

Energy efficient and climate friendly cooling in Southern and Eastern Africa

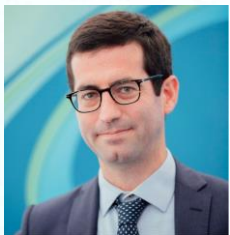
MADELEINE EDL, UNITED NATIONS ENVIRONNEMENT PROGRAMME – UNITED FOR EFFICIENCY (UNEP-U4E)

Presenter's Short Biography

- Energy Efficiency Specialist at UNEP-U4E since 2019, coordinating regional projects on energy efficient lighting, cooling and appliances & supporting the development of tools and resources.
- Previously advisor to the Niger Basin Authority to provide technical assistance in the context of securing the energy supply in the West African region.
- Academic background are two master's degrees, one in energy management (2022) and other one in international economies (2016).



Paper was developed thanks to teamwork with the following colleagues :



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Project Overview



Project Partners:



With technical support of:



Countries:

- East African Community (EAC) and Southern African Development Community (SADC)
- Total of 21 countries

Objective:

- Development of Minimum Energy Performance Standards and Labelling

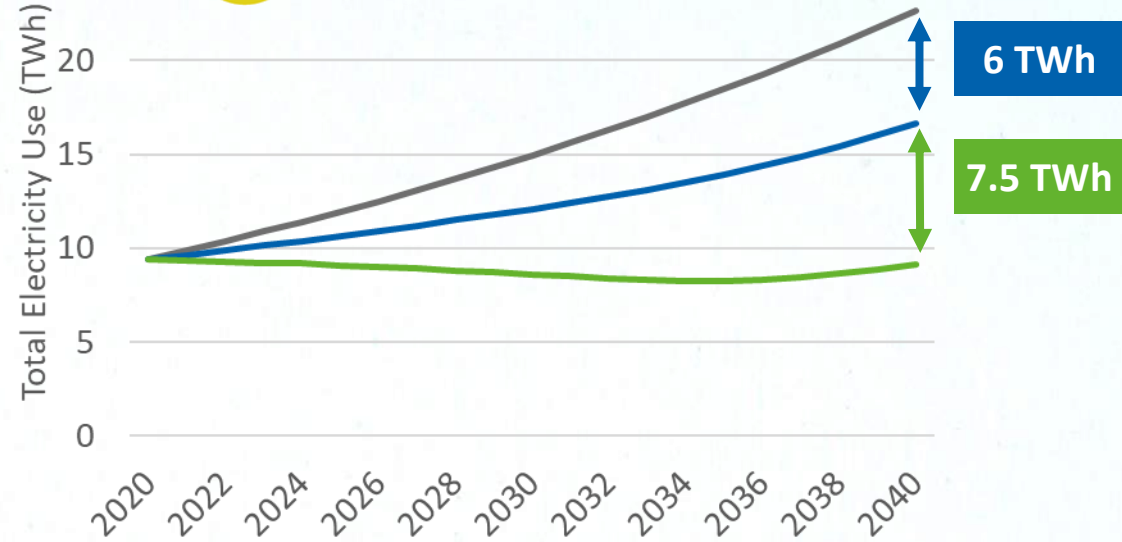
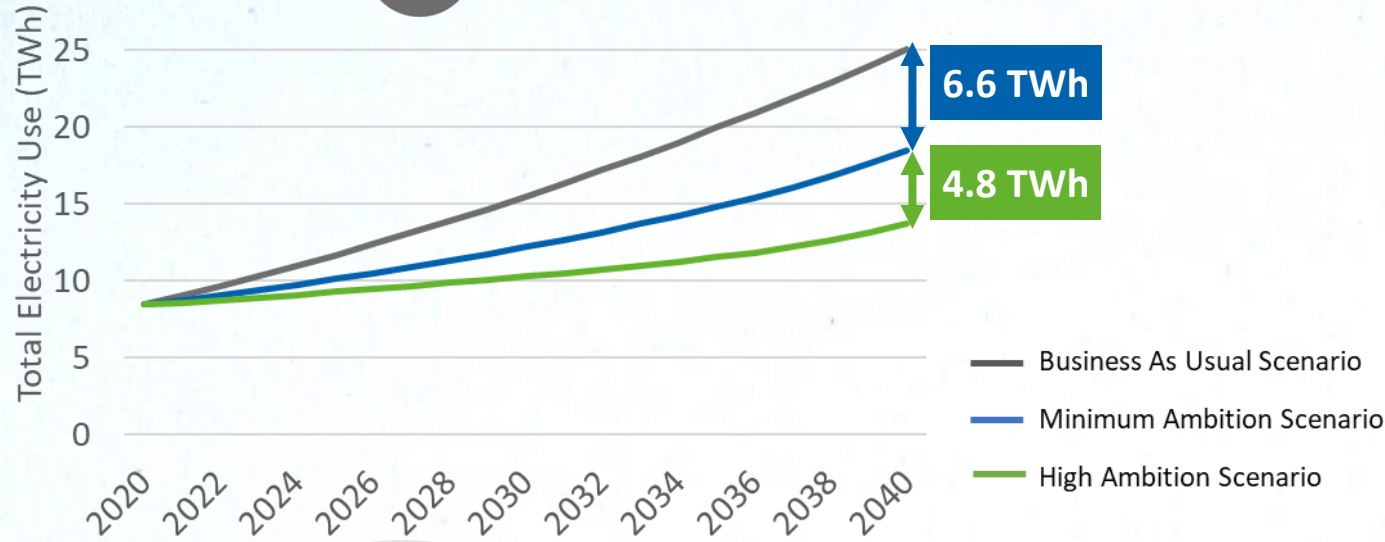
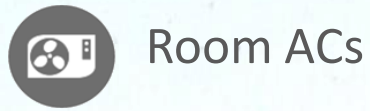
Technologies:

- Room Air Conditioners
- Residential Refrigerators

The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Cooling Savings Potential in the EAC and SADC Regions

Savings Per Product



Electricity Consumption is expected to increase by **2.5 times** by 2040!

Annual Savings in 2040*	Room ACs	Residential refrigerators
	Electricity Savings (TWh)	6.6
<i>equivalent to:</i>		
Power Stations [500 MW]	3	3
Millions of CO ₂	5.2	4
Millions of USD in electricity bills	590	540

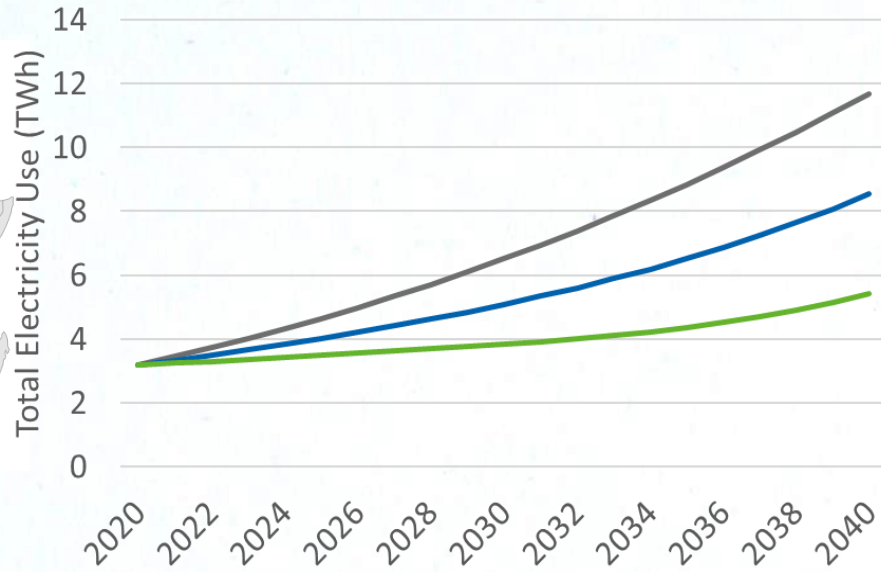
* With Minimum Ambition Scenario

Cooling Savings Potential in the EAC and SADC Regions

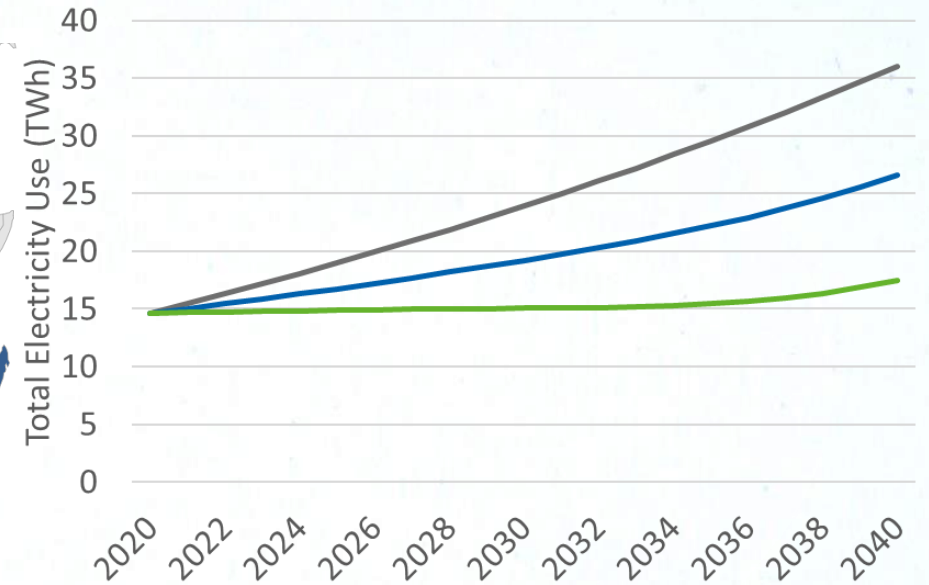
Savings Per Region



EAC



SADC



- Business As Usual Scenario
- Minimum Ambition Scenario
- High Ambition Scenario

Share of Savings	
EAC	SADC
25%	75%

Roles of MEPS & High-Performance Product Labels



Key Findings of the Market Assessment

<p>MEPS</p>	<ul style="list-style-type: none"> • Only 7 countries have MEPS in place (3 in EAC and 4 in SADC) • About half of those MEPS are voluntary • Mostly not harmonized
<p>Labels</p>	<ul style="list-style-type: none"> • Even less countries (3) have labels, which are all mandatory • Many of the appliances have already labels from their country of origin
<p>Refrigerants</p>	<ul style="list-style-type: none"> • Three countries have committed to the Kigali Amendment to the Montreal protocol • Room Air Conditioners are mostly equipped with R-410a (HFC) or R-22 (HCFC) • Residential Refrigerators are mostly equipped with R-134a (HFC) and in very rare cases with R-600a (HC)
<p>Institutions</p>	<ul style="list-style-type: none"> • Nearly all countries have standards bodies, while energy efficiency entities are not very common • Most of the countries have developed general energy policies



Overview of the Activities of the Project

Activity

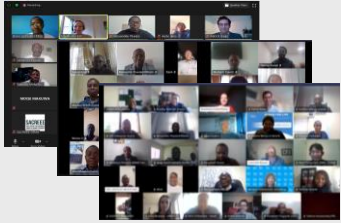
Main Conclusion/Content

Technical Notes



Technical recommendations based on international policy trends to establish a **harmonized energy-efficiency policy framework**.

Regional Workshops



Inception Meeting, Presentation of Market Assessment Findings, Technical Notes, General informative Meetings, Meetings to present MEPS and labels, etc.



National & Technical Committees

Regional and National Committees **to tailor MEPS and Labels**. Committees are based on SADCSTAN and EASC Committees & topped up with Ozone Experts.



National Consultations

Technical Meeting with each of the SADC and EAC countries **to discuss comments on the draft MEPS and labels**.

U4E Model Regulation Guidelines for ACs and Refrigerators



Download them [here!](#)

Objective

- Intended as guidance to help **inform regulatory authorities and policy makers**
- Set **minimum efficiency floor** to prohibit future sales of inefficient products from the market
- Set **maximum allowed GWP** levels to support compliance with HFCs phased-down
- Over **60 technical experts** from around the world contributed data, analysis, expert reviews
- References **global technology and policy trends**

Available: English, Spanish, Chinese, French, Portuguese

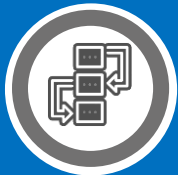
Room Air Conditioner MEPS and Labels



Scope and product categories



MEPS & performance labelling requirements



Test methods and efficiency metrics



Refrigerant requirements

Adopted from the U4E Model Regulation Guidelines

- Air conditioners, Heat pumps
- Ductless single-split, Self-contained, Portable types
- Largely aligned with international best practices (split & self-contained)

Ductless Split & Self-contained

- ISO 5151 & 16358
- CSPF (cooling-only ACs)
- APF (reversible HPs)

Portable

- ISO 18326
- EER (cooling-only ACs)
- EER and COP (reversible HPs)

Ductless Split

- GWP 750 or less
- ODP 0

Self-contained & Portable

- GWP 150 or less
- ODP 0

Residential Refrigerator MEPS and Labels



Scope and product categories



MEPS & performance labelling requirements



Test methods and efficiency metrics



Refrigerant requirements

Adopted from the U4E Model Regulation Guidelines

- Refrigerators
- Refrigerator-Freezers
- Freezers
- Largely aligned with international best practices

- IEC 62552: 2015
- $AEC_{MAX} = M \times AV + N$

$$R = \frac{AEC_{Max}}{AEC}$$

- GWP 20 or less
- ODP 0

Reference Ambient Temperature	Product Category	AEC_{Max} (kWh/year)
24°C	Refrigerators	$0.163 \times AV + 102$
	Refrigerator-Freezers	$0.222 \times AV + 161$
	Freezers	$0.2206 \times AV + 190$

Category	Low	Intermediate 1	Intermediate 2	High
Refrigerators	$1.00 \leq R < 1.25$	$1.25 \leq R < 1.50$	$1.50 \leq R < 1.75$	$1.75 \leq R$
Refrigerator-Freezers	$1.00 \leq R < 1.25$	$1.25 \leq R < 1.50$	$1.50 \leq R < 1.75$	$1.75 \leq R$
Freezers	$1.00 \leq R < 1.25$	$1.25 \leq R < 1.50$	$1.50 \leq R < 1.75$	$1.75 \leq R$

Current Status and Next Steps

As of May 2022

National Consultations:

- Concluded in SADC with 12 meetings
- Delayed in EAC due to bureaucratic reasons

MEPS & Labels Development:

- Comments received from SADC countries, request for additional comments
- SADC MEPS updated based on national consultations and presented during regional meeting in April 2022

Next Steps:

- Consolidate additional comments received and produce revised draft MEPS (if needed)
- Solicit approval of the revised final draft MEPS by following the EACS and SADCSTAN's principles and procedures
- Upon approval of the final draft MEPS, countries can begin the national adoption process



June 1st-3rd, 2022, Toulouse, France



Thank you !