Productive uses of energy are essential for reducing the costs of energy from minigrids, helping reduce subsidy needs and make funding go further.

Levelized costs of energy (LCOE) from minigrids and cost reduction potential:

- **2018 Baseline**
  - 1: Hardware 18%
  - 2: Managing Loads 13%
  - 3: Customer Engagement 10%
  - 4: Project Development, O & M 8%
  - 5: Finance 5%
  - 6: Policy 5%

- **2020 Target**
The productive use sector in Ethiopia is centered on agricultural productivity, and overlaps with activity in this sector.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Loads</th>
<th>Key references</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smallholder irrigation</td>
<td>Pumps&lt;br&gt;Standalone and grid connected systems</td>
<td>• National strategy for irrigation&lt;br&gt;• NEP-II, ATA mapping &amp; solar pilots</td>
</tr>
<tr>
<td>Mechanization</td>
<td>Grain mills&lt;br&gt;Threshers and coffee washing stations</td>
<td>• National strategy for mechanization&lt;br&gt;• Value chain analyses; AGP-II</td>
</tr>
<tr>
<td>Meat, dairy and poultry</td>
<td>Cold chain, milking and milk collection&lt;br&gt;Incubators, heating and lighting</td>
<td>• Value chain analyses in meat, dairy and poultry</td>
</tr>
<tr>
<td>Horticulture</td>
<td>Cold chain&lt;br&gt;Lighting and heating</td>
<td>• National strategy for horticulture&lt;br&gt;• Value chain analyses</td>
</tr>
<tr>
<td>Small businesses</td>
<td>Welding; woodworking; hair salons; tailoring; entertainment; food &amp; drink</td>
<td>• Existing business activities in electrified rural areas</td>
</tr>
<tr>
<td>Institutional loads</td>
<td>Schools: lighting, ICT&lt;br&gt;Health: lighting, cooling, medical eqpt</td>
<td>• Ministries of Health &amp; Education&lt;br&gt;• NEP-II, Geospatial mapping</td>
</tr>
</tbody>
</table>
A range of promising Productive Use appliances in Ethiopia but limited supply capacity

- **Agricultural value chains** (wheat, teff, coffee, oily seeds, soybeans)
  - Irrigation pumps
  - Threshers
  - Hullers and pulpers
  - Mills
  - Oil presses

- **Dairy and poultry value chains**
  - Milking machines
  - Dairy cold storage
  - Pasteurization units
  - Egg incubators

- **Commercial value chains** (carpentry, metal works, restaurants, hair saloons)
  - Ovens
  - Dough mixers
  - Welding machines
  - Hair dryers (hood)
In the Ethiopian context, the availability and financing of Productive Use appliances faces several bottlenecks

- Detailed market assessment (accurate evaluation of number and scale of appliances needed)
- Development and enforcement of standards applicable to productive use appliances
- Gaps in supply chain and limited capacity from both local manufacturing and import perspective
- Policy challenges
  - FOREX
  - VAT exemption/application scheme to
- Access to finance (loans and FOREX) is a major challenge for supply chain
- Stakeholder alignment and coordination
  - Development agencies – alignment of electrification and economic development goals
  - Communities – electrification systems, PU and payments (ability and will)
  - Government – “Task force” co-ordination key
  - Tailored community engagement mechanisms
- Capacity building needs
  - Fostering awareness of MFI and banks on business models for PU appliances
  - ESA - standards development and implementation
  - Appliance suppliers – quality assurance and business management
For communities to effectively develop productive uses, a range of barriers need to be overcome.

Needs

- Productive use included in electrification planning
- Access to markets for processed goods
- Access to stable input sources
- Last mile supply chains and after sales services
- Import and manufacture of appropriate appliances
- De-risking of financing for appliance supply chains

Enablers

- Affordable, reliable electricity
- Community productive uses
- Policy and regulation
- Local agricultural value chain infrastructure
- Efficient, affordable equipment and appliances
- Small business expertise
- Microfinance solutions

- Awareness of productive uses
- Recognition of multi sector implications
- Enabling environment to de-risk and promote productive uses
- Awareness of potential businesses or improvements for current businesses
- Training on new business models
- Knowledge transfer of best/worst practices
- Understanding of increased productivity, income, and production costs
- Access to local banking solutions
- Products that are affordable to customers
- Appropriate repayment mechanisms

Graphic includes elements from Sustainable Energy and Livelihoods, SELCO Foundation
A successful productive use program must intervene across supply, demand and capacity building.

Interventions:

Examples of national activities:
- Customer Surveys
- Equipment Database
- Bulk Procurement
- Concessional Finance Scheme
- Value Chain Analysis

Local activities:
- Customer Surveys
- Community engagement mechanisms
- Microfinancing
- Tariff Structures
- Ed: Appliance Financing
- Ed: Appliance Access
- Enterprise Development Training

Pilots