of the Intended Nationally Determined Contributions (INDCs), SADC regional Climate Change Strategy, Regional Industrialization Strategy and participation in the continental Agenda 2063 and global initiatives such as the Paris Agreement and Agenda 2030, all within the context of sustainable development Without policy intervention and other supporting initiatives, Southern African countries put at risk their economic development and also risk missing their climate targets, aspirations and obligations.

- **Increasing energy demand resulting in increasing CO_2 emissions**

Southern African countries are undergoing increasing economic development over the last years. The regional GDP has increased over 5% per annum over the past three years and is expected to stay at the same rate in the coming years. Some countries in the region are expected to see GDP grow by over 7% in the coming years, such as Mozambique and Tanzania.[2]As a result electricity demand has increased by 30% over the last ten years and is forecasted to increase by 3.1% per annum in the coming years.[3]

The increase in economic development results in increased electricity consumption due to the purchase of goods such as refrigerators and air conditioners. Similarly, with increasing economic development the region also increased the use of equipment such as motor and distribution transformers, which are used throughout industry and manufacturing. Both the appliances and equipment provide great benefits to the region, however the products that are currently being used and sold in Southern Africa often consume greatly higher energy than products that are technologically and financially available in the region.

- **Inefficient household appliances**

The Southern African market leaves room for improvement as it offers mainly inefficient lighting, appliances and equipment. Inefficient products continue to circulate freely on the market since minimum energy performance standards (MEPS) have only recently been developed in South Africa. The high-energy consuming products contribute to a strained grid with frequent power cuts, as described in the previous section.

By continuing to use inefficient products, consumers are forced to pay higher electricity bills putting a strain on their expandable income. For instance an inefficient refrigerator consumes about 160kWh more

[1]Southern African Power Pool.(2014). Annual report.
[2]The World Bank.(2015). Global Economic Prospects.
3Southern African Power Pool.(2014). Annual report.

annually than an efficient one, while the impact of air conditioners is even greater with inefficient products consuming more than 1250kWh per year than an efficient product. This results in a strain on the consumer's disposable income with funds that could go to beneficial areas such as food, education or business opportunities. For example, in Namibia an efficient refrigerator and an efficient air conditioner would respectively save 160 US$ and 1,300 US$ in their reduced electricity bills.[4]

- **Limited access to electricity restricts economic growth**

As a result of the economic development and the use of inefficient appliances and equipment, the electricity grid is becoming increasingly strained in Southern Africa. This also has resulted in an electricity grid with frequent blackouts, putting economic development at risk, which requires a stable supply of electricity. Further electricity tariffs have been increased in recent years and are expected to further increase in coming years. This financial burden puts large constraints on business opportunities in the region and also families' valuable disposable income.

Further, an additional challenge that the region faces is the limited access to electricity. Currently the region has an electrification rate of just 27%, with the national rate ranging from 9% (in Malawi) to 75% (in South Africa).[5]In order to provide access to a greater portion of the population, the region must increase its energy efficiency, which is more cost efficient than investing in building new capacity.

Past and ongoing efforts:

The Southern African Power Pool (SAPP) Energy Efficiency Framework, which has an objective of prioritizing energy efficiency measures implemented in the SADC region, has identified the need of advancing energy efficiency in appliances and equipment. The objective within this framework is to increase electricity savings from energy efficiency measures by 15% by 2030. In order to achieve this target the region aims to implement regulatory mechanisms, supporting policies and a management, verification and enforcement (MV&E) scheme.[6] In the majority of countries there are energy efficiency targets defined or measures planned.

Additionally almost every country within the region declared in their national communication to the UNFCCC that promotion of energy efficiency is a priority. For instance Namibia identified potential mitigations actions in the energy efficiency sector such as assessment of the economic and costs and benefits of improving lighting and energy efficiency or demand side management in public and other buildings[7]. Additionally Botswana prioritized demand-side management programmes and energy efficiency.[8]

Furthermore, the Technology Needs Assessments (TNA) submitted by Botswana, Lesotho, Malawi, Namibia, South Africa, Swaziland, Zambiaand Zimbabwe have demonstrated strong interest and motivation for projects on energy efficient appliances and equipment. For example in Zambia's TNA, the priority technologies include energy efficient technologies such as energy management systems and technologies for industry (such as motors and transformers), and household end use products (such as lighting, refrigerator, and air conditioners). Thus having identified and prioritised technologies that can contribute to the climate change mitigation and sustainable development of Zambia; the next step would involve assessing the savings potential and possible barriers in greater detail.

The SADC road map includes the development of a minimum energy efficiency standard for all new electrical connections, implementation of renewable energy technologies, and the phasing out of incandescent light bulbs in preference to the compact fluorescent lights (CFLs)[9]. However despite these initial efforts only a few countries in the region have already implemented sustainable measures such as mandatory labelling programmes or minimum energy performance standards (MEPS).

4 UNEP – United for Efficiency, CLASP (2015). Country Assessments.
[5]UNEP– United for Efficiency, CLASP (2015). Country Assessments.
[6]Southern African Power Pool (2013).SAPP Energy Efficiency Framework.
[7] UNFCCC – Namibia Second National Communication (2011) http://unfccc.int/resource/docs/natc/namnc2.pdf
[8]UNFCCC (2013). Zambia Technology needs assessment and technology action plans for climate change mitigation
[9] http://www.sardc.net/en/southern-african-news-features/sadc-road-map-to-address-power-shortages/

South Africa is one country that leads the way in having a comprehensive strategy and action plan on energy efficiency. The country is a partner of the UNEP-GEF enlighten initiative and plans in this framework to phase-out inefficient incandescent lamps by 2016. Furthermore, South Africa has endorsed a national GEF-6 project that promotes highly efficient LEDs and distribution transformers, through financial mechanisms and implementation of MEPS. Tanzania has also taken steps to advancing energy efficiency and expects to implement MEPS for refrigerators and air conditioners in 2016. The country also plans to develop labels for motors, fridges, air conditioners, and lighting fixtures.

As only a few countries have implemented measures, assistance is needed to develop a sound strategy for the entire region and to ensure harmonization. The need to develop of a common regional strategy had been also defined and agreed within SAPP Energy Efficiency Framework.[10]A future strategy must take into account and harmonize the approach with ongoing efforts, such as those in South Africa, Tanzania and other countries.

Assistance requested:

Support in developing **country and prioritization assessments**, which will provide the financial, energy, and climate potential of accelerating a market transformation for each of the prioritized products. Based on the prioritization of products, **the project will develop a holistic regional strategy and engage with potential funders for the market acceleration of energy efficient appliances and equipment in Southern African countries**. The regional strategy will define clear strategic goals and actions to establish an integrated policy approach that will sustainably and permanently transform the market to energy efficient lighting, appliances and equipment.

As most of the countries defined energy efficiency in their national energy strategies and the efforts already taken in South Africa, Tanzania and Zimbabwe demonstrate that the countries recognize the need for action in employing energy efficiency. The **application of the integrated policy approach** will accelerate the transformation to energy efficient products in the region and provide the enabling framework to reduce the energy and climate change challenges.

The CTCN technical assistance will focus on Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, South Africa, Tanzania, Zambia and Zimbabwe. The remaining SAPP member countries must still nominate a NDE to access the CTCN services and endorse the application to be part of the programme. The development of this regional strategy will be articulated in four steps:

1- Country assessments

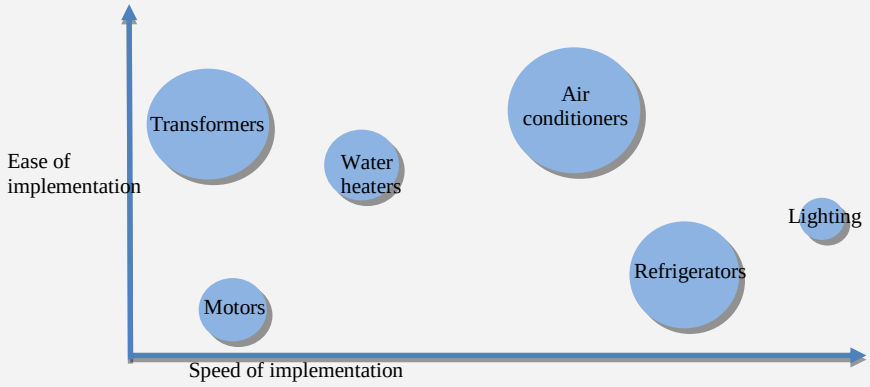
UNEP and CLASP have already developed preliminary country policy and savings assessments for energy efficient appliances and equipment. The assessments include residential refrigerators, room air conditioners and distribution transformers, showing the savings potential (financial, GHG, and energy). These assessments provide a first overview of the regional situation and demonstrated that there was a need for action to reduce the use of inefficient appliances and equipment to mitigate climate change.

Therefore with the assistance of the CTCN, more detailed country assessments will be developed for six products (lighting, air conditioners, residential refrigerators, water heaters, distribution transformers and motors). This is required in order to more accurately define the current situation and the future opportunities for action. The project will include policy makers as well as private and public organizations in the data collection process to ensure a detailed and well-grounded database. Following the data generation, the model used to measure the projected savings achievable with an improved policy framework will be re-evaluated. The country assessments will provide large financial, energy, and climate savings that are possible with such a market transformation, providing increased investor confidence from the private sector and international donors to fund the implementation policies in countries.

[10]Southern African Power Pool (2013).SAPP Energy Efficiency Framework.

2-Targeted appliances and equipment prioritized

In a second step, based on the results of the country assessments, the priority will be developed for each country and product. The procedure will include a qualitative assessment to measure the ease and the speed of implementation for each of the six products. The ease of implementation is measured among others by the number of stakeholders, the readiness of the stakeholders and consumers, the cooperativeness of policy makers and the variety of the individual products that exist on the market. The speed of implementation depends on the lifetime of the products. Some products have short lifetimes while others have very long lifetimes of over thirty years, such as transformers. The prioritisation will also be based on the total saving potential of technology. Graph 1 below shows a possible approach for the qualitative assessment, which can be applied in order to develop the regional strategy.



[1] The size of the circles corresponds to the CO^2 reduction potential (example not based on background data).

3-Regional strategy for efficient appliances and equipment

In a third step once the country assessments and the prioritizations of the target energy-efficient products have been conducted the regional strategy will be developed. Government representatives from the 12 countries will support this process to enforce a sound regional strategy to permanently leapfrog to energy-efficient, appliances and equipment. This strategy will be articulated in four action plans that will formulate:

- Minimum energy performance standards (MEPS) for the prioritized appliances and equipment;
- Framework for monitoring, verification and enforcement system to ensure products in the market comply with the MEPS;
- Supporting policies to accelerate the products' market transformation, such a financial mechanisms to reduce the initial purchase price of energy efficient products;
- An environmentally sound management plan throughout the lifecycle of appliances and equipment.

4- Funder engagement

Finally the effective implementation of the Regional Efficient Appliance and Equipment Strategy will require financial resources as well as human, technological and institutional resources. The project will engage financial institutions with governments and SAPP representatives, in order to the gain the commitment to fund the national projects. The key steps to follow to facilitate the mobilization of financing for the implementation of the strategy are: capacity building of stakeholders; a well-defined implementation plan; and a scaling up investment plan. The possible funding sources include public finance, private finance and public policies (potential funding sources Multilateral Fund (GEF), Green Climate Fund (GCF), World Bank Carbon Partnership Facility).

Expected benefits:

The technical assistance will result in countries prioritizing the relevant energy efficient products in their country and taking concrete actions to capitalize on their financial, energy, and climate benefits by 2030. It will ultimately improve energy productivity and allow the region to cope with growing demand electricity and reduce grid instability, ensuring future economic development.

According to the preliminary UNEP/CLASP country assessments the market transformation for just three products (refrigerators, air conditioners, and distribution transformers) to energy efficient products in Southern African would result in environmental benefits of 9 million tons annual CO_2 reduction, which is equivalent to removing 5 million cars off the road. This transition would also result in annual energy savings of 22TWhin electricity and in financial savings on electricity bills of 1.7 billion USD.

Post-technical assistance plans:

Implementation of the strategy

The assistance will result in leading stakeholders implementing the strategy at the national level (typically with the Ministries of Energy) with support from the Southern African Power Pool. Additional support on the technical assistance will be provided by the UNEP/GEF en.lighten / United for Efficiency (U4E) initiative's centre of excellence. The initiatives combined to support the market transformation to energy efficient lighting, appliances, and equipment. The initiatives include an established center of excellence composed of experts, which will cooperate with the CTCN on this technical assistance.

Following the development of the regional strategy the region will seek SADC Energy Ministerial endorsement to implement the activities designed. Political commitment is necessary to gain endorsement, which will be gained through the strong financial, energy, and climate arguments in the country assessments.

The implementation of the strategy would then be conducted in collaboration with the above-mentioned center of excellence. This centre of excellence will support country officials in providing expertise at stakeholder workshops. The developed country assessments will be used to convince key decision-makers of the need and great benefits to transition their markets to energy efficient appliances, and equipment.

Close linkage will be maintained with the Green Cooling Africa Initiative which we will start in 2016 with Ghana, Kenya, Namibia and Mauritius. The initiative is addressing refrigeration and air conditioning. The outreach and linkage to related initiatives and neighbouring African countries is an important element of the project. Linkage will be maintained through participation in regional workshops to cross-link activities under the CTCN in the Southern African Countries. In parallel to seeking the political support, fundraising activities and/or formulation of project proposals to implement the regional strategy will be conducted. The country assessments will provide confidence in potential funders of the projects, by showing the large financial, energy and environmental benefits of a market transformation. The en.lighten/U4E centre of excellence will support countries in the development of the project proposals, workshops with potential funders and ultimately in project implementation.

Key stakeholders:

Stakeholder	Role to support the implementation of the assistance
Ministries of Energy	• The Ministries of Energy are the main authorities for energy matters in the countries and will therefore take the lead on the project development as a main point of contact. • In particular the Ministries of Energy will be responsible for developing the

	national strategies. Afterwards a regional agreement of all Ministries of the region will ensure a harmonization of the strategy.
Ministries of Environment	• Ministries of Environment are also involved in energy matters of the countries and reduction of greenhouse gas initiatives. • The Ministries of Environment will take the lead in the development of the environmentally sound management plan of action, ensuring that health and environment concerns are properly handled throughout the lifecycle of the products.
Ministries of Industry	• The Ministries of Industry will be involved in the data collection process to generate a well-grounded information basis of the current situation. The researched data will be projected to savings potentials out of which the national and regional strategy can be evolved. • In addition the Ministries will assist in providing a strategy for the implementation of MEPS and MV&E.
Government-owned utilities	• As well the government-owned national utilities will contribute to the data collection process. • In addition the organizations will take part on the qualitative strategy development, in particular in the development of supporting policies.
Civil society	• The civil society will be enlightened about the project by awareness raising activities as well as with training and education.
If existing: National research institutes	• National research institutes do not exist in all countries of the region. However, if available, the organizations will, according to their objectives, be involved in the data collection process or the development of strategies.
If existing: Electricity regulating agency	• As well electricity-regulating agencies, if available, will be responsible for the same assignments like national research institutes.
If existing: National standard bodies	• Additionally national standard bodies, if available, will be responsible for formulating and promoting harmonized test standards to measure the performance of the products.
Leading private sector manufacturers	• ABB, DEFY, ICA, BSH,Osram, Philips Lighting are leading manufacturers of the six targeted appliances and equipment. • Therefore they will provide technical and policy experts to workshops to develop the regional strategy.

Alignment with national priorities:

Strategy development consistent with country priorities

The development of the regional efficient strategy for appliance and equipment will capitalize on the initiatives already taken by advanced countries to develop a clear roadmap.

Furthermore almost all countries of Southern Africa have declared in their national communications and Technology Needs Assessments (TNA) within the UNFCCC to promote energy efficiency of appliances or technologies in general.

In addition the region agreed in February 2015 to develop a common regional strategy on energy efficient appliances and equipment. Moreover in July 2015 the 34th SADC meeting of Energy Ministers acknowledged the SAPP-UNEP partnership to "Leapfrog to efficient lighting, appliances and equipment" and is among the list of approved projects by SADC Ministers for future cooperation on efficient

technologies.

The application is also consistent with the participating countries' follow a low carbon development pathways so as to minimise their GHG emissions as encapsulated in their Nationally Determined Contributions under the Paris Agreement.

Development of the request:

Partnership agreement for future cooperation

In September 2014 the Southern African Power Pool (SAPP) and the United Nations Environment Programme (UNEP) signed a partnership agreement for future cooperation. Following this agreement, in the end of February 2015 a SAPP-UNEP-ICA workshop was conducted in Johannesburg, South Africa to develop a regional roadmap to leapfrog countries to energy-efficient appliances and equipment. This consensus was reached by the delegates and participants from national utilities, governments, leading private sector companies and UN agencies. The members resolved that 2015 presents a unique window of opportunity to accelerate the deployment of the products in focus. The participants in the meeting agreed to develop a request for assistance from CTCN.

Additionally at the 34th SADC meeting of Energy Ministers held in July in Johannesburg, the Ministers welcomed the SAPP-UNEP partnership to "Leapfrog to efficient lighting, appliances and equipment" and is among the list of approved projects by SADC Ministers for future cooperation on efficient technologies.

Expected timeframe:

Based on assessment and past experience from the centre of excellence, it is expected that the development of the regional efficient appliance and equipment strategy from planning to preparation to finalization will take 12 months, as follows:

Month	M1	M2	M3	M4	M5	M6	M7	M8	M9	M 10	M 11	M 12
Phases												
1. Country Assessments												
2. Prioritization of Appliances and Equipment												
3. Regional Strategy												
4. Financing Plan												

Background documents:

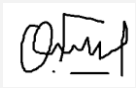
- National communications to the United Nations Framework Convention on Climate Change
- National Energy Action Plans
- SAPP Annual Report 2014 (http://www.sapp.co.zw/docs/Annual%20report-2014.pdf)
- Southern African Development Community Annual Report 2011-2012 (http://www.sadc.int/files/1613/7243/4333/SADC_ES_Report_2011-2012_web.pdf)
- Southern African Power Pool Energy Efficiency Framework 2013
- Technology Needs Assessments
- UNEP/CLASP preliminary country assessments on energy efficient refrigerators, air conditioners, and distribution transformers – February 2015

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 assistance provided by the CTCN. I understand that these processes will be explicitly identified in the Response Plan in collaboration with the CTC, and that they will be used in the country to monitor the implementation of the CTCN assistance.

☒ 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:	Elisha N. Moyo
Date:	2 June , 2016
Signature:	

THE COMPLETED FORM SHALL BE SENT TO THE CTCN@UNEP.ORG
Need help? The CTCN team is available to answer questions and guide you through the process of submitting a request. The CTCN team welcomes suggestions to improve this form.
>>> Contact the CTCN team at ctcn@unep.org