HARMONISATION OF ENERGY EFFICIENCY POLICIES AND IMPLEMENTATION MECHANISMS IN THE EAC, ECOWAS AND SADC REGIONS

Driving energy resilience through Minimum Energy Performance Standards (MEPS) and enforcement mechanisms:
the catalytic role of the EELA Program in regional adoption.

Eleonor Bommart, Unsplash

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Electricity access in Africa:
Around
600 million
Africans lack reliable access to electricity

Energy sector jobs in Africa:
2 million people
are employed in Africa's energy sector. Nearly **4 million additional jobs** will be needed to deliver universal energy access.

Energy consumption in sub-Saharan Africa
180 kilowatt hours
Annual per capita energy consumption in sub-Saharan Africa, compared to **6,500 kWh in Europe and 13,000 kWh in the USA**

Women in the energy sector:
16%
Women employed in the global energy workforce, despite making up nearly 40 % of total employment

Energy intensity in sub-Saharan Africa:
147 tonnes
of oil equivalent (toe)
are consumed per one million $ of GDP in sub-Saharan Africa, compared to a **global average of 106 toe per one million $ of GDP**

GHG savings:
480,000 tonnes
of CO2e
saved through the application of MEPS and labelling under the EELA Project

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Definitions

Decarbonisation
The process of reducing carbon dioxide (CO_2) emissions resulting from human activity, particularly from the energy sector.

Energy Access
Energy access refers to the availability and affordability of reliable, modern energy services that support both daily living and productive activities. It includes access to electricity and clean cooking solutions, which contribute to improved health, education, livelihoods, and gender equality.

Energy-as-a-Service (EaaS) Model
The Energy-as-a-Service (EaaS) model represents a paradigm shift in how energy efficiency solutions are delivered. Rather than selling equipment, service providers retain ownership and deliver energy services—such as lighting, cooling, or refrigeration—for a recurring fee.

Energy Efficiency
Energy efficiency is the practice of delivering the same energy services while using less energy. According to IEA, "energy efficiency is the single largest measure to avoid energy demand in the Net Zero Emissions by 2050 Scenario".

Energy Efficiency Standards and Labels (EE S&L)
Energy Efficiency Standards and Labels (EE S&L) are sets of procedures and regulations that prescribe, respectively, the MEPS for manufactured products and the informative labels that indicate those products' energy performance.

Energy Intensity
Energy intensity is the amount of energy consumed per unit of economic output, typically measured as energy use per unit of GDP. It reflects how efficiently an economy uses energy to produce goods and services.

Energy Label
A standardised visual label that communicates the energy performance of a product using a graded scale. It enables consumers to make informed purchasing decisions and incentivizes manufacturers to enhance the energy efficiency of their products.

Energy Performance Contracting (EPC)
Energy Performance Contracting (EPC) is a financing mechanism where an ESCO implements energy-saving measures and guarantees the resulting savings. Payments to the ESCO are

based on the actual performance of the project.

Energy Security

Energy security refers to the reliable and continuous availability of energy resources at affordable prices. It involves both the long-term stability of national and regional energy systems, and the short-term capacity to manage disruptions in supply and demand.

Energy Supply

The total amount of energy available for use across all sectors of a country's economy.

Energy Service Companies (ESCOs)

ESCOs are legal entities, typically businesses, that design, implement, and often finance energy-saving projects for clients. This model helps reduce upfront costs and promotes long-term energy and financial savings.

Greenhouse Effect

The effect produced by certain atmospheric gases that allow incoming solar radiation to pass through to the Earth's surface but prevent the radiation reflected from the Earth from escaping into outer space.

Minimum Energy Performance Standards (MEPS)

Minimum Energy Performance Standards (MEPS) specify the minimum level of energy performance that appliances and equipment must meet before they can be supplied or used for commercial purposes.

Legal and Regulatory Framework (LRF)

Combination of the laws, institutions, rules and regulations governing the operations of the electricity industry.

Renewable Energy

Renewable energy is energy derived from natural sources that are replenished faster than they are consumed. Generating renewable energy creates far lower emissions than burning fossil fuels.

List of Acronyms and Abbreviations

A
AFREC   African Energy Commission

B
BMZ   Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung

C
CaaS   Cooling-as-a-Service
CTCN   Climate Technology Centre and Network

E
EaaS   Energy as a Service
EAC   East African Community
EACREEE   East African Centre of Excellence for Renewable Energy and Efficiency
EASC   East African Standards Committee
ECOQMARK   ECOWAS Regional Conformity Mark
ECOWAS   Economic Community of West African States
ECREEE   ECOWAS Centre for Renewable Energy and Energy Efficiency
EE   Energy Efficiency
EELA Program Energy Efficiency for Sustainable Livelihoods in Africa Program
EELA Project   Energy Efficiency Lighting and Appliances Project
EE S&L   Energy Efficiency Standards and Labels
EPC   Energy Performance Contracting
EPR   Extended Producer Responsibility
ESCOs   Energy Service Companies
E-Waste   Electronic Waste

G
GIZ   Gesellschaft für Internationale Zusammenarbeit

K
KGRTC   Kafue Gorge Regional Training Centre

I
IEA   International Energy Agency
IEC   International Electrotechnical Commission Directives
INNOQ   Instituto Nacional de Normalização e Qualidade
ISO   International Organisation for Standardisation

L

LaaS   Lighting-as-a-Service
LRF   Legal and Regulatory Framework

M

MEPS   Minimum Energy Performance Standards
MRV   Measurement, Reporting, and Verification

O

OIF   Organisation Internationale de la Francophonie

P

ProCEM   Program Promotion of Climate-friendly Electricity Market

R

REEESAP   Renewable Energy and Energy Efficiency Strategy and Action Plan

S

SACREEE   SADC Centre for Renewable Energy and Energy Efficiency
SADC   Southern Africa Development Community
SADCSTAN   SADC Cooperation in Standardisation
SCs   Sub-Committees
SEA   Swedish Energy Agency
Sida   The Swedish International Development Cooperation Agency

T

TA   Technical Assistance
TC16   Technical Committee 16
TCs   Technical Committees
TBT   Technical Barriers to Trade
THCs   Technical Harmonisation Committees
TMC   Technical Management Committee
TOE   Tonnes of Oil Equivalent

U

UNEP   United Nations Environment Programme
UNIDO   United Nations Industrial Development Organization

W

WTO/TBT   World Trade Organization's Technical Barriers to Trade Agreements

Executive Summary

Africa's industrial sector is expanding, yet its productivity is often constrained by low energy efficiency and outdated technologies. These challenges are compounded by unreliable power supply, which collectively undermine industrial and economic competitiveness, increase environmental impacts, and discourage long-term investment.

Against this backdrop, energy efficiency emerges as a cornerstone for industrial transformation. By enabling the same level of output with reduced energy consumption, energy efficiency strengthens critical pillars of inclusive and sustainable development, including energy performance, access, and security. However, its full potential cannot be unlocked through fragmented actions alone. Comprehensive policy measures are essential to scale up innovation, generating ripple effects across the entire value chain and delivering tangible benefits for both industry and consumers.

Over the past years, African countries have made notable strides in this direction through the development and adoption of regional Minimum Energy Performance Standards (MEPS) for lighting and cooling appliances, including residential refrigerators and air conditioners. Complemented by the introduction of regional compliance frameworks and public procurement guidelines for energy-efficient products, these advances have laid the groundwork for systemic transformation in East and Southern Africa.

At the center of these achievements lies the Energy Efficiency Lighting and Appliances (EELA) Project, implemented by the United Nations Industrial Development Organization (UNIDO) from 2019 to 2024 with funding from the Government of Sweden. Through strong collaboration with international partners, national governments, regional energy efficiency centres, and the private sector, EELA has significantly reinforced the policy and regulatory landscape for energy-efficient products in the EAC and SADC regions. Building on this solid foundation, the initiative now transitions into the EELA Program, which expands its geographic scope to include the ECOWAS region while deepening regional coordination and broadening its technical focus to new sectors such as industrial motors, commercial refrigeration, and distribution transformers.

This report explores how recent policy updates on Minimum Energy Performance Standards (MEPS) for lighting and appliances, together with their progressive harmonisation across sub-Saharan Africa, have generated broad systemic benefits. These advancements are helping to create the conditions for deeper and more lasting impacts on both competitiveness and climate goals. The report also details the processes that guided the MEPS revisions and highlights the complementary measures that support their effective implementation, including enforcement mechanisms, financing models, capacity-building initiatives, and awareness-raising activities that promote the value of energy efficiency.

How the Report is Organised

The report is structured around a series of key thematic chapters.

Chapter 1 highlights the challenges and opportunities within the energy landscape of sub-Saharan Africa, illustrating how initiatives such as EELA have designed potential responses to create lasting impact.

Chapter 2 examines the processes through which innovation and harmonisation of MEPS have been carried out, while also identifying the next policy areas expected to undergo harmonisation efforts.

Chapter 3 describes the main enforcement measures that ensure the effectiveness of these policies, including guidelines for product registration and certification, testing infrastructure, public procurement frameworks, and end-of-life management practices.

Chapter 4 outlines four key models that enable the mobilisation of finance for energy efficiency improvements and presents case studies that illustrate their practical application.

Chapter 5 highlights capacity development and knowledge dissemination as essential drivers of energy efficiency, covering inclusive training, technical skill strengthening, and enhanced testing and regional collaboration.

Chapter 6 presents the main impact indicators of the EELA Project over its four years of implementation, providing insight into the broader potential of this type of initiative.

Who is This Report For?

This guide is designed for a broad spectrum of stakeholders committed to advancing energy efficiency across Africa. At its core, it serves policy makers and regulators at both national and regional levels, offering practical insights into how participatory approaches have successfully delivered harmonised policies.

For governments and regional bodies, the report provides a roadmap for aligning technical standards with institutional capacity, ensuring that policy harmonisation translates into measurable progress.

Equally, the guide speaks to private sector actors, including sector regulators, trade associations, and major industrial operators. For these stakeholders, the initiatives outlined here represent a strategic opportunity to capture the economic and environmental benefits of energy efficiency.

The report also highlights financing models and capacity-building measures that empower companies to overcome upfront cost barriers and actively participate in Africa's transition toward sustainable industrialisation.

Chapter 1
Energy Efficiency Policy Harmonisation in Sub-Saharan Africa: Challenges and Opportunities

Africa has long exhibited higher energy intensity than the global average. With 147 tonnes of oil equivalent (toe) consumed per one million dollars of GDP, sub-Saharan **Africa exceeds the global average of 106 toe per one million dollars**. This pattern of energy consumption is shaped by several persistent challenges, including heavy reliance on biomass fuels for cooking and the widespread use of outdated and energy-intensive appliances and technologies.

In the absence of Minimum Energy Performance Standards (MEPS), **African markets have often been saturated with low-cost, inefficient products**, particularly lighting, cooling systems, and household appliances. This has resulted in excessive energy consumption and increased pressure on already fragile power systems. Such inefficiency has far-reaching consequences, including higher energy supply costs, in-
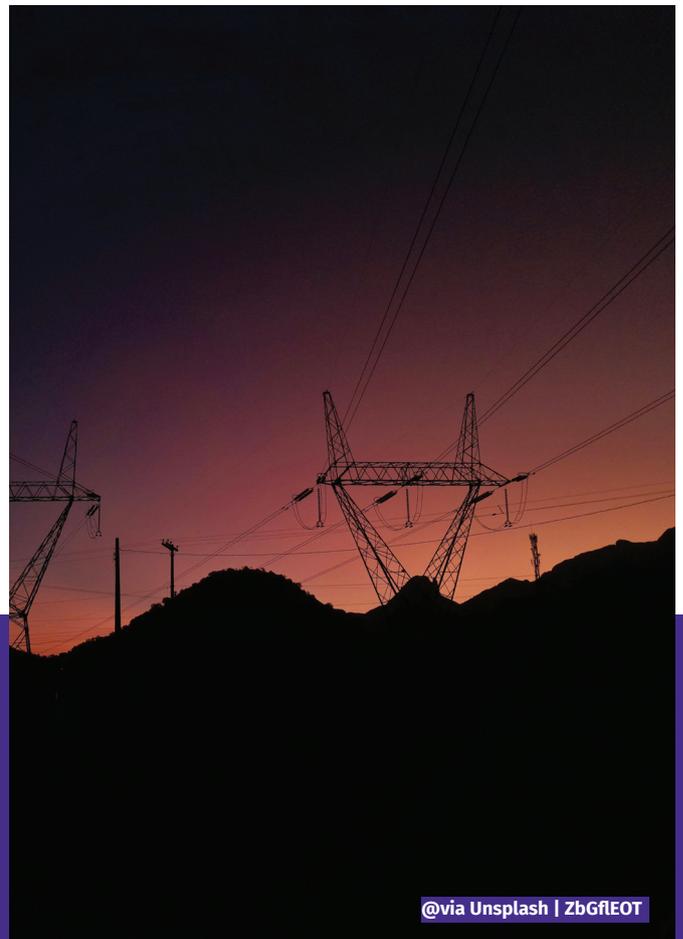
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" Energy demand in sub-Saharan Africa is expected to surge, driven by three key drivers: rapid population growth, economic expansion, and accelerating urbanisation. Yet the expansion of electricity access is not keeping pace, creating a widening energy gap ".

creased prices for locally produced goods, and greater environmental degradation.

However, significant progress has emerged at the regional level. The East African Community (EAC), the Economic Community of West African States (ECOWAS), and the Southern Africa Development Community (SADC) regions have made significant advances in the harmonisation of energy efficiency policies across their member states. This coordinated approach represents a major step forward in creating consistent market standards and facilitating cross-border trade in energy efficient technologies.

This chapter explores the **evolving landscape of energy efficiency policy harmonisation in sub-Saharan Africa**, focusing on the challenges and opportunities across the EAC, ECOWAS and SADC regions. It begins by examining the broader energy context, including persistent access gap and policy fragmentation, and highlights the strategic importance of energy efficiency as a lever for sustainable development. The chapter then outlines the process of regional policy harmonisation, emphasizing collaborative efforts and institutional coordination. Central to this narrative is the **Energy Efficiency Lighting and Appliances (EELA) Project** in East and Southern Africa, which laid the groundwork for regional market transformation through its multi-stakeholder approach, gender responsive strategies, and theory of change.

1.1 Navigating the Energy Landscape: Energy Access, Policy Challenges and Opportunities for Efficiency in the EAC, ECOWAS and SADC regions

Sub-Saharan Africa remains severely unserved in terms of energy access despite being endowed with abundant energy resources. Around **600 million people in Africa lack electricity**, with 98% of them located in sub-Saharan Africa. Additionally, approximately 963 million people in Africa have no access to clean cooking facilities. Excluding South Africa, sub-Saharan Africa's per capita energy consumption averages just 180 kilowatt hours (kWh) annually, compared to 6,500 kWh in Europe and 13,000 kWh in the United States of America (USA) .

Energy demand in sub-Saharan Africa is expected to surge, driven by three key drivers: rapid population growth, economic expansion, and accelerating urbanisation. Yet the expansion of electricity access is not keeping pace, creating a widening energy gap. Despite being rich in energy resources, many sub-Saharan countries remain **locked in a raw material export model**, shipping unprocessed minerals, oil and gas to developed nations to generate revenue. Meanwhile, energy-efficient technologies are manufactured in the developed countries and exported to Africa, creating a barrier that significantly hampers the growth of the local energy efficiency market.

Countries in sub-Saharan region face major structural challenges in their electricity sectors, including **insufficient generation capacity**, inadequate transmission and distribution networks. This infrastructure deficit leads to unreliable power supply and significant electricity losses, undermining both economic productivity and energy security across the region.

These technical limitations are exacerbated by **weak policy and regulatory frameworks for energy efficiency**, which have contributed to turning the region into a dumping ground for inefficient and low-quality energy products. The policy vacuum is particularly evident in the absence of national energy efficiency policies in some of the sub-Saharan countries. Without comprehensive policy, mandatory standards and proper labelling systems, these nations lack the regulatory tools necessary to drive energy efficiency improvements.

1.1.1 EAC
EAC is a regional intergovernmental organisation

composed of partner states in East Africa, working together to promote economic integration, policy harmonisation, and sustainable development across the region. EAC initiated the development of a unified **regional Energy Efficiency Policy in 2021**, leveraging technical and financial support from the United Nations Industrial Development Organization (UNIDO) through its EELA Project.

Central to the policy formulation was an **extensive consultation framework** that ensured representation across all the EAC Partner States. National consultations were systematically conducted in the Democratic Republic of the Congo, Republic of Burundi, Republic of Kenya, Republic of Rwanda, Federal Republic of Somalia, Republic of South Sudan, Republic of Uganda, and United Republic of Tanzania. This comprehensive engagement strategy ensured that diverse national contexts, priorities and implementation capacities were reflected into the regional policy framework.

The EAC Energy Efficiency Policy aims to create an enabling environment for adoption of EE technologies and practices across EAC Partner States through harmonisation of energy efficiency policy instruments. The specific objectives include to:

1. Advocate for establishment of **institutional structures** in EAC Partner States for spearheading energy efficiency programmes;
2. Spearhead development and harmonisation of an **energy efficiency metric framework** for tracking energy efficiency progress in the EAC region;
3. Promote **collaboration among Partner States** in implementation of energy efficiency programmes, sourcing for financing, and capacity building in the region;
4. Promote the adoption of a **harmonised policy and regulatory framework** for promoting energy efficiency in the region through harmonisation of energy efficiency standards and

conformity assessments;
5. **Set energy efficiency targets** for the EAC region;
6. **Promote research, development and innovation** in energy efficiency;
7. **Increase awareness** and understanding of energy efficiency in the EAC region.

The policy adopts a **holistic approach**, addressing energy efficiency across critical economic sectors including appliances and equipment, industrial and agriculture operations, transportation systems, the building sector, as well as the energy utilities. Additionally, the framework incorporates essential cross-cutting areas such as information management, local expertise and capacity building, inter-agency planning and coordination mechanisms, financing instruments for energy efficiency, and investment stimulation measures in energy efficiency.

The process for harmonising EAC Energy Efficiency Policy has been led by the **East African Sectoral Council on Energy, Mining and Petroleum**, while the **East African Council of Ministers** holds the mandate to approve the policies. Once a draft policy document is prepared, it is submitted to the EAC Secretariat for review. The Secretariat then coordinates national consultations and regional harmonisation meetings.

1.1.2. ECOWAS

ECOWAS is a regional organisation mandated to promote economic integration among the member countries. In accordance with the Article 3 of the revised ECOWAS Treaty (1993), ECOWAS member states ensure coordination of national policies and promotion of integration programmes, projects and activities. These efforts span key areas such as food, agriculture and natural resources, industry, transport and communications, energy, trade, money and finance, taxation, economic reform policies, human resources, education, information, culture, science, technology, services, health, tourism and legal matters.

To support this integration, ECOWAS adopted the **Regulation C/REG.14/12/12 Adopting ECOWAS Standards Harmonisation Model & Procedures in the Harmonisation of Regional Standards**. This regulation is based on the relevant International Organisation for Standardisation (ISO), the International Electro-Technical Commission Directives (IEC) and World Trade Organization's Technical Barriers to Trade Agreements (WTO/TBT). While not focusing solely on energy efficiency, Regulation C/REG.14/12/12 represents the legal and procedural backbone that has enabled the harmonisation of energy efficiency standards across the ECOWAS region.

Building on the institutional and procedural framework of the Regulation C/REG.14/12/12, ECOWAS adopted its **Energy Efficiency Policy in 2013** to define specific goals and strategies to improve energy efficiency across the region.

The policy sets the following targets:

- **Phase out inefficient incandescent lamps** by 2020;
- **Reduce losses in electricity distribution**, from the current range of 15% to 40%, to under 10% by 2020;
- Achieve **universal access** to safe, clean, affordable, efficient and sustainable cooking for the entire population of ECOWAS, by 2030;
- Establish an **ECOWAS Technical Committee for Energy Efficiency Standards and Labelling**, and adopt initial region-wide standards and labels for major energy equipment by end of 2014;
- Create **instruments for financing sustainable energy**, including carbon finance, by the end of 2013;
- By 2015, **begin implementation in each ECOWAS country at least one of the priority initiatives**;
- Implement measures that **free 2000 MW of power generation capacity**.

1.1.3. SADC

SADC is a regional organisation that fosters economic integration, sustainable development, and political cooperation among countries in Southern Africa. In the SADC region, the development of strategic expertise and harmonisation of regional policies and strategies to accelerate regional integration and sustainable development in the region has been undertaken by the **SADC Secretariat**. As the principal executive institution of the Community, the Secretariat is responsible for strategic planning, the implementation of regional strategies and policies, and the coordination of the national consultations and regional harmonisation meetings for regional policies and standards. The Secretariat works closely with member states ministries and relevant institutions to draft regional standards, labels, and other regulatory instruments. SADC's efforts in policy harmonisation are aligned with the broader continental and global frameworks, including the Tripartite Free Trade Area agreement, the African Union Agenda 2063, and the United Nations Agenda for Sustainable Development.

In 2017, SADC Ministries responsible for energy adopted the **Renewable Energy and Energy Efficiency Strategy and Action Plan (REEESAP)**, covering the period from 2016 to 2030. This strategic framework serves as a roadmap for SADC Member States to develop national energy and energy efficiency action plans structured around five core pillars:

- Promoting energy efficiency (EE) and renewable energy (RE) technologies;
- Mobilising financial resources for EE/RE projects;
- Supporting industrialisation through energy-efficient technologies;
- Enhancing energy access, particularly for underserved and rural populations;
- Reducing dependency on energy imports and mitigate climate risks.

For SADC, **Article 6** of the Technical Regulation Framework has objectives of identification, prevention and elimination of unnecessary technical barriers to trade (TBTs) among Member States and between SADC and other regional and international trading blocs. This is achieved through harmonised standards, technical regulations, and conformity assessment procedures in order to facilitate and increase trade in goods and services.

The SADCSTAN Standards harmonisation process, which is **guided by the principles of consensus**, coherence, impartiality, transparency and relevance, operationalises the goals of Article 6 and is implemented as follows:

- Harmonisation work is undertaken within Technical Committees (TCs) or Sub-Committees (SCs) hosted by National Standards Bodies (NSBs);
- Each TC operates within a scope of work assigned;
- Member States participate as P (Participating) or O (observer) members;
- Votes by 0 members have no consequence on balloting;

- A minimum threshold of 75% of P votes is required for a standard to be adopted as a regional harmonised text (HT);
- International standards are the first choice of harmonisation work.

1.2   The EELA Project: Overview of Objectives and Approach

The Energy Efficient Lighting and Appliances (EELA) Project in East and Southern Africa was designed to **support and advance regional energy efficiency policies by fostering market development for energy-efficient lighting and appliances**. By aligning with national and regional frameworks, the project sought to strengthen policy implementation, promote regulatory compliance, and accelerate the adoption of sustainable energy solutions across East and Southern Africa.

Key outcomes included:
- Establishment of a regional coordination mechanism for market transformation;
- Improved policy and regulatory frameworks with climate and gender responsiveness;
- Strengthened institutional and technical ca-

PROJECT STAGE	ASSOCIATED DOCUMENT		TIME FRAME
	Name	**Abbreviation**	
0: Preliminary Stage	**Preliminary Work Item**	**PWI**	**Not Applicable**
1: Proposal Stage	**New Work Item Proposal**		**3 or 5 Months**
2: Preparatory Stage	**Working Draft(s)**		**Not Applicable**
3: Committee Stage	**Committee Draft(s)**		**4 months** (4-6 months)
4: Enquiry Stage	**Draft Harmonised Standard**		**3 months** (5 months for direct entry)
5: Approval Stage	**Final Draft Harmonised**		**2 months**

Figure 1: Stages of standards development within SADCSTAN

pacities;
- Increased awareness among market actors and policymakers;
- Introduction of incentive mechanisms to promote uptake of energy-efficient products.

The project was implemented from June 2019 to November 2024, funded by the **Government of Sweden** through the **Swedish International Development Cooperation Agency (Sida)**. Execution was led by **UNIDO**, with **EACREEE** and **SACREEE** serving as regional execution centres, and technical support provided by the **Swedish Energy Agency (SEA)** and **CLASP**.

Following its successful completion, and in recognition of its impact, Sida allocated additional funding for a new phase: the **Energy Efficiency for Sustainable Livelihoods in Africa (EELA) Program**. This programme builds on the achievements of the EELA Project and expands its scope both thematically and geographically, aiming to drive market transformation toward a cleaner, more resilient, and inclusive energy market across 36 African countries.

The programme promotes inclusive and sustainable economic growth through integrated energy efficiency interventions, focusing on:

- High-performing, affordable energy-efficient appliances;
- Industrial energy efficiency investments;
- Development of sustainable local value chains.

Significantly, **the EELA Program has expanded to include the ECOWAS**, alongside EAC and SADC, marking a major expansion in regional collaboration. It is implemented through regional platforms and country-specific initiatives such as the **EELA Kenya Country Window Project**, the **EELA Zambia Country Window Project**, and the **EELA Zimbabwe Country Window Project**, each at different stages of implementation. Execution continues under UNIDO, with EACREEE, ECREEE and SACREEE as regional execution centres.

1.3   Overview of Key Stakeholders

The stakeholders involved in the implementation of the EELA Project and Program include:

United Nations Industrial Development Organization (UNIDO)

UNIDO is a specialized agency of the United Nations with a unique mandate to promote, dynamise and accelerate industrial development. UNIDO was the Lead Implementer of the first EELA Project and is the Lead Implementer of the EELA Program. UNIDO hosts the management and technical project staff of the Project Coordination Unit (PCU).

East African Centre of Excellence for Renewable Energy and Efficiency (EACREEE)

EACREEE was one of the executing agencies of the first EELA Project and the ongoing EELA Program. EACREEE hosts technical project staff of the PCU.

ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE)

ECREEE is one of the executing agencies of the EELA Program. ECREEE hosts technical project staff of the PCU.

SADC Centre for Renewable Energy and Energy Efficiency (SACREEE)

SACREEE was one of the executing agencies of the first EELA Project and EELA Program. EACREEE hosts technical project staff of the PCU.

Swedish Energy Agency (SEA)

Swedish Energy Agency (SEA) operates under the Ministry of Environment and Energy. Among its responsabilities, SEA supports the development and dissemination of knowledge on energy efficiency for households, industry, and the public sector. SEA also contributes to the development of MEPS and capacity building activities.

CLASP

CLASP, an international NGO, is the leading global authority on efficient appliances' role in fighting climate change and improving people's lives.
CLASP supported the EELA Project as follows:

1. Developed a regional lighting framework for SADC and EAC on the implementation of regional standards and labelling program;
2. Developed the regional MEPS for lighting in EAC and SADC regions;
3. Developed the regional compliance framework for EELA in EAC and SADC regions;
4. Developed the public procurement guidelines for EELA in EAC and SADC regions.

Regional economic communities

The EAC and SADC Secretariats were part of the steering committee of the EELA Project.

Ministries responsible for energy

Ministries responsible for energy in EAC and SADC supported the policy activities of the EELA Project and designated the project's focal points.

SADC Cooperation in Standardisation – SADCSTAN

SADCSTAN is a SADC Cooperation in Standardisation mandated by the SADC Council of Ministers to coordinate standardisation activities and services in the region. Established 1997 in Port Louis, Mauritius, SADCSTAN is one of the seven structures implementing the Technical Barriers to Trade (TBT) Annex to the SADC Protocol on Trade. The seven structures form the SADC Standardization, Quality Assurance, Accreditation and Metrology (SQAM) body. The umbrella structure, the SADC Expert Group (TBTEG), is responsible for coordinating the scope of work for all 46 strategic partners for regional SQAM activities, and it supports the SADC Secretariat in an advisory capacity on TBT issues. SADCSTAN has been the main cooperation partner regarding the development and implementation of the MEPS under the EELA Project and hosts the technical committee for SADC.

East African Standards Committee (EASC)

The East African Standards Committee (EASC) is a Sectoral Committee established by Article 4 of the EAC Standards Quality Management, Metrology, and Testing (SQMT) Act (2006), which aims to harmonise standards and technical regulations in the region. The functions of the Committee includes: (i) undertaking and coordinating activities related to standardisation, metrology and conformity assessment; (ii) monitoring and keeping under constant review the implementation of the standardisation, metrology and conformity assessment programmes at national and Community levels; (iii) establishing procedures for the development, approval, gazetting and withdrawal of harmonised East African Standards including the adoption of these standards at the national levels.

EASC was the main cooperation partner regarding the development and implementation of the MEPS in the EAC region and hosts the technical committees for EAC.

United Nations Environment Programme-United for Efficiency (UNEP-U4E)

UNEP-U4E is a global effort supporting developing countries and emerging economies to move their markets to energy-efficient appliances and equipment. It collaborated with the EELA Project in the development of regional MEPS and energy labels for cooling appliances (residential refrigerators and room air conditioners).

Gender focal points and experts; local and international associations and/or agencies promoting gender equality

Stakeholder meetings considered relevant gender focal points and experts, as well as local and international associations and or agencies promoting gender equality and women's empowerment, particularly those focusing on the nexus between gender and lighting, energy needs, energy efficiency and entrepreneurship. Gender experts were involved throughout the project activities, especially in conducting market studies and supply chain analyses, developing the communication plan as well as the monitoring and evaluation framework.

1.4 Theory of Change: Strategic Path to Impact

Since 2019, the developmental impact of the regional EELA Project has rested on a central assumption: that increased adoption of energy efficiency (EE) products, services, and industrial equipment can **trigger a chain of development benefits**.

According to this theory of change, greater uptake of EE solutions contributes to a **wide range of development gains**. On the energy front, it improves access by reducing grid strain, improving trade balances through reduced fuel imports, and enhanced affordability for off-grid users. Socially, EE adoption contributes to better health outcomes and household savings. Environmentally, it reduces carbon emissions and e-waste. Economically, it protects regional markets from low-quality imports, boost local business opportunities, and strengthens food and medical storage systems. Together, these interconnected results support sustainable and inclusive energy access.

To unlock these gains, EELA has focused on creating enabling conditions, such as harmonised policies, stronger institutional capacities, and improved access to finance. These measures have accelerated market transformation by encouraging the adoption of EE technologies, promoting innovative business models such as energy-as-a-service, and supporting productive-use equipment, especially in agro-processing and cooling.

Together, these interconnected effects are generating a **reinforcing cycle of economic growth**, social well-being, and environmental sustainability, advancing the shared vision of inclusive and resilient energy access across Africa.

IMPROVED ACCESS TO SUSTAINABLE ENERGY AND MITIGATION OF NEGATIVE EXTERNALITIES OF THE ENERGY SYSTEM IN EAC AND SADC

Lower life cycle costs for users

Reduced cost of energy per service deliver for users = lower bills

Reduced carbon footprint

Reduced harmful waste

Increased electricity capacity in constrained network

Reduced demand for grid power with excess used for access - making it more affordable

Improved trade balances (less imported fuel) and more funds to be invested in other activities, thus boosting economic development

Improved health (indoor and outdoor air quality)

Improved quality life by delivering sustainable energy services with less maintenance

Demand and uptake of quality EELA products is accelerated / increased

Promotion of a market transformation for EELA

Regional Mechanism and Platform Established

Regional Policies and Regulations Strengthened

Capacity Built

Awareness Raised

Private Sector Supported

Partnerships / Outreach

TC Establishment

Regional Energy Efficiency Centres strenghtening

Compliance framework development

MEPS development and adoption

Waste management guidelines

EAC Energy Efficiency Policy

Workshops / Webinars / Training

Public procurement and EELA guidelines

E-learning platform

Testing equipment / testing centres

Communication strategy

Website

Side events and conferences

Awareness

TA and co-financing facility

Figure 2: Theory of change of the EELA Project

1.5   Empowering Inclusive Energy Transition: Gender Mainstreaming in EELA

Gender disparities are still affecting the energy sector under multiple perspectives. Globally, **women represent only 16 % of the energy workforce**, despite making up **nearly 40 % of total employment**, highlighting persistent structural inequalities in the sector. Among these women, one in three often finds herself as the only woman in the room, underscoring the lack of gender diversity in the industry. This **imbalance** is not limited to the workforce; it also extends to energy access and decision-making at the household level. In East and Southern Africa, research by Energia 2020 found that over **68 % of energy-efficient appliance purchases were made by men**, even though women are primary users in households. These disparities demonstrate that a just energy transition requires not only a shift to clean energy but also a transformation in how energy projects are developed and who benefits from them.

Gender mainstreaming has been a core component of EELA since its inception, reflecting its commitment to inclusive and sustainable economic growth.

Recognizing that energy access and efficiency affect women and men differently, EELA has moved beyond simply tracking gender participation to actively address barriers, **integrate gender considerations into project design**, and create opportunities for women to participate, benefit, and lead in the energy sector. By incorporating a gender-responsive approach across all policies, activities and outcomes, EELA continues to ensure that the transition to energy efficiency is inclusive, just, and sustainable.

As part of this effort, a **gender baseline assessment** was carried at the outset of the EELA Project to inform planning and guide the integration of gender considerations throughout the project lifecycle. This was complemented by other initiatives, including:

Inclusion in Policy Frameworks and Regional Integration

EELA promotes the development of gender-responsive policies and regulations for energy-efficient lighting, appliances, and industrial equipment, addressing both climate change and gender equality. The program collaborates with **gender experts** to ensure women's needs and voices are integrated into sustainable

Ashanti Mbanga receives the EELA Champion Award for outstanding country action in promoting energy efficiency @ EELA, UNIDO

energy systems. **Two regional compliance frameworks (SADC and EAC) were developed with explicit gender mainstreaming components**, and the EAC Regional Energy Efficiency Policy was designed to be gender-sensitive, ensuring equitable access to energy services and inclusive implementation. EELA also facilitates gender mainstreaming across EAC, ECOWAS, and SADC through policy dialogues and cross-learning, fostering a regional approach to a just energy transition.

Gender Focal Points

A total of 18 gender focal points were identified and integrated into the EELA Project's implementation, including participation in Project Steering Committee (PSC) meetings. Gender experts played a key role during project design and continue to support effective gender mainstreaming throughout the EELA Program implementation. Progress reports confirm the involvement of a gender expert from UNIDO who provided ongoing guidance on gender-related aspects of EELA.

Targeted Capacity Building

EELA embeds gender considerations into all training, technical assistance, and skills development initiatives. Through the EELA E-learning Platform and regional webinars, **gender inclusion is mainstreamed across capacity-building efforts**, supporting women to develop green careers in a traditionally male-dominated sector. Ten regional webinars were organised, including a session on "Putting a Gender Lens on EELA," reaching together 1560 stakeholders (19% women). Additionally, 154 change agents (28% women) were trained, creating a pool of professionals equipped to integrate gender considerations into national EE initiatives.

Private Sector Engagement and Business Models

The EELA Technical Assistance (TA) Facility supports private sector actors, including women-led businesses and entrepreneurs along the EE value chain. Emphasis is placed on **increasing women's participation in energy service companies (ESCOs)**, consulting, and

manufacturing. EELA also supports innovative business models such as Energy as a Service (EaaS) which address barriers women face in accessing finance, technology, and information, enabling inclusive energy solutions.

Gender-Responsive Procurement

Public procurement guidelines were developed to support women-led enterprises and integrate gender-responsive processes. By **embedding gender criteria into procurement**, EELA helps create a level playing field and expands opportunities for women-owned businesses to participate in the EE market.

Gender in Monitoring and Evaluation (M&E)

Gender-disaggregated data is collected to track participation and project impacts. Although a 40% female participation target was set during the EELA Project timespan (2019-2024), actual participation was around 25%. This highlights the need for stronger gender outreach and targeted capacity-building measures to increase women's involvement in future project activities.

Awareness and Knowledge Sharing

EELA promotes the gender dimensions of energy efficiency through fact sheets, case studies, and publications highlighting women's roles in the sector. Gender-focused sessions were also integrated into the EELA Annual Stakeholder Forum and regional webinars, creating platforms for dialogue among policymakers, private sector actors, and women professionals.

Recommendations for Strengthening Gender Mainstreaming in Design and Implementation

EELA emphasises the need to intensify efforts to encourage women's participation in the energy sector and to raise awareness of the critical linkages between energy efficiency and gender. Based on EELA' s experience, the following measures are recommended:

- **Maintain gender baseline assessments**: Conducting a gender baseline assessment has proven to be good practice and should be continued. Reliable gender-disaggregated data and understanding gender-energy linkages ensure projects address women's needs and enable gender-responsive implementation;

- **Strengthen collaboration with local actors**: Involve local women's associations and government agencies throughout all project stages to ensure gender-responsive implementation. Maintain gender focal points and experts to ensure strategies effectively involve women at the local level;

- **Standardise gender tracking in M&E systems**: Track gender participation using standardised methods. Train M&E stakeholders and provide tools and templates to ensure consistent reporting of gender indicators;

- **Promote innovative engagement of young women**: Create targeted activities to engage young women, for example, by partnering with educational institutions;

- **Provide tailored capacity building for women**: Organise training sessions specifically for women, including practical guidance on interpreting energy labels and selecting efficient appliances that meet their household and business needs.

1.6   Lessons Learnt and Key Takeaways

The harmonisation of energy standards across the EAC, ECOWAS and SADC regions addresses a shared objective of improving energy efficiency and strengthening energy access and security across sub-Saharan Africa. While each region adopts its own process for developing regional policies, standards, and labelling frameworks, **all approaches are grounded in inclusive, multi-stakeholder governance**. This ensures that regional strategies are responsive to the specific contexts, priorities, and implementation capacities of member states.

The Energy Efficient Lighting and Appliances (EELA) Project in East and Southern Africa was launched to contribute to inclusive development by promoting the adoption of energy-efficient products and systems across the East and Southern Africa regions, addressing both energy access and sustainability challenges. Since 2019, its theory of change has been based on the premise that **increased uptake of energy-efficient appliances and equipment can generate a cascade of development benefits,** improving energy access and affordability, enhancing health and quality of life, reducing environmental impacts, and strengthening local economies. To unlock these outcomes, EELA has focused on enabling conditions such as **harmonised policies**, institutional **capacity building**, and **access to finance**, thereby accelerating market transformation and supporting inclusive, sustainable energy access.

Gender-responsive policy design has proven essential for ensuring that energy efficiency benefits reach all segments of society. The EELA initiative has adopted a gender mainstreaming approach from the outset, operationalising targeted measures such as the appointment of gender focal points, the implementation of gender baseline assessments, and the integration of gender criteria into procurement processes and capacity-building activities. This approach provides a replicable model for future regional initiatives.

Chapter 2
Standardisation of Market Trasformation: Minimum Energy Performance Standards (MEPS) and Labels

Minimum Energy Performance Standards (MEPS) specify the minimum level of energy performance that appliances and equipment must meet or exceed before they can be supplied or used for commercial purposes. **MEPS can effectively accelerate market transformation for efficient appliances**, spur innovation and construction, create demand for renovation services, and provide certainty to market players across the value chain.

Energy Efficiency Standards and Labels (EE S&L) are sets of procedures and regulations that prescribe, respectively, the MEPS for manufactured products and the informative labels indicating the products' energy performance. They are meant to **help the market recognise energy efficiency and act on it**. Energy labels provide information to end-users about the energy

consumption and performance of appliances and equipment to which they are affixed. When developing

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" MEPS can effectively accelerate deep energy renovation, spur innovation and construction, create demand for renovation services, and provide certainty to market players across the value chain ".

an energy label, it is generally advisable to establish levels of ambition that are both appropriate for the local market and, where possible, aligned with existing international labels. This approach helps avoid expensive re-testing for imported products and facilitate smoother market integration.

This chapter outlines the research and alignment process that led to the definition of MEPS, highlighting the institutional framework that enabled this participatory effort. It also presents the energy labelling initiative and identifies the key sectors targeted by the new MEPS policy, such as commercial refrigerators, distribution transformers, and industrial motors, offering a clear roadmap for advancing energy efficiency across the African subcontinent.

2.1. The Process of the Development of Regionally Harmonised MEPS and Labels in EAC, ECOWAS and SADC

The harmonisation of standards refers to the process of aligning technical requirements across member states to facilitate trade and regional integration. This alignment helps reduce Technical Barriers to Trade (TBT) by establishing common definitions for goods and services. The World Trade Organisation (WTO) Agreement on TBT strongly encourages members to base their measures on **international standards** to promote smoother trade flows, while its transparency provisions also contribute to a more predictable and stable trading environment.

In the energy sector, harmonising MEPs across EAC, ECOWAS, and SADC is crucial for regional economic integration, boosting trade, and promoting energy efficiency. It streamlines markets, reduces costs, attracts investment, and combats the influx of inefficient products. This harmonisation also facilitates **regional cooperation, strengthens testing and enforcement capacity,** and contributes to achieving Sustainable Development Goals (SDGs) and climate action targets. The benefits of harmonisation include reduced technical barriers to trade, improved the competitiveness of regional industries, and ensure consumer protection by quality standards and regulations. Under the EELA Program, these efforts aim to harmonise energy efficiency standards and labels across member states, fostering a unified approach to sustainable energy development.

The development of MEPS and energy efficiency labels in the East African Community (EAC), Economic Com-
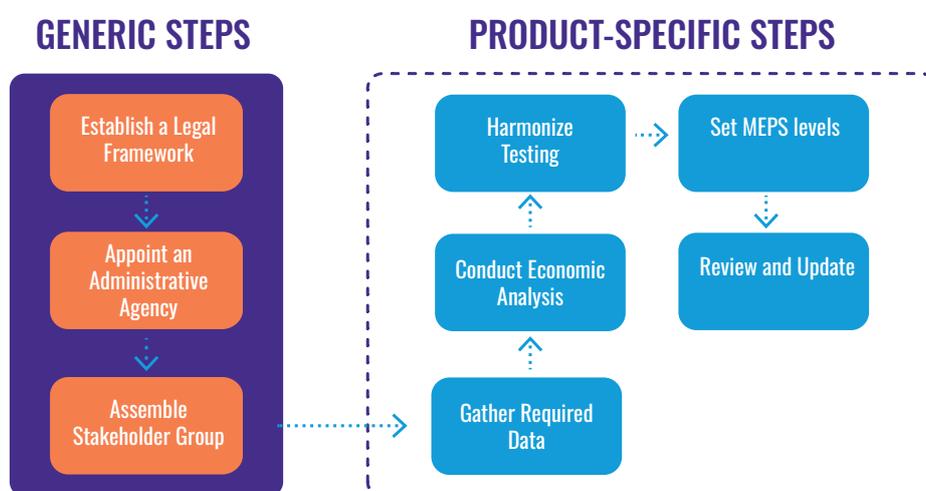

Figure 3: Stages of standards development within SADCSTAN

munity of West African States (ECOWAS), and Southern African Development Community (SADC) has been following **a structured, multi-step process**. As illustrated in **Figure 3**, this process includes market assessments, stakeholder consultations, the formation of technical committees, technical drafting, regional reviews and adoption, and ultimately implementing and enforcing the standards at the national level.

2.1.1   Foundations for MEPS: Market Assessment and Baseline Studies

Market research is a crucial first step in identifying priority products for MEPS and labelling initiatives. This process should be guided by key factors such as regional strategic priorities, energy consumption trends, market availability, product demand and potential for energy efficiency improvements. **Comprehensive market assessments** are essential to ensure informed decision making, as they reveal current energy consumption patterns, products availability in the market, and consumer behaviour related to energy efficiency. Equally important is the **use of baseline studies** to establish a benchmark of current energy performance levels, providing a foundation for setting future MEPS and enabling effective monitoring over time.

2.1.2.   Participatory Process for Regional Energy Standardisation

Stakeholder engagement forms the foundation of successful MEPS development and implementation. A **comprehensive consultative process** ensures that standards reflect diverse market realities, foster buy-in from local stakeholders, and enable improved execution. Regional organisations like the EACREEE, ECREEE and SACREEE, under the EELA framework, play a key role in facilitating consultations with governments, manufacturers, retailers, consumers, industry experts, academia and other stakeholders. Engaging key stakeholders early and consistently throughout the process helps identifying potential conflicts, gather valuable information, and build consensus, leading to more effective and sustainable outcomes.

The **harmonisation process operates through structured phases** and requires active participation and input from member states at each stage, including proposal development, preparatory review, committee deliberation, the enquiry period, and the approval stages. Throughout this progression, each member state reviews the draft standards within their respective national contexts by conducting consultations with domestic stakeholders, ensuring that regional standards remain relevant to local market conditions while maintaining harmonised objectives.

2.1.3   Formation of Regional Technical Committees

Technical committees have been established under the regional organisations tasked with coordinating standardisation activities and promoting harmonisation within the regions to provide expert input and guidance throughout the development process.

In the EAC, the **East African Standards Committee (EASC)** serves as a statutory body responsible for developing and implementing standards that ensure consistent quality and safety across the region.

ECOWAS does not have a regional standards body. Instead, standards harmonisation is coordinated through the **ECOSHAM framework**, established by Regulation C/REG.14/12/12, under which the Technical Management Committee (TMC) oversees the establishment of Technical Harmonisation Committees (THCs). While not focusing solely on energy efficiency, Regulation C/REG.14/12/12 represents the legal and procedural backbone that has enabled the harmonisation of energy efficiency standards across the ECOWAS region.

In the SADC, standards harmonisation is coordinated by the **SADC Cooperation in Standardization (SADC-STAN)**, the body that is responsible for standardisation in the SADC region.

2.1.4   Technical Drafting and Review Process

The development of draft technical MEPS and labels

is led by technical experts who draw on international best practices and standards, the local context, and stakeholder input. The draft standards are then reviewed at the regional level to ensure harmonisation and consistency across member states.

In the EAC region, the harmonisation of energy efficiency standards and policies is coordinated by the **EAC Secretariat**, with technical support from EACREEE (East African Centre of Excellence for Renewable Energy and Efficiency). Unlike ECOWAS and SADC, which rely on formal technical committees, EAC's approach is more centralized but still inclusive, engaging national energy ministries and technical officers throughout the process.

In ECOWAS, the process is coordinated at the regional level by the ECOWAS Commission through the **Technical Management Committee (TMC)**, which oversees and approves the technical work carried out by the Technical Harmonisation Committees (THCs). National Standards Bodies (NSBs) of Member States actively participate in these regional committees, providing technical expertise, submitting national positions, and ensuring the subsequent adoption and implementation of the harmonised standards within their respective national frameworks.

In the SADC region, SADCSTAN oversees standardisation through its **regional Technical Committees (TCs)** depending on the sector, and Sub-Committees (SCs) that handle specific harmonisation tasks. In developing MEPS for lighting and cooling appliances, the EELA Project collaborated with the **SADCSTAN regional Technical Committee TC16,** which addresses energy-related issues. The SADCSTAN process involves applying for a New Work Item through a Proposal (NWIP), which is circulated to NSBs for comment and support. A minimum threshold of two NSBs is required before work on the NWIP can commence. In SADC, national stakeholders are involved throughout the MEPS development process via national mirror technical committees, which provide input to the regional TCs.

2.2. Formal Adoption and Implementation of MEPS and Labels in EAC, ECOWAS and SADC Regions

2.2.1 Regional Approval

Once finalised, MEPS and labelling regulations are formally adopted at the regional level, typically through a directive or regulation. In **the EAC region, these regulations become compulsory upon adoption**, requiring member states to implement them. In contrast, **implementation in the ECOWAS and SADC regions is voluntarily at the national level**. However, within ECOWAS, while some MEPS may initially be adopted voluntarily, a core set of standards is expected to become mandatory across all ECOWAS member states through regulations. Once enforced, products that do not meet these standards will be prohibited from being manufactured, imported, marketed, or sold within the region.

EAC

In the EAC region, the **MEPS for lighting** were officially adopted in **July 2022**, followed by the approval of MEPS and labelling standards for room air conditioners and residential refrigerators in July 2025. These decisions were endorsed in consultation with the East African Standards Committee (EASC) through its Standards Management Committee (SMC) and gazetted by the EAC Secretariat. The development of these standards was carried out with the support of EELA, in collaboration with UNEP-United for Efficiency (U4E).

ECOWAS

In the ECOWAS region, MEPS for lighting, refrigerators, and air conditioners were developed and adopted through a phased approach **between 2015 and 2022**. This process was supported by the Program Promotion of Climate-friendly Electricity Market in the ECOWAS Region (ProCEM) and the German Ministry of Cooperation (BMZ) through GIZ.

SADC

For SADCSTAN, once the Regional TC16 has granted technical approval, the harmonised text is presented to the SADCSTAN Standards Management Committee (SMC) and the Executive Committee (EXCO) for final approval. As a final step, the harmonised MEPS are presented to the regional Council of Ministers for commerce and trade for their information. It is important to note that harmonised standards are not published directly by SADCSTAN or SADC.

a. Member State NSBs are responsible for adopting and publishing harmonised standards as national standards;
b. Member States are expected to align or remove conflicting standards and replace them with harmonised standards;
c. Member States must report progress to the SADCSTAN Secretariat with regard to adoption and implementation.

In **April 2021**, SADCSTAN approved regional MEPS for lighting. This milestone was followed in **November 2023** by the adoption of MEPS for cooling appliances, encompassing residential refrigerators and room air conditioners. The development of these standards was supported by the **EELA Project in collaboration with UNEP-U4E**. Following their regional endorsement, several countries have begun adopting the MEPS at national level, including the Democratic Republic of Congo, Eswatini, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Zambia and Zimbabwe. Notably, South Africa made MEPS for lighting mandatory in May 2025, while Mauritius made MEPS for air conditioners mandatory in August 2025.

2.2.2.   National Implementation

Individual member states then implement the regional standards, often through their own national legislation and enforcement mechanisms. The harmonised MEPS for lighting has already been adopted by DRC, Eswatini, Mozambique, Namibia, and South Africa

within the SADC region, and by Uganda, Kenya, Rwanda, and South Sudan within the EAC region. Additionally, the SADC member states Eswatini and Zimbabwe have adopted the MEPS for cooling appliances at the national level.

2.2.3.   Conformity Assessment and Enforcement

To support the effective implementation of MEPS and Labels, a **Regional Compliance Framework was developed under the EELA Project for both EAC and SADC regions**. *Further details are provided in Section 3.1.* Manufacturers are required to demonstrate compliance with MEPS through conformity assessment procedures, which typically include testing and certification. Compliance authorities are responsible for enforcing MEPS and labelling regulations. Their duties include conducting market surveillance and taking appropriate action against products that do not meet the required standards.

2.2.4.   Monitoring and Evaluation

To ensure the effectiveness and continuous improvement of MEPs and labelling regulations, robust monitoring and evaluation mechanisms are structured around the following tasks:

• **Tracking Progress**: Regular monitoring and evaluation are crucial to assess the effectiveness of MEPS and labelling programs and identify areas for improvement.
• **Data Collection**: Data on energy consumption, product performance, and market trends is collected and analysed to support evidence-based policy development.

2.3   Progress for MEPS and Labelling for Industrial Motors, Commercial Refrigeration and Distribution Transformers

2.3.1 Industrial Motors

In June 2025, UNIDO, through the EELA Program,

launched a call for the assessment of industrial motors in the EAC, ECOWAS, and SADC regions. The initiative aims to harmonise industrial motor MEPS and thereby advancing market transformation, regional integration, and supporting Africa's industrialisation agenda. The assessment is designed to **evaluate the current market landscape, policy environment, and practices related to industrial motors across the continent**. A selected contractor will undertake detailed studies in the three regions, aiming at delivering actionable recommendations on critical areas such as producer responsibility, repairability, capacity building, and skills development.

A central goal of the initiative is to develop **updated national-level MEPS** that are aligned with international benchmarks and regional harmonisation goal. Industrial motors are a cornerstone of energy efficiency, accounting for approximately 45% of total electricity consumption, according to the International Energy Agency (IEA). The adoption of high-efficiency motors can lead to energy savings of 20-30%, thereby reducing operational costs and contributing to the reduction of greenhouse gas emissions. These improvements are particularly critical in regions like Africa, where energy demand is rapidly increasing, and the pursuit of sustainable development remains a priority.

It is noteworthy that South Africa has implemented Minimum Energy Performance Standards (MEPS) for industrial motors through the **VC 9113 regulation**, which became effective in June 2025. This regulation mandates that all industrial electric motors supplied or sold in the country must meet at least the IE3 efficiency level. The measure is intended to reduce energy consumption, lower carbon emissions, and align with international energy efficiency best practices. This policy encourages innovation, drives supply chain transformation, and promotes economies of scale for energy-efficient motors.

2.3.2   Commercial Refrigeration

SACREEE, in collaboration with UNEP-U4E, has submitted in a new work item proposal to the SADCSTAN Regional Coordinator. Once the required threshold for initiating the New Work Item Proposal (NWIP) is met, the SADCSTAN Technical Committee 16 (TC16) will be mobilised to carry out the work. The process will be **guided by the Model Regulation Guidelines already developed by UNEP-U4E**. At present, UNEP-U4E is undertaking a market study in the SADC region focused on commercial and industrial refrigeration MEPS. Subject to funding availability, these works will be extended to EAC and ECOWAS regions.

2.3.3   Distribution Transformers

SADC is currently the only region that developed MEPS for distribution transformers. These standards were limited to eight countries supported by the **Climate Technology Centre and Network (CTCN)** under the "Leapfrogging to Energy-Efficient Refrigerators and Distribution Transformers" project. The countries include Botswana, Eswatini, Lesotho, Malawi, Namibia, Tanzania, Zambia and Zimbabwe. To achieve regional harmonisation, these MEPS need to be formally submitted to SADCSTAN under TC16.

2.3.4   Development of Regional Energy Efficiency Labels

Energy Efficiency labels play a critical role in **enabling consumers and end-users to make informed decisions** about product performance and lifecycle costs. Without clear labelling, manufacturers have little incentive to improve energy performance, as the market cannot recognise and value these efforts. Standards can be set to ensure that obsolete and inefficient technology does not continue to dominate the market, much more effectively than is possible by the actions of individual end users. Among other benefits, standards and label policies help to cut air pollution, abate greenhouse gas emissions, and are among **the most cost-effective forms of energy policy**.

Standards and labels work best as part of a holistic

market transformation strategy. Standards ensure that the worst performing products are removed from the market, while labels encourage consumers to purchase increasingly more efficient products. However, standards and labels are fundamentally different in that labels support consumer choice in the market and **provide manufacturers with benchmarks for product performance**, while standards limit the choices available to manufacturers and consumers.

Building on this approach, the EELA Project engaged a consultant to conduct a market assessment of the existing labels across SADC and EAC countries, examining their rationale and effectiveness. The consultancy involved extensive stakeholders engagement to gather perspectives on appliance labelling systems, develop label design options, and provide guidance and next

steps to EACREEE, SACREEE and UNIDO on harmonised regional energy efficiency labels. The **South African EE Label** served as the foundation for the development of the SADC EE Label, while the Kenyan EE Label informed the design of the EAC EE label. Following a comprehensive review process and stakeholders consultations, two label options were recommended for SADC and EAC respectively, as illustrated in **Figures 4, 5, 6, 7, 8**. The SACREEE Steering Committee, alongside stakeholders of the 2024 SADC Industrializing Week, approved the recommendation to adopt the South African EE Label as regional standard. The harmonisation process awaits the finalised revised label from the South African National Energy Development Institute (SANEDI) to enable SADC Member states to complete the harmonisation process.
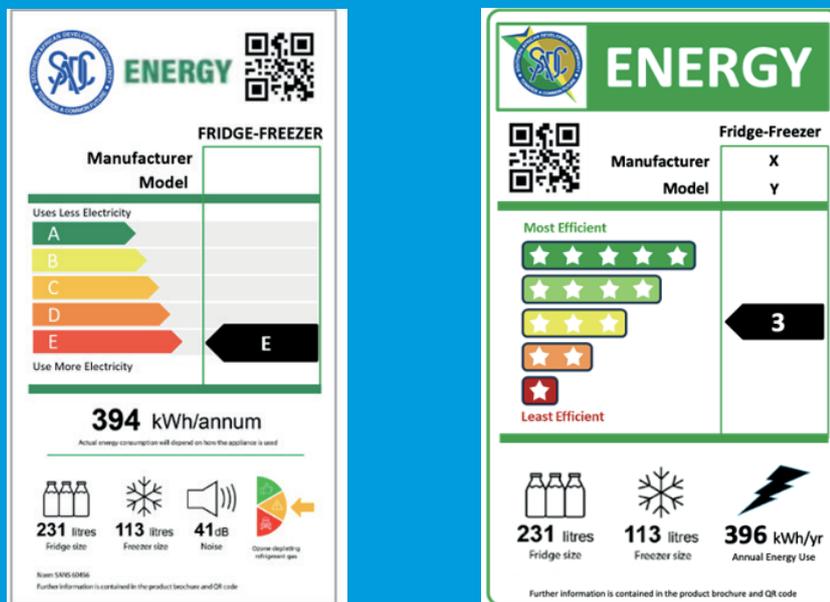
Figure 4-5: SADC energy efficiency label options

Mock-up of a fridge-freezer energy label based on a draft design for the revised South Africa label (as of June 2024). The design is subject to change due to ongoing stakeholders consultations.

Mock-up of a fridge-freezer energy label based on choosing a star-based energy bar scale, three icons and custom SADC logo option. Other design elements could be chosen for this custom design.
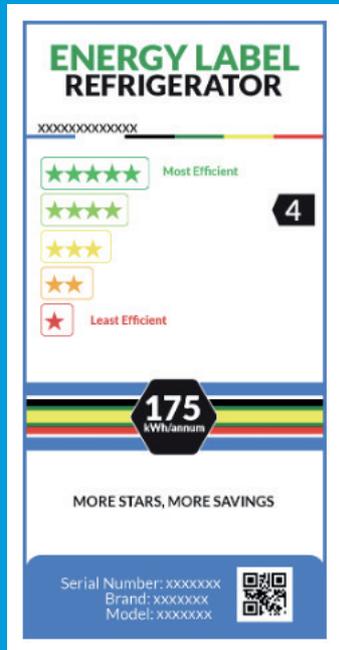
Figure 6: SADC energy efficiency label options

Draft refrigerator label published for comment by EASC in July 2024. The design is subject to change due to ongoing stakeholder consultations.
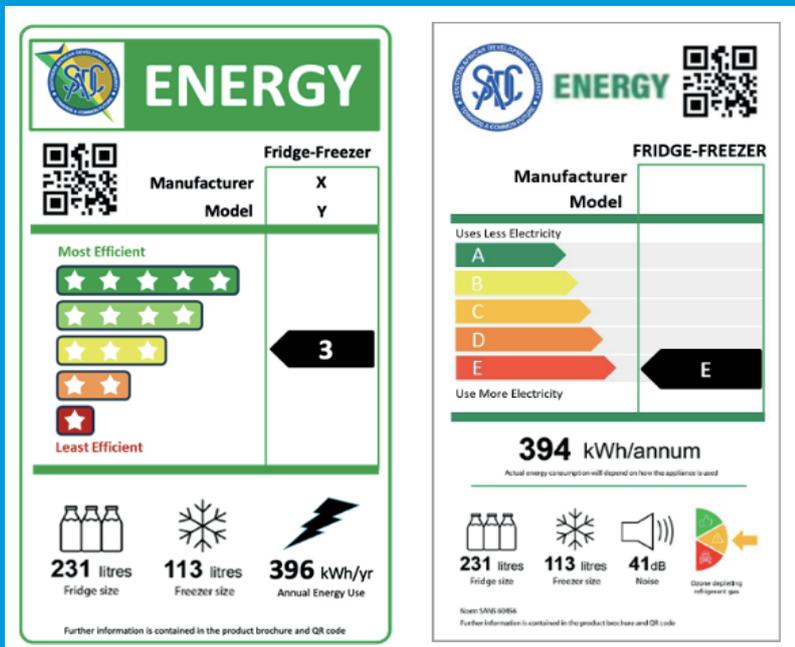
Figure 7-8: SADC energy efficiency label options

Two mock-ups of a fridge-freezer energy label. The draft design on the left adapts the EASC bar approach, with 1 to 5 stars, but shades the background instead of the stars. The draft design on the right is adapted from the South African label.

Some Examples from the Regions

In **Ghana**, energy labelling has been in place for over a decade. The Energy Commission requires labels for air conditioners, refrigerators, lighting products and other appliances, including computers, water heaters, distribution transformers, electric motors. Labels must be approved before importation, and products are checked at ports and in retail outlets. Ghana's success lies in its integrated system: mandatory registration, independent testing, label approval, and market surveillance. Public awareness campaigns and retailer inspections are also conducted regularly.

In **Rwanda**, the Rwanda Standards Board (RSB) and Rwanda Energy Group have introduced an energy labelling framework as part of broader energy efficiency efforts. Labels have been piloted for lighting and cooling appliances, with training conducted for retailers and public sector buyers. Although enforcement is still in early stages, Rwanda's approach shows how new labelling programmes can be introduced gradually alongside MEPS.

In **South Africa**, mandatory Minimum Energy Performance Standards (MEPS) and energy efficiency labels have been implemented for more than twelve appliance categories, including refrigerators, freezers, fridge-freezer combinations, dishwashers, washing machines, washer-dryers, tumble dryers, electric ovens, storage water heaters (geysers), lamps, and air conditioners. These measures are enforced under the National Regulator for Compulsory Specifications (NRCS) and Department of Mineral Resources and Energy (DMRE) regulations. The program aims to remove inefficient appliances from the market, guide consumers toward energy-efficient choices, and reduce electricity demand and greenhouse gas emissions. Appliances must display a standardised South African Energy Efficiency Label, which provides information on energy consumption and performance class, and manufacturers/importers are required to register products in an online database before sale.

2.4 Lessons Learnt and Key Takeaways

The development and adoption of regional MEPS across EAC, ECOWAS and SADC demonstrates that technical harmonisation must be aligned with political and institutional readiness. **Seven regional MEPS have been adopted**, covering lighting and cooling appliances, but **national implementation has varied significantly**, with population coverage ranging from 73 percent for lighting MEPS to just 3.8 percent for cooling standards. This disparity highlights the need to complement regional adoption with targeted national support, including the development of legal frameworks, stakeholder engagement, and capacity building for enforcement institutions.

The varying approaches to harmonisation across the three regions reveal that **no single model fits all contexts**. ECOWAS's reliance on technical management committees and voluntary national adoption contrasts with EAC's more centralized approach mandating immediate national adoption. SADC's consensus-based model requiring 75% approval from participating members offers a middle path. Each approach reflects **different regional integration philosophies and institutional structures**, suggesting that future harmonisation efforts should assess and adapt to existing regional governance frameworks rather than imposing uniform processes.

Effective MEPS implementation extends far beyond standard-setting. It requires a **comprehensive compliance ecosystem** that includes product registration systems, accredited testing laboratories, market surveillance mechanisms, and enforcement protocols. *Further details are provided in Section 3.1*. The establishment of regional reference test laboratories in Uganda and Mozambique, along with equipping 21 countries with portable testing kits, demonstrates how strategic infrastructure investments can build sustainable compliance capacity. However, initial market surveillance revealing 75% non-compliance across tested

LED lamps highlights the critical gap between policy adoption and market reality, emphasising the need for **sustained enforcement efforts** and industry engagement to achieve meaningful market transformation.

Chapter 3
Translating Policy into Action: Implementation Mechanisms for Energy Efficiency Policies

The successful implementation of energy efficiency policies for lighting and other appliances across East, Southern, and West Africa requires robust mechanisms that **translate policy frameworks into tangible market outcomes**. While policy harmonisation establishes the foundation for regional coordination, implementation mechanisms serve as the operational backbone that ensures standards are enforced, markets are transformed, and sustainable practices are adopted at scale.

This chapter examines the **implementation mechanisms** that have been developed and refined through the EELA Project's experience across the EAC and SADC regions, with strategic insights for expansion into ECOWAS. These mechanisms encompass regulatory instruments such as regional compliance framework, procurement guidelines that leverage public sector demand, and waste management systems that address the full lifecycle of energy-efficient technologies.

The chapter also explores strategies for fostering industrial engagement, recognizing that successful policy implementation requires active participation

" Implementation mechanisms serve as the operational backbone that ensures standards are enforced, markets are transformed, and sustainable practices are adopted at scale ".

from manufacturers, importers, retailers, and end-users. Through detailed analysis of lessons learnt from different stages of policy development, capacity building initiatives, and comparative insights from international best practices, this chapter provides a comprehensive guide for policymakers, regulators, and market actors seeking to implement effective energy efficiency policies.

3.1   Regional Compliance Framework

The value of MEPS and energy labels lies in their enforcement. A regional compliance framework is **a set of tools, processes, and institutions** that allow countries to verify product performance, enforce standards consistently, and protect markets from inefficient or unsafe products. MEPs enforcement promotes **cross-border cooperation**, which is particularly relevant in

regions with harmonised standards and porous trade borders.

3.1.1   Product Registration and Certification

An effective compliance system begins with **product registration**. This process ensures that products entering the market have been tested and certified against regional standards. A registration system provides visibility over products and enables authorities to monitor which models are legally permitted for sale.

At the regional level, product registration can take the form of:

- **A centralised platform** hosted by a regional body (e.g. ECOWAS, EAC, SADC);
- **A national registry** aligned with regional requirements and interoperable with neighbouring systems;
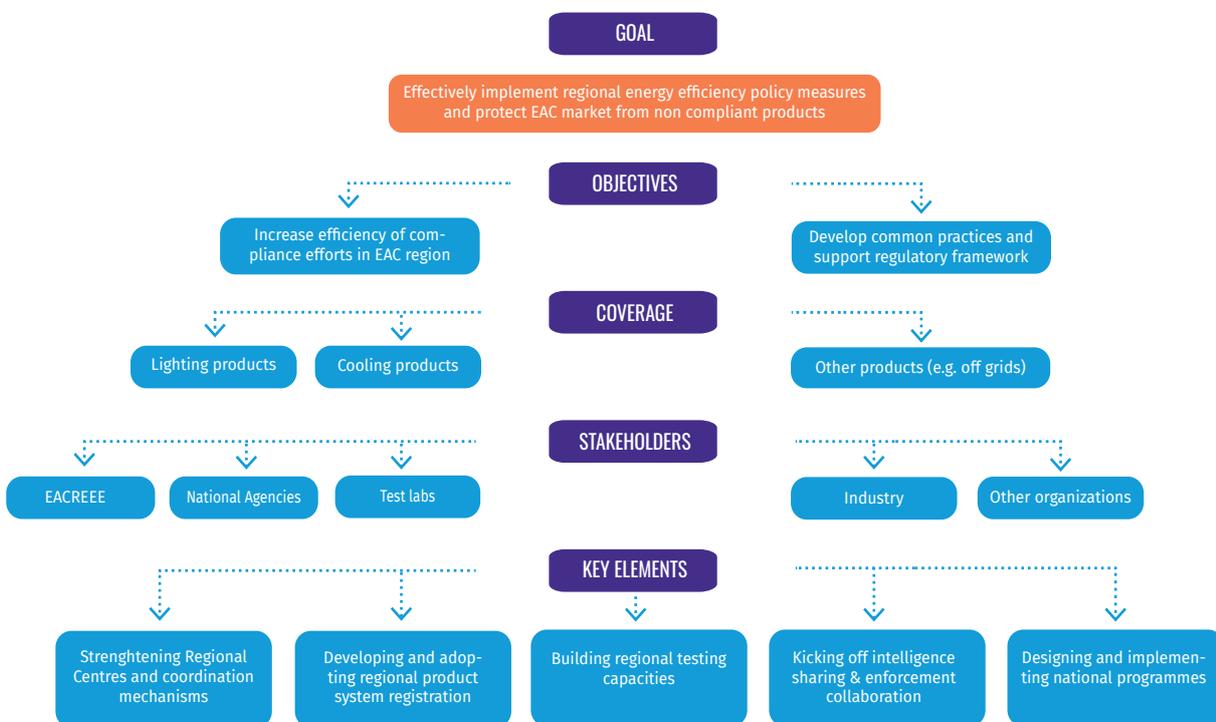- **A mutual recognition mechanism**, where cer-

Fig. 9 - Integrated regulatory enforcement of the EELA Project

tification issued in one country is accepted by others.

Ghana, for example, operates a **national Product Registration System (PRS)** where suppliers must submit test reports and receive approval from the Energy Commission before importing appliances. This system reduces the risk of non-compliant products entering the market and supports customs inspection. Similarly, in the SADC region, Mauritius (through the Energy Efficiency Management Office (EEMO)) and South Africa (through the National Regulator for Compulsory Specifications (NRCS)) also run PRS schemes for regulated products, ensuring compliance and market surveillance.

In the EELA intervention strategy, it was recommended to update the regional product registration database for ECOWAS. An improved system would help track compliant models, streamline customs checks, and support market surveillance. In addition, the platform could also serve as a public tool, allowing consumers and retailers to verify product compliance.

3.1.2 Testing and Laboratory Infrastructure

Testing aims to verify whether products meet the performance levels claimed on their labels or declared for certification. A regional compliance framework requires three key components:

- **A network of accredited laboratories** capable of testing key appliances;
- **Harmonised test procedures** based on standards;
- **Mutual recognition agreement**s that allow test results to be accepted across borders.

However, many African countries currently lack local laboratories or rely on under-equipped facilities. In response, regional projects have promoted several solutions:

1. The designation of **regional reference laboratories**;
2. The use of **third-party certification bodies** for countries without national labs;
3. T**argeted support for lab upgrading**, accreditation, and inter-lab comparison exercises.

Under the EELA Project, two regional reference laboratories were selected to service the testing requirements in their respective regions: the **Uganda National Bureau of Standards (UNBS) for EAC**, and **Mozambique's Instituto Nacional de Normalização e Qualidade (INNOQ) for SADC.** This strategic approach established regional hubs capable of serving multiple countries while building sustainable testing capacity. Laboratories in Uganda, Tanzania, and Namibia received targeted support to enhance their capacity to test lighting against regional MEPS. The regional laboratory network addresses several critical functions including product performance verification, technical standards development support, and capacity building for national standards bodies. Technicians from other member states receive hands-on training at these reference laboratories, strengthening collaborative efforts among national standards bodies.

In parallel, efforts to strengthen testing infrastructure have also progressed in West Africa, notably under the Regional Energy Efficiency WAEMU-OIF program. Five qualified laboratories were selected for performance testing of energy-efficient products:

- **For lighting**: The Laboratoire des Systèmes d'Energie Renouvelable et Environnement in Burkina Faso, The Laboratoire Solaire Photovoltaïque (LSP) of the Agence des Énergies Renouvelables du Mali;
- **For refrigerators and freezers**: The Centre autonome de Contrôle de Conformité aux Normes de Performance Energétique (CCNPE) in Benin and the laboratoire de contrôle de qualité des composants photovoltaïques at the Centre

d'Études et de Recherches sur les Énergies Renouvelables (CERER) in Senegal;

- **For building materials**: The Laboratoire du Bâtiment et des Travaux Publics (LBTP) in Côte d'Ivoire, focused on the thermal and dynamic performance of construction materials.

Despite these advancements, the selected laboratories continue to face challenges, particularly with regard to ISO/IEC 17025 accreditation, a critical step to ensure international recognition of test results. Continued support is needed to guide these institutions through the accreditation process and equip them with the technical and procedural tools required for reliable conformity assessment. In this context, EELA's expansion into ECOWAS offers an opportunity to build on these existing efforts, leveraging regional expertise while harmonising testing protocols with SADC and EAC practices.

3.1.3 Market Surveillance and Enforcement

Even the best-designed policies are ineffective without **regular market checks and enforcement action**. A strong surveillance and enforcement system includes customs inspections to verify label presence and documentation, retail audits to check proper label display and detect non-compliant products, and sanctions and penalties for suppliers violating MEPS or labelling rules.

Market surveillance is often under-resourced. In many countries, agencies lack vehicles, staff, or legal authority to seize non-compliant goods. As a result, non-conforming products can continue to circulate freely, undermining compliant suppliers and eroding consumer trust.

To address this, EELA has supported:

- The development of **enforcement protocols** and checklists for border agents;
- Training **workshops for customs officers** and

market inspectors;
- Regional dialogue on **coordinated sanctions** and information sharing.

For example, customs authorities in Kenya are now applying updated checklists for lighting products in line with EAC MEPS, following EELA-supported training. Such practical tools are critical to translating policy commitments into action.

3.1.4. Data Sharing and Regional Coordination

A regional framework must also facilitate countries to share compliance data and coordinate enforcement. This includes:

- The **lists of approved or banned products** and suppliers;
- **Shared laboratory results** under mutual recognition agreements;
- **Alerts on non-compliant shipments** detected in other Member States.

Coordinated data-sharing helps prevent market fragmentation, reduces the risk of regulatory dumping, and improves trust between national authorities. At present, most of these systems are largely informal. To address this gap, EELA has proposed the establishment of a regional compliance coordination platform to:

- **Host product databases** and compliance records;
- **Share test results** and enforcement outcomes;
- **Facilitate meetings of national regulators** and surveillance bodies.

By improving access to reliable information, this platform would enhance transparency, allowing consumers, suppliers, and public buyers to verify the compliance status of products and brands.

3.2 Energy Efficiency Public Procurement Guidelines

Public institutions accounts for a significant share of appliance and equipment purchases in many African countries. Facilities such as schools, hospitals, government offices, and administrative buildings rely heavily on energy-consuming products such as lighting, air conditioning, and refrigeration. When aligned with energy efficiency goals, public procurement offers a practical and high-impact mechanism to reinforce MEPS and labelling frameworks while promoting the market uptake of compliant products.

Governments purchase of energy-efficient products can generate multiple benefits. They signal leadership to the private sector, **stimulate demand for compliant appliances**, encouraging suppliers to stock and promote efficient models. In addition, they reduce long-term energy expenditures in public budgets and reinforce MEPS and labelling systems by aligning procurement criteria with national or regional standards. However, in many countries, public procurement is disconnected from energy policy. Despite policy interest, **implementation of energy efficiency criteria in public procurement remains limited**. Tenders often focus solely on upfront cost, with little attention to energy performance, total lifecycle cost, or environmental standards. Key barriers include:

- **The lack of clear technical specifications** aligned with MEPS and labels;
- **Limited awareness** or training among procurement officers;
- **Absence of legal mandates** requiring efficiency criteria;
- **Inadequate market information** on compliant products;
- and **Budgeting practices** that favour low upfront costs over long-term savings.

To address these gaps, EELA has promoted the integration of energy efficiency into public procurement systems. This has included:

- Developing **model procurement guidelines for lighting and cooling appliances**;
- Supporting **national adaptation workshops and stakeholder consultations**;
- Providing **training materials** for procurement officers and facility managers;
- **Facilitating dialogue between procurement authorities**, energy ministries, and standards bodies.

In **Zambia**, EELA supported the introduction of energy efficiency criteria in public lighting tenders, in collaboration with the Ministry of Energy and the Zambia Public Procurement Authority. In **Uganda**, public procurement workshops raised awareness among central government buyers and led to pilot procurement of efficient office equipment. These interventions demonstrate that aligning procurement systems with MEPS and labelling frameworks not only drives market demand but also strengthens institutional ownership of energy efficiency policies.

To turn energy-efficient procurement into a scalable implementation mechanism, regions should consider:

- **Issuing regional guidelines** or directives requiring the use of MEPS-aligned specifications in public tenders;
- **Including energy efficiency in national public procurement legislation** and budgeting rules;
- **Creating approved product lists for public buyers** based on MEPS and labelling registries;
- **Training public procurement officers** and auditing energy performance post-purchase;
- **Encouraging regional and cross-border procurement** of compliant products to reduce costs and improve availability.

By adopting these measures, public institutions would become anchor customers for efficient technologies,

leading by example and reinforcing compliance from both the supply and demand perspectives.

3.3 E-waste Management Guidelines

Energy efficiency policies are primarily designed to reduce electricity consumption and improve product performance. However, their long-term sustainability also depends on how energy-using products are managed at the end of their life. Without proper disposal, recycling, or recovery mechanisms, inefficient and hazardous appliances often continue circulating in informal markets, undermining policy goals and posing risks to public health and the environment.

The increasing adoption of energy-efficient lighting and appliances introduces new challenges for end-of-life product management. Electronic waste (e-waste) contains not only **valuable materials that can be recovered** through proper recycling processes, but also **hazardous substances that require careful handling** to prevent environmental and health impacts. Integrating e-waste management into energy efficiency implementation is therefore essential to prevent the reintroduction of non-compliant products and to ensure safe disposal.

Africa faces a growing e-waste burden, much of it is imported. Products banned elsewhere due to inefficiency or safety risks frequently enter informal resale networks in African cities. The situation is exacerbated by the **lack of formal collection systems**, weak enforcement of bans on second-hand imports or reconditioned equipment, lack of incentives for manufacturers or retailers to manage take-back schemes and limited public awareness on safe disposal practices.

Recognising these challenges, EELA has taken steps to **align energy efficiency and e-waste**. Specifically, it has:

- Developed **guidelines on e-waste management** tailored to lighting and cooling appliances;
- **Promoted alignment between MEPS enforcement and end-of-life restrictions** (e.g. ensuring non-compliant appliances are not resold);
- **Integrated e-waste considerations into ECOWAS market assessment** and intervention strategy.

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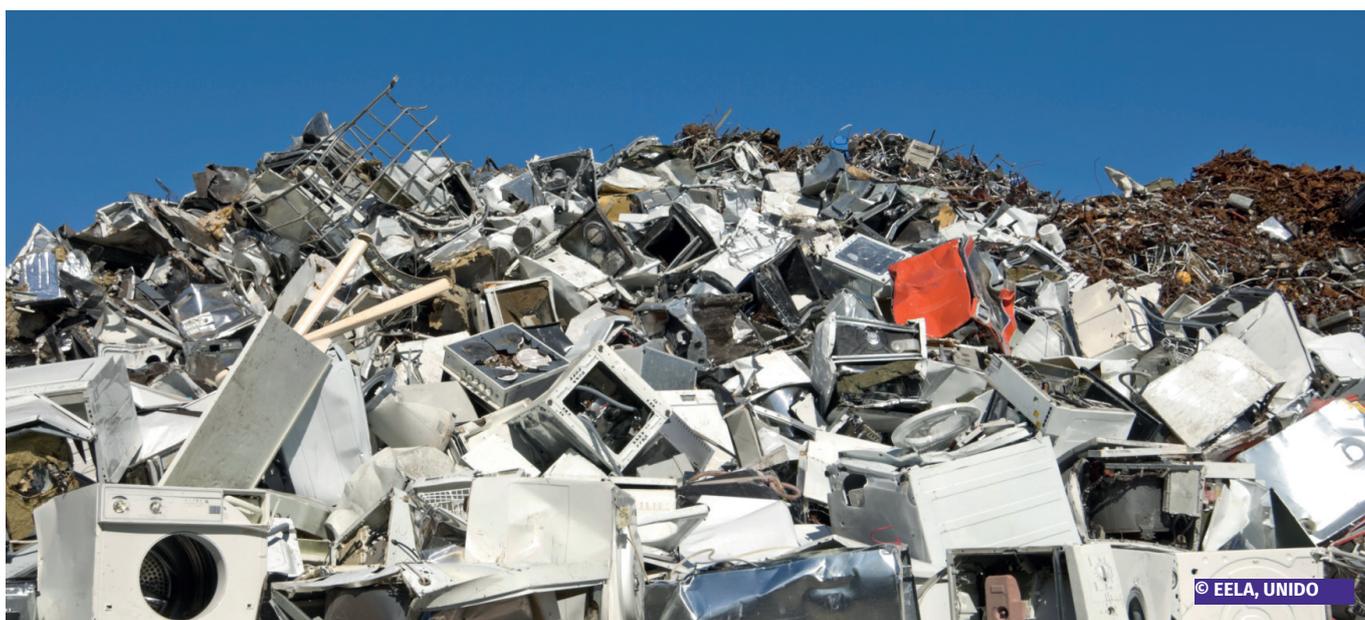
These guidelines advocate for a lifecycle approach that connects the entry and exit points of appliances in the market. They also outline key policy instruments such as:

- **Extended Producer Responsibility (EPR)** schemes;
- **Trade controls** for used electrical and electronic equipment;
- **Public-private partnerships** for e-waste collection and processing;
- **Incentive mechanisms** for safe recycling.

Several African countries have already made progress in this area. **Ghana** has established a structured legal framework for e-waste via the **Hazardous and Electronic Waste Control and Management Act** (Act 917, 2016) and its regulation LI 2250 (2016). These instruments impose obligations for importers and manufacturers including mandatory registration with the Environmental Protection Agency, an advanced eco levy on imported electronics, and producer take-back requirements. The Act also establishes an e-waste fund to finance collection facilities and recycling infrastructure and supports formalisation of informal dismantlers.

Rwanda adopted its **National E-Waste Management Policy** in 2018, prohibiting the importation of used or second-hand electrical and electronic equipment and mandating the establishment of certified collection centres. These requirements, reinforced through regulations issued by the Rwanda Utilities Regulatory Authority (RURA), have been completed by pilot recovery and dismantling initiatives linked to vocational training programs, positioning e-waste collection as a source of green jobs.

South Africa enacted mandatory Extended Producer Responsibility (EPR) Regulations in May 2021 under the **National Environmental Management: Waste Act**. These regulations require producers and importers of electrical and electronic equipment - including lighting, appliances, and batteries - to register with the Department of Forestry, Fisheries and the Environment, participate in Producer Responsibility Organisations, and meet collection, recycling, and reporting targets. Disposal of e-waste into landfills is also prohibited.

These country experiences demonstrate that e-waste management can support the enforcement of MEPS and labelling enforcement by removing obsolete and non-compliant products from the market, while also generating environmental and social benefits.

Effective e-waste management requires active participation from all stakeholders, including manufacturers, retailers, consumers, and waste management companies. To strengthen the connection between energy efficiency and e-waste management, regional programs should:

- **Incorporate e-waste regulations in MEPS enforcement** and compliance frameworks;
- **Establish cross-border protocols** to prevent illegal trade in non-compliant used appliances;
- **Promote regional recycling infrastructure** for priority products (e.g. lighting, RACs);
- **Support national governments in integrating e-waste into public awareness campaigns** and consumer incentives (e.g. take-back schemes, discounts on efficient replacements).

By embedding e-waste guidelines into broader energy efficiency strategies, African regions can ensure that the benefits of cleaner, more efficient appliances are sustained across the entire product lifecycle.

3.4 Fostering Industrial Engagement for Policy Enablement

The effectiveness of MEPS, labelling, and other energy efficiency policies depends not only on regulatory

design and enforcement, but also on the engagement and **response of market actors**. Manufacturers, importers, distributors, and retailers play a pivotal role in ensuring that efficient products are available, visible, and competitively priced. Their engagement is essential to translate energy efficiency policies into tangible market outcomes.

Industrial engagement is not solely a matter of enforcement: it is a strategic opportunity for collaboration, capacity-building, and incentives alignment to enable long-term market transformation.
Industry actors influence every stage of the appliance value chain:

- **Manufacturers** and assemblers design and produce products that must meet MEPS;
- **Importers** and wholesalers decide what models are brought into national markets;
- **Distributors** and retailers affect visibility, pricing, and promotion of efficient products;
- **After-sales service providers** manage maintenance, upgrades, and disposal.

When these actors are excluded from policy development and implementation, several risks emerge. Non-compliant products may continue entering markets, efficient products may remain unavailable or unaffordable, labels may be ignored or misused, and incentives for innovation or compliance may be weak.

Across EAC, ECOWAS, and SADC, common challenges persist. These include limited awareness of energy efficiency regulations among smaller importers and retailers, lack of technical capacity to test or certify products locally, weak communication between regulators and private sector associations, absence of business incentives to shift toward higher-efficiency products, and unregulated competition from informal markets or second-hand imports.

Recognising these barriers, EELA has positioned **the**

private sector as a strategic partner in implementing MEPS and labelling. In countries such as Tanzania and Namibia, EELA has engaged industry associations and national standards agencies through capacity building workshops and consultations.

To scale up industrial participation in energy efficiency implementation, regional and national programs should:

- **Establish permanent public–private dialogue platforms** on energy efficiency;
- **Encourage voluntary early compliance schemes**, branding, or award programs;
- **Provide financial or fiscal incentives** (e.g. reduced import duties, green procurement preferences);
- **Support market transformation programs**, such as bulk procurement of efficient models with suppliers;
- **Strengthen retailer engagement**, ensuring energy labels are correctly displayed and explained to customers.

Energy efficiency cannot succeed without the active involvement of market actors. Regulatory pressure alone is not enough. Engagement must be continuous, two-way, and solution-oriented supporting businesses to comply, innovate, and benefit from a more efficient and sustainable appliance market. By investing in meaningful partnerships with industry, African regions can turn standards and policies into real-world outcomes, ensuring that the supply of efficient products meets and drives growing demand.

Lesson Learnt: Integrating Member States at Different Policy Development Stages

The EELA Project's experience across the EAC and SADC regions has highlighted the importance of accommodating different levels of policy development maturity when implementing regional initiatives. Member states entered the project with varying degrees of existing energy efficiency policies, regulatory capacity, and market development.

The challenge

Some countries had well-established MEPS and labelling programs, while others were just beginning to develop basic energy efficiency policies. This created challenges for regional harmonisation efforts and required flexible approaches that could accommodate different starting points while maintaining common objectives.

Adaptive strategies employed

- **Tiered implementation approach**: developed differentiated timelines and support levels based on each country's existing capacity and policy framework;
- **Peer learning networks**: established formal mechanisms for knowledge sharing between more advanced and developing countries;
- **Flexible standards framework**: created core standards that all countries could adopt while allowing for country-specific adaptations where necessary;
- **Capacity building prioritisation**: allocated additional technical assistance and training resources to countries with less developed institutional capacity.

Key outcomes

- Successfully maintained regional coherence while respecting national sovereignty over policy implementation;
- Accelerated policy development in less advanced countries through targeted support and peer learning;
- Created sustainable networks for ongoing collaboration and knowledge sharing;
- Demonstrated that regional harmonisation can be achieved without requiring identical policies across all participating countries.

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Upgrading Testing Facilities with Machineries and Skills Development

Uganda National Bureau of Standards (UNBS) - EAC Regional Hub

The EELA Project equipped UNBS with specialized testing equipment for lighting products and provided training for laboratory technicians. This facility now serves as the regional reference laboratory for the entire EAC region, offering testing services that previously required expensive third-party testing from product origin countries.

Instituto Nacional de Normalização e Qualidade (INNOQ), Mozambique - SADC Regional Hub

INNOQ was similarly upgraded with testing equipment and technical training to serve as the SADC regional reference laboratory. The facility provides testing services for lighting products and supports market compliance activities across the Southern African region.

Capacity building achievements

Technical Training: Laboratory technicians from multiple member states received hands-on training at the regional reference laboratories, building collaborative networks among national standards bodies;

Equipment Procurement: Specialised testing equipment was procured for lighting product testing, significantly reducing the region's reliance on overseas testing facilities;

Portable Testing Equipment: Each of the 21 member states received portable lighting test equipment, enabling basic compliance verification at the national level.

Learning from the European Union: Lessons for Energy Efficiency Policy Harmonisation

The European Union (EU)'s experience with energy efficiency policy harmonisation provides valuable insights for regional initiatives in Africa. The EU has successfully implemented common MEPs and labelling systems across 27 member states with diverse economic conditions, regulatory traditions, and market structures.

Key EU success factors:
- **Gradual Evolution**: The EU approach evolved over several decades, beginning with voluntary initiatives and gradually expanding to mandatory requirements with common implementation timelines;
- **Technical Harmonisation**: Focused initially on harmonising technical standards and testing procedures rather than attempting comprehensive policy alignment;
- **Market Integration**: Linked energy efficiency policies to broaden single market objectives, creating strong economic incentives for harmonisation;
- **Institutional Framework**: Established dedicated institutions and mechanisms for ongoing coordination and policy development.

Adaptive lessons for Africa:
- **Start with technical standards**: Begin harmonisation efforts with testing procedures and technical specifications before attempting comprehensive policy alignment;
- **Respect Sovereignty**: Maintain flexibility for national implementation while establishing common objectives and frameworks;
- **Build incrementally**: Allow for gradual expansion of scope and coverage rather than attempting comprehensive harmonisation immediately;
- **Leverage trade benefits**: Emphasize the economic benefits of harmonisation for facilitating regional trade and investment.

3.5 Lessons Learnt and Key Takeaways

The transition from energy efficiency policies to real market impact requires more than standards alone. MEPS and labels are powerful tools but only when backed by systems that ensure their enforcement, integration, and uptake. This chapter has outlined the **operational backbone of energy efficiency implementation**: a regional compliance framework, functioning testing infrastructure, strategic public procurement, responsible end-of-life management, and proactive industrial engagement. These mechanisms work best when implemented together reinforcing one another to build trust, stimulate demand, and strengthen supply chains.

With support from the EELA Project and regional organisations, EAC, SADC, and ECOWAS are laying the foundation for a more coordinated, reliable, and sustainable approach to energy efficiency. The lessons and models presented in this chapter offer **a practical guide for policymakers, technical agencies, and market actors** seeking to turn energy efficiency from a policy commitment into a lived reality for households, businesses, and public institutions across the continent.

Energy efficiency, therefore, presents a win-win as it reduces production costs and boosts competitiveness, improves energy security by lowering demand and cuts emissions, aligning with Africa's climate goals. Unlocking these benefits requires local capacity like technical skill improvement, testing capacities, and increased awareness; areas where EELA plays a catalytic role.

Testing laboratory of the Swedish Energy Agency © EELA, UNIDO

Chapter 4
Mobilising Finance for Energy Efficiency Implementation

One of the critical barriers to the widespread adoption of energy-efficient lighting and appliances in sub-Saharan Africa is the high upfront cost of energy-efficient technologies and the **limited availability of suitable financing models**. To address this, the EELA Project designed and piloted innovative financing mechanisms aimed at unlocking private sector investment, supporting market transformation, and ensuring the long-term sustainability of energy efficiency interventions.

Recognizing the success of these approaches in the EAC and SADC regions, the new EELA Program is currently expanding into ECOWAS with the aim of adapting and scale EELA's financing models, such as the technical assistance, co-financing, EPCs, leasing, and Energy-as-a-Service (EaaS), in this new regional

context. The expansion to ECOWAS aims to replicate proven strategies while fostering regional collabora-

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" The integration of ECOWAS into the EELA Program opens the door for a pan-African platform on energy efficiency financing, encouraging continental market transformation ".

tion and policy harmonisation to catalyse investment in energy-efficient technologies.

This chapter explores **the range of financing mechanisms deployed and promoted under the EELA Project**. It begins with the launch of the **EELA Technical Assistance and Co-Financing Facility**, which provided foundational support for energy efficiency projects through grants and advisory services. It then examines various business and **financial models such as EaaS, Energy Performance Contracting**, and leasing structures that were tested or supported within the project. Lastly, the chapter presents **real-world case studies from across the EAC and SADC regions**, highlighting lessons learnt, success factors, and recommendations for scaling up financing solutions in the EELA Program.

4.1. Technical Assistance and Co-Financing Facility Launch

Launched in 2021, the EELA Technical Assistance and Co-Financing Facility was a cornerstone initiative designed to **reduce the risks and upfront costs associated with implementing energy efficiency projects**. The facility had two main components:

- **Technical Assistance (TA)**: Provided targeted support to energy users, Energy Service Companies (ESCOs), and manufacturers to develop bankable energy efficiency project proposals. This included capacity building, business model development (e.g., EPC, leasing, EaaS), financial structuring, and matchmaking with financiers;
- **Co-Financing Grants**: Offered financial incentives to selected projects through cost-sharing mechanisms. This lowered the capital burden on service providers and clients, accelerating the implementation of pilot projects and encouraging replication.

The first Call for Expressions of Interest (EOI) under the facility attracted a diverse range of proposals. Successful applicants received support for projects targeting productive use equipment (e.g., solar cooling and drying), institutional retrofits (e.g., schools, hospitals), and public lighting.

The Co-Financing Facility's rollout revealed the importance of pairing finance with advisory services. Many applicants needed support beyond funding, such as guidance on selecting viable technologies, structuring agreements, and navigating national regulations. By bundling technical assistance with grants, the facility ensured that projects were well-prepared and aligned with national energy strategies.

The following achievements highlight the practical outcomes and market impact of the pilot phase, demonstrating the potential of energy efficiency business models in the region.

- **Six pilot projects** were implemented in Kenya, Malawi, Rwanda, and Tanzania. *Further details are provided in Section 4.5.*
- The facility enabled ESCOs to demonstrate **viable business models** such as shared savings, leasing, and pay-as-you-go (PAYGo).
- The facility also triggered **increased interest from private investors** and development banks for further scaling.

4.2. Energy-as-a-Service (EaaS) Model

The Energy-as-a-Service (EaaS) model represents a paradigm shift in how energy efficiency solutions are delivered. Rather than selling equipment, service **providers retain ownership and deliver energy services** (such as lighting, cooling, or refrigeration) for a recurring fee. In the EELA context, EaaS proved particularly effective for institutions and small businesses that lacked capital or creditworthiness to invest in efficient

appliances. Projects in Tanzania and Malawi, for example, used **pay-per-use models** to offer solar-powered cooling and lighting solutions to fishers and market vendors.

EaaS offers a range of benefits that make energy efficiency solutions more accessible, manageable and cost-effective for end users:

- No upfront investment;
- Bundled services including installation, maintenance, and performance monitoring;
- Transfer of performance risk to the service provider;
- Scalability through replication of successful models across sectors.

Globally, **EaaS is gaining traction**. In Europe and the United States, models like **Lighting-as-a-Service (LaaS)** and **Cooling-as-a-Service (CaaS)** are increasingly being adopted in commercial and industrial facilities, offering greater flexibility, efficiency, and predictable costs.

The model, as applied in the present context, has surfaced a number of practical implementation challenges, including:

- **Lack of awareness** and trust in the EaaS model;
- Need for robust **Measurement, Reporting, and Verification (MRV)** systems;
- **Difficulty accessing working capital** for service providers.

EELA addressed some of these issues through its TA component, equipping service providers with tools to design contracts, develop MRV frameworks, and prepare investor-ready proposals.

4.3. Energy Performance Contracting (EPC) Model

Energy Performance Contracting (EPC) is a financing mechanism where an ESCO implements energy-saving measures and guarantees the resulting savings. Payments to the ESCO are based on the actual performance of the project.

Two common EPC models include:

- **Shared Savings:** The ESCO and client share the financial savings generated;
- **Guaranteed Savings:** The ESCO guarantees a specific level of savings and bears the risk if targets are not met.

In East and Southern Africa, EPCs are still emerging. However, the EELA Project facilitated their introduction by supporting demonstration projects, particularly in Kenya and Rwanda. For example:

- **In Kenya**, Icopower implemented a shared-savings EPC at a commercial hatchery. The client incurred no upfront costs and started saving immediately on energy bills;
- **In Rwanda**, two firms undertook retrofits in educational and healthcare institutions under EPC arrangements.

Further details are provided in Section 4.5.

Key enabling conditions include the presence of clear policy frameworks supporting ESCO activities, access to baseline data and standardised savings measurement tools, as well as legal contracts that ensure protection for all involved parties. EELA's experience showed that EPCs are effective in institutional settings where energy bills are significant and predictable. To expand EPC uptake, governments and financial institutions need to foster a supportive environment, including standard contract templates, training, and risk-sharing facilities.

4.4. Leasing Models

Leasing is a practical and flexible financing solution for clients who are unable or unwilling to invest capital in energy-efficient technologies. Under a financial lease, **a lessee gains access to the energy-efficient equipment without the need for upfront capital investment**, **while paying back periodic fees** to use the equipment. In this context, the lessee takes on most of the risks and benefits of ownership, while the asset is financed by the lessor, typically an equipment supplier or a bank. In contrast, an operational lease involves the service provider retaining ownership and responsibility for maintenance.

The EELA Project promoted both **operational and financial leasing models**, particularly in the context of productive use appliances and public lighting. Leasing models under EELA included:

a. **Zuwa Energy** implemented a lease-to-own refrigeration solution with SureChill benefiting 400 low-income off-grid households in Malawi. The initiative included training and marketing support to ensure adoption and sustainability.

Its impact included promoting energy efficiency, enabling new electricity connections, and reducing energy costs for households. Zuwa Energy's project was one of the five Energy Service Performance Contracts (ESPCs) signed under the TA and co-financing facility, aimed at advancing sustainable energy solutions.

b. **Green Impact Technologies** implemented 500 solar water pumps for smallholder farmers and installed solar streetlights for ten marketplaces in Lilongwe, Malawi. The initiative aimed to improve agricultural productivity by providing reliable irrigation and enhance safety and economic activity in marketplaces with solar lighting. Additionally, the project strengthened water pumping and purification systems for community use.

Leasing models offer several benefits for financing energy efficiency interventions. They help reduce the capital barrier for end users, provide predictable monthly payments, and often include technology upgrades and maintenance as part of the service package. These features make **leasing an attractive option**

PROJECT	MECHANISMS	HIGHLIGHTS AND TAKEAWAYS
ICOPOWER (Kenya)	Shared-savings EPC	Zero Upfront to hatchery clients; ESCO assumed all financial risks.
GREEN IMPACT TECHNOLOGIES (Malawi)	Leasing / PAYGo	Solar streetlights and fridges distributed to farmers and households via leasing /payment schemes.
ERE Ltd & STOP Ltd (Rwanda)	EPC / Retrofits	Hospital and campus energy retrofits without client capital outlay.
AG Energies (Tanzania)	Service Contracting	Provided solar-based fish-drying services on a pay-per-use model.

Fig. 10: Finance for energy efficiency implementation: case studies.

for clients seeking flexibility and lower upfront costs.

However, several challenges can hinder the effectiveness of leasing in this context. These include the weak credit worthiness of micro and small enterprises, limited capacity among financial institutions to assess energy efficiency technologies, and the absence of standardised lease contracts tailored to the energy sector. To address these issues, the EELA facility provided advisory support to leasing firms and facilitated partnerships with local banks and cooperatives. Over time, the pilot projects helped build trust in leasing as a viable path to energy access and efficiency.

4.5.   Case Studies under the EELA Project

The EELA Project supported five pilot projects through its financing facility. Each project illustrated different financing models and provided valuable insights. Four of these projects are highlighted below.

4.5.1   Icopower (Kenya): Shared Savings EPC
An energy retrofit was implemented at a hatchery under a shared savings EPC, requiring no upfront cost to the client. Icopower, a technology company specialised in energy efficiency solutions for businesses,

Key Cross-Cutting Lessons:

1. **Derisking and capacity building**: TA and small grants help build ESCO pipeline and credibility.

2. **Flexible financing mix**: Combining EPC, leasing, and service models caters to varied client needs.

3. **Data-driven performance guarantees**: MRV systems are essential for trust and scalability.

4. **Policy & instruments alignment**: Enabling regulations (e.g., ESCO-friendly policies, fiscal leasing incentives) enhances uptake.

5. **Scaling potential**: Early pilot outcomes validate scaling via hybrid loan guarantees and deeper partnership with financial institutions.

Ere L.t.d. pilot project © EELA, UNIDO

installed LED lighting and optimised power quality, resulting in a 30% reduction in energy consumption.
Lesson: *EPC is effective for facilities with predictable energy use and savings potential. Clients responded positively to zero-capex models.*

4.5.2   Green Impact Technologies (Malawi): Leasing/PAYGo

Solar-powered streetlights and refrigerators were deployed to local vendors using PAYGo systems. The project improved safety and reduced post-harvest losses.
Lesson: *PAYGo combined with leasing improves affordability and technology uptake in rural and peri-urban markets.*

4.5.3   STOP Ltd and ERE Ltd (Rwanda): Institutional Retrofits

STOP Ltd and ERE Ltd in Rwanda partnered to implement institutional retrofits at a rural health centre. To ensure financial sustainability, the companies combined technical assistance with a grant, structuring a sustainable payment plan in collaboration with the district authority.
Lesson: *Institutional clients are open to performance-based contracts if reliability and savings are guaranteed.*

4.5.4   AG Energies (Tanzania): Energy-as-a-Service

The project offered solar-powered fish drying and cooling services to cooperatives, charging a fixed fee per use. This approach boosted productivity and reduced spoilage, providing a practical solution for preserving fish and improving efficiency.
Lesson: *Pay-per-use service models are effective in informal and semi-formal sectors, especially when asset ownership is not a priority for users.*

4.6.   Expanding Financing Mechanisms to ECOWAS: Tailoring Financial Instruments on Market Potential and Needs

Building on the success and lessons learnt from EELA implementation in the EAC and SADC regions, the project has laid a strategic foundation for its expansion into ECOWAS. This expansion aims to replicate and tailor proven financing mechanisms to support the uptake of energy-efficient lighting and appliances in West Africa, where similar energy access, affordability, and market development challenges persist.

The ECOWAS region presents a strong case for EELA expansion, with its rapidly growing population, increasing electricity demand, and significant reliance on inefficient appliances. Many countries in the region are still in early stages of establishing Minimum Energy Performance Standards (MEPS) and energy efficiency policies. As a result, the region stands to benefit greatly from structured financing support, capacity development, and harmonised standards frameworks already piloted in EAC and SADC.

A market assessment conducted in collaboration with ECREEE in 2024 identified **critical financing gaps**:

- Limited access to capital for SMEs and ESCOs;
- Absence of structured energy performance contracting frameworks;
- Low awareness of service-based models (EaaS, leasing) among market players;
- Minimal involvement of local financial institutions in EE markets;

In response to these findings, the next phase of EELA will adapt its financing toolkit to ECOWAS by:

- **Establishing a regional Technical Assistance and Co-Financing Facility**, aligned with ECOWAS energy goals and financial ecosystems;

- **Developing regional guidelines for EPC and leasing** applicable across ECOWAS member states;
- **Building partnerships with local financial institutions**, offering de-risking instruments and capacity building to support green lending;
- **Engaging ECOWAS member states** in national pilot projects focused on productive use appliances (cooling, refrigeration, clean cooking) relevant to rural and peri-urban contexts.

UNIDO, in partnership with Sida, ECREEE, and other technical partners, aims to initiate country-specific interventions starting with high-impact markets such as Nigeria, Ghana, and Senegal. These pilots will be designed to demonstrate scalable and replicable financing models, with a strong focus on gender inclusion and youth entrepreneurship.

4.7 Strategic Alignment, Future Prospects, and Recommendations for Scaling Up

The ECOWAS expansion of EELA aligns with ongoing regional energy efficiency strategies such as the ECOWAS Energy Efficiency Policy (EEEP) and U4E West Africa Lighting and Appliances Initiatives. Synergies will be sought with institutions such as the ECOWAS Bank for Investment and Development (EBID), BOAD, and private sector actors including microfinance institutions and cooperative banks.

The integration of ECOWAS into the EELA Program opens the door for **a pan-African platform on energy efficiency financing**, encouraging knowledge exchange, cross-regional collaboration, and the creation of unified tools and standards that support continental market transformation.
Based on the results and lessons from EELA's pilot phase, a set of actionable recommendations have been identified:

1. **Institutionalise Financing Mechanisms:** Governments should develop supportive frameworks for EPCs, leasing, and service contracts. This includes standardised templates, regulatory guidelines, and public procurement rules.

2. **Blend Financing Instruments:** Future facilities should integrate grants, concessional loans, and guarantees to address different risk profiles and market needs.

3. **De-risk ESCOs:** Provide credit enhancements, working capital support, and project aggregation to attract private capital into EE markets.

4. **Build Capacity:** Train ESCOs, financiers, and policymakers in structuring EE projects and evaluating risks.

5. **Scale through Replication:** Document successful business models and promote replication through regional platforms and knowledge-sharing forums.

6. **Leverage Public Institutions:** Target schools, hospitals, and government buildings for initial scale-up, as these offer visibility and stable repayment mechanisms.

4.8 Lessons Learnt and Key Takeaways

The EELA Project has laid a strong foundation for the financing of energy-efficient lighting and appliances across East and Southern Africa. Through the introduction and testing of multiple financing mechanisms, from technical assistance and co-financing grants to EPCs, leasing, and EaaS, the project has demonstrated that financial innovation is key to overcoming the cost barriers associated with EE technologies.

Scaling these solutions will require multi-stakeholder collaboration, stronger policy alignment, and sustained investment in market development. The next phase of EELA should continue to expand access to tailored financing solutions that empower ESCOs, de-risk energy efficiency investments, and deliver long-term benefits for households, businesses, and the environment.

As the program expands to the ECOWAS region, these financing mechanisms can serve as proven models to catalyse market transformation. The outlook is promising, with early groundwork indicating a strong appetite for structured support, regional harmonisation, and capacity building. By adapting its successful approaches to the specific needs of West African markets, EELA is well-positioned to drive energy efficiency adoption across the continent and contribute meaningfully to sustainable development and climate resilience in Africa.

Lydia Banda, beneficiary of the EELA Project's co-financed off-grid refrigeration solutions, with her Zuwa Chill Fridge @ EELA, UNIDO

Chapter 5
Capacity Building and Awareness

Capacity building and awareness raising are essential enablers of energy efficiency, a cornerstone of sustainable industrial development. In the African context, where energy efficiency remains both a pressing challenge and a significant opportunity, it is essential to ensure that **energy efficiency expertise is made accessible to all**: women and men, girls and boys. This inclusive approach is not only critical for advancing environmental sustainability, but also for enhancing industrial competitiveness and expanding employment opportunities.

Currently, around 2 million people are employed in Africa's energy sector, spanning utility operations, manufacturing, and energy efficiency roles. However, the continent's transition to clean energy is significantly constrained by a **significant shortage of local technical skills**, particularly in electrical, mechanical, and civil fields. This skills gap poses serious challenges to the deployment of renewable energy solutions and energy efficiency measures.

This chapter explores **how capacity building and** **awareness raising contribute to unlocking the continent's energy efficiency potential** and supporting a just and inclusive transformation of its industrial and energy landscape.

Chaning Agents Training @EELA UNIDO

" In the African context, where energy efficiency remains both a pressing challenge and a significant opportunity, it is essential to ensure that energy efficiency expertise is made accessible to all: women and men, girls and boys ".

5.1   Empowering All: Inclusive Capacity Building and Awareness in Africa's Energy Efficiency Journey

According to the IEA's Africa Energy Outlook, 4 million new energy-related jobs will be needed across the continent by 2030 to achieve universal energy access, underscoring the urgent need to invest in human capital for energy and efficiency. UNIDO´s EELA Program recognises that, without dedicated efforts to strengthen human capacities, African industries will struggle to develop a skilled workforce that can enhance energy security and decoupling economic growth from increasing energy consumption and carbon emissions.

To address this challenge, **EELA takes a systemic, multi-level approach to capacity building** in energy efficiency. This is aligned with UNIDO's broader mandate of Inclusive and Sustainable Industrial Development and tailored to the specific needs and contexts of African countries. Without inclusive strategies, capacity building risks reinforcing existing power imbalances, such as only training men in technical roles or overlooking underserved communities. To ensure that energy efficiency efforts contribute to a truly inclusive and equitable industrial transformation, capacity building and awareness initiatives must be intentionally designed to reach and **empower underrepresented groups**, including women, youth, and marginalized communities.

5.2   Human Capital: Strengthening the Technical Backbone through Capacity Building

Building local expertise is essential for reducing reliance on external support and enabling long-term industrial efficiency. To address this need, EELA established a knowledge platform, the **EELA E-learning Platform**, alongside a series of in-person trainings. The platform comprises five modules, focusing on essential EELA topics - covering **lighting, clean cooling, productive use of energy, and market development strategies** - identified through regional capacity needs and consultations with stakeholders, ensuring a strong focus on priority areas for Sub-Saharan Africa.

EELA E-LEARNING PLATFORM

Accelerating Investments, Promoting Innovative Business Models and Strengthening Technology Cooperation

The EELA E-learning Platform

The training was developed in collaboration with the Kafue Gorge Regional Training Centre (KGRTC), while the Swedish Energy Agency (SEA) complemented the self-paced modules with three online trainings to reinforce technical understanding.

The EELA E-learning platform has been developed and made available to all stakeholders free of charge. By offering free, flexible, and self-paced modules, the platform lowers common barriers to participation such as cost, time, and location, making it more accessible to a diverse range of learners, including women, who often face disproportionate barriers to accessing technical training. To date, 131 stakeholders, 28% of whom are women, have successfully completed the five modules and been certified as **"Change Agents"**, which means they received training by EELA enabling them to transfer knowledge within their organisations and contribute to a growing regional pool of skilled professionals.

In addition to training, EELA supported evidence-based policy development through **three market studies on productive uses of energy, refrigerating appliances, and on-grid/off-grid markets**. EELA also developed **EE public procurement guidelines** (including a gender-responsive procurement chapter) and **E-waste management guidelines** focusing on Extended Producer Responsibility, repairability, and skills development. *Further details are provided in sections 3.2 and 3.3.*

To build institutional capacity, **EELA supported 31 institutions in the EAC and SADC regions**, established two regional coordination platforms with 28 participating organisations, and strengthened 46 regional and national technical committees on lighting and cooling MEPS to align regional and national implementation. **EELA further mobilised the private sector**, training 355 industry actors, supporting five SMEs, and organising ESCO financing webinars. These efforts revealed a clear need for additional technical assistance and accessible financing to accelerate private-sector participation in Africa's energy efficiency transformation and additional technical assistance.

EELA Stakeholder Forum 2023, Nairobi, Kenya; @ EELA, UNIDO

5.3 Improving Labs, Testing Capacities and Regional Collaboration

Reliable testing and laboratory capacity are fundamental for enforcing Minimum Energy Performance Standards (MEPS) and ensuring that only compliant, energy-efficient products enter the market. In the absence of testing infrastructure, many African markets have faced a high influx of substandard lighting products, with market surveillance exercises in several countries indicating that many tested products do not comply with MEPS. This lack of enforcement capacity undermines energy savings, erodes consumer confidence, and limits the effectiveness of national policies. Strengthening testing infrastructure is therefore not only a technical necessity but also a prerequisite for market transformation, effective policy implementation, and the protection of consumers and businesses alike.

In addition to equipping 21 countries with portable lighting test kits, **EELA trained 102 testing staff through two intensive lab technician training weeks in Sweden and Zambia**, complemented by three regional webinars. Market surveillance exercises allowed policymakers to assess product quality, monitor compliance with harmonised MEPS for lighting, and track market transformation.

Furthermore, regional reference laboratories for lighting products were capacitated in Uganda and Mozambique. These reference laboratories accommodate product testing from other member states and host technicians for hands-on training. Lab technicians from Angola, DRC, Eswatini, Lesotho, Madagascar, Malawi, Namibia, Mozambique, South Africa, Tanzania, Zambia, and Zimbabwe **participated in the equipment installation and received training** which contributed to the objective of strengthening collaborative efforts among national standards bodies. The establishment of regional reference

laboratories in Uganda and Mozambique further enhances this ecosystem by providing shared testing infrastructure and hands-on training opportunities, especially for countries without full lab facilities. This promotes regional cooperation, encourages harmonised implementation of MEPS, and helps countries move from policy to practice in a consistent and credible way.

Laboratory testing also inform national policies and standards, shaping the types of lighting products available in local market. Stakeholders highlighted that while these efforts have significantly strengthened technical capacity and market monitoring, there remains an ongoing need for further awareness raising, both within local communities and the business sector. Ensuring access to affordable, energy-efficient lighting is especially beneficial on low-income households, many of which are led by women or marginalized groups, particularly in off-grid or informal settlements. This **makes the testing work socially impactful, beyond its technical function**.

5.4 Driving EE and Policy Uptake Through Awareness Raising

Awareness raising is not only about information dissemination, but also a **critical driver of market transformation and behavioural change**. By informing consumers, suppliers, retailers, and policymakers about the benefits of energy-efficient appliances, EELA helps to create demand for compliant products, encourage policy uptake, and shift market dynamics toward sustainability. **Clear, accessible communication plays a key role in building trust in standards and labels**, which is essential for adoption at scale, aiming to reach a broad and diverse audience and limit barriers in accessing information about energy efficiency.

EELA communicates energy efficiency-related topics through **a targeted, multi-channel approach tailored to different audiences**. Raising awareness about the benefits of energy efficient technologies among market players, policymakers, and consumers is achieved through public information campaigns across traditional and social media channels. These efforts are complemented by **EELA's participation in regional and international forums**, which further amplify key messages and position energy efficiency as a strategic development priority for the continent. Events provide a platform to track the uptake of energy-efficient appliances, share lessons learnt, raise awareness, showcase trends and initiatives, and explore potential markets.

EELA organised 18 climate and energy events like the annual **Stakeholder Forum**, which are crucial to bring together key energy stakeholders from the regions to discuss and promote energy efficiency initiatives, multiple workshops across eight countries, as well as national sensitisation meetings in several countries, including parallel sessions on youth and gender dimensions. Through these activities, the EELA Project conducted important sensitisation work aimed at raising awareness and **providing information on the benefits and importance of compliance frameworks**, energy efficiency (EE) policies, and standards, among other related topics.

EELA maintains a high profile through targeted information campaigns and a strong communication focus on EELA outreach events and programs. This includes extensive **social media engagement** on platforms such as LinkedIn and X (formerly Twitter) at EELA Energy and @eela_energy, respectively, along with traditional media coverage. In addition, the EELA project website, **www.eela-project.org**, is a resource to support countries with information, tools, and guidelines, including an ongoing series of webinars on key EELA topics.

EELA's campaigns across digital platforms, publications and participation in global events reached more than **10.000 stakeholders**, raised awareness and advance knowledge, enhancing understanding for energy efficiency and driving demand for clean and energy-performing technologies. This helps consumers, policymakers and businesses to better understand the value of switching to energy efficient solutions, contributing to sustainable development across Africa. The awareness and capacity building efforts have positioned EELA as a regional knowledge hub for energy efficiency and a catalyst for policy uptake and market transformation.

5.5 Lessons Learnt and Key Takeaways

EELA's experience in capacity building and knowledge transfer has generated several valuable lessons that can inform the design of future initiatives aiming to scale energy efficiency across Africa. These insights highlight the importance of adaptable, inclusive, and locally grounded approaches to ensure long-term impact and sustainability:

- **Adopt hybrid and tailored training approaches:** Effective capacity building requires a blended model of virtual and in-person training. This combination enhances accessibility, accommodates different learning styles, and strengthens technical understanding through hands-on practice. Training content should be adapted to the specific needs of different stakeholders, whether introductory sessions for policymakers or advanced technical modules for engineers and regulators, ensuring relevance, local ownership, and post-project sustainability.

- **Strengthen gender mainstreaming and inclusivity:** With women representing only 33% of participants compared to a 40% target, future initiatives must embed gender-sensitive strat-

egies from the outset. This includes targeted training for women entrepreneurs on interpreting energy labels, selecting appliances, and accessing financing. Women-only training sessions or scholarships can boost participation and create a multiplier effect, inspiring broader community engagement.

- **Empower and leverage knowledge hubs:** Regional and national training centres play a critical role in sustaining energy efficiency capacity. By actively involving these institutions in training delivery and knowledge transfer, their expertise can be used to develop new e-learning modules grounded in real-world experience, ensuring content remains relevant and scalable.

- **Expand outreach to end-users and the private sector:** Broader awareness-raising campaigns should target both end-users and market actors. Combining social media with traditional channels such as radio and newspapers can effectively reach rural and peri-urban communities. Engaging private-sector player importers, retailers, manufacturers, and business associations on compliance requirements and market opportunities is equally vital for accelerating EE market transformation.

- **Strengthen regional knowledge exchange:** Structured knowledge-sharing between countries promotes mutual learning, collaborative problem-solving, and the replication of successful approaches across regions.

- **Embed local ownership for sustainability:** Ensuring meaningful participation from local institutions, governments, and private actors strengthens relevance, builds long-term capacity, and supports the replication of proven practices across Africa.

In Africa, the pathway to sustainable industrialisation hinges on the integration of energy efficiency as a core strategy. However, scaling energy efficiency requires more than the deployment of advanced technology: it demands a strong foundation of human capital and institutional capacity. By investing in Africa's energy efficiency ecosystem, EELA equips countries not only to reduce energy consumption, but to catalyse a structural and societal transformation, unlocking Africa's potential through capacity building and awareness raising.

Capacity Building:
the EELA Impact in Figures

31

institutions in the EAC and SADC regions supported

2

regional coordination platforms established with 28 participating organisations

46

regional and national technical committees on lighting and cooling MEPS

18

climate and energy events

355

industry players reached

10,000

stakeholders reached

138

technicians that completed the EELA E-learning training platform

Chapter 6
# Key Achievements and Impact

The harmonisation of MEPS in the EAC and SADC regions, together with complementary actions aimed at improving energy access and reducing negative environmental externalities, has strengthened the resilience of the energy system while promoting sustainable energy development and inclusive industrialisation for women and men in Africa.

The support provided by the UNIDO's EELA Project has been instrumental in guiding the efforts of government partners and leveraging the expertise of regional energy efficiency centres. This **synergistic approach**, going beyond the legislative scope of MEPS to also include regulatory enforcement, capacity building, and awareness raising, has helped to **consolidate impacts that can be measured through a set of quantitative indicators**. These outcomes not only anchor tangible results in the present but also lay the groundwork for **progressive transformation at both institutional and market levels**.

This chapter outlines the main achievements in the development and regulatory enforcement of Minimum Energy Performance Standards (MEPS), providing a concise yet comprehensive overview of their approval and implementation status. It also highlights the complementary regulatory and institutional mechanisms that have enabled their effective and coordinated implementation. Furthermore, the chapter presents data

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" Energy-efficient lighting and cooling appliances have been made accessible to 160 million people in the SADC and EAC regions, representing around 35% of the population of their combined population ".
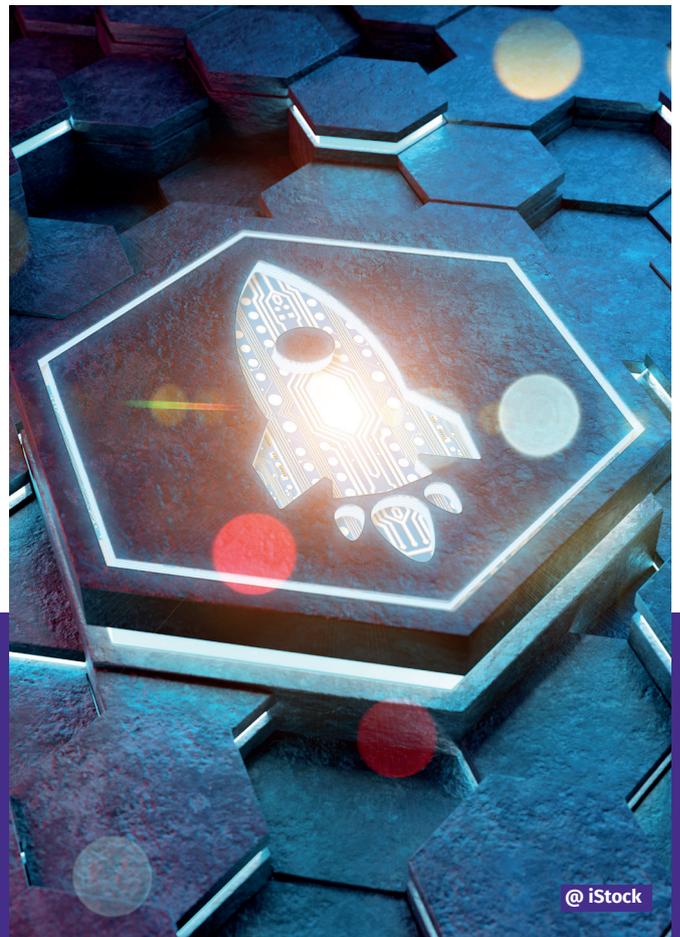
on both energy and cost savings, including projections for the coming years, and references the methodologies and sources used for these calculations.

6.1 - Milestones and Regulatory Frameworks by Region and Country

The development and facilitation of harmonised regional MEPS encompassed both regional and national dimensions. At the regional level, two MEPS for each region, covering lighting and cooling, were successfully validated. Simultaneously, at the national level, 21 technical committees were either established or strengthened, providing essential support for the implementation, oversight, and enforcement of these standards.

Seven harmonised MEPS are adopted at the regional level:

1. **SADC HT: 109 2021** – SADC Harmonised MEPS for lighting
2. **SADC HT: 110 2023** - SADC Harmonised MEPS on Air Conditioners
3. **SADC HT: 111 2023** – SADC Harmonised MEPS for Refrigerating Appliances
4. **EAS 1064-1:2022, Lighting Products** - Minimum Energy Performance Standard - Part 1 - Lamps (1st Edition)
5. **EAS 1064-2:2022 - Lighting Products** - Minimum Energy Performance Standard - Part 2 - Luminaires (1st Edition)
6. **EAS 1213:2024. Air conditioning appliances for household and similar use** — Minimum energy performance — Requirements
7. **EAS 1214:2024. Refrigerating appliances for household and similar use** — Minimum energy performance — Requirements.

11 countries have adopted the regional MEPS as national level MEPS so far:

The **harmonised lighting MEPS** have been adopted as national MEPS by **Eswatini, Namibia, Mozambique, South Africa, DRC, Uganda, Kenya, Rwanda, South Sudan, Tanzania** and **Zambia**, covering **73%** of the population across the EAC and SADC regions.
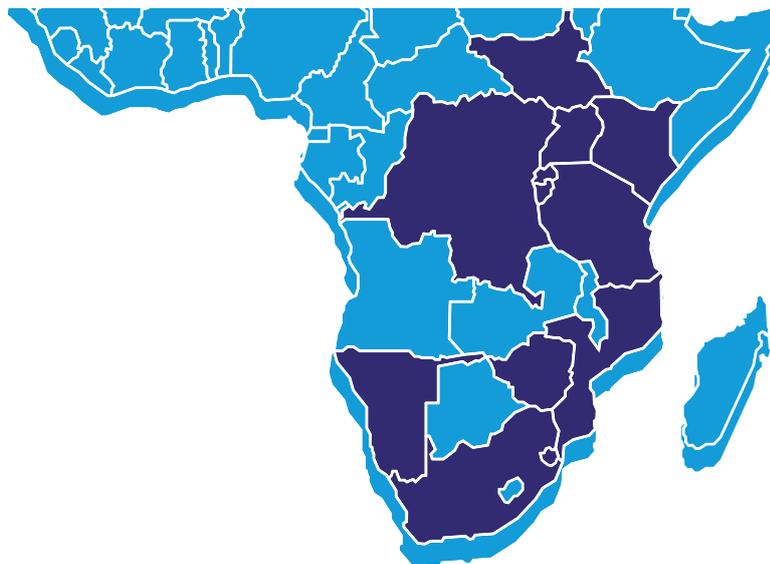

Figure 11: Countries adopting the Regional Lighting and/or Cooling MEPS at the national level.

The **harmonised cooling MEPS** have been adopted by **Mauritius, Zambia, Zimbabwe, Eswatini** and **Namibia** as national MEPS, representing **3.8%** of the regions' populations. The process of national adoption is on-going for both ACs and refrigerators in Botswana, South Africa and the Seychelles with support from UNEP-U4E and GIZ.

Two Regional Compliance Frameworks for EELA Developed and Adopted:

The SADC regional compliance framework was adopted in 2023 and the EAC regional compliance framework was developed and shared with the EAC Secretariat for adoption. The draft EAC regional compliance developed was validated in August 2024 in Dodoma, Tanzania. EELA held national consultations in Burundi, DRC, Kenya, Rwanda, South Sudan, Tanzania and Uganda. The draft EAC Regional Compliance Framework was presented during the 17th meeting of the EAC Sectoral Council on Energy, Petroleum and Mining held on 10th-14th February 2025. The Republic of Tanzania requested for more time to finalise the national consultations by June 2025. The draft EAC Regional Compliance Framework was to be presented during the 18th EAC Sectoral Council on Energy, Petroleum and Mining. National consultations on the SADC Regional compliance framework was carried out in Botswana. *Further details are provided in Section 3.1.*

Draft EE Labelling Options Proposed for EAC and SADC

Draft EE labelling options were developed for EAC and SADC following a review of existing labels and regional consultations. This alignment is expected to simplify regional trade, improve consumer awareness, and accelerate the adoption of energy-efficient products by making performance information more accessible and comparable across markets. *Further details are provided in Section 2.3.*

Regional Testing Laboratories

Under the EELA Project, two regional reference laboratories—UNBS in Uganda for EAC and INNOQ in Mozambique for SADC—were designated to support testing needs across member countries, establishing sustainable regional capacity. Targeted support was also provided to laboratories in Uganda, Tanzania, and Namibia to enhance their ability to test lighting and cooling appliances against regional MEPS. Additionally, **public procurement guidelines** were developed and disseminated to 21 countries in EAC and SADC, enabling procurement officers to integrate energy efficiency criteria into purchasing decisions for appliances and equipment. *Further details are provided in Section 3.1.*

E-waste Management Guidelines have been developed for both the EAC and SADC regions, and have so far been validated by the SADC Directors of Energy. These guidelines emphasise the critical role of infrastructure and capital investment in maximizing material and energy recovery from end-of-life energy equipment. By addressing these priorities, current e-waste policies and practices lay the foundation for effective and sustainable Waste Electrical and Electronic Equipment (WEEE) management. They also include recommendations on Extended Producer Responsibility (EPR), product reparability, and the development of institutional capacity and technical skills. The implementation of EPR is expected to lead to improved recycling rates, a reduction in illegal dumping, and the creation of new economic opportunities aligned with circular economy goals. *Further details are provided in Section 3.1.2.*

Regional Compliance Framework Enforcement

Training workshops, national consultations, and regional harmonisation meetings were organised to promote the regional compliance framework across Burundi, South Sudan, Uganda, Kenya, Mauritius, and Botswana. In nearly all participating countries, the roadmaps focused on **identifying key institutions to lead the three pillars of compliance**: Conformity Assessment, Market Surveillance, and Enforcement to ensure a successful implementation of the regional

compliance framework. *Further details are provided in Chapter 3.*

6.2 Social Impact: Lives Impacted and Jobs Created

Energy-efficient lighting and cooling appliances have been made accessible to **160 million people** in the SADC and EAC regions who already have access to electricity, representing around 35% of the population of these regions. Beyond enabling households to achieve cost savings through the use of more efficient equipment, this increased availability also helps expand energy access by allowing more people to benefit from the existing power supply, as well as **easing demand on the grid** and reducing dependence on imported fossil fuel. As a result of these cascading effects, the project has already reached more than **395 million people, including 200 million living in poverty**.
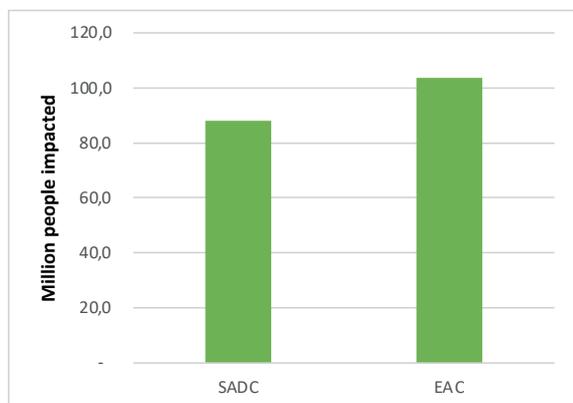

Figure 12: Number of lives impacted by the EELA project by November 2024 . Note that Tanzania and DRC, the two largest countries by population, are members of both regions. To avoid double counting Tanzania is counted in EAC and DRC in SADC.

Through the EELA Technical Assistance and Co-financing Facility, **€335,000 has been leveraged from the private sector to support energy-efficient lighting and appliance projects**. This figure is expected to

grow significantly with the expansion of national EELA initiatives focused on industrial energy efficiency. Additionally, **173 jobs** have been created directly through pilot projects, with projections indicating exponential growth as further ESCOs are established and investment in EE solutions increases.

6.3 Energy Saved: Quantifying the Impact of Energy Policies

Energy savings are among the primary direct benefits of MEPS adoption. Over the course of the EELA Project, these savings include both indirect effects from MEPS approval and direct effects from pilot projects. UNIDO estimates that approximately **600,000 MWh of energy have already been saved**, based on MEPSY data (*source: https://www.clasp.ngo/tools/mepsy/*) for baseline and MEPS consumption per lamp, along with the number of units installed per country. Adoption is assumed for countries that have implemented MEPS nationally, with compliance starting at 10% in the year of adoption and increasing by 10% annually.

Projections to 2030 suggest even more substantial savings. Considering lighting alone, **cumulative energy savings could reach up to 32,000,000 MWh by 2030**, assuming all countries adopt the regional MEPS and compliance continues to grow at 10% per year. Including the adoption of MEPS for refrigeration and air conditioning could further increase total energy savings to as much as **40,000,000 MWh by 2030**.

6.4 Costs Saved: Financial Benefits of Energy Efficiency Policies

Based on the energy savings achieved to date and the average electricity price in each country, these energy savings have already generated roughly **€64 million in cost reductions for households**, industry, govern-

ment, and markets. Assuming continued adoption and compliance with MEPS across the region, cumulative cost savings from lighting alone could exceed €3,000 million by 2030, based on current national electricity prices *(source: https://mera.mw/2023/11/24/comparative-energy-prices-within-the-sadc-region-as-at-23-november-2023/).*

6.5   GHG Emissions Reduced

GHG emission reductions result from the energy savings calculated from the introduction of MEPS and labelling and the pilot projects. Where countries heavily rely on coal fired generation, the GHG emissions saved are considerably higher than in countries that rely predominantely on renewable energy. It is estimated that:

- **480,000 tonnes of CO2e** have been saved until 2024.
- By 2030, **24 million tonnes of CO2e** will be mitigated.

6.6   Lessons Learnt and Key Takeaways

The development of regionally harmonised MEPS in sub-Saharan Africa represents a major milestone in advancing the implementation of sustainable development goals and stands as one of the most significant achievements of the EELA Project.

The adoption of MEPS extended beyond regulatory progress, reaching over 395 million people. With more than 600,000 MWh of energy saved and €64 million in cost reductions to date, **the initiative is on track to deliver substantial greenhouse gas (GHG) emission reductions**.

Equally impactful has been the capacity-building **support provided to national laboratories**, including the

provision of specialized equipment for testing lighting products. This support has strengthened enforcement and **market surveillance capabilities**, enabling stakeholders to assess product conformity and take appropriate action. Stakeholders consistently highlighted the value of combining equipment with targeted training to enhance institutional effectiveness.

The alignment of labelling schemes and compliance frameworks laid the groundwork for **deeper regional integration**, simplified trade, and improved consumer awareness. Complementary tools, such as public procurement guidelines and e-waste management strategies, reinforced the importance of a holistic and synergistic policy environment, ensuring that **energy efficiency efforts are both sustainable and scalable**.

Estimated EELA Impact by 2030

32,000,000
MWH energy saved

> € 3,000
million saved

24
million tonnes CO2e
emissions reduced

800,000
lives impacted with
access to EE products

Conclusions

The harmonisation of energy efficiency policies across the EAC, ECOWAS, and SADC regions demonstrates that regional coordination, while complex, can generate significant benefits for market transformation and cross-border trade. Lessons from the EELA Project show that effective policy alignment goes beyond standardising technical norms. It requires sustained political commitment, strengthened institutional capacities, and flexible frameworks that accommodate the diverse national contexts within each region. Even when countries begin the harmonisation process from different levels of policy maturity, tangible progress can be achieved through phased implementation strategies and structured peer-learning initiatives.

The results of these efforts are evident. Eleven countries have already adopted regional MEPS at the national level, covering 73 percent of the population for lighting standards and initiating adoption for cooling appliances. Two regional compliance frameworks have been validated, and testing capacity has been strengthened through the establishment of reference laboratories in Uganda and Mozambique, supported by portable testing kits distributed to 21 countries. These investments have enhanced enforcement and market surveillance, ensuring that standards translate into real-world outcomes.

The impact is measurable. To date, 600,000 MWh of energy have been saved, generating €64 million in cost reductions for households, businesses, and public institutions. These savings have also produced environmental benefits, with 480,000 tonnes of CO_2e emissions avoided—a figure projected to reach 24 million tonnes by 2030. Socially, the initiative has reached 395 million people, including 200 million living in poverty, and has created 173 new jobs while mobilizing €335,000 in private sector investment through innovative financing models.

Sustaining this progress will require ongoing regional coordination, stronger national implementation, and closer engagement with industry and financial institutions. The evidence presented in this report shows that harmonised policies, supported by effective compliance mechanisms and inclusive capacity-building efforts, can generate measurable benefits across the value chain. Continued commitment to these approaches will be critical for advancing energy efficiency, supporting industrial development, and addressing climate challenges across Africa.