Data Collection Activities
ECOWREX Regional Workshop

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Accelerating our transition to a more sustainable world

CLASP improves the energy and environmental performance of the appliances & equipment we use every day
What We Do

• **Energy & Quality Standards** to keep inefficient, cheap products off the market

• **Policy Compliance, Testing & Quality Assurance** to ensure products perform & markets are fair to all

• **Product Labeling & Consumer Education** to attract consumers to good products & inspire demand

• **Awards & Product Recognition** to reward early-movers & accelerate markets

• **Procurement, Incentives & Bulk Buys** to incentivize innovative manufacturers, reduce risks for all & saturate markets

• **Global Collaboration & Knowledge Sharing** to leverage cutting edge & collective knowledge and forge productive partnerships
Where We Work

Past: Haiti, Brazil, Chile, Guatemala, Peru, Mexico, United States

Current: Kenya, Tanzania, Uganda, India, South Africa, Ghana, Pakistan, Bangladesh, China, Japan, ASEAN, APEC, CARICOM, ECOWAS, Thailand, Vietnam, Philippines, Cambodia, Laos, Peru, Australia

Current Past: China, Japan, ASEAN, APEC, CARICOM, ECOWAS, Thailand, Vietnam, Philippines, Cambodia, Laos, Peru, Australia
### Evaluation Data: Type and Sources

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Main Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer and retailer knowledge, awareness, understanding, and decision making</td>
<td>• Surveys of customers and retailers and in-depth interviews</td>
</tr>
<tr>
<td>Availability of products</td>
<td>• Sales data from manufacturers, trade associations, or government</td>
</tr>
<tr>
<td>• Surveys of manufacturers and retailers</td>
<td></td>
</tr>
<tr>
<td>Prices for efficient products</td>
<td>• Surveys of customers, retailers, and manufacturers</td>
</tr>
<tr>
<td>Market penetration</td>
<td>• Sales data from manufacturers, trade associations, or government</td>
</tr>
<tr>
<td>• Surveys of participant and non-participant customers</td>
<td></td>
</tr>
<tr>
<td>• Surveys of suppliers</td>
<td></td>
</tr>
<tr>
<td>Energy use</td>
<td>• Manufacturer data</td>
</tr>
<tr>
<td>• Independent laboratory data</td>
<td></td>
</tr>
<tr>
<td>• Engineering specifications</td>
<td></td>
</tr>
<tr>
<td>• Metered end-use data</td>
<td></td>
</tr>
<tr>
<td>GHG emissions</td>
<td>• Reported emissions factors</td>
</tr>
<tr>
<td>• Utility dispatch model data</td>
<td></td>
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</tbody>
</table>
Kigali Cooling Efficiency Programme:
Supporting ECOWAS Standards Implementation
ECOWAS Compliance Cooling Project

- Support implementation of ECOWAS regional EE standards
- Lay foundation for regional compliance collaboration on cooling products
- Prevent dumping of inefficient products across borders by increasing capacity for compliance through:

  **Compliance Training**
  - Conduct training workshops for compliance officers and policymakers
  - Distribute best practices suitable for ECOWAS market

  **Regional Product Database**
  - Develop a regional cooling product database for online information-sharing
  - Enable customs officials to restrict entry of inefficient cooling products

  **Test Laboratory Assessment**
  - Evaluate ECOWAS test laboratory capacity for cooling products
  - Assess gaps, challenges, and opportunities for increased cooling testing capacity
Proposed ECOWAS Regional Product Database

- Single regional tool, web-based, centrally hosted and managed
- Implemented/accessible at the national level
- Focused on cooling products initially (refrigerators and air conditioners), can be expanded later
- In French, English, and potentially also Portuguese
- Various uses:
  - Register products on the market
  - Customs checks
  - Market surveillance and enforcement
  - Inform standards and label policy implementation and reporting
  - Consumer and industry education
- Incorporating existing tools and processes used in ECOWAS countries
- Designed to be compatible for future mobile application
## Database sample data fields for ACs

<table>
<thead>
<tr>
<th>Data Fields</th>
<th>Description / details and examples</th>
<th>Public/ private Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Brand Name</strong></td>
<td>Manufacturer’s brand name for the product</td>
<td>Public</td>
</tr>
<tr>
<td><strong>Model names &amp; numbers</strong></td>
<td>Unique model name or number</td>
<td>Public</td>
</tr>
<tr>
<td><strong>Sales/prices</strong></td>
<td>Suggested retail price and/or estimated annual sales quantity in the region</td>
<td>Public/ Private</td>
</tr>
<tr>
<td><strong>Energy performance/star ratings</strong></td>
<td>If the label system uses stars, this could indicate the appliance performance level using the number of stars that would appear on the product label; may alternatively indicate EER level</td>
<td>Public</td>
</tr>
<tr>
<td><strong>Availability</strong></td>
<td>Specific countries where this product is available for purchase; e.g. Nigeria, Ghana, Cote d’Ivoire, etc.</td>
<td>Public</td>
</tr>
<tr>
<td><strong>Country of Manufacture</strong></td>
<td>Where the product is manufactured; such as: China, Thailand, Japan, Malaysia, etc.</td>
<td>Public</td>
</tr>
<tr>
<td><strong>Registration number and expiration date</strong></td>
<td>Provides a unique ID for each product model and expiration for registration</td>
<td>Private or public</td>
</tr>
<tr>
<td><strong>Additional information</strong></td>
<td>Split/packaged systems; Ducted/Non-ducted; cooling capacity; compressor type; power input &amp; frequency, etc.</td>
<td>Public</td>
</tr>
<tr>
<td><strong>Refrigerant</strong></td>
<td>R-22, R-32, R-134a, R410A, R-452B, R-290, etc.</td>
<td>Public</td>
</tr>
<tr>
<td><strong>Compliance information</strong></td>
<td>Indicator of compliance or non-compliance, verification test results, dates when registered, test reports, etc.</td>
<td>Private</td>
</tr>
</tbody>
</table>
Market Assessment Case Study:
Understanding air conditioner market in CARICOM
CARICOM was looking to harmonize with existing regional or international test standards.

Impact assessments were developed and included:
- Market analysis
- Cost-benefit analysis
- Summary of national impacts: energy savings and GHG emissions mitigation
The value of data in the CARICOM roadmap

- There was no data available when CLASP first met with the various stakeholders
- CLASP needed to collect market data to answer key questions about the market
- Light touch market data collection in 13 CARICOM countries:
  - AC product characteristic and energy performance data, were collected by visiting local appliance retailers
# Data needed

<table>
<thead>
<tr>
<th>Data type</th>
<th>Data needed</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Data</td>
<td><strong>Recommended</strong>&lt;br&gt;- Electricity tariff schedule for residential or commercial customers (as applicable). At a minimum, average annual energy price.&lt;br&gt;- Residential or commercial consumer discount rates (as applicable)&lt;br&gt;- Societal discount rate</td>
<td>• Ministry of Energy&lt;br&gt;• Ministry of Environment&lt;br&gt;• Ministry of Finance&lt;br&gt;• Other relevant agency</td>
</tr>
<tr>
<td>Market Data</td>
<td><strong>Recommended</strong>&lt;br&gt;- Market Structure: manufacturers, importers, and distribution channels → to inform supply chain&lt;br&gt;- Households or commercial buildings ownership levels (or market shares for household vs commercial)&lt;br&gt;- Annual sales of each class of product (past 5 years)&lt;br&gt;- Relative market share of product classes&lt;br&gt;- Share of imports vs. local manufacturing</td>
<td>• National market assessments&lt;br&gt;• Local manufacturers / Importers&lt;br&gt;• Industry associations&lt;br&gt;• Customs&lt;br&gt;• National statistics office</td>
</tr>
<tr>
<td>Product Data</td>
<td><strong>Recommended</strong>&lt;br&gt;- Annual energy consumption for existing models of each class of product (EER, SEER, etc.)&lt;br&gt;- Average product lifetime&lt;br&gt;- Retail prices&lt;br&gt;- Usage (hours of use, days per year)</td>
<td>• National market assessments&lt;br&gt;• Local manufacturers / Importers&lt;br&gt;• Industry associations&lt;br&gt;• Retailer surveys&lt;br&gt;• Online data</td>
</tr>
<tr>
<td>Energy Sector Data</td>
<td><strong>Recommended</strong>&lt;br&gt;- Conversion factor from site electricity to source energy (transmission and distribution losses)&lt;br&gt;- CO2 emissions factor from electricity generation</td>
<td>• Ministry of Energy&lt;br&gt;• Ministry of Environment&lt;br&gt;• Ministry of Finance&lt;br&gt;• Other relevant agency</td>
</tr>
</tbody>
</table>
Where to find information? - Energy label

**Refrigerator volume (liters)**

**Refrigerator type**

**Annual Energy Consumption**

Location: To be affixed on the top right hand corner of the refrigerator door.
Where to find information? - Rating Plate

- Manufacture Name
- Model Number
- Dimensions ARE NOT equivalent to storage volume
- Country of origin/manufacture
- Refrigerant Type
Where to find the information? - Product Manual

Haier Arctic Series Submittal
9000 BTU/HR WALL MOUNTED INVERTER DRIVEN HEAT PUMP SYSTEM
1U09EH2VHA / AW09EH2VHA

Job Name: 
Purchaser: 
Submitted To: 
Construction To: 
Reference: 
Approval: 
Date: 
Submitted By: 
Unit: 
Drawing #: 

Electrical Requirement:
- Power Supply: 208/230V, 1 Phase, 60 HZ
- Operating Voltage Range: 187-233 VAC
- Recommended Fuse/Breaker Size:
  - MCA: 15A
  - NCA: 12A

Operating Range:
- Cooling: 14-115°F (10-26°C)
- Heating: -22-79°F (-28-25°C)

Cooling Performance:
- Rated Cooling Capacity: 9,000 BTU
- Cooling Capacity Range: 3,100-12,000 BTU
- Rated Power input: 998 W
  - SEER: 28.0
  - EER: 15.5

Heating Performance:
- Rated Heating Capacity: 12,000 BTU
- Heating Capacity Range: 3,100-22,000 BTU
- HSPF: 13.0

Pipe Length:
- Maximum Pipe Length: 66 ft
- Maximum Pipe Height Difference: 50 ft
- Connection: 1/4" Discharge, 3/8" Liquid/Electric Line
• The collected data provided an understanding on what products are sold on the market.
Market Analysis – Air Conditioners

- The collected data provided an understanding on the prices for different types of ACs
Market Analysis – Air Conditioners

Different MEPS scenarios – what is the ambition of the program?

EER vs. Capacity

- **China MEPS - FS Split AC (2010)**
- **India MEPS - Fixed Speed (2017)**
- **Draft COPANT Class A Split**
- **Draft COPANT Class E Split**
- **CARICOM Products**
Cost-Benefit analysis results - Jamaica

- Costs and benefits from the consumer perspective use a Life-Cycle Cost (LCC) calculation

<table>
<thead>
<tr>
<th></th>
<th>MEPS Option 1 EER 3.0</th>
<th>MEPS Option 2 EER 3.2</th>
<th>MEPS Option 3 EER 3.4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit Level Benefits</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payback Period (years)</td>
<td>0.9</td>
<td>0.96</td>
<td>1.02</td>
</tr>
<tr>
<td>LCC savings (US$)</td>
<td>398</td>
<td>554</td>
<td>688</td>
</tr>
<tr>
<td><strong>National Level Benefits</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Electricity Cost Savings through 2030 (mUS$)</td>
<td>96.4</td>
<td>135.2</td>
<td>169.4</td>
</tr>
<tr>
<td>Cost/Benefit Ratio</td>
<td>7.42</td>
<td>6.97</td>
<td>6.57</td>
</tr>
<tr>
<td>Site Energy Savings in 2030 (GWh)</td>
<td>76</td>
<td>106</td>
<td>132</td>
</tr>
<tr>
<td>Site Energy Savings through 2030 (GWh)</td>
<td>492</td>
<td>691</td>
<td>866</td>
</tr>
<tr>
<td>CO$<em>2$ Emissions Mitigation through 2030 (Mt CO$</em>{2e}$)</td>
<td>0.38</td>
<td>0.53</td>
<td>0.66</td>
</tr>
</tbody>
</table>
Reduce electricity use
- by over 2.25 TWh in 2030
- More than 9% of current electricity use

...equivalent to 4 100MW power plants

Save approximately 400 million US$ on electricity bills

Reduce CO2 emissions by more than 1.5 million tonnes
...equivalent to 814,000 passenger cars
Data Collection:
Real-time appliance energy consumption in India
Many baseline estimates based on limited data and assumptions

Goal to assess real-time baseline to assess realistic energy efficiency policy impacts and inform standards setting

Analysing appliance energy use in households

- Nationwide survey of 5000 households to gather information on appliance usage, purchase behaviours, usage patterns, penetration of EE appliances
- Monitoring home appliance energy use through installed load monitoring devices (Wattman) in 200 households across the country to capture real time appliance energy consumption
- Monitoring appliance specific energy consumption data in 20 households to validate findings of “Wattman” device
Development and Implementation of ISO Standards for Clean Cookstoves: Data collection activities in Bangladesh
Bangladesh improved cookstoves market

- Last market assessment conducted in 2012 by the Clean Cooking Alliance
- Target market for improved cookstoves is over 30 million households:
  - Only 510,000 stoves in use in 2012
  - Penetration rate was less than 2%
- Market is shared by 2 main dissemination programs and small manufacturers
- Different programs/manufacturers collect data on their activities and product performance, but no comprehensive market assessment for Bangladesh
- Limited market and product performance information available
- Data needed to inform standards development and implementation
Data Collection Approach

- Collect all available data to understand data gaps, and to review current status of improved cookstoves market compared to international standards
- Mainly secondary data collection:
  - Product performance testing reports from all stakeholders
  - Sales and pricing information and reports
  - Programme monitoring & evaluation reports with product performance data and sales
  - And more…!
## Data types and sources to be collected

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Data Needed</th>
<th>Sources</th>
</tr>
</thead>
</table>
| **Market Data**    | **Market Composition**  
Traditional Solid fuel stoves built on site, Traditional Solid fuel stoves sold as product, Improved solid fuel stoves built on site, Improved solid fuel stoves sold as product, Liquid fuel stoves sold, LPG Cookstoves sold as product, and other.  
**Sales Channels**  
Store, Roadside/Market Vendor, Installation Technician, Local NGOs/IDCOL partner organizations, and other. | • Global Alliance  
• SREDA  
• Local test laboratories  
• IDCOL  
• IDCOL partner organizations  
• World Bank  
• BBF  
• Local NGOs  
• Local commercial entities  
• Other relevant agencies |
| **Product Data**   | Data Source, Country/Region, Local/Imported, Stove Maker, Stove Name, Stove Type, Model Number, Weight (grams), Built Materials, Installation, Fuel Type, Picture, Product Lifetime, Thermal Efficiency (%), Specific Consumption Rate (MJ/min/L), PM2.5 (mg/MJd), PM2.5 Emission Rate (mg/min), CO (g/MJd), BC (mg/MJd), Stove Distributor/Retailer, Type of Distributor/Retailer, Retail Price (USD $/Unit), Warranty Period (months), and other. |                                                                                               |
Anticipated data collection outputs

- Market assessment to establish a reference baseline
  - How can the market apply proposed thermal efficiency tiers?
  - How should the tiers be adapted or implemented to suit the national market?
Questions?
See more about CLASP at www.clasp.ngo

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