Towards efficient Lighting Market, the case of Ghana.

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Presentation Outline

- Country overview/Background
- Current status Energy Efficient Lighting in Ghana
- Description of standards
- How we did it
- Additional steps
- Ghana’s interest in regionally harmonized MEPS
- Lessons
Background

- Domestic electricity demand is growing at 7% p.a. whereas generation is lacking.
- A significant proportion (30%) of total electricity generated goes waste as a result of the use of inefficient appliances.

* System losses in electricity distribution are about 25%  
* The most efficient tool for energy efficiency is the adoption of Standards and Labelling Programme
Background-Electricity Generation

- Annual production: 10,000GWh
- Access rate: 64%
- Thermal capacity is gradually exceeding hydro
- Increasing cost of generation from more expensive fuels
- Increasing environmental impact from carbon-rich fuels
• Energy Efficiency Standards and Labelling (Non-Ducted Air-conditioners and Self-Ballasted Fluorescent Lamps) Regulations, 2005 (LI 1815)

• Energy Efficiency (Prohibition of Manufacture, Sale or Importation of Incandescent Filament Lamp, Used Refrigerator, Used Refrigerator-Freezer, Used Freezer and Used Air-conditioner) Regulations, 2008 (LI 1932)
Labelling requirements

- The label shall;
  - be printed in colour on a water proof material and pasted conspicuously on the appliance.
  - have gold background appliance and all stars on the label shall be black.
  - be in English language
  - include the energy efficiency star rating determine in accordance with GS 323:2003
  - Include the luminous flux of the lamp in lumens measured in accordance with GS 323:2003
Labelling
## Description of standards

<table>
<thead>
<tr>
<th>Lamp Configuration</th>
<th>Lamp Power Rating (LP, Watts)</th>
<th>Minimum Efficacy (Lumen/W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare Lamp</td>
<td>Less than 15; More than or equal to 15</td>
<td>More than or equal to 45</td>
</tr>
<tr>
<td></td>
<td>Less than 15; More than or equal to 15</td>
<td>More than or equal to 50</td>
</tr>
<tr>
<td></td>
<td>But less than 19</td>
<td>More than or equal to 33</td>
</tr>
<tr>
<td>Covered Lamp</td>
<td>More than or equal to 15</td>
<td>More than or equal to 55</td>
</tr>
<tr>
<td>Without Reflector</td>
<td>More than or equal to 19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>But less than 25; More than or equal to 25</td>
<td></td>
</tr>
<tr>
<td>Lamp with Reflector</td>
<td>Less than 20; More than or equal to 20</td>
<td>More than or equal to 40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More than or equal to 48</td>
</tr>
</tbody>
</table>
Policy Direction

- Support a sustained and comprehensive public education and awareness creation campaign on the methods and benefits of energy conservation; and
- Promote the establishment of Centres of Energy Efficiency.

**Electricity**

- Discontinue, through legislation, the local production, importation and use of inefficient electricity consuming equipment and appliances.
Key Stakeholders

- Ministry of Energy
- Ministry of environment, Science & Technology
- Ministry of Trade & Industry
- Energy Foundation
- Council for Scientific & Industrial Research
- Customs Excise & Preventive Service
- Business community
- Consumer Associations
The Efficient Lighting Project 2007

- The Government of Ghana with the advice of the Energy Commission procured and distributed for **FREE 6million CFLs** as direct replacement of 6 million Incandescent Lamps

- Replacement was Load Reduction measure to reduce impact of Power Shortages in Ghana in 2007

- Ghana is the first country in Africa to take such action.

- All 6 million lamps were distributed and installed in 3 months
Objectives of Efficient Lamp Project

- Peak electricity demand reduction 200-220MW
- Stabilisation of Electricity Grid System
- Reduction of Brownout and transformer overloads
- Reduction of Diesel and other Thermal generators to supplement the existing power generation mix
How it was done

- National Project Implementation Committee, chaired by the Minister for Energy

- Members:
  - Executive Secretary - Energy Commission
  - Chief Executive - Energy Foundation
Transportation
Public Education Bill Boards
Retrieved Incandescent Lamps
Retrieved Incandescent Lamps
Prohibition of Incandescent Lamps

• LI 1815
• A person shall not import, manufacture, store, offer for sale or distribute an incandescent filament lamp.
• Contravention attracts a fine of 250 penalty units or 12 months imprisonment or both.
Implementation of ban

- Porous borders allow for smuggling of incandescent into Ghana
- Market surveillance have led to the seizure of two major hauls which have been destroyed at the cost of the importers
- Permitting regime has been instituted for the importation of limited amount for special purposes
By September 2009

- CFL penetration rate had increased from 20% in 2007 to 79%.
- Incandescent lamps had also decreased from 58% in 2007 to 3% in 2009.
- Empirical evidence? Fly by night!
Results - 2

- Peak Saving of 124 MW or 172.8GWh/annum

- Delay in thermal energy generation expansion investment of US$105million

- At US$120/bbl, energy cost saving is US$3.3million per month or US$39.5million per annum.

- Between October 2007 and June 2008 Savings of US$29.6million.

- CO2 savings of 105,000tons per annum.

- 2 Factory established to produce CFLs in Ghana
2010 EE Global Award
Additional Steps - Refrigerator Efficiency Project

- 2007 Survey: Average Refrigerator in Ghana consumes 1,200kWh per annum
- New Efficiency Standards limits to 650kWh/annum
- Potential Saving per refrigerator is 550kWh/year
- Assume 1 million out of 2.7 million refrigerators are removed in 3 years
- Saving is 550 x 1 million = 550,000,000 kWh
- 324,000 tons of CO2 per annum
Energy Consumption in Refrigeration in Ghana, 2006
A comparative study

\[ y = 386.19x + 109.17 \quad R^2 = 0.6057 \]

\[ y = 176.23x + 75.288 \quad R^2 = 0.5358 \]

\[ y = 1246.5x + 543.1 \quad R^2 = 0.1409 \]
The Ghana Refrigerator Energy Efficiency Label
Refrigerator with Label on Ghana Market
Fiscal Incentives

- Government on the advice of the Energy Commission has removed import duty and VAT on CFLs and LED.
- Standards and Labels being developed for LED to protect consumers from inferior products.
Regionally harmonized standards

- Neighboring countries will no longer be used as transit point for smuggling of incandescent and substandard CFLs into Ghana.
- The sub-region becomes ring-fenced from dumping.
- Expanded market which is attractive to investors. Ghana has two assembly plant of CFLs.
Lessons

◆ Key success factors;

• Availability of CFLs on the market before any attempt to outlaw incandescent.

• Effective institutional collaboration

• There should be a key institution that will drive the policy

• The politicians should be the first target as the major stakeholder

• The “stick and carrot” approach to implementation is the best.
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