



Lighting MEPS & UNIDO/SACREEE EELA – SADCSTAN standard

CLASP
2 December 2022

Electricity enables us to do things...



- Its about services, not electricity.
 - Cold drinks
 - Cool air
 - Bright lights
 - Great movies
 - Clean clothes

- Energy-efficiency enables you to enjoy the same services while using less electricity

Think of Energy-Efficiency as a Power Station

- Reducing demand is the same as building new capacity – new MW are available
- Megawatts of freed-up capacity are **cheaper and faster** than building new capacity, and have **zero running costs**

Traditional
Power Station
“Megawatts”



Efficiency
Power Station
“Negawatts”



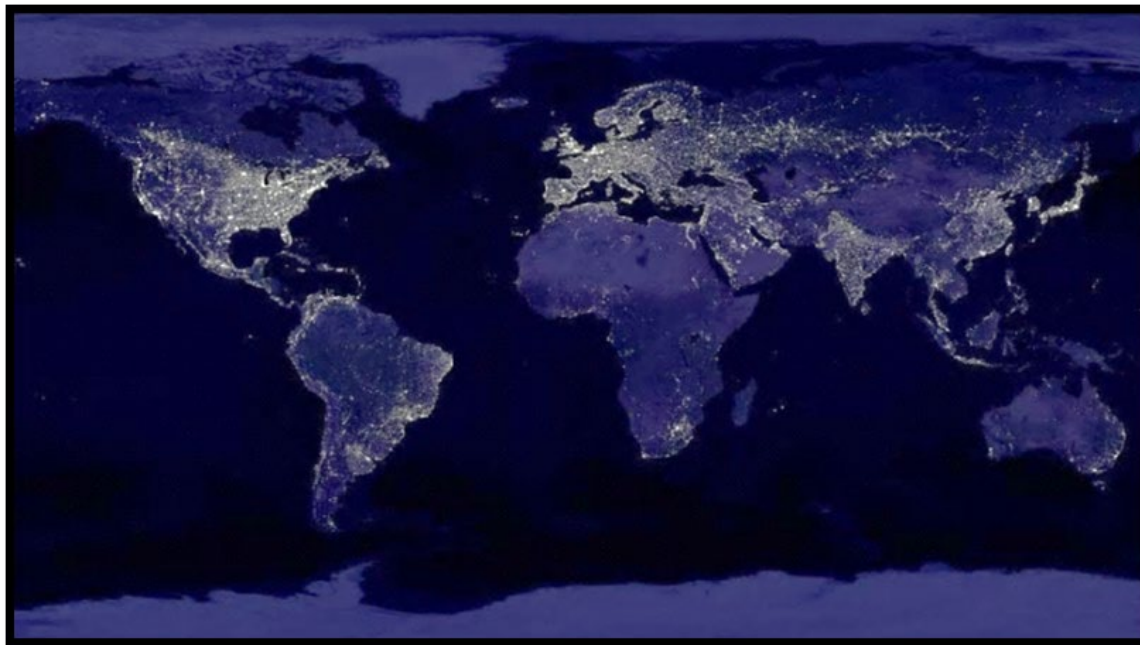
Reasons to increase the efficiency of lighting and appliances

- **Household savings** - reduce household energy bills (but still enjoy the same services!)
- **New / emerging energy users (SMEs, farmers)** – have lower energy bills, more cost-effective
- **Grid reliability** – reduce electricity shortages (brown-outs / black-outs); reduces peak power
- **Save national investment** – reduce capital tied up in power stations and grid; slows growth in demand
- **Market protection** - avoid becoming dumping-ground for old technologies banned elsewhere
- **Energy imports** – reduce capital out-flow for fuel purchases / electricity imports; strengthen national energy security
- **Climate change** – develop on a ‘soft energy path’, avoid becoming a high CO₂ emission country



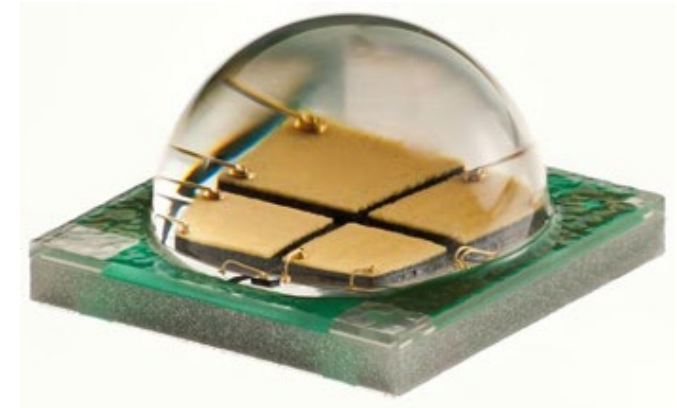
Lighting Electricity Use Globally

- Lighting consumes approximately 15% of the total electricity consumption
- Electricity to run the lights contributed 1.6 Gt of CO₂ emissions
- Over one billion people lack electrical lighting – future demand
- A disruptive technology (LED) has entered the market – changes are coming

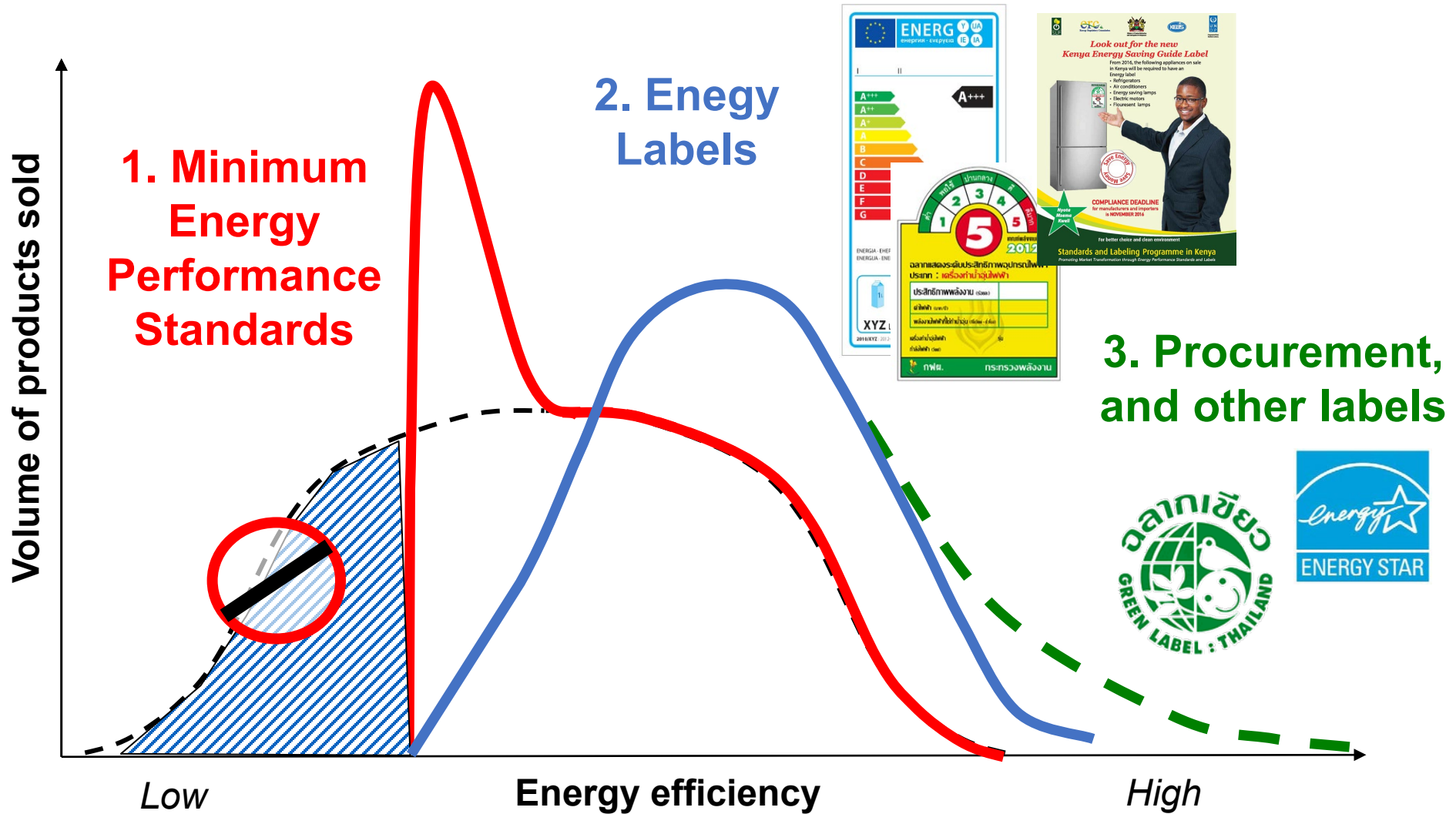


Lighting in all end-use sectors is shifting to LED

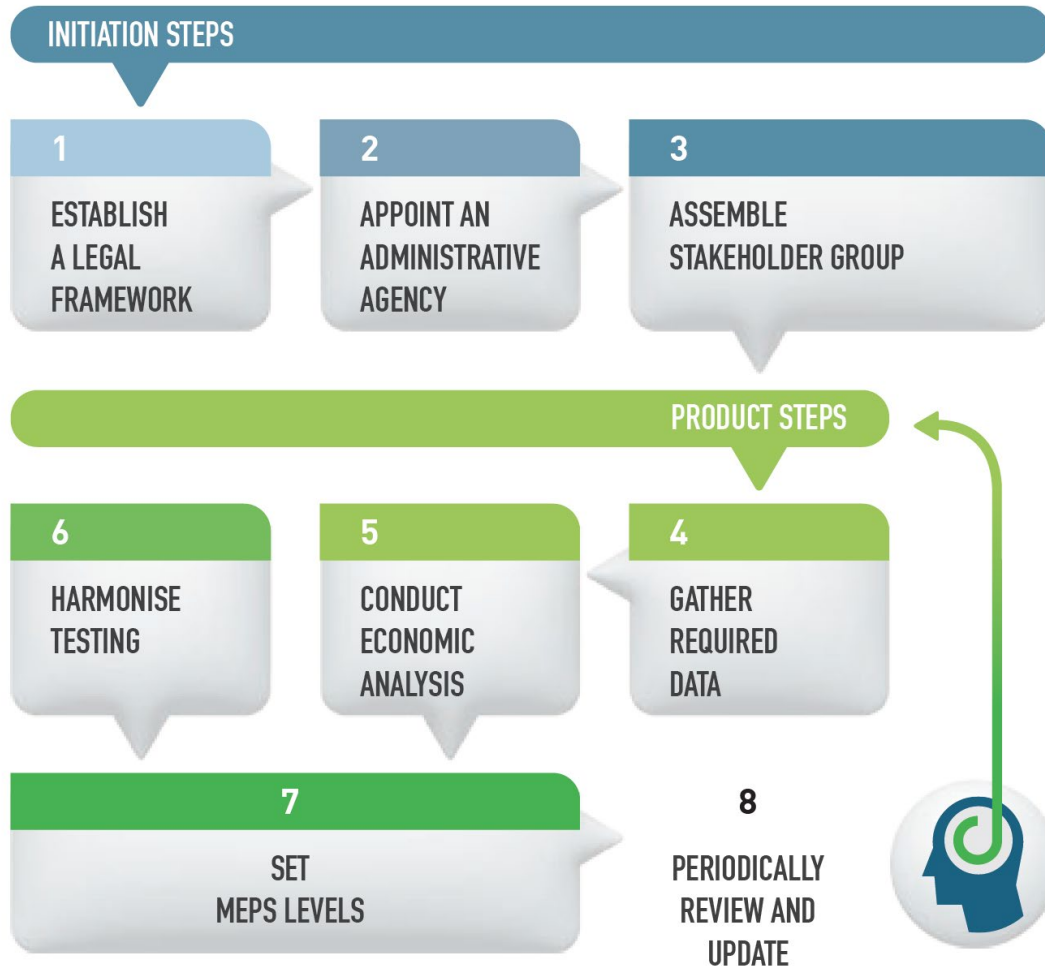
- Residential - household lighting, indoor & outdoor
- Commercial – hallway, offices, meeting rooms, architectural, retail / shop, parking, area...
- Industrial – high-bay, process
- Municipal / Outdoor – street lighting, walkway, sports stadium...



Market Transformation through MEPS and Labels



Policy Process for Setting MEPS

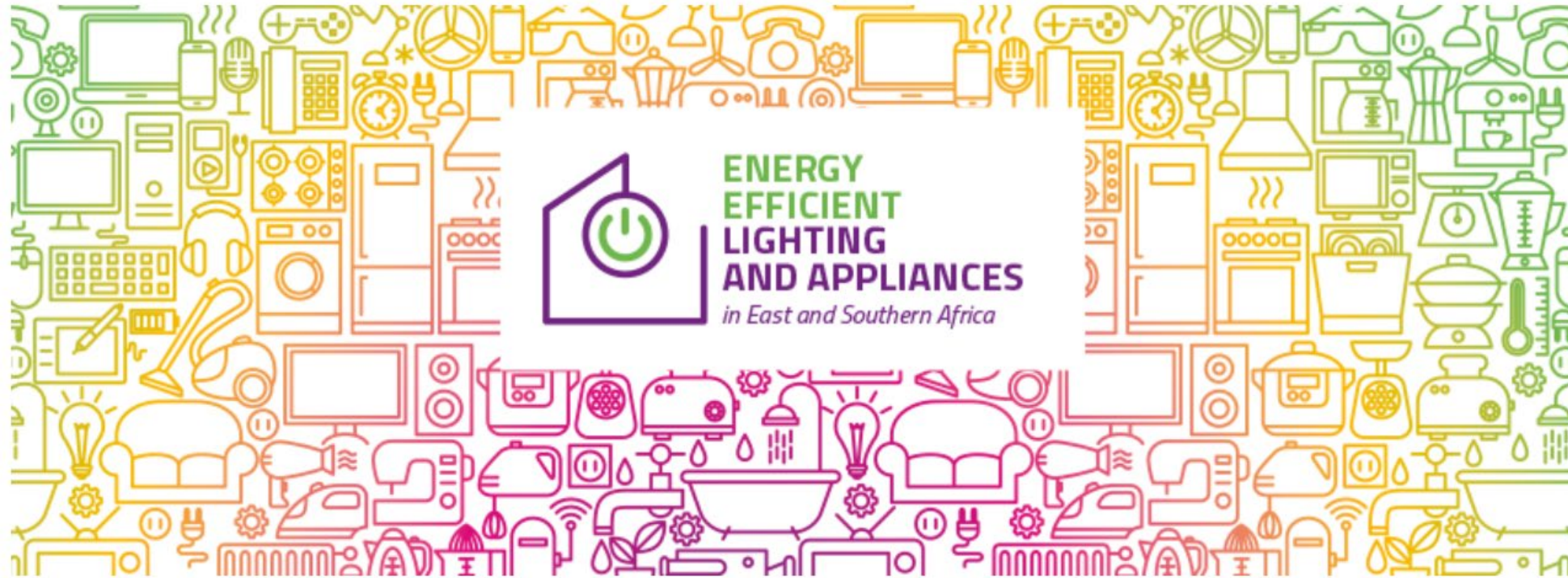


INITIATION STEPS

1. **Establish a legal framework:** Review existing legislation and establish framework legislation to develop a legal basis for, and political commitment to, mandatory efficiency standards and energy labels.
2. **Appoint an administrative agency:** Assess existing institutional capacity for developing, implementing and maintaining a standards and labelling programme. Develop an overall standards and labelling plan and assign one government agency with primary responsibility for driving each element of the programme.
3. **Assemble a stakeholder group:** Identify the key relevant people in your economy who would be interested and invite them to participate in the process.

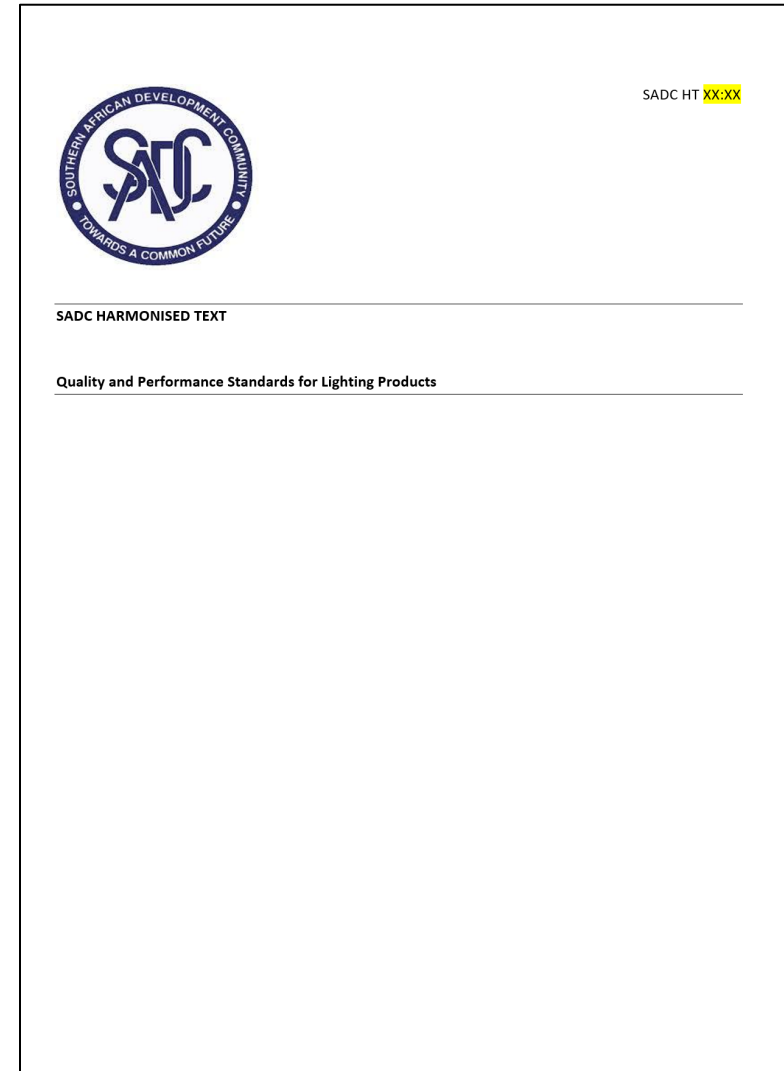
PRODUCT STEPS

4. **Gather required data:** Establish minimum data needs and develop a plan for collecting the data necessary to conduct analysis to support the programme. This includes information on the market, technology, engineering and usage of the product.
5. **Conduct an economic analysis:** Use cost-effectiveness analysis to determine the appropriate level of ambition for the regulatory measure(s).
6. **Harmonise testing:** To the greatest extent possible, harmonise energy performance test procedures with international protocols (such as International Electrotechnical Commission test standards) to facilitate testing and reduce barriers to trade.
7. **Set MEPS levels:** Determine the technically feasible, economically optimal regulatory level; invite stakeholder comment and refine MEPS if necessary; secure political endorsement; publish regulatory notice; and specify a future date when MEPS will take effect.
8. **Review and update:** Plan to periodically review and update the standards every few years to ensure they remain appropriate and relevant.



Energy Efficient Lighting and Appliances in EAC and SADC (EELA)

1. Scope of coverage
 - Lamps
 - Luminaires
 2. Terms and definitions
 3. Requirements
 - Efficacy
 - Functional performance
 - Product Information
 4. Referenced Test Standards
 - Lamps
 - Luminaires
 5. Requirements for Applicant
- Annexes A, B, C, D



- General Service Lamps



- Certain Indoor Luminaires



- Tubular Lamps



- Outdoor/Streetlight Luminaires



1. Scope of Coverage

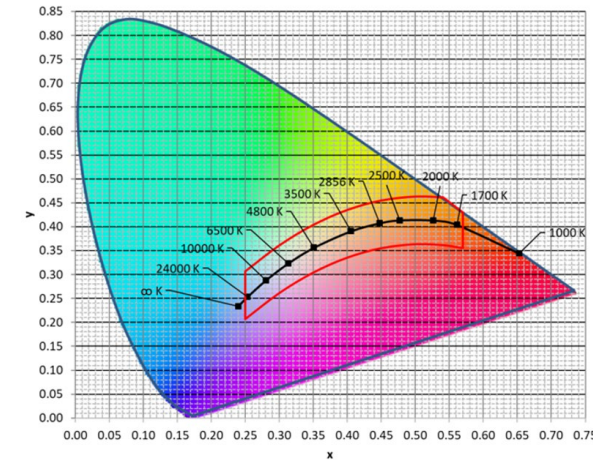
- Defines white light area with (x,y) chromaticity equations

Lamps:

- Inclusions – uses technology-neutral aspects and characteristics that apply to all technologies for a particular application
- Exclusions – special purpose, non-covered types of lamps

Luminaires:

- Inclusions – includes conventional (IEC sockets, IEC 60061) and new LED types
- Exclusions – special purpose, excluded types of luminaires



- $0,250 < x < 0,570$ and
- $- 2,3172 x^2 + 2,3653 x - 0,2400 < y < - 2,3172 x^2 + 2,3653 x - 0,1400;$

Example of Technology Neutral for General Service Lamps:

- Colour of light
- Voltage / Frequency
- Quantity of light (lumens)
- Base types

2. Terms and Definitions

- All the key terms and definitions used in the standard
- Notes that definitions used in referenced standards in Section 4 also apply
- Used IEC definitions wherever possible
- Many definitions coming from the U4E model regulation, which was carefully reviewed by industry partners

2 Terms and definitions

For the purposes of this standard, the definitions in standards referred in Section 4 of this standard shall apply. In addition, the following definitions shall apply:

- 2.1 **applicant:** the manufacturer or importer seeking approval for lighting product(s). The applicant shall be an existing legal entity.
- 2.2 **approval:** confirmation by the appropriate government agency that a particular lighting product(s) satisfies all the requirements of this mandatory standard.
- 2.3 **arithmetical mean:** the average of a set of numerical values, calculated by adding them together and dividing by the number of terms in the set.
- 2.4 **beam angle** of a directional light source: the angle between two imaginary lines in a plane through the optical beam axis, such that these lines pass through the centre of the front face of the light source and through points at which the luminous intensity is 50% of the centre beam intensity, where the centre beam intensity is the value of luminous intensity measured on the optical beam axis.

Note 1. For light sources that have different beam angles in different planes, the largest beam angle shall be considered; Note 2. For light sources with user-controllable beam angle, the beam angle corresponding to the 'reference control setting' shall be considered.

- 2.5 **chromaticity:** the property of a colour stimulus defined by its chromaticity coordinates (in either x, y or u', v' coordinate system).
- 2.6 **colour consistency:** the maximum deviation of the chromaticity coordinates of samples of a product from the chromaticity coordinates of the nominal CCT value.
- 2.7 **colour rendering index (CRI):** the measure of the degree to which the psychophysical colour of an object illuminated by the test illuminant conforms to that of the same object illuminated by the reference illuminant suitable allowance having been made for the state of chromatic

3. Requirements - Efficacy

3.1 Luminous Efficacy Requirement

All covered lamps and luminaires shall comply with the minimum luminous efficacy requirements for the entire light source (i.e., lamp or luminaire) set out in two phases in Table 1:

Table 1: Minimum luminous efficacy of Lamps and Luminaires

Type of Covered Product*	Minimum luminous efficacy (lm/W)	
	Phase 1 (1 April 2022)	Phase 2 (1 April 2024)
General Service Lamps – Non-Directional	90	105
General Service Lamps – Directional	75	85
Tubular Lamps	115	130
Linear Batten and Troffer Luminaires	105	115
Downlight Luminaires	85	95
High and Low-Bay Luminaires	120	130
Planar (or Panel) Luminaires	85	95
Outdoor / Streetlight Luminaires	105	115

**The scope of coverage of these lamps and luminaires is given in Section 1 of this Standard.*

3. Requirements - Functional Performance (Quality)

All lamps and luminaires

Displacement Factor, (Cos ϕ 1)
Harmonics
Standby Power
EMC emissions
EMC immunity
Colour Rendering Index (CRI)
Nominal CCT
Colour consistency
Lumen maintenance factor
Survival factor
Short term flicker indicator (P_{stLM})
Stroboscopic effect visibility measure (SVM)

All luminaires (indoor and outdoor)

Serviceability / Repairability
Warranty
IP Rating

Outdoor luminaires

Luminaire Lifetime
Total Circuit Power
Voltage Variation
Surge Protection Devices
Smart Lighting Compatible
Control of Light Distribution

4. Referenced Test Standards

Table 7: Relevant test standards, conformity assessment and surveillance testing for General Service Lamps and Tubular Lamps

Phenomena	Lamp Type	Standard	Conformity Assessment (for suppliers)	Surveillance Testing (for government)
Luminous Efficacy in [lm/W]	All	Calculated. See below for (measured luminous flux / measured power)	Sample of 10 units. The arithmetical mean of the calculated luminous efficacy of the 10 units shall not be less than required level.	Sample of 10 units. The arithmetical mean of the calculated luminous efficacy of the 10 units shall not be less than required level.
Luminous flux in [lm]	Incandescent / Halogen	IEC 60064 CIE 84 / IEC 60357	Sample of 10 units. The arithmetical mean of the measured luminous flux of the 10 units shall not be less than 92.5% of the rated luminous flux and the measured luminous flux of each individual lamp of the sample shall not be less than 90% of the rated luminous flux	Sample of 10 units. The arithmetical mean of the measured luminous flux of the 10 units shall not be less than 90% of the rated luminous flux
	CFL	IEC 60969 CIE 84		
	LFL	IEC 60081 CIE 84		
	LED	IEC 62612 CIE S025 IEC 62722.2.1 IEC 62717		
Power in [W]	Incandescent / Halogen	IEC 60064 CIE 84	Sample of 10 units. The arithmetical mean of the measured power of the 10 units shall not exceed 107.5% of the rated power, and the	Sample of 10 units. The arithmetical mean of the measured power of the 10 units shall not exceed 110% of the rated power, and the
	CFL	IEC 60969 CIE 84		
	LFL	IEC 60081		

- Table 7 for Lamps
- Table 8 for Luminaires

5. Requirements for Applicant

- Guidance for Suppliers – supporting compliance

5 Requirements for Applicant

- a) With respect to the performance requirements (Section 3), the following evidence shall be submitted to the national regulatory authority as proof of conformity with the requirements of this standard:
 - A completed application form as specified in Annex C or a similar form as required by the national regulatory authority
 - Evidence of conformity to requirements set out in Section 3 - A valid test report issued by a laboratory appropriately accredited by an internationally recognised body being a member of an IAF/ILAC/IECEE mutual recognition scheme in accordance with the country's conformity assessment policy
 - Other documents as required by the national regulatory authority
- b) The applicant shall ensure that each model of the lighting product has been approved and successfully registered by the relevant regional or national regulatory authority before offering it for sale, or import, or supply in accordance with the requirements set out in the

Thank you!

Michael Scholand, LC

Senior Advisor
CLASP Europe
London, UK

Mscholand.consultant@clasp.ngo

Tel: +44 7931 701 568



- Lighting Products in Part I of Annex A to the [Minamata Convention on Mercury](#) as set out in the table on the right
- New (March 2022) amendments are shown in grey shading
- South Africa is a Party to the Convention

<i>Mercury-added products</i>	<i>Date after which the manufacture, import or export of the product shall not be allowed (phase-out date)</i>
Compact fluorescent lamps (CFLs) for general lighting purposes that are ≤ 30 watts with a mercury content exceeding 5 mg per lamp burner	2020
Compact fluorescent lamps with an integrated ballast (CFL.i) for general lighting purposes that are ≤ 30 watts with a mercury content not exceeding 5 mg per lamp burner	2025
Linear fluorescent lamps (LFLs) for general lighting purposes: (a) Triband phosphor < 60 watts with a mercury content exceeding 5 mg per lamp; (b) Halophosphate phosphor ≤ 40 watts with a mercury content exceeding 10 mg per lamp	2020
High pressure mercury vapour lamps (HPMV) for general lighting purposes	2020
Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for electronic displays: (a) short length (≤ 500 mm) with mercury content exceeding 3.5 mg per lamp (b) medium length (> 500 mm and ≤ 1 500 mm) with mercury content exceeding 5 mg per lamp (c) long length (> 1 500 mm) with mercury content exceeding 13 mg per lamp	2020
Cold cathode fluorescent lamps (CCFL) and external electrode fluorescent lamps (EEFL) of all lengths for electronic displays, not included in the listing directly above	2025

Contact Group Annexes A & B – Held for COP5

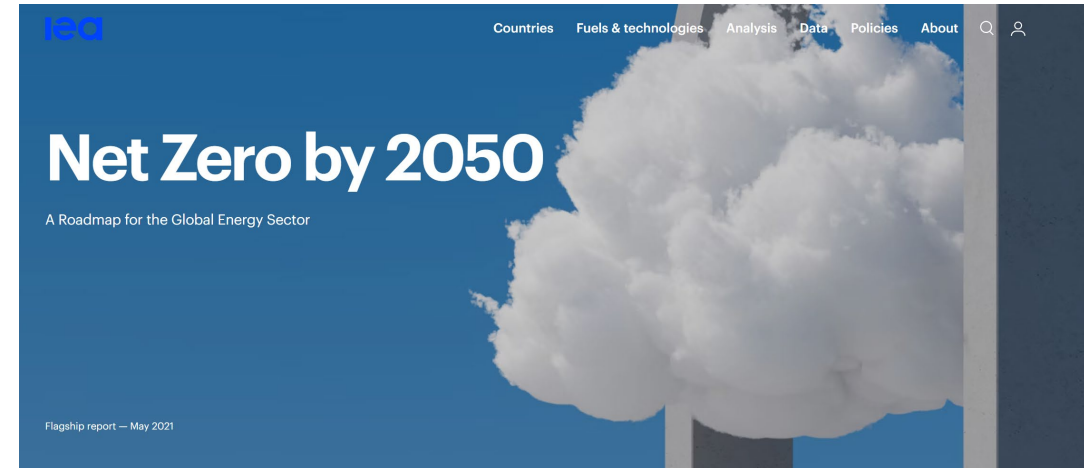
- Concluded with a decision to discuss the Amendments to Linear Fluorescent Lamps at COP5 in Geneva (November 2023)
- The proposed amendments are shown in grey shading, and the phase-out years that were discussed in Bali are shown in brackets [].

5. *Decides* to consider at the fifth meeting of the Conference the following phase-out dates for Part I of Annex A;

<i>Mercury-added products</i>	<i>Date after which the manufacture, import or export of the product shall not be allowed (phase-out date)</i>
Linear fluorescent lamps (LFLs) for general lighting purposes: (a) Halophosphate phosphor \leq 40 watts with a mercury content not exceeding 10 mg per lamp (b) Halophosphate phosphor $>$ 40 watts	[2025] [2027] [2030]
Linear fluorescent lamps (LFLs) for general lighting purposes: (a) Triband phosphor $<$ 60 watts with a mercury content not exceeding 5 mg/lamp	[2027] [2030]

Lighting Policy Initiatives – Global

- IEA report for [Net Zero emissions in 2050](#): “The share of light-emitting diode (LED) lamps in total lightbulb sales reaches 100% by 2025 in all regions.”
(see page 146 of the IEA report)



- IKEA (global retailer) – switched to all LED, on shelves and in store, in 2015
- UNEP United for Efficiency (U4E) – working in 10+ countries on phase-out; have model regulations that phase-out all fluorescent ([CFL](#) and [LFL](#)) 2023-2025

