



mineral resources
& energy

Department:
Mineral Resources and Energy
REPUBLIC OF SOUTH AFRICA



sanedi

South African National Energy
Development Institute.



Street Lighting Minimum Energy Performance Standard (MEPS) Market Study

Multi-stakeholder Industry Briefing

2 December 2022

Overview

1. Overview of the Study
2. Stakeholder Consultation
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Objective of the Study

To conduct a **market analysis and economic appraisal** of the existing state of, and influences on, lighting infrastructure and to **assess the impact that the implementation of street lighting MEPS would have on a range of impacted stakeholders**

Research team

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Stakeholder Consultations

Stakeholder Consultation's

- Information gathered in 4 discrete stages
- 38 stakeholders representing 4 stakeholder groups partook in the process (governing bodies, end-users, manufacturers and suppliers and civil society)

1

Firstly, all municipalities engaging in the DMRE's EEDSM streetlighting programme, past and present, were invited to participate in the data collection surveys

2

Secondly, online interviews with various stakeholders (not all) that submitted surveys. The interviews were conducted to collect qualitative information and to clarify any areas of uncertainty. There was no exclusionary method used to request interviews. Invitations were sent to as many stakeholders as possible; and those who had shown interest and availability were contacted for online interviews.

Stakeholders approached for interviews

- Policy & governance: DMRE, NCRS, SABS
- Consumers: two primary public sector streetlighting end consumers i.e. municipalities, SANRAL
- Civil society & industry associations: Lightcycle SA, Safehouse, Illumination Engineering Society of SA, Sustainable Energy Africa
- Industry Manufacturers, assemblers & distributors:
 - BEKA Schreder, Regent Lighting, GiantLight and Mggnitech: Responded
 - Lascon (Voltex), LEDwise, Nordland, Rubicon: Do not supply street lights
 - Signify, Genlux Lighting (ACTOM), LEDworx and Light Kinetics: No response

Stakeholder Consultation's

3 Thirdly, due to the relatively lower response from municipalities, the project team then sought to augment the submitted data by participating in a series of EEDSM stakeholder workshops, hosted by the DMRE in June 2022

4 A questionnaire was provided to these municipalities

A total of twenty-nine (out of 268) municipalities (representing 17.9 million (32%) of SA's population) and two SANRAL regions (Northern and Eastern) participated in the study

Implementation Scenarios

Scenario 1 - Baseline

- **“Do nothing” or “business as usual”** scenario, used as the control sample will be used as the benchmark or a point of comparison against which Scenario 2 and 3 will be measured
- In this scenario MEPS are not introduced and the DMRE’s EEDSM streetlighting luminaire specification remains in place (only applicable to municipalities who participate in the voluntary programme)
- **Implementation rate of energy efficient streetlighting technology will continue to be implemented to varying degrees across the country**

Scenario 2 - MEPS

- Represents the scenario where streetlighting energy performance is **regulated through technical energy performance specifications**
- Thus, from the effective date **all purchases of new streetlighting luminaires will be efficient** and over time, as existing luminaires are replaced, the **market will shift towards 100% penetration levels**

Scenario 3 – Phased-in MEPS

- Represents the scenario where the **regulation is promulgated at a future date, beyond 2025**
- A precursor to the regulation is **mandatory municipal participation in the EEDSM programme**
- Once all municipalities become acquainted with the technical specification requirements and the market has shifted to higher efficiency luminaires, the MEPS would be promulgated

Implementation Scenarios

2022	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15

Scenario 1
Baseline

Business-as-usual

Scenario 2
MEPS

Drafting & legislating MEPS

Capacity building & awareness

MEPS implemented in Year 4, thereafter there is ongoing awareness campaigns, monitoring and enforcement of the MEPS

Scenario 3
Phased-in MEPS

Drafting MEPS guideline

Implementation of MEPS guideline, capacity building & awareness

Drafting & legislating MEPS

MEPS is implemented in Year 7, thereafter there is ongoing awareness campaigns, monitoring and enforcement of MEPS

Methodology & Approach

Methodology & Approach

- Cost Benefit Analysis was used as the methodology to undertake an assessment of the impact of implementing a MEPS
- Steps undertaken in the CBA:
 1. Creating a framework where quantifiable costs and benefits are identified
 2. Converting costs and benefits into financial values
 3. Converting costs and benefits to Net Present Values using a Social Discount Rate
 4. Calculating CBA indicators, including Economic Net Present Value and Benefit Cost Ratios

Framework for the CBA

Costs

- Higher upfront cost of energy efficient luminaires
- Higher operational and maintenance costs of current HID technology
- Additional costs to suppliers associated with the implementation of MEPS
- Additional costs to regulators associated with the implementation of MEPS

Benefits

- Reduced operational and maintenance costs of energy efficient technology
- Reduced capital costs to replace end of life luminaires
- Reduced electricity consumption, electricity cost and GHG emissions

Key Assumptions

Estimation of luminaire stock for municipalities

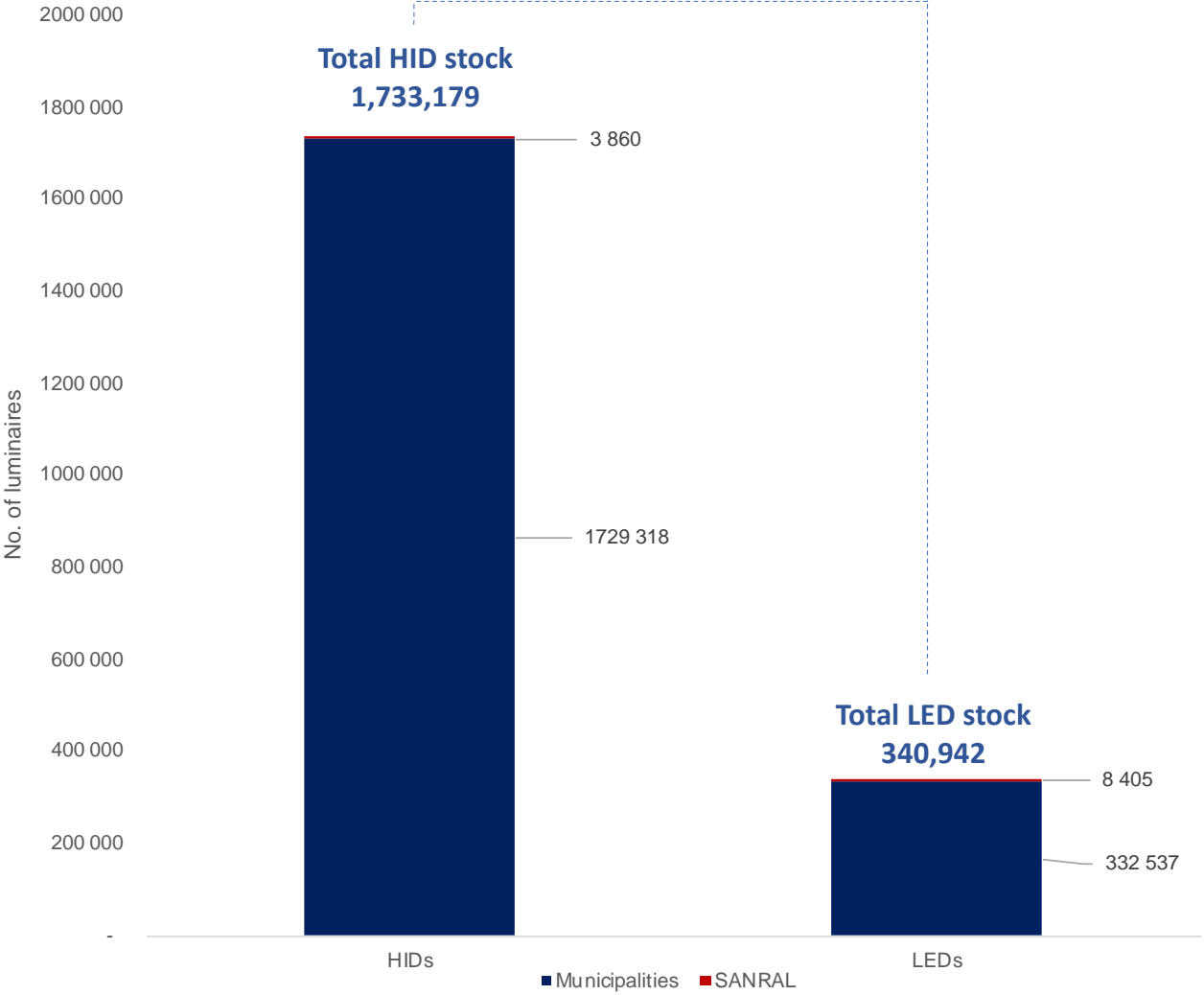
Type of municipality	Population	Ratio of people / luminaire	No. of luminaires	LED penetration rate (%)
Estimation for large metropolitan municipalities				
City of Johannesburg & eThekweni	8 651 577		508 833	
Extrapolation for CoT, Ekurhuleni & CoCT	10 659 271	17	629 732	10,4%
Sub-total for large metropolitan municipalities	19 310 848		1 138 565	
Estimation for small metropolitan municipalities				
Nelson Mandela Bay Metropolitan Municipality	1 263 051		64 401	
Extrapolation for Buffalo City & Mangaung	1 622 801	20	82 744	48,3%
Sub-total for small metropolitan municipalities	2 885 852		147 145	
Estimation for other EEDSM municipalities				
Other EEDSM municipalities	201 554	43	4 676	44,7%
Estimation for non-EEDSM municipalities				
Non-EEDSM municipalities				
<i>(Based on data from municipalities new to EEDSM)</i>	33 255 391	52	771 469	7,9%
Total/average	55 653 645	27	2 061 855	16,1%

Estimation of luminaire stock for SANRAL

SANRAL Regions	No. of luminaires	LED penetration rate (%)
Northern Region (Gauteng, North West, Limpopo, Mpumalanga)	4 530	57,9%
Eastern Region (Free State, KwaZulu-Natal)	2 681	83,0%
Estimation for Western Region (Western Cape, Northern Cape)	5 055	70,4%
Total	12 266	68,5%

Summary of luminaire stock

Estimate of total stock in South Africa
2.074 million luminaires
16.4% penetration rate



General Assumptions

Description	Assumption	Notes
No. of years in the review period (years)	15	A medium-term review period was selected as this study deals with a regulatory change which requires some time for implementation, and thereafter, for results to filter through the economy.
Social Discount Rate (SDR) (%)	2,3%	Based on the SDR calculated for South Africa by Nova Economics in the Cost Benefit Analysis of technology-neutral regulations to introduce minimum energy performance standards for general lighting
Consumer Price Index (CPI) applicable to costing for Year 1 (2022) (%)	5,10%	Based on CPI from National Treasury, Medium Term Budget Policy Statement for 2022
Consumer Price Index (CPI) applicable to costing for Years 2 to 15 (%)	4,60%	
Baseline luminaire stock in Year 1 (2022) (no. of luminaires)	2 074 121	This estimate is based on an extrapolation of data from municipalities and SANRAL as per the SANEDI-CLASP Survey of 2022. The methodology for extrapolation is contained within this report.
Baseline LED penetration rate in Year 1 (2022) (no. of luminaires)	16,4%	
Baseline luminaire replacements in Year 1 (2022)	288 333	Data obtained from the SANEDI-CLASP Survey of 2022
Annual growth rate due to increased electrification (%)	1%	Assumption based on annual population growth rate and the ongoing efforts to increase the number of streetlights as municipalities continue to electrify areas
Average lifespan for LED streetlight (hours)	50 000	Based on CLASP Economic Cost Model
Average lifespan for HID streetlight (hours)	24 000	

Assumptions used in calculating energy saving

Description	Assumption	Notes
Daily usage (number of hours)	10	Typical running hours for streetlights in South Africa
Tariff per kWh	R1.63	Source: DMRE's EEDSM tariff
Annual tariff escalation	8%	Electricity tariff escalation is based on increases which have exceeded inflation for more than a decade

For any queries or comments please contact
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Q&A