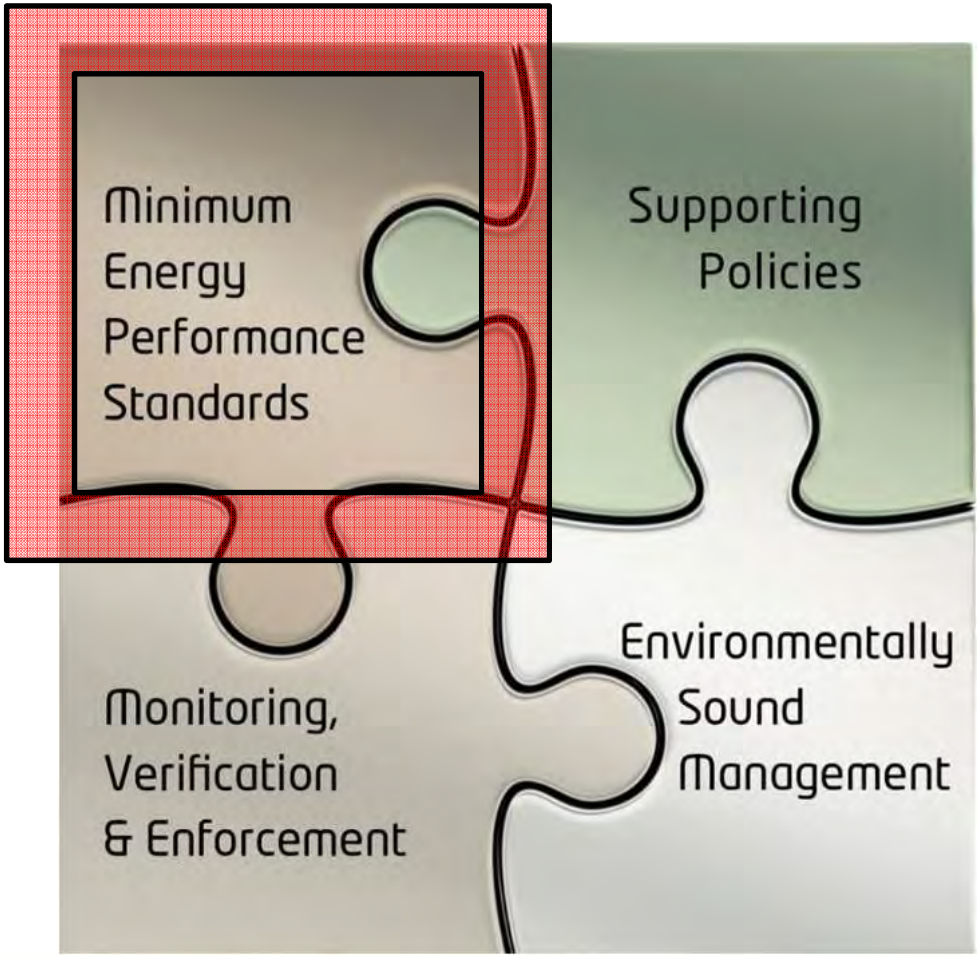
United Nations Environment Programme
en.lighten Initiative

Minimum Energy Performance Standards (MEPS) Breakout Group

ECOWAS Workshop, Cotonou, Bénin
2 October 2013

Four Pillars of the Integrated Policy Approach
Our Focus is MEPS



Introductions – Around the Table

- Country
- Name
- Title
- Organisation

Agenda Item

11:10 Review agenda – Mbacké, Chairman MEPS Group

11:10 Revue ordre du jour - Mbacké, président des eurodéputés du Groupe

MEPS Breakout Group Agenda – Overview

Very full Agenda today – keep to time

- 11:00 – 13:00 Session A. Introductions and On-Grid Lighting
- 13:00 – 14:00 Lunch
- 14:00 – 15:30 Session B. Off-Grid Lighting
- 15:00 – 15:45 Coffee Break
- 15:45 – 17:00 Session C. Responsibilities, Timeline, Milestones, Financial Considerations

Session A. Introductions and On-Grid Lighting

11:10 Review agenda – Mbacké, Chairman MEPS Group

11:15 Review the detailed objectives of the MEPS Group – Mike, UNEP

11:20 Review economic spreadsheet – LCC, PBP, IRR, CO2, kWh savings – Mike, UNEP

11:30 Key Questions for today's on-grid session (5-10 minutes each) – Mbacké

12:40 Group discussion of two key questions – Mbacké

13:00 Lunch (1 hour)

Group Participation

Session B. Off-Grid Lighting

14:00 Review different types of off-grid lighting, clarify what is covered by IEC / Lighting Africa and other – Benjamin, Philips

14:15 Review discussion and conclusions from Dakar Meeting on Off-Grid, Mike

14:20 Key Questions for today's session (5-10 minutes each) – Mbacké

15:10 Group discussion of two key questions – Mbacké

15:30 Coffee Break (15 minutes)

Group Participation

Session C. Responsibilities, Timeline, Milestones, Financial Considerations

15:45	Review of Key Activities Table – "Table 1"
16:10	Milestones and Timeline for On-Grid and Off-Grid – complete the Log Framework Analysis for each, "Table 2"
16:40	Financial Considerations of MEPS: i) Domestic Sources; ii) Private Sector Funding; iii) Non-Domestic Funding; iv) Carbon Financing
16:55	Wrap-up and Next Steps (Mbacké / All)
17:00	Close

Group Participation

Agenda Item

11:15 Review the detailed objectives of the MEPS Group – Mike, UNEP

11:15 Passez en revue les bjectifs o détaillée du groupe MEPS - Mike, le PNUE

Objective of the MEPS Group

- Objective: To adopt and implement Minimum Energy Performance Standards of on-grid and off-grid efficient lighting products in all ECOWAS countries

- Objectif: adopter et mettre en œuvre des normes de rendement énergétique minimum de sur-grille et hors réseau des produits d'éclairage efficaces dans tous les pays de la CEDEAO

Detailed Objectives of the MEPS Group

1. Discuss specification of MEPS for on-grid and off-grid lighting
   - Session A for on-grid and Session B for off-grid
2. Decide on which criteria and the requirements
   - Review existing requirements in the region
   - Review the economic spreadsheet
   - Consider the supply chain
3. Take back to your countries for discussion and approval

Agenda Item

11:20 Review economic spreadsheet – LCC, PBP, IRR, CO_2, kWh savings – Mike, UNEP

11:20 Revue économique sprea dsheet - LCC, PBP, IRR, CO_2, en kWh d'économies - Mike, le PNUE

Economic Analysis Spreadsheet

Filename: ECOWAS Lighting Policy Economic Analysis v3.xlsx

Title: ECOWAS Lighting Policy Economic Analysis / Analyse Economique de la Politique de la CEDEAO sur l'éclairage

Purpose: to provide some calculations on common economic factors associated with four on-grid lighting technologies in each ECOWAS country in your own currency, compared with an incandescent baseline.

Technologies: (1) Incandescent (baseline); (2) Halogen Incandescent; (3) Compact Fluorescent Lamp (CFL); (4) Light Emitting Diode (LED)

Outputs: LCC – Life-Cycle Cost; PBP – Pay-Back Period; IRR – Internal Rate of Return; CO2 – Carbon Dioxide Emission savings; kWh – electric power savings

Economic Analysis Spreadsheet - Instructions

Tab: Cover

	A	B
1–15		
16		**ECOWAS Lighting Policy Economic Analysis / Analyse Economique de la Politique de la CEDEAO sur l'éclairage**
17		**Description and Instructions**
18	1	This spreadsheet provides an economic assessment of replacement options for incandescent lamps in ECOWAS. Some of the countries have provided data on performance, which are reflected in the country sheets. Other countries contain estimates based on an average across the reporting ECOWAS countries.
19	2	The spreadsheet considers the price of lamps, the price of electricity and the cost of replacement lamps over a period of time. The time period of analysis is determined by the lifetime of the longest lamp (in this situation, it is assumed to be that of the LED lamp). All of the prices shown are current (2013), although it should be noted that LED lamp prices are expected to reduce in the coming years.
20	3	Please review the values in the spreadsheet for your country - you can adjust the calculations to reflect your currency if it doesn't already. Please try to ensure when you select lamps to put into the calculation that the light output from the lamps being compared is approximately equivalent. In other words, if you are considering a 60W incandescent lamp in the baseline, then the halogen replacement should be about 52W, the CFL should be about 15W and the LED should be about 12W - all of those lamps have a light output of approximately 800 lumens.
21	4	When you are satisfied with the calculation, please share it with your colleagues and please bring a copy to the meeting in Benin. We will discuss these in the MEPS breakout group.
22		
23		**Description et Instructions**
24	1	Cette feuille de calcul fournit une évaluation économique des solutions de remplacement des lampes à incandescence dans la CEDEAO. Certains de ces pays ont fourni des données sur la performance, qui se reflètent dans les fiches pays. D'autres pays contiennent des estimations basées sur une moyenne pour les pays de la CEDEAO.
25	2	La feuille de calcul considère le prix des lampes, le prix de l'électricité et le coût du remplacement des lampes sur une période données. La période d'analyse est déterminée par la durée de vie la lampe la plus longue (dans ce cas, celui de la lampe LED est pris en hypothese). Tous les prix indiqués sont en cours (2013), mais il convient de noter que les prix des lampes LED sont censés baisser dans les années à venir.
	3	Veuillez passer en revue les valeurs de la feuille de calcul pour votre pays - vous pouvez ajuster les calculs pour refléter votre monnaie si cela n'est pas déjà fait. S'il vous plaît assurez vous lorsque vous sélectionnez les lampes de mettre dans le calcul que la lumière émise par les lampes étant comparé est à peu près équivalente. En d'autres termes, si vous envisagez une lampe à incandescence de 60W comme référence, alors le remplacement des

Choose Your Country

Click on a tab to select the spreadsheet for your country

BEN is for Benin

(1) Red is for inputs; (2) Green is for outputs; (3) Calculations are below

Bénin

Tableur pour evaluer la rentabilité des mesures politiques sur l'éclairage efficace.

Quatre types de lampes:

INC (Référence):	Lampe à incandescence (INC)
HAL:	Lampe halogène à tension secteur (HAL)
LFC:	Lampe fluorescente compact intégralement à ballast (LFC)
DEL:	Diode électroluminescente (DEL)

Données de calcul (par lampe):

Pays:	Bénin	
Devise:	US$	
Lampe allumée pendant des heures / jour:	5.50	heures/jour
Prix de l'électricité:	0.16	US$/kWh
Variation annuelle des prix de l'électricité	1.0%	pourcent
Intensité de CO2 de l'électricité:	0.703	kg CO2/kWh
Taux d'actualisation	10.0%	pourcent
Lampe à incandescence (INC)		
Puissance de la Lampe à incandescence (INC):	60	Watts
Durée de vie de la Lampe à incandescence (INC):	1000	heures
Coût de la Lampe à incandescence (INC):	1.00	US$/lampe
Lampe halogène (HAL)		
Puissance de la Lampe halogène (HAL):	52	Watts
Durée de vie de la Lampe halogène (HAL):	2000	heures
Coût de la Lampe halogène (HAL):	1.50	US$/lampe
Lampe Fluorescente Compact (LFC)		
Puissance de la Lampe Fluorescente Compact (LFC):	12	Watts
Durée de vie de la Lampe Fluorescente Compact (LFC):	6000	heures
Coût de la Lampe Fluorescente Compact (LFC):	4.00	US$/lampe
Diode électroluminescente (DEL)		
Puissance de la Diode électroluminescente (DEL):	10	Watts
Durée de vie de la Diode électroluminescente (DEL):	20000	heures
Coût de la Diode électroluminescente (DEL):	13.90	US$/lampe

Résultats de calcul (par lampe):

	Incandescence	Halogène	LFC	DEL	
Consommation annuelle d'électricité pour chaque type de lampe:	120	105	24	21	kWh/an
Économies annuelles d'électricité par rapport aux lampes à incandescence:	---	16	96	100	kWh/an
Pourcentage d'économies d'électricité par rapport aux lampes à incandescence:	---	13%	80%	83%	percent
Coût de l'électricité pour faire fonctionner les lampes chaque année:	18.79	16.34	3.76	3.27	US$/an
Économies en US$ des couts d'électricité par an		2.45	15.03	15.52	US$/an
Coût du Cycle de vie (CCV) d'une lampe fonctionnant pendant 9 ans.					
Periode d'analyse du CCV:	9.0	9.0	9.0	9.0	ans
CCV d'une lampe fonctionnant pendant 9 ans:	135.81	116.58	36.28	35.31	US$ (2013)
Économies du CCV par rapport aux lampes à incandescence:	---	19.23	99.52	100.49	US$ (2013)
Pourcentage d'économies du CCV par rapport par rapport aux lampes à incandescence:	---	14%	73%	74%	percent
Les économies du CCV sont (X) fois plus grande que les économies du CCV de l'halogène	---	---	5.2	5.2	fois plus élevée
Émissions de CO2 dues à l'électricité pour l'utilisation d'une lampe 9 ans:	762.1	662.7	152.4	132.5	kg CO2/9 ans
Économies de CO2 par rapport aux lampes à incandescence:	---	99.4	609.7	629.6	kg CO2/9 ans
L' Économies de CO2 est (X) supérieur à l'économies de CO2 de l'halogène:	---	---	513%	533%	percent
Période de retour sur investissement et Taux de Rendement Interne (TRI)					
Période de retour sur investissement en annees.	---	0.20	0.20	0.83	ans
Période de retour sur investissement en mois:	---	2.4	2.4	10.0	mois
Pèriode de retour sur investissement est (X) pourcent meilleure que pour l'halogène:	---	---	2%	not defined	courte
Taux de Rendement Interne (TRI) pour chaque type de lampe:	---	596%	841%	149%	percent

Cacul des flux de trésorerie non-actualisés

Montants Simples (non-actualisés)			Remarque: Les valeurs présentées ci-dessous tiennent compte de l'augmentation prévue du coût de l'électricité		
Année	Année	Heures d'utilisation	Les coûts d'investissement (US$)	Les coûts d'électricité (US$)	Somme de l'épargne pour TRI calcul

Red Shaded Area – the Inputs

Données de calcul (par lampe):		
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Devise:	US$	
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Currency

Hours/day

Price/kWh

Elec price increase

CO2 intensity

Discount rate

Four lamps – comparable in light output (all about 800 lumens)

Green Shaded Area – the Outputs

- Comparison of lamp types – all outputs are labelled
- kWh used, kWh saved, % saved; electricity saved per year; Life-Cycle Cost; CO2; Payback Period in years and months and IRR.

Résultats de calcul (par lampe):	Incandescence	Halogène	LFC	DEL	
Consommation annuelle d'électricité pour chaque type de lampe:	120	105	24	21	kWh/an
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Green Shaded Area – the Outputs

- Analysis for you to consider for your country – what are the important factors?
  - Electricity savings, least life-cycle cost, payback period, internal rate of return, CO_2…..?

Résultats de calcul (par lampe):	Incandescence	Halogène	LFC	DEL	
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Agenda Item

11:30 Key Questions for today's on-grid session
(5-10 minutes each) – Mbacké

11:30 Questions clés pour la session en réseau d'aujourd'hui
(5-10 minutes chacun) - Mbacké

In Dakar, we discussed the MEPS….

- Agreed a process: UNEP will prepare a table of requirements, participants consult with in-country Electrotechnical experts and then feedback to our Chairman. Considering:
  a. Luminous efficacy of lamps ("efficiency") – Ghana 30/40 lm/W; European equation of efficiency
  b. Lifetime: May require a rated lamp life minimum, or, a declaration of rated lamp life
  c. Voltage Fluctuation tolerance (e.g., 180-260V)
  d. Quality power: Power factor; total harmonic distortion
  e. Quality light: Correlated colour temperature; colour rendering index or colour quality scale; colour consistency
  f. Hazardous materials: May limit or ban the use of elements such as arsenic, cadmium, lead or mercury.
  g. Safety: referencing IEC for electrical, fire, health, communications
  h. Warranty: may be required or encouraged

MEPS for Non-Directional Lamps

Three issues to keep in mind:

- If you set MEPS for CFLs and do not phase-out incandescent technologies, the market will not transform and no energy will be saved
- If you set requirements for CFLS to have a very high specification, this makes lamps more expensive and may offer features that consumers don't need (e.g., high power factor)
- If you set MEPS that align with other large markets (e.g., Europe – 550 million people) you markets can benefit from those economies of scale and realise lower prices

Table Comparing some MEPS on CFLs

	A	B	C	D	E	F	G
1	**Region/Country:**	**EUROPE**	**EUROPE**	**KENYA**	**GHANA**	**NIGERIA**	**NIGERIA**
2	Incandescent MEPS?	Phase-out incandescent lamps.	Phase-out incandescent lamps.	Keeps incandescent lamps.	Phase-out incandescent lamps.	Keeps incandescent lamps.	Keeps incandescent lamps (presents incandescent lamp efficacies in the Draft EE Policy document, May 2013).
3	Halogen MEPS?	Keeps halogen lamps.	Keeps halogen lamps.	Keeps halogen lamps.	Phase-out halogen lamps.	Keeps halogen lamps.	Keeps halogen lamps.
4	**CFL Requirements**	**Europe Stage 1 (9/2009)**	**Europe Stage 5 (9/2013)**	**Draft Kenya KS 2446-1:2013**	**Ghana GS 323:2003**	**Nigeria NIS 747-2012**	**Nigeria Draft EE Policy (May 2013)**
5	Maximum Power (scroll down to view a graph comparing these requirements)	Pmax = 0,24√Φ+0,0103Φ	Pmax = 0,24√Φ+0,0103Φ	Bare lamp: Efficacy$_{min}$ = 1/((0.24/(F)^0.5)+0.0103) Covered lamp: Efficacy$_{min}$ = 0.85% of bare lamp.	Configuration[1] / Lamp Power (Watts) / Minimum Efficacy (Lumen/W) based upon initial Lumen data[2] Bare Lamp: <15 → ≥ 45; ≥15 → ≥ 60 Covered (no reflector): <15 → ≥ 40; 15 ≤ LP < 19 → ≥ 48; 19 ≤ LP < 25 → ≥ 50; LP ≥ 25 → ≥ 55	Requirements are the same as Ghana GS 323:2003	12W minimum 46 lm/W; 15W minimum 50 lm/W and 18W minimum 54 lm/W. No specification of configuration type or other requirements in the draft MEPS.
6	Lamp survival factor at 6 000 h	≥ 0.50	≥ 0.70	≥ 0.50	Minimum rated life of 6000 hours	Minimum rated life of 6000 hours	
7	Lumen maintenance	At 2 000 h: ≥ 85 % (≥ 80 % for lamps with second lamp envelope)	At 2 000 h: ≥ 88 % (≥ 83 % for lamps with second lamp envelope)	2000 hrs = 0.88 5000 hrs = 0.80	1000 hrs = 90% of initial 2000 hrs = 88% of initial	1000 hrs = 90% of initial 2000 hrs = 88% of initial	
8	Number of switching cycles before failure	≥ half the lamp lifetime expressed in hours ≥ 10,000 if lamp starting time > 0,3	≥ lamp lifetime expressed in hours ≥ 30,000 if lamp starting time >	3000 for ≥80% of lamps	twice the claimed lamp life in hours	twice the claimed lamp life in hours	
9	Starting time	< 2,0 s	<1,5 s if P < 10 W <1,0 s if P ≥ 10 W	≤ 2 seconds for ≥80% of lamps	Not greater than 1.5 seconds	Not greater than 1.5 seconds	
10	Lamp warm-up time to 60 % Φ	<60 s or < 120 s for lamps containing mercury in amalgam	<40 s or < 100 s for lamps mercury in amalgam form	not specified	Run-up time shall not be more than 90 seconds.	Run-up time shall not be more than 90 seconds.	
11	Premature failure rate	≤ 2,0 % at 200 h	≤ 2,0 % at 400 h	10% at 30% of rated life			
12	UVA + UVB radiation	≤ 2,0 mW/klm	≤ 2,0 mW/klm	not specified	not specified	not specified	
13	UVC radiation	≤ 0,01 mW/klm	≤ 0,01 mW/klm	not specified	not specified	not specified	
14	Lamp power factor	≥ 0,50 if P < 25W ≥ 0,90 if P ≥ 25W	≥ 0,55 if P < 25W ≥ 0,90 if P ≥ 25W	0.55 or 0.9 for high PF	not less than 0.90	"High Power Factor" shall be >0.85 for lamps ≤25W and for lamps >25W refer to IEC 61000-3-2; "Low Power Factor" shall be ≥ 0.5	
15	Colour rendering (Ra)	≥ 80	≥ 80	80			
16	Maximum mercury content (mg)			2 mg			
17	Colour appearance			IEC 60081	IEC 60081		
18	Guarantee & Quality					1 year guarantee on lamp failure	
19	Climatic Compliance					Humidity upto 95% and ambient T up to 40C	

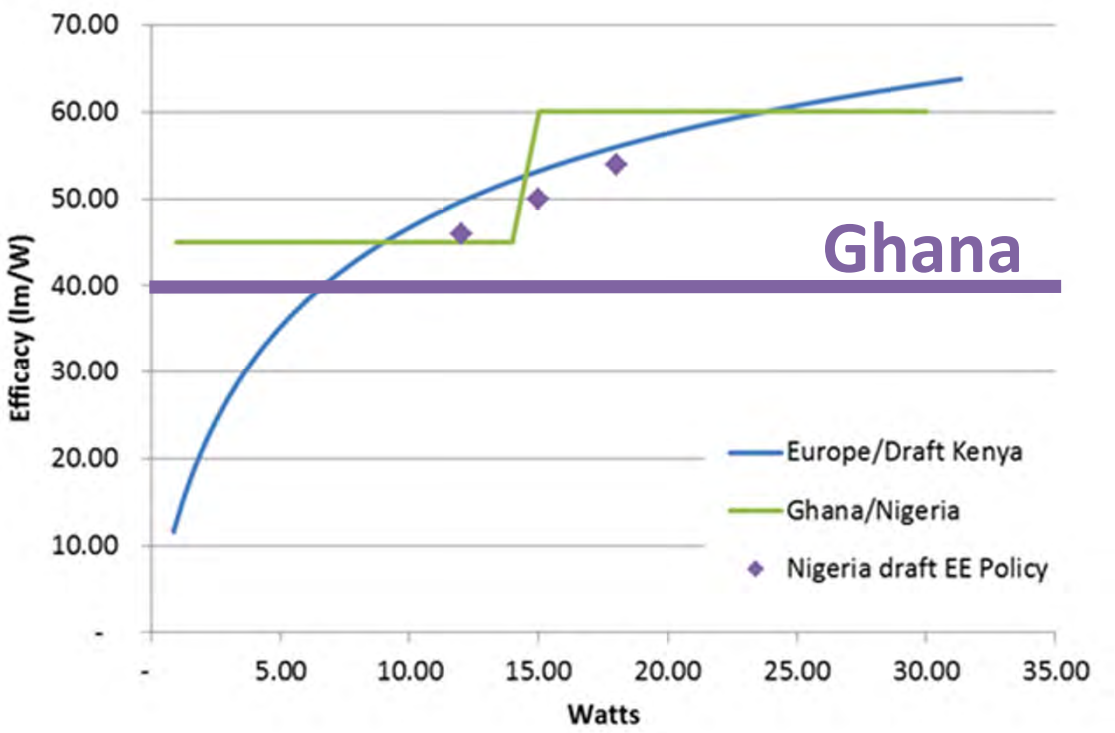
Table of Comparison for CFLs

- Europe Stage 1 of 244/2009 – took effect 1 Sept 2009
- Europe Stage 5 of 244/2009 – took effect 1 Sept 2013
- Kenya KS 2446-1:2013 (Draft for review)
- Ghana GS 323:2003
- Nigeria NIS 747:2012
- Nigeria National Energy Efficiency Policy Document, May 2013

Key Question: a) Efficacy

a. Luminous efficacy of lamps (“efficiency”)

a. L'efficacité lumineuse des lampes («efficacité»)



- Kenya and Nigeria keep incandescent lamps
- Senegal, Ghana and Europe phase out incandescent
- Incand. is 8-14 lm/W
- Interior heat load – A/C impact and cost

Key Question: b) Lifetime

b. Lifetime: a rated lamp life minimum or a declaration of rated lamp life

b. Durée de vie: un classé La fusion de vie minimum ou une déclaration de vie nominale de la lampe

Region/Country:	CFL Requirements	Lamp survival factor at 6 000 h
EUROPE	Europe Stage 1 (9/2009)	≥ 0.50
EUROPE	Europe Stage 5 (9/2013)	≥ 0.70
KENYA	Draft Kenya KS 2446-1	≥ 0.50
GHANA	Ghana GS 323:2003	Minimum rated life of 6000 hours
NIGERIA	Nigeria NIS 747-2012	Minimum rated life of 6000 hours
NIGERIA	Nigeria Draft EE Policy (May 2013)	

Key Question: c) Power Quality

c. Quality power: Power factor; total harmonic distortion

c. Alimentation de qualité: Facteur de puissance; distorsion harmonique totale

Region/Country:	CFL Requirements	Lamp power factor
EUROPE	Europe Stage 1 (9/2009)	≥ 0,50 if P < 25W ≥ 0,90 if P ≥ 25W
EUROPE	Europe Stage 5 (9/2013)	≥ 0,55 if P < 25W ≥ 0,90 if P ≥ 25W
KENYA	Draft Kenya KS 2446-1	0.55 or 0.9 for high PF
GHANA	Ghana GS 323:2003	not less than 0.90
NIGERIA	Nigeria NIS 747-2012	"High Power Factor" shall be >0.85 for lamps ≤25W and for lamps >25W refer to IEC 61000-3-2; "Low Power Factor" shall be ≥ 0.5
NIGERIA	Nigeria Draft EE Policy (May 2013)	

Key Question: d) Light Quality

d. Quality light: Correlated colour temperature; colour rendering index / colour quality scale; colour consistency

d. Qualité de la lumière: la température de couleur proximale; la cohérence des couleurs; index / rendu des couleurs échelle de qualité de couleur

Region/Country:	CFL Requirements	Colour rendering (Ra)	Colour appearance
EUROPE	Europe Stage 1 (9/2009)	≥ 80	
EUROPE	Europe Stage 5 (9/2013)	≥ 80	
KENYA	Draft Kenya KS 2446-1	80	IEC 60081
GHANA	Ghana GS 323:2003		IEC 60081
NIGERIA	Nigeria NIS 747-2012		
NIGERIA	Nigeria Draft EE Policy (May 2013)		

Key Question: e) Hazardous Materials

e. Hazardous materials: May limit or ban the use of elements such as arsenic, cadmium, lead or mercury.

e. Les matières dangereuses: Peut limiter ou interdire l'utilisation d'éléments tels que l'arsenic, le cadmium, le plomb ou le mercure.

Region/Country:	CFL Requirements	Maximum mercury content (mg)
EUROPE	**Europe Stage 1 (9/2009)**	≤5mg (Directive 2002/95/EC)
EUROPE	**Europe Stage 5 (9/2013)**	
KENYA	**Draft Kenya KS 2446-1**	2 mg
GHANA	**Ghana GS 323:2003**	
NIGERIA	**Nigeria NIS 747-2012**	
NIGERIA	**Nigeria Draft EE Policy (May 2013)**	

Key Question: f) Safety

f. Safety: referencing IEC for electrical, fire, health, communications

f. Sécurité: IEC pour le référencement électrique, d'incendie, de la santé, les communications

Region/Country:	CFL Requirements	UVA + UVB radiation	UVC radiation
EUROPE	**Europe Stage 1 (9/2009)**	≤ 2,0 mW/klm	≤ 0,01 mW/klm
EUROPE	**Europe Stage 5 (9/2013)**	≤ 2,0 mW/klm	≤ 0,01 mW/klm
KENYA	**Draft Kenya KS 2446-1**	not specified	not specified
GHANA	**Ghana GS 323:2003**	not specified	not specified
NIGERIA	**Nigeria NIS 747-2012**	not specified	not specified
NIGERIA	**Nigeria Draft EE Policy (May 2013)**		

Key Question: g) Warranty

g. Warranty: may be required or encouraged

g. Garantie: peut être tenu ou encouragé

Region/Country:	CFL Requirements	Guarantee & Quality
EUROPE	Europe Stage 1 (9/2009)	
EUROPE	Europe Stage 5 (9/2013)	
KENYA	Draft Kenya KS 2446-1:2013	
GHANA	Ghana GS 323:2003	
NIGERIA	Nigeria NIS 747-2012	1 year guarantee on lamp failure
NIGERIA	Nigeria Draft EE Policy (May 2013)	

Key Question: h) Other Factors

h. Other factors or parameters

h. D'autres facteurs ou paramètres

- Lumen maintenance
- Starting time
- Warm-up time
- Lifetime – switching cycles and premature failure rates

Key Question: h1) Lumen maintenance

Region/Country:	CFL Requirements	Lumen maintenance
EUROPE	Europe Stage 1 (9/2009)	At 2 000 h: ≥ 85 % (≥ 80 % for lamps with second lamp envelope)
EUROPE	Europe Stage 5 (9/2013)	At 2 000 h: ≥ 88 % (≥ 83 % for lamps with second lamp envelope) At 6 000 h: ≥ 70 %
KENYA	Draft Kenya KS 2446-1:2013	2000 hrs = 0.88 5000 hrs = 0.80
GHANA	Ghana GS 323:2003	1000 hrs = 90% of initial 2000 hrs = 88% of initial
NIGERIA	Nigeria NIS 747-2012	1000 hrs = 90% of initial 2000 hrs = 88% of initial
NIGERIA	Nigeria Draft EE Policy (May 2013)	

Key Question: h2) Starting time

Region/Country:	CFL Requirements	Starting time
EUROPE	Europe Stage 1 (9/2009)	< 2,0 s
EUROPE	Europe Stage 5 (9/2013)	<1,5 s if P < 10 W <1,0 s if P ≥ 10 W
KENYA	Draft Kenya KS 2446-1:2013	≤ 2 seconds for ≥80% of lamps
GHANA	Ghana GS 323:2003	Not greater than 1.5 seconds
NIGERIA	Nigeria NIS 747-2012	Not greater than 1.5 seconds
NIGERIA	Nigeria Draft EE Policy (May 2013)	

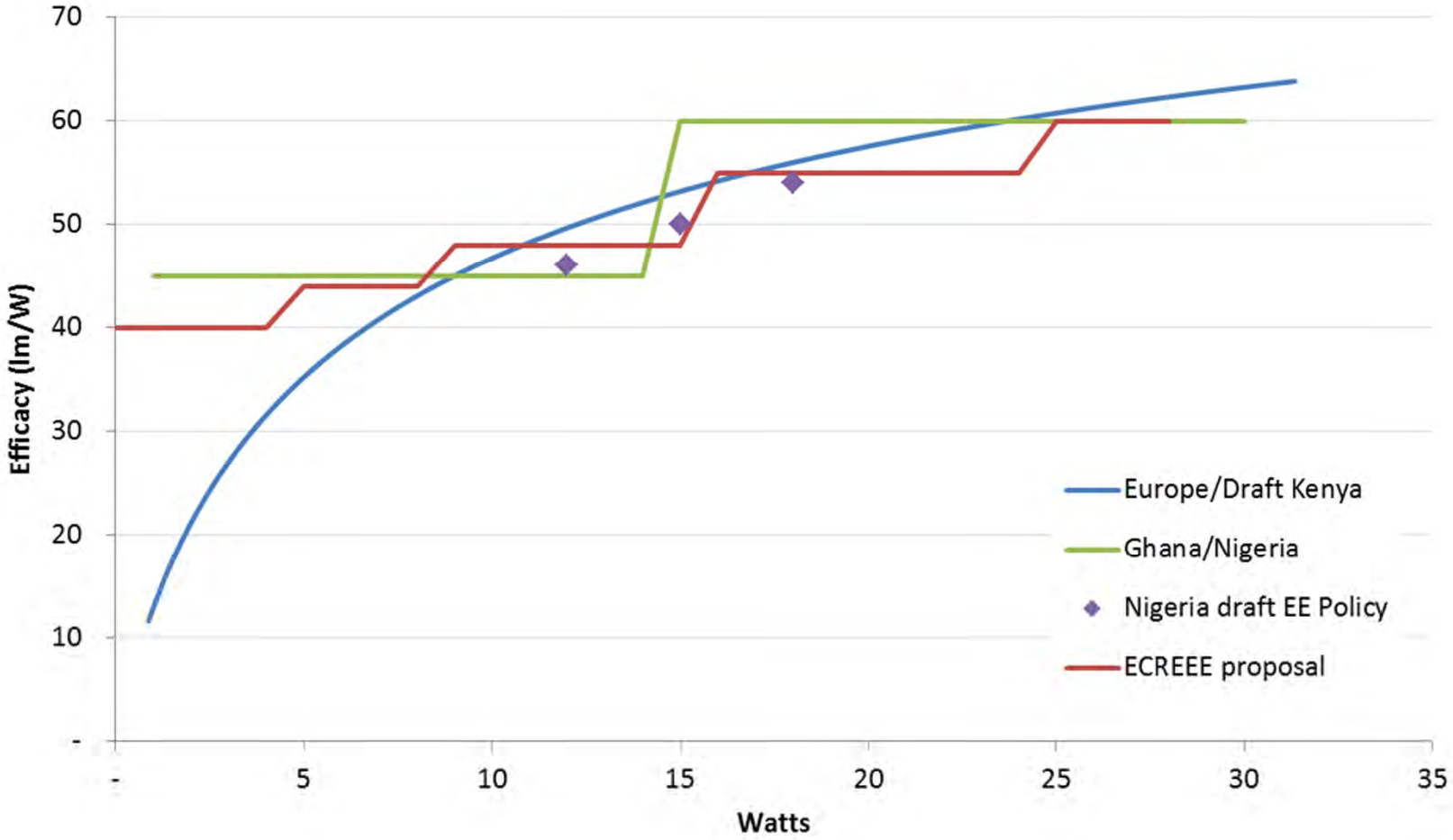
Key Question: h3) Warm-up time

Region/Country:	CFL Requirements	Lamp warm-up time to 60 % Φ
EUROPE	Europe Stage 1 (9/2009)	<60 s or < 120 s for lamps containing mercury in amalgam form
EUROPE	Europe Stage 5 (9/2013)	<40 s or < 100 s for lamps mercury in amalgam form
KENYA	Draft Kenya KS 2446-1:2013	not specified
GHANA	Ghana GS 323:2003	Run-up time shall not be more than 90 seconds.
NIGERIA	Nigeria NIS 747-2012	Run-up time shall not be more than 90 seconds.
NIGERIA	Nigeria Draft EE Policy (May 2013)	

Key Question: h4) Lifetime

Region/Country:	CFL Requirements	Number of switching cycles before failure	Premature failure rate
EUROPE	**Europe Stage 1 (9/2009)**	≥ half the lamp lifetime expressed in hours ≥ 10,000 if lamp starting time > 0,3 s	≤ 2,0 % at 200 h
EUROPE	**Europe Stage 5 (9/2013)**	≥ lamp lifetime expressed in hours ≥ 30,000 if lamp starting time > 0,3 sec	≤ 2,0 % at 400 h
KENYA	**Draft Kenya KS 2446-1:2013**	3000 for ≥80% of lamps	10% at 30% of rated life
GHANA	**Ghana GS 323:2003**	twice the claimed lamp life in hours	
NIGERIA	**Nigeria NIS 747-2012**	twice the claimed lamp life in hours	
NIGERIA	**Nigeria Draft EE Policy (May 2013)**		

ECREEE Proposal Discussed at Start Session B



Agenda Item

12:40 Group discussion of two key questions – Mbacké

12:40 Discussion de groupe sur deux questions clés - Mbacké

Key Question #1

a. What should be included in the legislative framework / MEPS?

a. Quel devrait être inclus dans le cadre législatif / MEPS?

a. Luminous efficacy of lamps ("efficiency")
b. Lifetime: a rated lamp life minimum
c. Quality power: Power factor; total harmonic distortion
d. Quality light: colour rendering index; colour consistency
e. Hazardous materials: such as arsenic, cadmium, lead or mercury.
f. Safety: referencing IEC for electrical, fire, health, communications
g. Warranty: may be required or encouraged
h. Other factors or parameters
    - Lumen maintenance
    - Starting time
    - Warm-up time
    - Lifetime – switching cycles and premature failure rates

Key Question #2

b. Which test methods should be used to assess the requirements in the regulation?

b. Quel méthodes d'essai uelles devraient être utilisés pour évaluer les uirements req dans la réglementation?

UNEP will work on this, based on criteria selected. Suggestion that we consider harmonised standards published by:

- International Electrotechnical Commission (IEC)
- Commission International de l'Eclairage (CIE)
  (English: International Commission on Illumination)

Session B: Off-Grid Lighting

14:00 Review different types of off-grid lighting, clarify what is covered by IEC / Lighting Africa and other – Benjamin, Philips

14:00 Passez en revue les différents types d'éclairage hors réseau, de clarifier ce qui est couvert par la CEI / Éclairer l'Afrique et d'autres - Benjamin, Philips

Current Situation - Africa

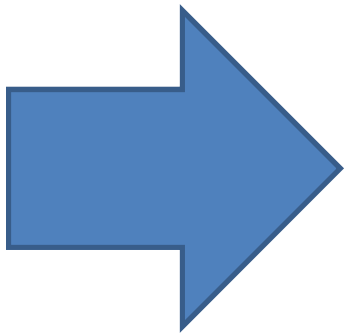
- 750M people have no access to electricity in 2013
- $35 billion spent annually on fossil fuels for lighting which causes poor illumination & health
- Strained gov't resources, hence grid connection into rural areas near impossibility
- Intermittent power cuts in urban areas due to huge demands/ wastage on existing grids
- Off-grid solutions critical for socio + economic development

Growth of the Off-grid lighting segment

- 4% growth in consumer solar segment in Africa (2.5 years)
- 4.4 million solar lamps sol d in Africa (Dec. 2012)
- 1.4 million LA approved sold
- Sales have grown more than 300% over last 2.5 years
- Used in rural + urban areas
- Lighting Africa (LA)/ IEC standards

Types of Off-grid lighting

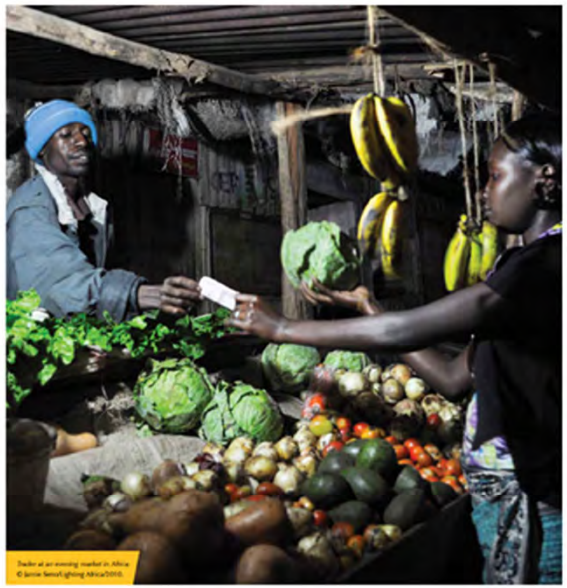
- Consumer solar lamps
- Solar Home systems
- Community lighting centres
- Mini grid solar solutions

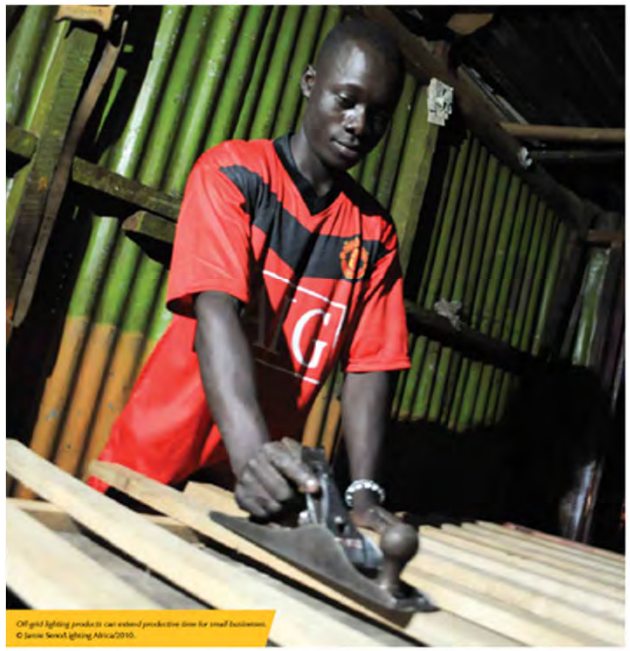


- LED lighting
- Solar Panels
- Batteries
  - Lithium
  - GEL
  - others
- Charge controllers

Off-grid lighting- Enhancing lives

- Education
- Mobile charger
- Extended working hours





Critical Success factors

- Affordability
- Quality
- Distribution
- Micro-finance
- donations

Types of Stand-alone renewable kits

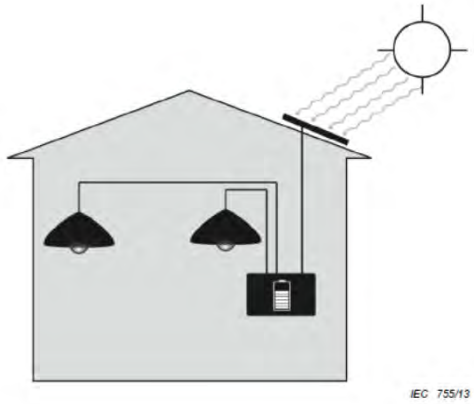
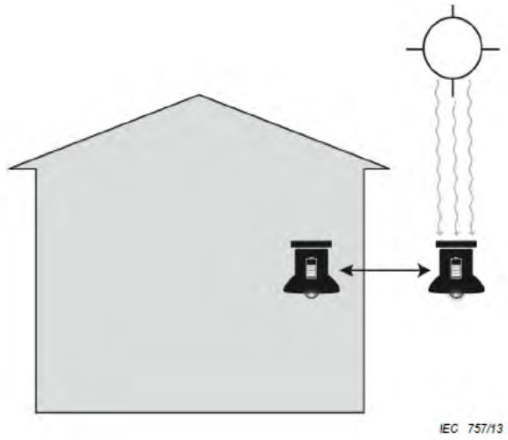


Figure 1 – Fixed separate (fixed indoors) system—example arrangement of components



ure 3 – Portable integrated system—example arrangement of components

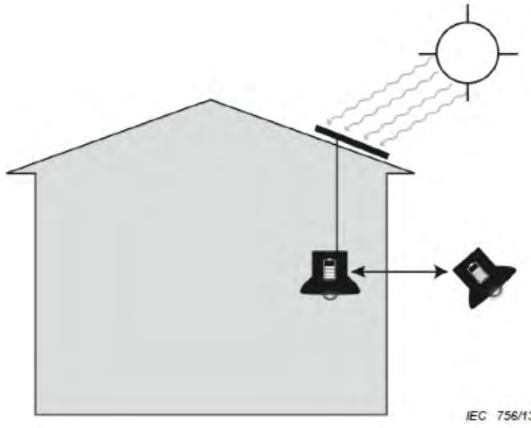


Figure 2 – Portable separate system—example arrangement of components

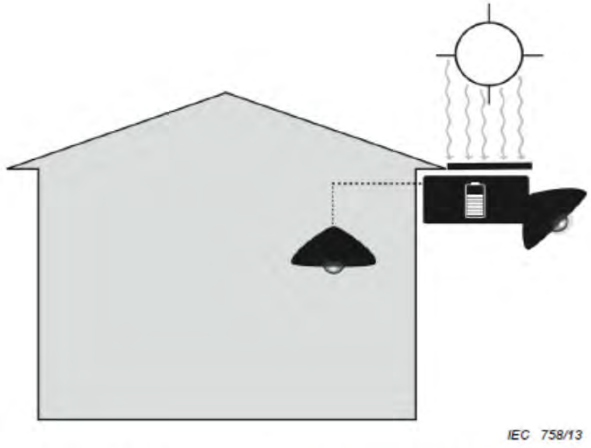


Figure 4 – Fixed integrated (fixed outdoors) system – example arrangement of components

Consumer solar Lamps

- Illumination for the home
- Opportunity to charge mobile phones
- Multiple usage options e.g. desk lamp etc

Community Light Centres

- 1000 sqm of LED lighting
- Made up of 4 light poles
- Minimum pole height is 6.5m
- 6000 lumens
- Lifetime 10 years
- Battery - 5 years

Community solar light center

- 24 hour economy
- Better visibility & security at night
- One time cost for 5 years before battery replacement
- Lighting opportunity for minimal 1000sqm clusters
- Opportunity to extent solution for mini communities

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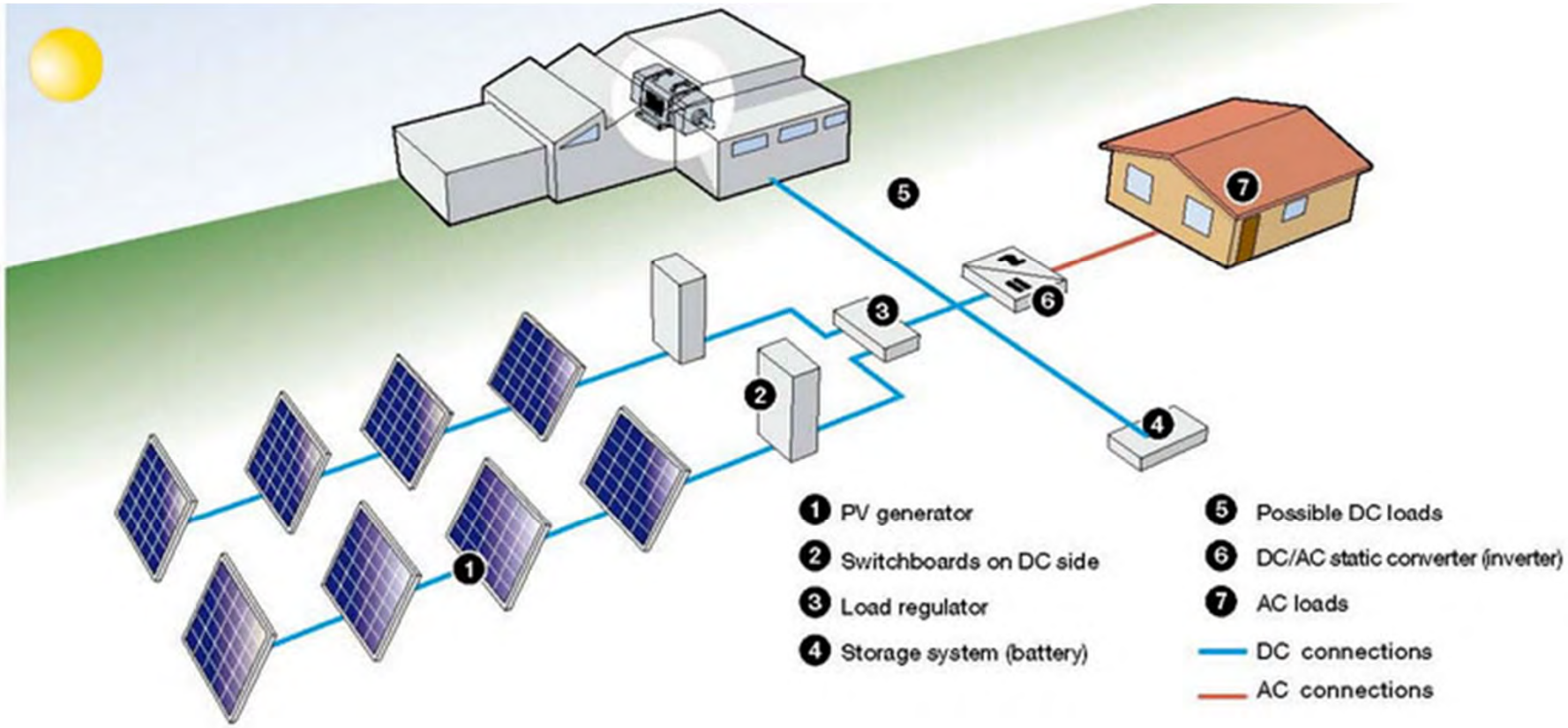
Outdoor Community Light Centres

Solar Mini-grid solutions



- Electricity for rural communities for basic lighting
- Lighting for health centres/ markets etc.
- External security lighting

Existing Standards today

Summary of Minimum Quality Standards

Truth-in-Advertising: Accurate consumer-facing labeling (e.g., rated run time, battery capacity, PV power).

Lumen Maintenance: L70 time is greater than 2,000 hours.

Durability and Quality: Appropriate protection to prevent early failure.

Warranty: At least six months of coverage.

- List of Minimum Quality Standards & test methods defined, products tested for compliance to performance standards

The need for MEPS

Protect the end user / consumer:

- Unsafe and very low quality products are kept from the market.
- Consumers have options to choose from only approved quality brands
- Protect / safeguard consumers investment in better , more sustainable products

Support the local government:

- Right product assembled locally or imported and sold to drive government's initiative to provide lighting for all

Protect the environment:

- Products with high levels of hazardous materials and quack standards are kept out the market.

Support the industry

- Adequate market surveillance is in place to enable fair business

Key success factors for 100% Off-Grid lighting - Africa

Solution	Requirements
▪ Consumer Solar	▪ Finance for local players ▪ Distribution & accessibility ▪ Pay – as –you go options ▪ Regional standards ▪ Testing centres ▪ Donor funding ▪ Set period for total ban of kerosene lamps
▪ Community light Centres	▪ System donations e.g. Philips ▪ Grants
▪ Mini grids	▪ Finance (Grants etc) ▪ Simplified pay meters for rural homes

Agenda Item

14:15 Review discussion and conclusions from Dakar Meeting on Off-Grid, Mike

14:15 Discussion d'examen et les conclusions de la réunion de Dakar sur l'Off-Grid, Mike

Off-Grid Lighting

- In Dakar, we had a presentation by Lighting Africa
- Discussion of the new IEC Test Standard for solar lighting systems
  - IEC 62257-9-5: Integrated system – Selection of stand-alone lighting kits for rural electrification
  - Only standard in the world for off-grid lighting
- 36 products qualified and on the market
- $10 to $180 in cost – lots of features, performance attributes
- Adopt at the ECOWAS level, and countries make it applicable when their markets are ready
  - Today – we will look at specific aspects of IEC 62257-9-5 and how to take things forward

Off-Grid Lighting – Issues to Keep in Mind

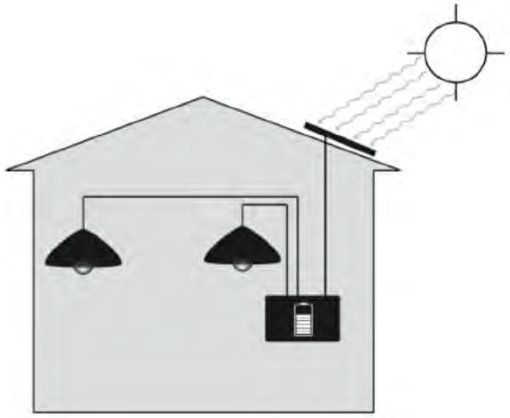
- The most important aspects are:
  - Customer safety – no electrocutions, fire, etc.
  - Truth in advertising – you get what it says on the box
  - Minimum quality standards and some performance targets
- May need to prepare the market by incentivising (e.g., zero import duty, utility or government promotion) products compliant with the quality specification
- After a few years when the market is ready, make this a mandatory requirement (like MEPS)
- Other performance aspects such as efficacy, lifetime and so-on are important too, but regulating these may slow the market development because of costs

Key Questions for Discussion

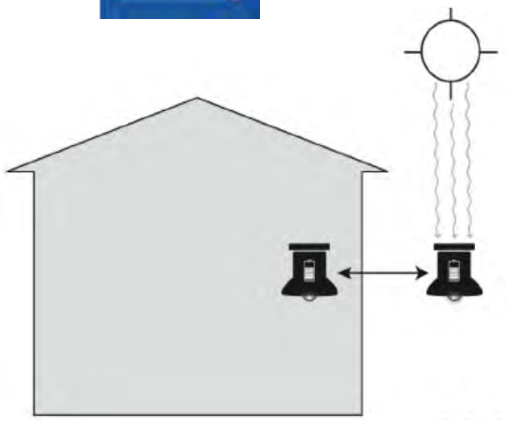
14:20 Key Questions for today's session (5-10 minutes each) – Mbacké

14:20 Questions clés pour la séance d'aujourd'hui (5-10 minutes chacun) - Mbacké

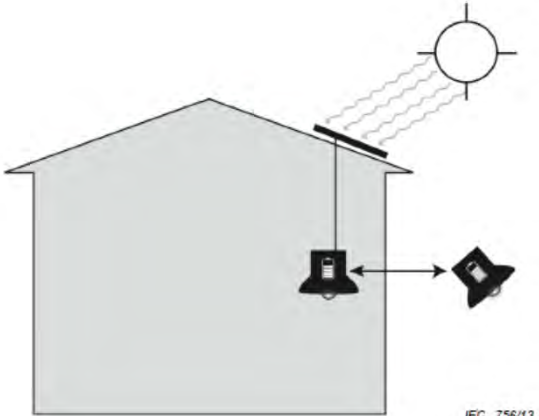
Scope of IEC 62257-9-5



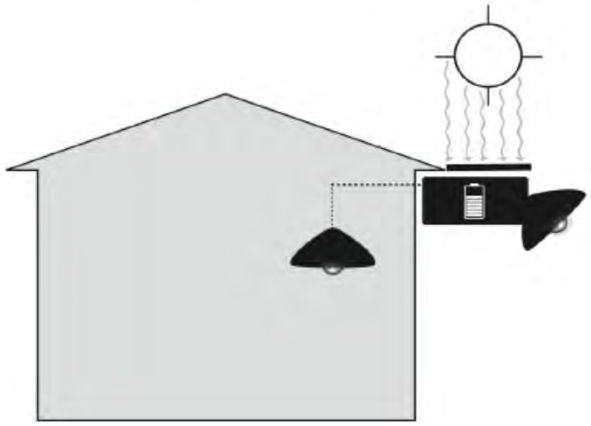
Fixed (indoors) Separate System



Portable Integrated System



Portable Separate Systems



Fixed (outdoors) Integrated System

Key Questions: Summary of Minimum Quality Standards

Key aspects of the Lighting Africa Performance Targets (July 2013) (tested using IEC 62257-9-5):

- Truth-in-Advertising: Accurate consumer-facing labeling (e.g., rated run time, battery capacity, PV power).
- Lumen Maintenance: L70 time is greater than 2,000 hours.
- Durability and Quality: Appropriate protection to prevent early failure.
- Warranty: At least six months of coverage.

Detail on Quality Standards

- Truth-in-Advertising
- Lumen Maintenance:
- Durability and Quality
- Warranty

Note: Update to these specifications may be issued by end of October 2013.

Category	Sheet Field		Quality Standards
Information	Manufacturer		Accurately specified
	Product Name & Model #		Accurately specified
	Warranty		Accurately specified; Minimum coverage 6 months on manufacturing defects under normal use, including battery
Illumination	Light Output		Accurately specified at each available level (lumens)
	Lamp Type		Accurately specified
Energy System Performance	Run Times		Accurately specified for each light setting
Lumen Maintenance	Lumen Maintenance at 2,000 hours		≥ 70% of specified light output at 2,000 hours (depreciated at highest setting)
Charger	Charger Rating		Charger power rating accurately specified (e.g. PV power or mechanical charge time)
	AC-DC Charger Safety		Any *included* AC-DC charger carries approval from a recognized consumer electronics safety regulator[i]
Storage	Battery Capacity		Accurately specified
	Battery Protection		Protected by an appropriate charge controller that prolongs battery life and protects the safety of the user
Quality and Durability	Physical Ingress Protection	Fixed Outdoor	IP 5x
		Others	IP 2x
	Water Protection[ii]	Fixed Indoor	No requirement
		Portable Separate	Occasional rain: *IP x1* OR *technical equivalent* OR *with warning label*
		Portable Integrated	Frequent rain: *IP x3* OR *technical equivalent* OR *IP x1 / equivalent + warning label*
		Fixed Outdoor	Permanent outdoor exposure: *IP x3* AND *circuit protection*
	Drop Test	Fixed Indoor	None result in dangerous failures[iii]
		Others	5 out of 6 samples are functional after drop test (1 m onto concrete); None result in dangerous failures[iii]
	Soldering and Electronics Quality		Pass soldering and electronics inspection (without endemic bad joints, pinched wires, etc.)
	Switch, Gooseneck, Connector, and Strain Relief Durability		5 out of 6 samples are functional after 1000 cycles (switch, connector, gooseneck tests); 5 out of 6 samples are functional (strain relief test); None result in dangerous failures (all tests)

Key Questions: Lighting Africa Performance Targets

Key aspects of the Lighting Africa Performance Targets (tested using IEC 62257-9-5):

- Minimum Quality Standards must be met.
- Brightness: A total light output (lumens) and/or task light illuminance (lux over a specific area) target that defines the expected lighting service.
- Run time: A duration of daily lighting service over which the brightness target should be met, based on either "solar run time" (for products that include solar modules) or a full battery (for products without individual solar modules).

Detail on Lighting Africa Performance Targets

Criterion	Description
Brightness	At least one lighting level, which defines the "specified light output" in subsequent testing, must meet one of the following criteria: • Light output of at least 20 lumens, or • Illuminated area of at least 0.1 m^2 at 25 lux or higher on a surface 75 cm from the product, or • Illuminated area of at least 0.1 m^2 at 25 lux or higher on a work surface when the product is used as a task light.
Runtime	To meet the runtime target, the product must provide either: • 8 hours of light at greater than or equal to the specified light output with a fully charged battery • 4 hours of light at greater than or equal to the specified light output after one day of solar charging as defined by the QTM (PV only)

Note: these are being updated in October 2013, but industry has indicated the new levels could be too stringent for MEPS, and new levels might be better as an incentive or target, not a requirement.

Agenda Item

15:10 Group discussion of two key questions – Mbacké

15:10 Discussion de groupe sur deux questions clés - Mbacké

Key Question #1

a. What should be included in the legislative framework / MEPS for Off-Grid Lighting Products?

a. Quel devrait être inclus dans le cadre législatif / MEPS pour un éclairage hors réseau produits?

Key Question #2

b. Which test methods should be used to assess the requirements in the regulation?

b. Quel méthodes d'essai quelles devraient être utilisés pour évaluer les requirements dans le règlement?

- IEC 62257-9-5: Integrated system – Selection of stand-alone lighting kits for rural electrification

Session C - Agenda Item

15:45 Review of Key Activities Table

- Does the Table 1 (MEPS – Key Activities) cover all the relevant regional and national activities on MEPS?
- How would you prioritize the national and regional activities in the Table 1?

15:45 Revue des activités clés Tableau

- Le tableau 1 (MEPS - Principales activités) couvre toutes les activités régionales et nationales pertinentes sur MEPS?
- Comment décririez-vous la priorité aux activités nationales et régionales dans le tableau 1?

Review Key Activities Table 1

		Échéancier	Parties d'exécution
Objectif 1:Adopter et mettre en œuvre des normes de rendement énergétique minimal des contrôles sur réseau et hors réseau des produits d'éclairage efficaces dans tous les pays de la CEDEAO			
Résultat escompté 1.1	Normes minimales de performance énergétique (MEPS) de sur-grille et les lampes économes hors réseau ont adopté et mis en œuvre dans tous les pays de la CEDEAO		
Activité prioritaire 1.1.1	Créer une prise de conscience, adopter et mettre en œuvre des MEPS en réseau et hors réseau des produits d'éclairage efficaces dans tous les pays de la CEDEAO		
Tâches	1. Mener des consultations nationales avec les décideurs politiques et autres parties prenantes sur les MEPS harmonisées de sur-grille et les lampes économes hors réseau	Juillet 2014 to Décembre 2015	Standard Autorité - Lead Ministère de l'Énergie - Co-Lead Ministère du Commerce Agence des douanes Les fabricants / importateurs / distributeurs de lampes économes
	2. Faire connaître les MEPS harmonisées dans la Gazette du Gouvernement pour l'information du public	Juillet 2014 to Décembre 2015	Standard Autorité - Lead Ministère de l'Énergie - Co-Lead Ministère du Commerce Agence des douanes
	3. Adopter les MEPS harmonisées dans certains cas, pour remplacer MEPS nationaux existants	Juillet 2014 to Décembre 2015	Standard Autorité - Lead Ministère de l'Énergie - Co-Lead Ministère du Commerce Agence des douanes

Agenda Item – Milestones and Timeline

16:10 Milestones and Timeline for On-Grid and Off-Grid

- What are the milestones, indicators and means of measuring progress of the implementation of the Strategy? Complete the Log Framework Analysis Table 2 (attached)

16:10 Jalons et calendrier de Sur-réseau et hors-réseau

- Quelles sont les étapes, les indicateurs et les moyens de mesurer les progrès de la mise en œuvre de la stratégie? Comp Lete le Tableau d'analyse de cadre logique (ci-joint)

Agenda Item – Milestones and Timeline

Strategy	Indicators	Baseline (Year 0)	Target	Sources of Verification	Risks and Assumptions
GOAL: To establish an integrated policy approach for a sustainable and rapid transition to on-grid and off-grid efficient lighting in the ECOWAS Region					
PROJECT OBJECTIVE 1: To adopt and implement Minimum Energy Performance Standards of on-grid and off-grid efficient lighting products in all ECOWAS countries					
OUTCOME 1: Minimum Energy Performance Standards (MEPS) of on-grid and off-grid efficient lamps adopted and implemented in all ECOWAS countries					
Output 1.1: Awareness created on MEPS of on-grid and off-grid efficient lighting products in all ECOWAS countries					
Output 1.2: MEPS of on-grid and off-grid efficient lighting products adopted and implemented in all ECOWAS countries					

Considérations financières de députés

16:40 Considérations financières de députés

- Quels sont les coûts estimés de ces activités?
- Quel est le budget disponible pour les activités aux niveaux national et régional?
- Comment décririez-vous la priorité aux options de financement suivantes pour les activités internes nationaux et régio de la stratégie?

i) les sources domestiques
- Governement Administré programmes
- Administré utilitaire Programmes

ii) le financement du secteur privé

iii) Le financement non-domestique
- Les bailleurs de fonds internationaux
- Inte établissements de crédit rnational

iv) Financement Carbone
- Cle un Mécanisme de développement propre (MDP)
- Actions d'atténuation appropriées au niveau national (NAMA)
- Autre financement du carbone

Financial Considerations

16:40 Financial Considerations of MEPS / Considérations financières de députés

- What are the estimated costs of the activities?
- What budget is available for the activities at the national and regional levels?
- How would you prioritize the following financing options for the national and regional activities of the Strategy?

i) Domestic Sources
- Government Administered Programmes
- Utility Administered Programmes

ii) Private Sector Funding

iii) Non-Domestic Funding
- International Donors
- International Lending Institutions

iv) Carbon Financing
- Clean Development Mechanism (CDM)
- Nationally Appropriate Mitigation Actions (NAMAs)
- Other Carbon Financing

Thank You.

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