Low Energy Inclusive Appliances (LEIA): Using end-user insights to develop standardised impact metrics for the sector

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Low Energy Inclusive Appliances (LEIA)

- 5 year (2018-2022) £22m project funded by FCDO and IKEA Foundation, co-managed by EST and CLASP.

- Aims to accelerate the **availability, affordability, efficiency and performance** of appliances suited to off and weak-grid contexts in Africa and South Asia.

- Diverse activities to support **innovation and market growth**, to help deliver **end-user impacts** from appliances.
LEIA Theory of Change

**CONTEXT**
Basic Energy Services

**INPUTS** - Funding: DFID, CLASP, EST, partners

**ACTIVITIES**
- Product test methods & data platform development
- Consumer research
- Market research
- Road mapping
- Impacts research
- Underpinning Activities
- Product testing, data publication, quality assurance frameworks
- Awards, prizes & demand aggregation
- Communications, sector co-ordination (EforA coalition) & policy briefings
- R&D partnerships & co-investment
- Market Development

**OUTPUTS**
- Near to market products
  - Quality assured products recognised and prioritised
  - Demand aggregation to support sales
- Market-wide
  - Stakeholders informed by research publications and campaigns
  - Increased collaborations within sector
- Horizon & enabling technologies
  - Strategic R&D partnerships promoted
  - Grants awarded to new technologies

**EXPECTED OUTCOMES**
- Affordable Quality Appliances
  - Prices: halved
  - Efficiency: doubled
- Stronger market: more active companies & sales
- Increased public & private investment

**EXPECTED IMPACTS**
- Increasing levels of Energy Services & enhanced access globally
- Improved access to energy services
- Improved well-being and incomes for poor people
- Reduced greenhouse gas emissions

**KEY STAKEHOLDER GROUPS:**
- Firms, design engineers, technologists
- Financiers
- Policymakers
- End-users

**LIMITED FOCUS ON LOW-INCOME MARKETS**

**SUPPLY CHAIN WEAKNESSES**

**INCONSISTENT, UNSUPPORTIVE POLICY**

**LIMITED COMMERCIAL FINANCE & INVESTMENT**

**CONSUMER RESEARCH**

**MARKET RESEARCH**

**ROAD MAPPING**

**IMPACTS RESEARCH**

**PRODUCT TESTING, DATA PUBLICATION, QUALITY ASSURANCE FRAMEWORKS**

**AWARDS, PRIZES & DEMAND AGGREGATION**

**COMMUNICATIONS, SECTOR CO-ORDINATION (EFORA COALITION) & POLICY BRIEFINGS**

**R&D PARTNERSHIPS & CO-INVESTMENT**

**MARKET-WIDE**
- Stakeholders informed by research publications and campaigns
- Increased collaborations within sector

**HORIZON & ENABLING TECHNOLOGIES**
- Strategic R&D partnerships promoted
- Grants awarded to new technologies

**PRODUCT TESTING METHODS & DATA PLATFORM DEVELOPMENT**
LEIA Programme Impact Tracking

Tracking of sales and impacts delivered for fans, TVs, solar water pumps (SWPs) and refrigerators.

<table>
<thead>
<tr>
<th>Intended impacts</th>
<th>Tracking methods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Energy access:</strong> number of people benefitting from LEIA appliances</td>
<td>• GOGLA bi-annual sales surveys</td>
</tr>
<tr>
<td></td>
<td>• Existing published research</td>
</tr>
<tr>
<td><strong>2. Income and livelihoods:</strong> Measured by:</td>
<td>→ <strong>impact metrics</strong></td>
</tr>
<tr>
<td>a) household savings due to LEIA appliances</td>
<td></td>
</tr>
<tr>
<td>b) (i) time savings</td>
<td></td>
</tr>
<tr>
<td>b) (ii) increased productive time</td>
<td></td>
</tr>
<tr>
<td>c) income generation from productive use</td>
<td></td>
</tr>
<tr>
<td><strong>3. Environmental impact:</strong> GHGs avoided</td>
<td></td>
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</tbody>
</table>
Preliminary impact metrics developed for programme tracking using existing research.

Realised other sector stakeholders can also benefit.

Companies in receipt of R&D grants and broader stakeholders asking for help in this area.

EforA donor coalition and investor network members.

Identify existing high quality end-user research

Use conservative assumptions to adjust for contextual factors

Validate through triangulation across multiple data sources

Create standardised impact metrics for programme reporting
There is a need for a shared impact measurement framework: Other sector stakeholders also need to **understand and communicate impacts** from appliance usage. Such a framework can help standardize impact reporting and help inform **investment decisions and donor interventions**.

LEIA's impact assessment framework links with the LEIA Theory of Change.

It seeks alignment with other impact frameworks such as the GIIN and is being done in collaboration with GOGLA, Rural Senses and SVT.
First Published Impact Metrics

LEIA programme impact metrics and GOGLA SHS metrics

Additional data collection and expert peer review with Impact WG

Agree and publish standardised impact metrics
**Impact Metrics – Overview of Formulas**

### 2. Economic Activity

<table>
<thead>
<tr>
<th></th>
<th>Equation</th>
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</thead>
<tbody>
<tr>
<td>2a</td>
<td>Number of People using their appliances to support enterprise</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>2b</td>
<td>Number of People generating additional income</td>
</tr>
</tbody>
</table>

### Variables (input by user)

- \( S_L \): Number of units sold which are estimated to currently be in use (based on the products estimated lifespan being \( 1.5 \times \) warranty period)

### Variables (standard value)

<table>
<thead>
<tr>
<th></th>
<th>Fan</th>
<th>TV</th>
</tr>
</thead>
<tbody>
<tr>
<td>( D_L ): Discount for loss (products not working or not in use, excluding loss in supply chain)</td>
<td>3%</td>
<td>7%</td>
</tr>
<tr>
<td>( E ): The percentage of customers using products to support enterprise (including those that have opened a new business)</td>
<td>3%</td>
<td>9%</td>
</tr>
<tr>
<td>( IG ): Percentage of customers/households creating additional income</td>
<td>-</td>
<td>4%</td>
</tr>
</tbody>
</table>
Pumps and Fridges: Metric Examples

➤ Pumps
  - Water conservation/ground water depletion – links with consumer awareness efforts
  - Increase in leisure time
  - Metrics like improvement in sanitation/hygiene practices where research can help inform if improved availability in water access has led to improvement in sanitation and hygiene practices

➤ Fridges
  - Increase in income – use of fridge for productive vs domestic use
  - Reduction in food waste/ food spoilage
  - Fridge utilization and its impact on energy consumption and fridge performance
  - Increase in comfort
  - Time savings
Identifying and Filling Data Gaps

- Identified data gaps in existing published research
- LEIA programme can undertake dedicated research into appliance usage patterns
- Generate more behavioural insights and impact data
- Refrigeration, solar water pump and milking machine field trials in progress
Refrigeration Field Trials

Fridge user behaviour:
- Stocking behaviour analysis
- Domestic needs for fridge
- Gender differences in stocking needs
- Opening behaviour – this is also covered above
- Change in stocking patterns through the year
- Capacity adequacy, free space or over stocking

Grouping users based on following consumption types:
- Average Fridge energy consumption by food type loaded
- Average Fridge energy consumption by business type
- Average Fridge energy consumption by business hours
- Possible energy consumption vs level of fridge loading

This helps map user behaviour to observed energy consumption and fridge performance data
Impact assessment will continue to be an iterative exercise as more data becomes available:

- to add new metrics
- cover more appliances
- improve discount rates
- potential regional disaggregation of metrics

Linkages to broader sets of standardised impact investment tools: GIIN / IRIS +

Strategic importance of estimating impacts in order to attract investment and inform investment decisions

Specific requests for further metrics and positive feedback on first set from sector stakeholders
Thank you!