Leapfrogging Countries to Energy Efficient Lighting, Appliances, and Equipment

Jonathan Duwyn
United Nations Environment Programme

IEA - 21st Century Energy Efficiency Standards and Labelling Programme
16 December 2015
Efficient Appliances & Equipment – taking the en.lighten approach to the next low hanging fruits

- UNDP, ICA, CLASP, NRDC and UNEP launched the United for Efficiency (U4E) in 2014
- The Programme aims to join forces with private and public sector to expand the en.lighten approach to the next high impact opportunities,
- Supporting the second goal of the Secretary General’s SE4ALL initiative: double the global rate of improvement in energy efficiency
- The en.lighten and U4E initiatives form part of the SE4ALL Energy Efficiency Accelerators on Lighting and Appliances & Equipment
# Project Partners on Lighting, Appliances & Equipment

## Donors and International organizations

<table>
<thead>
<tr>
<th>Donors and International organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNEP</td>
</tr>
</tbody>
</table>

## Partner Organizations

<table>
<thead>
<tr>
<th>Partner Organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Copper Association (Copper Alliance)</td>
</tr>
<tr>
<td>CLASP</td>
</tr>
<tr>
<td>COPENHAGEN CENTRE ON ENERGY EFFICIENCY</td>
</tr>
<tr>
<td>National Lighting Test Centre China</td>
</tr>
</tbody>
</table>

## Supportive Private Sector

<table>
<thead>
<tr>
<th>Supportive Private Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSRAM</td>
</tr>
<tr>
<td>PHILIPS</td>
</tr>
<tr>
<td>mabe</td>
</tr>
</tbody>
</table>

## Countries

<table>
<thead>
<tr>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>En.lighten: 66 partner countries</td>
</tr>
<tr>
<td>U4E: 18 partner countries</td>
</tr>
</tbody>
</table>
Most Developing Countries Do Not Have Policies in Place Today to Leapfrog to Efficient Products

MEPS in 2013: mostly in OECD Countries

Our goal: MEPS in all countries by 2020!

Source: UNEP, 2014
Integrated Policy Approach to Transform Markets

Minimum Energy Performance Standards

Supporting policies promoting demand for efficient products incl. innovative financing mechanisms, loans and grants

Monitoring, verification and enforcement programmes discouraging non-compliant products

Environmentally sound life-cycle management mercury, electronic waste, ozone depleting substances...

Policy Guidance Available for all Products in 2016!
Development of tools and guidance for countries

On-grid lighting

Off-grid lighting

6 regional status reports
MAKING THE CASE
100 Country Savings & Policy Assessments Released During COP21!

See http://united4efficiency.org
Providing Expertise & Developing Tools
The U4E Country Partnership

- Support in the development of project proposals and providing access to financing
- Training (online and face to face) on particular aspects of the integrated policy approach
- Expertise provided throughout the implementation of projects advancing energy efficiency in lighting, appliances and equipment
Support to Regional Harmonization for Efficient Lighting, Appliances, and Equipment

- MENA: 19 countries
  - Completed or under finalization
- West Africa: 15 countries
  - Under development
- Central America: 8 countries
  - Under development
- Southeast Asia: 10 countries
- Southern Africa: 15 countries
- Pacific Community: 22 countries
What U4E-en.lighten has to offer

Promoting international cooperation

- Global public-private partnership (international organizations, expert organizations, manufacturers, countries)

Promoting the development of new effective approaches to design, implement and evaluate energy efficiency standards and labels programmes

- Integrated policy approach and regional harmonization
- Making the case with country assessments
- Specific guidance and tools

Opportunities for sharing experiences and data

- Country assessments
- U4E taskforces
- Training (online and workshops)
- Online platforms
THANK YOU

For more information visit:

http://united4efficiency.org/

http://www.enlighten-initiative.org/
Backup
The potential annual savings in ECOWAS in 2030 for select products

- Save electricity
  - by over 11 TWh
  - By 8% of future electricity use
  - Equivalent to Ghana total electricity consumption in 2015
  - ...and equivalent to 24 power plants [100MW]

- Save 1 billion US$ on electricity bills

- Increase grid connection
  - 5 million Households

- Reduce CO2 emissions by 5 million tonnes per year
  - ...equivalent to 3 million passenger cars

Share of savings potential:
- Lighting 37%
- Refrigerators 22%
- RACs 18%
- Transformers 18%
- Motors 5%
The potential annual savings in Mesoamerican in 2030 for select products

Save electricity
- by over 26 TWh
- By 5% of future electricity use
- Equivalent to Costa Rica and Cuba total electricity consumption in 2015
...and equivalent to
58 power plants [100MW]

Save 3 billion US$ on electricity bills

Increase grid connection 2 million households

Reduce CO2 emissions by 14 million tonnes per year
...equivalent to 8 million passenger cars
The potential annual savings in Southeast Asia in 2030 for select products

- Save electricity
  - by over 80 TWh
  - By 6% of future electricity use
  - Equivalent to Philippines total electricity consumption in 2015
  - ...and equivalent to 184 power plants [100MW]

- Save 9 billion US$ on electricity bills

- Increase grid connection 18 million households

- Reduce CO₂ emissions by 57 million tonnes per year
  - ...equivalent to 31 million passenger cars

Share of savings potential:
- Motors 17%
- Refrigerators 27%
- Transformers 19%
- RACs 17%
- Lighting 20%
The potential annual savings in ECOWAS in 2030 for select products

- Save electricity by over 11 TWh
- By 8% of future electricity use
- Equivalent to Ghana total electricity consumption in 2015
- Equivalent to 24 power plants [100MW]
- Save 1 billion US$ on electricity bills
- Increase grid connection for 5 million Households
- Reduce CO2 emissions by 5 million tonnes per year
- Equivalent to 3 million passenger cars

Share of savings potential:
- Lighting 37%
- Refrigerators 22%
- RACs 18%
- Transformers 18%
- Motors 5%
Making the Case
Country Assessments

Guatemala

Energy efficiency benefits from lighting, residential refrigerators, room air conditioners, distribution transformers and industrial electric motors with the implementation of globally benchmarked minimum energy performance standards

ANNUAL SAVINGS IN 2030

- Reduce electricity use
  - by over 1.3 TWh
  - 10.0% of future national electricity use
- Save electricity worth 320 million USD equivalent to 3 Power Plants [100MW]
- Reduce CO₂ emissions by 480 thousand tonnes equivalent to 270 thousand Passenger Cars

PERCENTAGE OF EACH PRODUCT’S SAVINGS TO THE COUNTRY’S TOTAL SAVINGS IN 2030

- Lighting: 12%
- Residential Refrigerators: 39%
- Room Air Conditioners: 19%
- Distribution Transformers: 7%
- Industrial Electric Motor: 3%

THE PATHWAY TO ENERGY EFFICIENCY

ANNUAL SAVINGS IN 2025 and 2030

<table>
<thead>
<tr>
<th>Product</th>
<th>2025</th>
<th>2030</th>
<th>2025</th>
<th>2030</th>
<th>2025</th>
<th>2030</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting</td>
<td>309.8</td>
<td>305.7</td>
<td>235.4</td>
<td>233.0</td>
<td>123.4</td>
<td>121.1</td>
<td>11.8</td>
<td>9.9</td>
</tr>
<tr>
<td>Residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Room Air</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditioners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transformers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric Motors</td>
<td>76.0</td>
<td>75.2</td>
<td>62.6</td>
<td>62.6</td>
<td>31.8</td>
<td>31.8</td>
<td>12.7</td>
<td>12.7</td>
</tr>
<tr>
<td>CO₂ Emissions</td>
<td>132.3</td>
<td>113.1</td>
<td>92.9</td>
<td>90.1</td>
<td>47.1</td>
<td>47.1</td>
<td>18.8</td>
<td>18.8</td>
</tr>
</tbody>
</table>

CUMULATIVE SAVINGS (2020 – 2030)

<table>
<thead>
<tr>
<th>Product</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2025</th>
<th>2030</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting</td>
<td>3.68</td>
<td>2.84</td>
<td>1.39</td>
<td>0.58</td>
<td>0.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Room Air</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditioners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transformers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric Motors</td>
<td>659.60</td>
<td>667.70</td>
<td>414.50</td>
<td>414.50</td>
<td>142.36</td>
<td>142.36</td>
<td>172.35</td>
</tr>
<tr>
<td>CO₂ Emissions</td>
<td>973.25</td>
<td>1,031.15</td>
<td>504.65</td>
<td>504.65</td>
<td>177.41</td>
<td>177.41</td>
<td>308.30</td>
</tr>
</tbody>
</table>

OTHER BENEFITS IN 2030

- Direct GHG emissions reduced by 476.7 thousand tonnes
- Increased grid connection to 665.1 thousand households
- Reduced emissions by SO₂ 1.1 thousand tonnes NOₓ 620.8 tonnes
# Policy Status

## Brazil

**Energy Efficiency Policy Assessment for Lighting, Residential Refrigerators, Room Air Conditioners, Distribution Transformers and Industrial Motors.**

### Lighting

<table>
<thead>
<tr>
<th>Policy Description</th>
<th>Policy Type</th>
<th>Mandatory or Voluntary</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Energy Performance MEPS for incandescent lamps/odium lamps/CFL</td>
<td>MEPS</td>
<td>Implemented</td>
<td></td>
</tr>
<tr>
<td>EE Label for CFL/HID, incandescent/ballasts for HID</td>
<td>Label Comparative</td>
<td>Mandatory</td>
<td>Implemented</td>
</tr>
<tr>
<td>EE Endorsement Seal for CFL/HID/incandescent/ballasts for</td>
<td>Label Endorsement</td>
<td>Voluntary</td>
<td>implemented</td>
</tr>
<tr>
<td>Monitoring, verification and enforcement Mechanisms of MV&amp;E</td>
<td>MVE</td>
<td>Implemented</td>
<td></td>
</tr>
<tr>
<td>Environmentally sound management Initiatives dealing with the recycling of fluorescent lamps</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments: For more details please visit http://map.enlighten-initiative.org/

### Refrigerators

<table>
<thead>
<tr>
<th>Policy Description</th>
<th>Policy Type</th>
<th>Mandatory or Voluntary</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Energy Performance Ordinance Interministerial No 326/2011</td>
<td>MEPS</td>
<td>Mandatory</td>
<td>implemented -2011</td>
</tr>
<tr>
<td>Supporting Policy Procêl - Refrigerators</td>
<td>Label Endorsement</td>
<td>Voluntary</td>
<td>implemented -2010</td>
</tr>
<tr>
<td>Ordinance Intermeto nº 20 de 01/01/06</td>
<td>Label Comparative</td>
<td>Mandatory</td>
<td>Under review 2006</td>
</tr>
<tr>
<td>Monitoring, verification and enforcement Ordinance Interministerial No 326/2011</td>
<td>Verification and Enforcement</td>
<td>Mandatory</td>
<td>implemented -2011</td>
</tr>
<tr>
<td>Environmentally sound management Refrigerator Recycling Programme - a pilot facility</td>
<td>Recycling facility...</td>
<td>Completed 2011</td>
<td></td>
</tr>
</tbody>
</table>

Comments: |

### Room Air Conditioners

<table>
<thead>
<tr>
<th>Policy Description</th>
<th>Policy Type</th>
<th>Mandatory or Voluntary</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Energy Performance Ordinance Interministerial No 323/2011</td>
<td>MEPS</td>
<td>Mandatory</td>
<td>implemented -2011</td>
</tr>
<tr>
<td>Supporting Policy Procêl - Air conditioners</td>
<td>Label Endorsement</td>
<td>Voluntary</td>
<td>implemented -2013</td>
</tr>
<tr>
<td>RAC annexed to Intermetro Portaria No. 007 04/01/2011</td>
<td>Label Comparative</td>
<td>Mandatory</td>
<td>implemented -2011</td>
</tr>
<tr>
<td>Monitoring, verification and enforcement ORDNANCE INTERMINISTERIAL NO 323, OF 26 MAY 2011</td>
<td>Verification and Enforcement</td>
<td>Mandatory</td>
<td>implemented -2011</td>
</tr>
<tr>
<td>Environmentally sound management Sectorial Plan Agreement</td>
<td>Agreement for recycling scheme...</td>
<td>Mandatory</td>
<td>implemented -2013</td>
</tr>
</tbody>
</table>

Comments: |
Off-Grid Lighting Publications
Countries Risk Locking-in Inefficient Products

Global stock of room air conditioners

OECD
- 2010: +25% to 2030
- Non-OECD: +78% to 2030

Global stock of refrigerators

OECD
- 2010: +30% to 2030

Non-OECD
- 2010: +107% to 2030

With No Action, Electricity Demand in non-OECD Countries Will Double by 2030

Electricity Generation [TWh]

World: +64%
OECD: +22%
Non-OECD: +103%

Source: IEA World Energy Outlook 2013, current policies scenario
The Potential of Improving Energy Efficiency in the Top 6 High-consuming Products

Source: UNEP, 2014 (estimated annual figures for 2030)
50% of Savings We Need to Keep the 2°C Climate Goal Alive Can Be Achieved With Energy Efficiency