SUSTAINABLE ENERGY FOR ALL FORUM KIGALI 2022

17-19 May 2022
Kigali Convention Centre
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Energy Efficiency Policy Actions and Market Development

U4E United for Efficiency

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ENERGY EFFICIENT LIGHTING AND APPLIANCES in East and Southern Africa

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Opportunities for Advancing Energy-Efficient and Climate Friendly Appliances and Equipment

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SPEAKER

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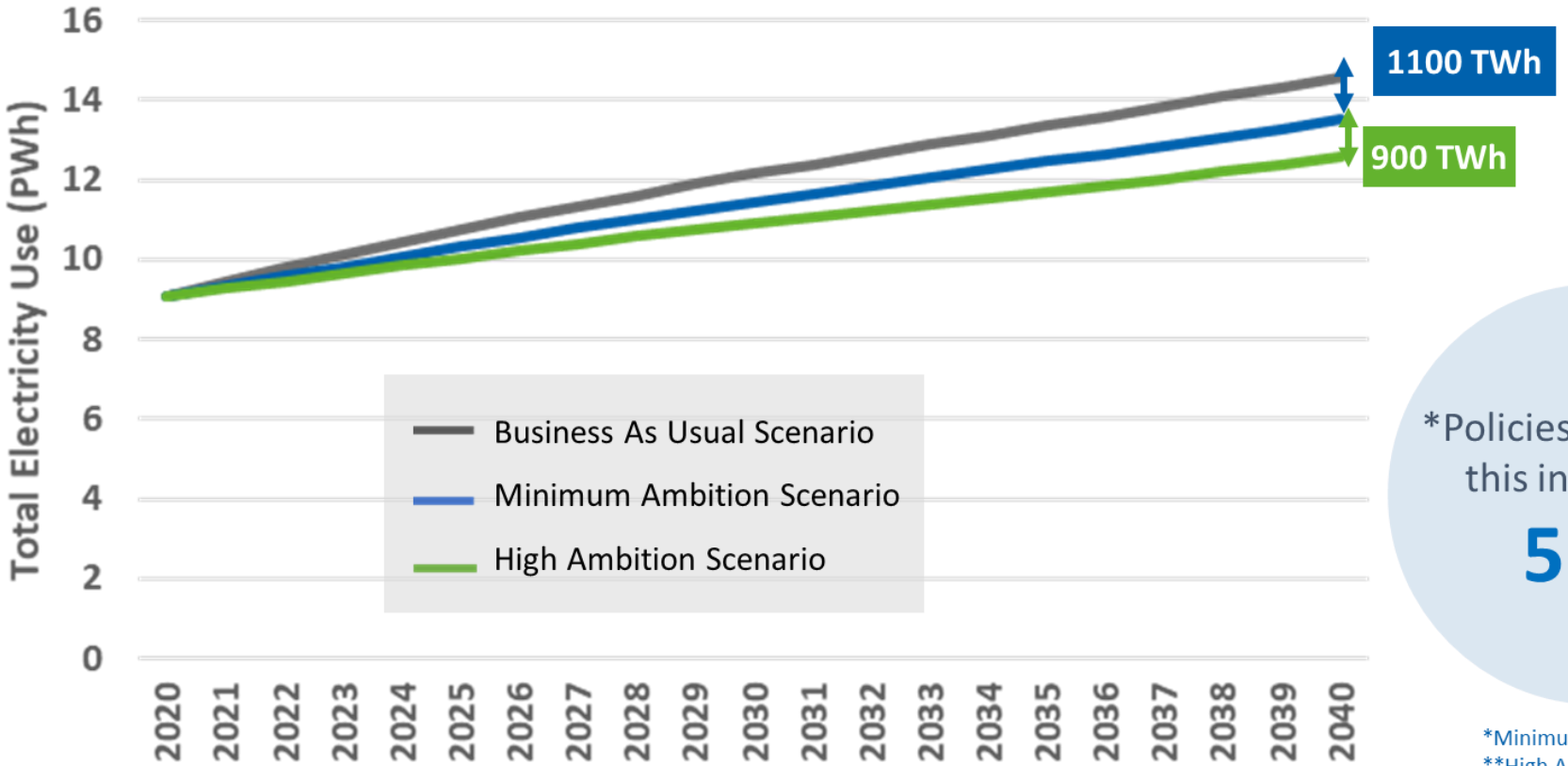
Saving Opportunities from Energy-Efficient Lighting, Appliances and Equipment



By 2040 the electricity consumption is forecasted to increase by over **66%**

*Policies can reduce this increase to **55%**

More stringent policies reduce this increase to **44%

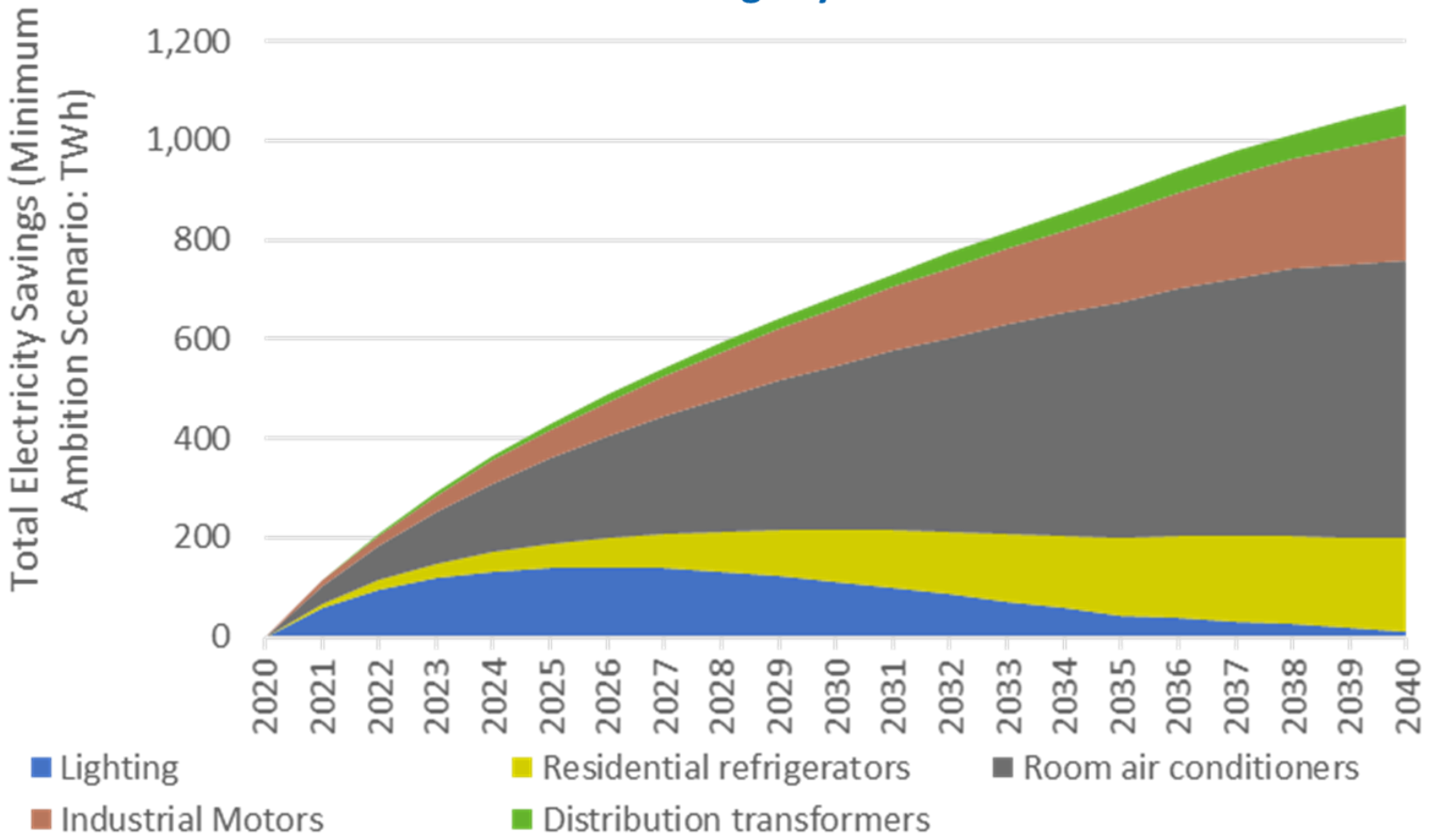
*Minimum Ambition Scenario
**High Ambition Scenario

Lighting | Refrigerating Appliances | Room Air Conditioners | Industrial Motors | Distribution Transformers

Graph refers to the 156 developing countries and emerging economies that had been assessed for the U4E Country Saving Assessments per the Minimum Ambition Scenario (1 PWh = 1000 TWh); Resource: https://united4efficiency.org/countries/country-assessments/

Saving Opportunities from Energy-Efficient Lighting, Appliances and Equipment

Savings by Product



Annual Savings in 2040:

1,100 TWh of electricity consumption, which is equivalent to:

- **490 Power stations** [500 MW each]
- **940** Million tonnes of **CO_2**
- **95** Billion **USD on electricity bills**

Savings refer to the 156 developing countries and emerging economies that had been assessed for the U4E Country Saving Assessments and the Minimum Ambition Scenario.

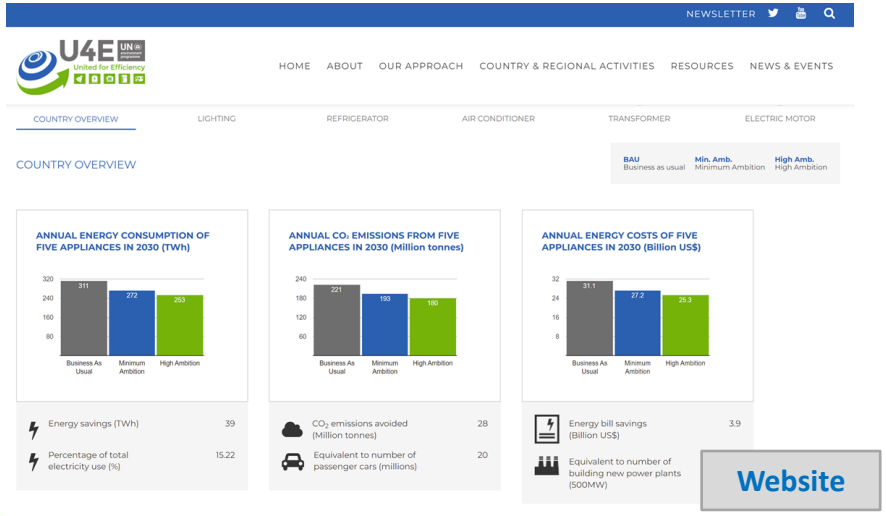
Country Savings Assessments

Overview

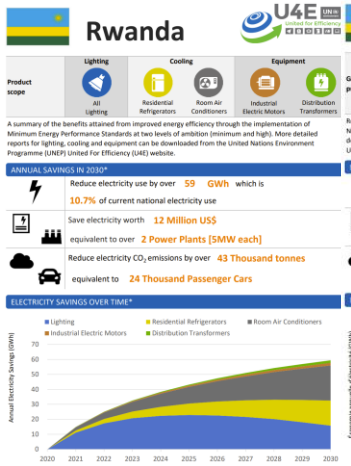
- The assessment provides three scenarios: **Business As Usual Scenario (BAU)**– No policy intervention; **Minimum Ambition Scenario** – assumes Minimum Energy Performance Standards (MEPS) implemented; **High Ambition Scenario** – Assumes MEPS are implemented at a higher level of ambition.
- The **energy savings potential** is calculated till 2040 and is computed based on the difference between total energy consumption in the ambition scenarios and that of the BAU scenario and is expressed in terms of **GHG emissions mitigated, Capacity (Power plants) avoidance and Financial savings.**

Application

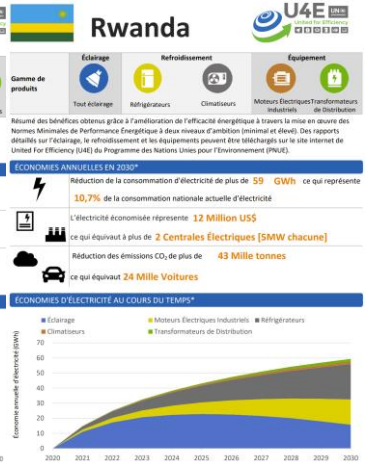
- The CSA serves as a powerful tool by providing **tangible (social, economic and environmental) benefits** that **enable policy makers** take informed **decisions and prioritizing countries for funding/implementing** climate change mitigation projects.



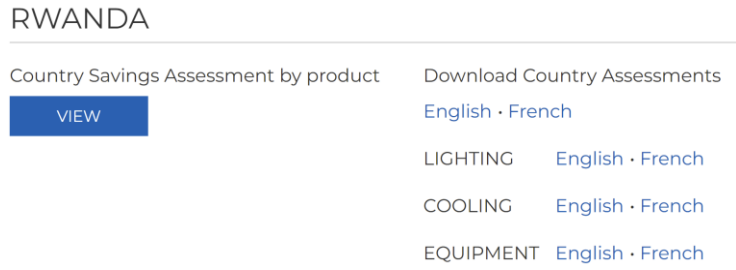
Website



English



French



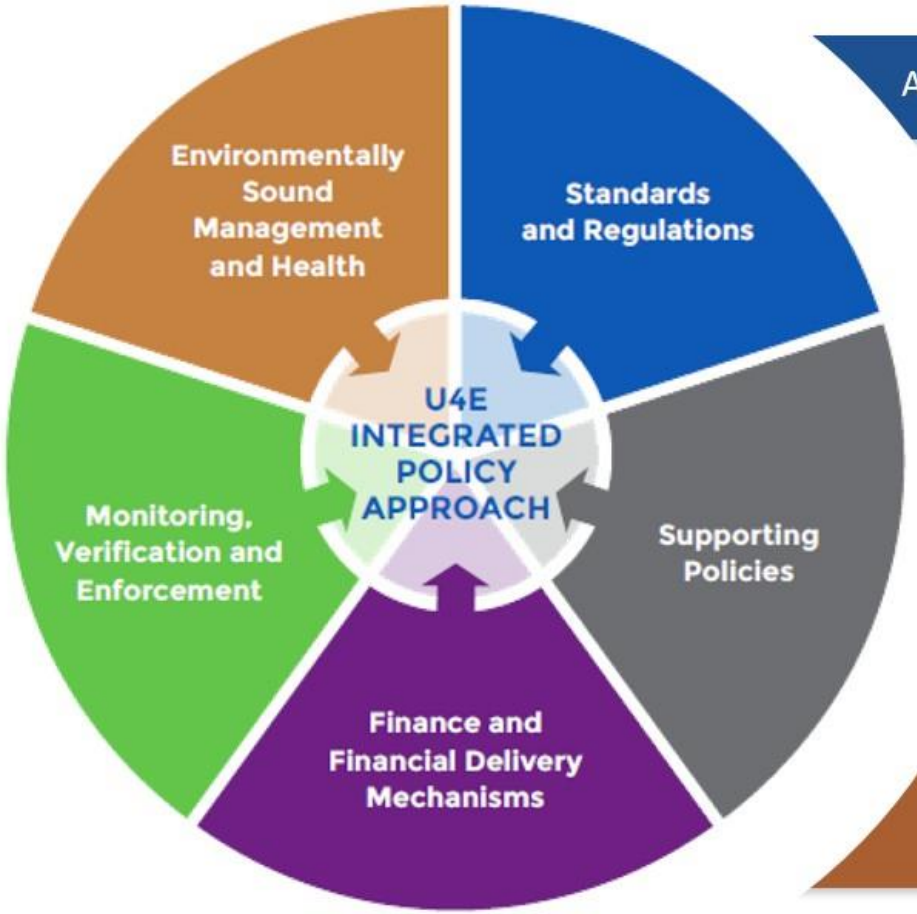
PDF downloads

Resource: https://united4efficiency.org/countries/country-assessments/

U4E Integrated Policy Approach

Overview

U4E implements a proven ***Integrated Policy Approach*** for product market Transformation



Adopt minimum energy performance and internationally-recognized test standards

Ensure effective labels are in place and that appropriate consumer information and advice is available

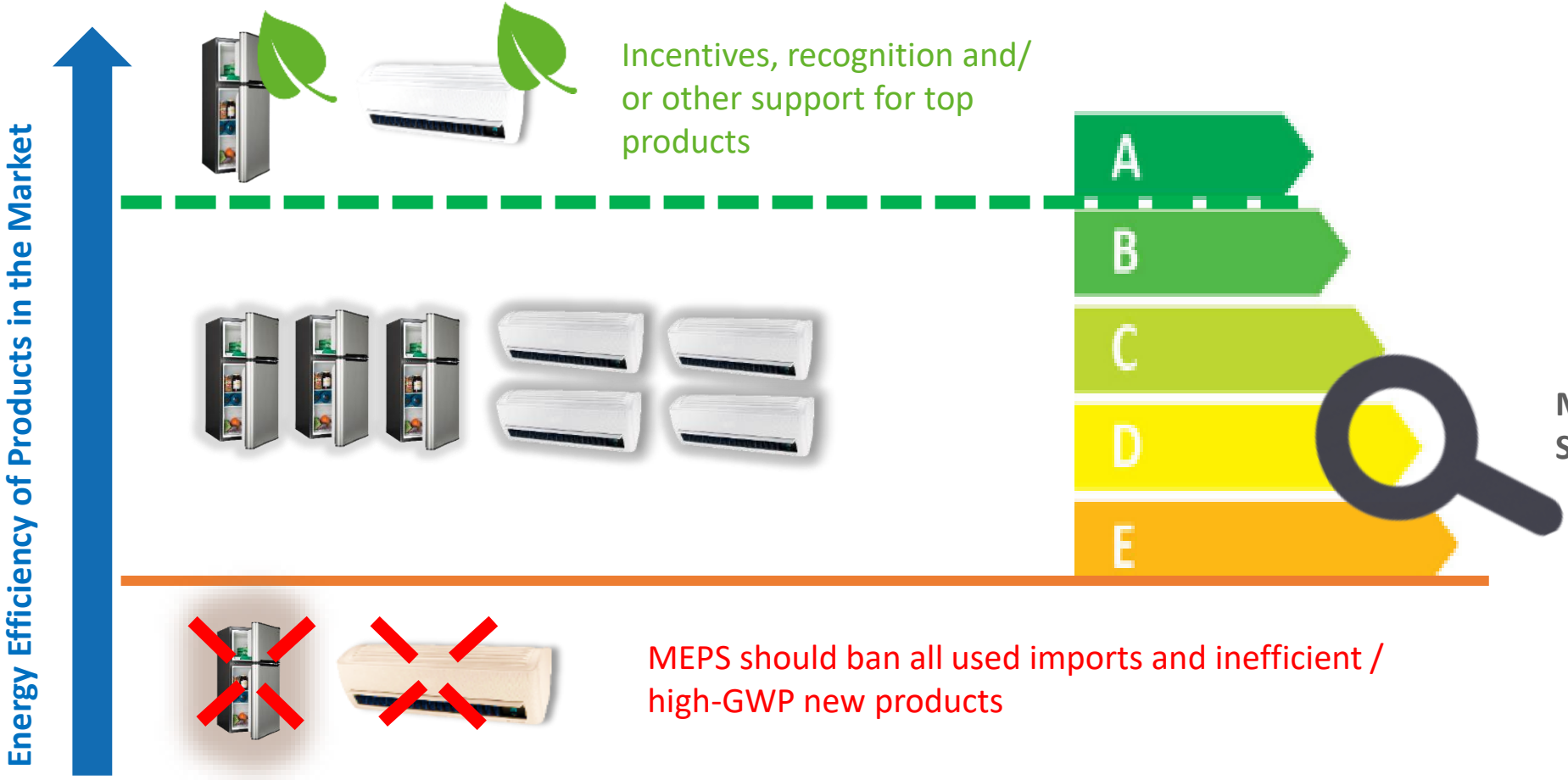
Consider a blend of financing mechanisms and incentives to help offset the incremental costs of energy-efficient products

Include legal authority, enforcement powers, capacities and penalties in the national legal and enforcement frameworks;
Use a product registration system as an initial compliance gateway

Provide for Materials Recovery (e.g. glass, ferrous and nonferrous metals and phosphors including any mercury in lamps and refrigerant gases).

Role of MEPS & High-Performance Product Labels

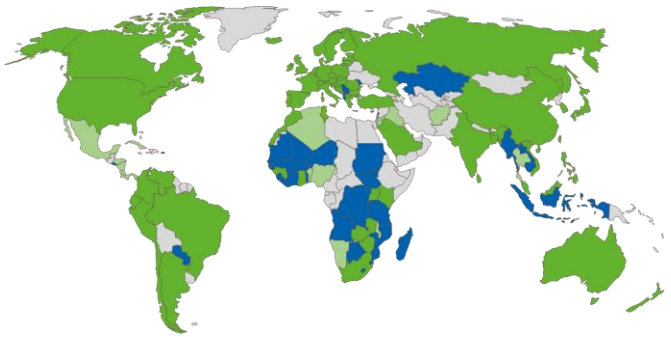
Overview



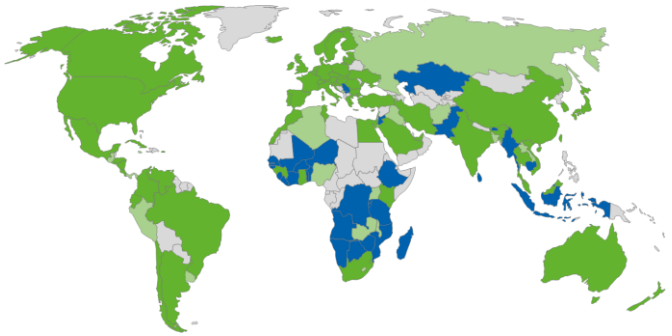
Global Mapping of MEPS

Overview

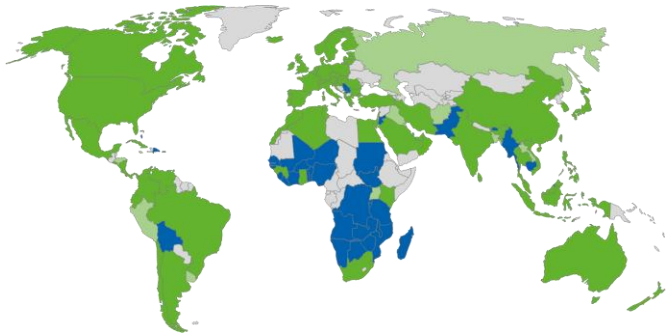
Lighting



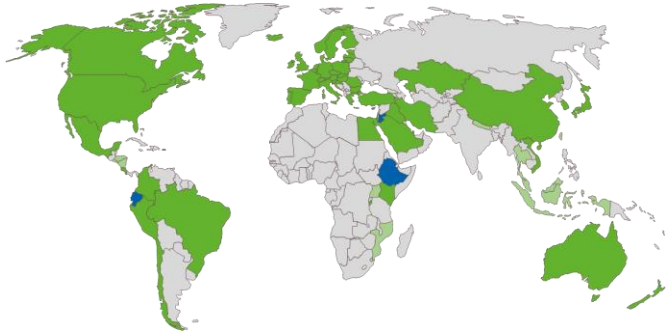
Refrigerators



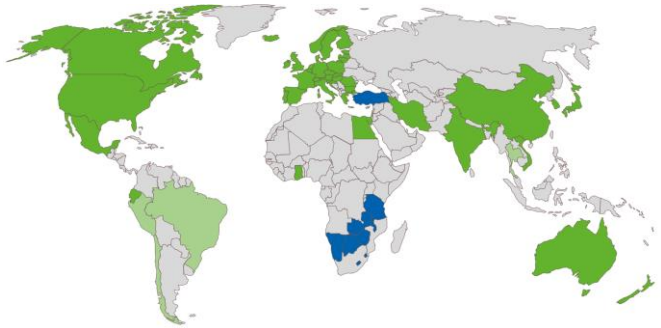
Air Conditioners



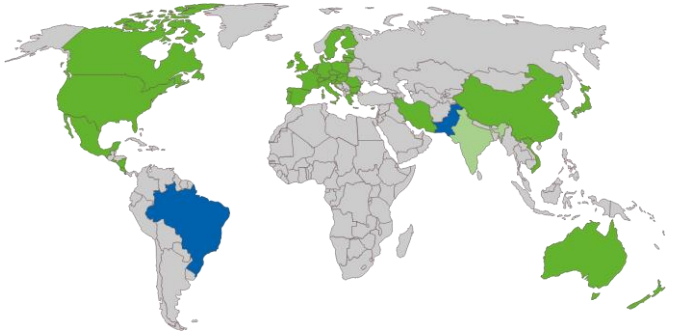
Motors



Transformers



Commercial refrigerators



Mandatory

Voluntary

In Progress

No Data Found

Model Regulation Guidelines

Objective

Guidance to help **inform regulatory authorities and policy makers**

Sets a **minimum efficiency floor** to prohibit future sales of inefficient products from the market and sets higher **tiers** consistent with technology and market opportunities.

Over **60+ technical experts** (per product group) from around the world contributed data, analysis, expert reviews

Robust **refrigerant GWP ceiling** for viable, fast action on the Kigali Amendment

Dual focus on **efficiency** and **refrigerants** and widespread deployment

References **global technology and policy** trends

Various translations: English (all), Arabic, Spanish, Chinese, French, Portuguese

Available at: https://united4efficiency.org/resources/model-regulation-guidelines/

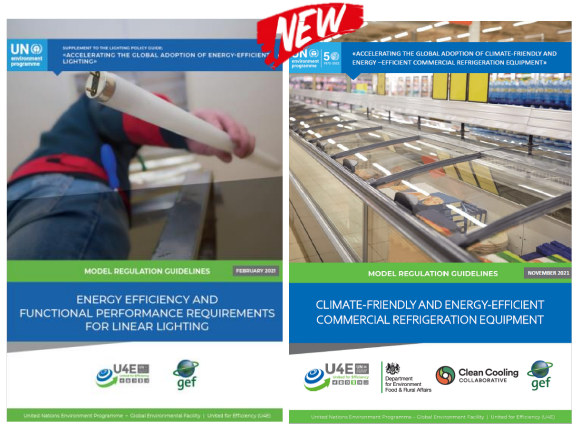
U4E Model Regulation Guidelines

Achievements

MRGs developed for lighting, air conditioners, refrigerators, distribution transformers and motors.

Supporting information documents are also available.

Available in English, Spanish, Chinese, French, Portuguese.



Revised MRGs for GSL and, inclusion of **linear lighting; commercial refrigeration equipment**

U4E Model Regulation Guidelines for Off-Grid Refrigeration Appliances

U4E Model Regulation Guidelines for Motor Systems: Pumps, Fans, Compressors

Introduction of MRGs for **Off-Grid Refrigeration** appliances and **Motor Systems**.

2018 — 2021 — 2022

Way Forward

Expanding the portfolios of MRG appliances to **heat pumps, ceiling fans water heaters, commercial air conditioners** (and/or update or expand existing Model Regulation guidelines) **in 2023 and beyond.**

Available at: https://united4efficiency.org/resources/model-regulation-guidelines/

Sustainable Public Procurement (SPP) Toolkit

Approach

Integrated purchasing process

Legislation framework
- International: NDC, Kigali, ILO, etc.
- National: Public finances & procurement

Financing models
- “Regular” capex procurement
- Alternative delivery models

Sustainability requirements
- Product: primarily environmental
- Supplier: primarily social & governance

Soft factors
- Additional community benefits
- Political buy-in

Toolkit includes:

Assessment document & Excel worksheet

Sustainable Public Procurement Guidelines

Intended for **Public Procurers, Lighting and Cooling Technical Personnel, Policy Makers and officers involved in procurement activities.**

Lighting

Office/large buildings lighting (LED luminaires and LED tubes) and all street/outdoor lighting luminaires.

Refrigerator appliances

Domestic refrigerators and freezers, commercial/ professional refrigeration appliances, vending machines and laboratory grade refrigerators.

Room air conditioners

Portable air conditioners, split air conditioners (single and multi-split), window air conditioners and ducted air conditioners.

Additional U4E Resources for GPP:

- ✓ **Toolkit: Key sustainable considerations** (environmental, social and economic), **current barriers** for its deployment (financial, awareness, capacity and regulatory), **Economic analysis of delivery models** and overall recommendations for the tendering process.
- ✓ **SPP Excel Spreadsheet Tool:** Compares the **economic cost and environmental impact** of different bids during the life span of the appliances. SPP minimum requirements on energy efficiency and refrigerant GWP can be used to easily check the compliance of each bid.

Bid code	Number of units	Capacity per unit [kW]	Energy efficiency for cooling CSPF [kWh/kWh]	Minimum energy efficiency requirement	Meets Energy requirements?	Unitary Cooling Seasonal Energy Consumption (CSEC) in kWh per year	Special controls to reduce energy consumption? [Yes/No]	Expected savings for special controls in %	GWP for refrigerant	Refrigerant charge per unit (kg)	Meets fluid requirements?
1	100	7.00	8.50	7.60	YES	2,300	Yes	20%	675	0.1	YES
2	100	7.00	7.80	7.60	YES	2,500	No		3	0.1	YES
					-						-
					-						-

Total price of the bid [USD]	Total operational cost (for all life of product) [USD]	Total External cost for CO2 emissions [USD]	Total Life Cycle Cost [USD]	Total indirect emissions (energy use) in kg CO2eq	Indirect + Direct (Refrigerants) emissions in kg CO2eq
50,000	3,53,280	32,625	4,35,905	12,03,270	12,08,332
50,000	4,80,000	44,142	5,74,142	16,34,877	16,34,900

Air Conditioner SPP Spreadsheet tool

Available at: https://united4efficiency.org/resources/sustainable-public-procurement-excel-spreadsheet-tool/

Three Sustainability Aspects and Barriers to SPP

	Assessment areas					
Environmental	Ozone depletion	Direct GHG emissions	Indirect GHG emissions	Hazardous substances	Waste minimisation	Light pollution
Social	Effect of lighting and cooling on quality of life			Worker rights		
Economic	Budget implications			Local job creation		

GPP Technical guidelines and specifications

Toolkit & GPP Technical guidelines and specifications

Toolkit

Typical Barriers to SPP

Financial Barriers

- Higher initial cost
- Competing projects
- Limited revenue-generating capability

Awareness barriers

- Business as usual momentum
- Lack of reliable data and comparability between products
- Inadequately informed of sustainable technologies and pros / cons

Capacity barriers

- Public entities:
  - Lack of personnel
  - Lack of knowledge / training
- Vendors:
  - Limited experience with newer technologies (e.g., hydrocarbon refrigerants)
  - Unadapted business models

Regulatory barriers

- For all delivery models:
  - Rigid procurement regulations
  - Lack of standards
- For alternative delivery models:
  - Limited financial committments
  - Accounting regulations

Several financial delivery models are prescribed in the SPP toolkit to overcome these barriers

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Thank you!

TRANSFORMING MARKETS TO ENERGY-EFFICIENT PRODUCTS

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Regional Harmonization and Compliance Framework for Energy-Efficient and Climate Friendly Appliances and Equipment

UNIDO
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

ENERGY EFFICIENT LIGHTING AND APPLIANCES in East and Southern Africa

EACREEE
Building a Sustainable Energy Future

SACREEE
SADC CENTRE FOR RENEWABLE ENERGY & ENERGY EFFICIENCY

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SPEAKER

Denis Ariho

Lead Technical Expert for
EAC on EELA Project
EACREEE

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Regional harmonization benefits

What is regional harmonization for Energy-Efficient and Climate Friendly Appliances and Equipment?

- Regionally harmonized policy measures among member states, incl. Minimum Energy Performance Standards (MEPS), test procedures, and labels
- Regional compliance framework to implement and enforce the harmonized policies

What are the benefits of regional harmonization for local markets?

- **Governments:** development and adoption of policies accelerated, compliance programs cost shared and reduced for all member states, cross-border challenges addressed
- **Industry:** easier access to more markets with aligned testing and fewer legal and trade barriers
- **Consumers:** better consumer protection from low quality products but also lower prices and wider choice of goods because of a larger total market
- **Society:** Reduced stress on electricity supply grids and greenhouse gas emissions

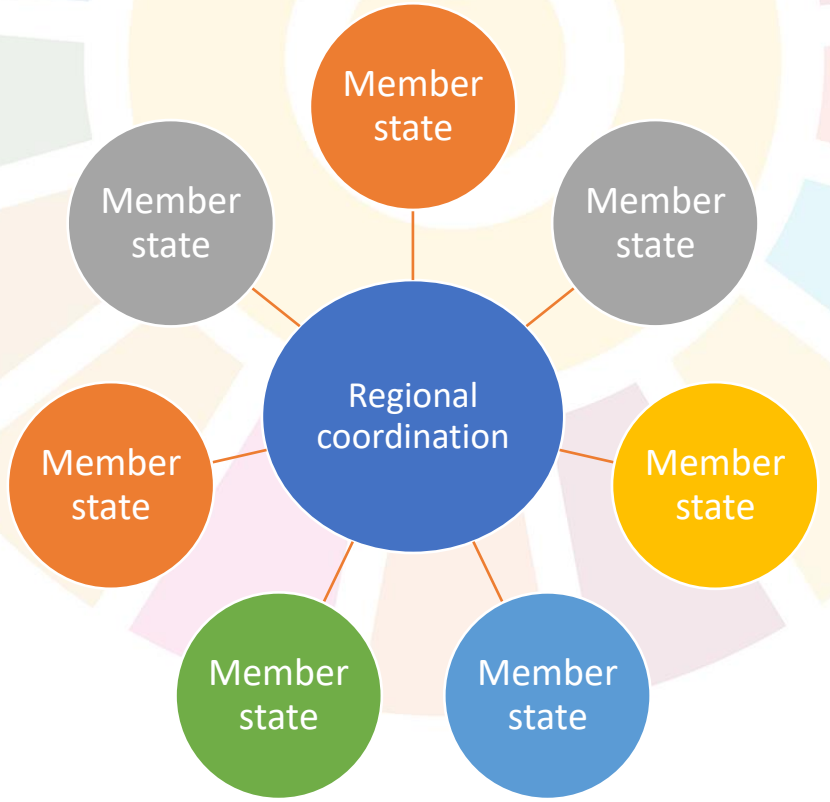
What is ultimately achieved?

- Dumping of low-quality products is avoided in the region, transition of the regional market towards high performance and climate friendly appliances and equipment is accelerated, and objectives of regional economic blocks are achieved

A regional compliance framework

A strategic cost-effective approach to reduce non-compliance:

- A collaborative network for compliance authorities (government to government collaboration) facilitated by regional organization
- Intelligence-sharing and peer learning (market intelligence and test results, testing and market surveillance plans, best practices/lessons learned)
- Conducting joint testing activities, building regional rather than national testing capacity (outsourcing testing, accepting results through MRA)



Considerations for setting up a regional framework:

- Regulatory framework
- Institutional framework
- Collaboration mechanisms
- Budget and funding

Example of regional harmonization process from EAC

EELA Project supported the development of Regional MEPS for lighting in the EAC and SADC regions.

Regional harmonization process in EAC region:

Followed the principles and procedures for the development of East African Standards established by the East African Standards Committee (EASC).

1. Formation of Regional Technical Committee (October 2019)
2. First TC meeting held on 29th November 2022 in Nairobi, Kenya
3. Development of draft MEPS for lighting by a specialized consultant (April 2020)
4. Review and update of draft MEPS by Regional Technical Committee (Sep-Oct 2020)
5. Consultations with National Technical Committees in the EAC Partner States (Feb-Mar 2021)
6. Regional harmonisation meetings to finalise MEPS based on comments (Sep 2021). Six EAC Partner States participated (Uganda, Kenya, Tanzania, Rwanda, Burundi, South Sudan)
7. Sharing of MEPS for public review (Oct-Nov 2021)
8. Balloting (Feb 2022). The technical review was concluded and now at the stage of **Approval and Declaration**

UNIDO-EELA Project is collaborating with UNEP-U4E in the development of MEPS for cooling appliances (residential refrigerators and room air conditioners).

EAC – JUMUIYA YA AFRIKA MASHARIKI

UNBS – UGANDA NATIONAL BUREAU OF STANDARDS

BBN – Bureau Burundais de Normalisation – Burundi Bureau of Standards

KEBS – Kenya Bureau of Standards – Standards for Quality life

RSB – Rwanda Standards Board

TBS – Tanzania Bureau of Standards

SSNBS – South Sudan – National Bureau of Standards

+ Ministries of energy, national and regional technical experts, energy suppliers, etc.

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Example of regional harmonization process from SADC

Regional harmonisation process in SADC region

1. SADCSTAN dedicated webinar on MEPS for lighting was held 11 June 2020
2. MEPS Documents for lighting were revised incorporating comments from Member States and circulated on 9 September 2020
3. Dedicated National TC consultations on MEPS for lighting were held for SADC Member States between 1 October to 14 December 2020
4. SADC regional TC16 meeting was held in December 2020 at which all member states present gave a verbal approval to the adoption of the Harmonized Regional MEPS for Lighting. 75% of the SADC members voted YES to the draft standards
5. Written confirmation followed with deadline of 12 February 2021
6. The MEPS for lighting were approved and adopted by the SADCSTAN Executive Committee after an overwhelming yes vote by the regional technical committee (TC16) in 2021. The approved MEPS for lighting have since been given reference SADC HT 109:2021

https://www.unido.org/news/sadc-member-states-welcome-introduction-new-efficient-lighting-standards

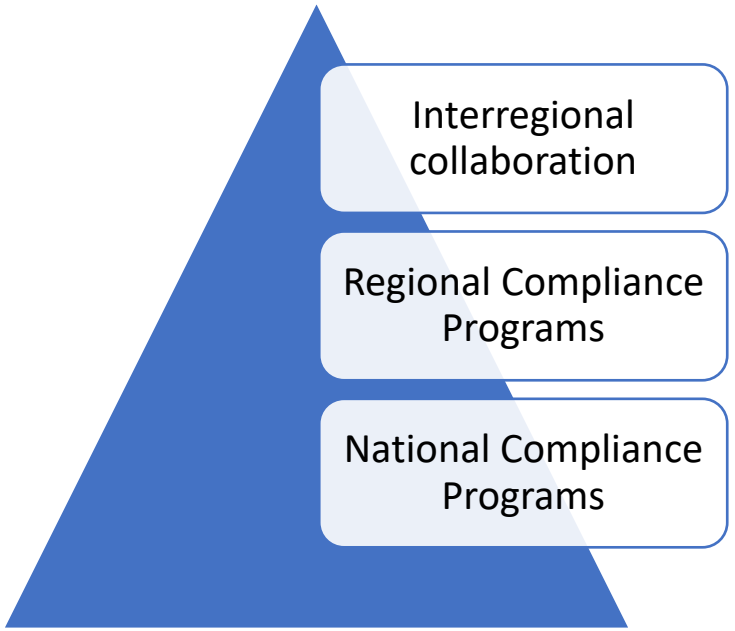
Regional compliance framework for energy efficient appliances policies in EAC & SADC

- The level of enforcement of MEPS for lighting and appliances in EAC and SADC regions is quite low
- EELA Project supported the development of the Regional Compliance Framework for MEPS for lighting and appliances

Objectives of regional compliance framework

- To increase the efficiency of compliance efforts throughout the two regions,
- To establish appropriate communication channels and collaboration between the national compliance authorities through regional centers to share compliance intelligence and resources,
- To establish a regional product registration system,
- To ensure adequate and accessed-by-all testing capacity in the regions,
- To develop common practices and methodologies, and support alignment of national compliance regulations to the extent possible.

Proposed arrangement for the regional compliance framework

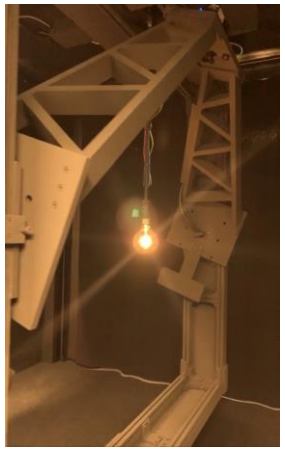


Regional compliance framework elements

GOAL: to enable member states effectively implement regionally harmonized energy efficiency policy measures and protect EAC and SADC markets from non-compliant and low-quality products

FIVE ELEMENTS

1. **Strengthen Regional Centers**
   - Build up capacity of the two centers to coordinate regional collaboration, information sharing, and serve as intra-regional coordinators to align activities between EAC and SADC
2. **Regional Product Registration System [PRS]**
   - EAC and SADC regions establish and use regional Product Registration System to be hosted by EACREEE & SACREEE and implemented nationally. To serve as go-to product registration and compliance resource for member states
3. **Regional Testing Capacity**
   - Member States would use and build on the existing regional network of testing laboratories and use alternative mechanisms
4. **Regional Coordination on Enforcement and Intelligence Sharing**
   - Regional centers coordinate at regional level to share market intelligence and testing information; market surveillance plans and results with all member states; and to conduct joint testing activities with some member state partners
5. **National Compliance Programmes**
   - Member states to establish national compliance programmes to enforce adopted efficiency policies and safeguard markets from substandard products



Goniophotometer at SEA lab (EELA partner)

Handover of portable LightSpion to Partner States for market surveillance

Opportunities for the private sector

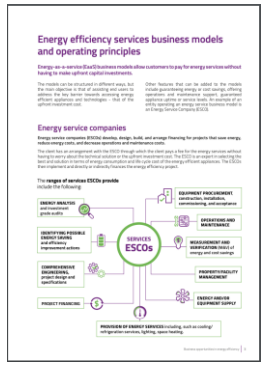
Vibrant markets are supported by enabling policies and regulations, and governments with the capacity to enforce standards, but also through suppliers and other energy companies offering quality products and services, while consumers are aware and are demanding quality energy efficient appliances and equipment.

Barriers to private sector investments

- High upfront cost of EE products
- Lack of affordable funding for EE projects
- Limited technical skills for designing, implementing, operating and maintaining EE products

Energy efficiency service business

- Energy user has an arrangement with energy service company through which they pay a fee for the energy services without worrying about technical solution or upfront investment cost
- Relevant business model - Energy Performance Contracting, Lighting/ Heating/ Cooling as a Service, Energy Efficient Equipment Leasing - depends on the energy user targeted



[Link to EELA private sector strategy]

Programs that support energy service providers and energy users will help the private sector enter the energy efficiency sector

- Awareness raising & capacity building
- Access to affordable financing

… and support manufacturers to transition to EE and CF products.

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