

State of the Off-grid Appliance Market Report

Introduction

The Low Energy Inclusive Appliances programme (LEIA) aims to accelerate the availability, affordability, efficiency and performance of a range of low energy inclusive appliances particularly suited to less developed countries. LEIA is supported by UK Aid and is a contribution to the broader [Efficiency for Access Coalition](#) (EforA). LEIA supports market, consumer, impacts, and technology research that further the programme's goal to double the efficiency and halve the costs of a suite of off- and weak-grid technologies. This includes research to better understand the market opportunities and challenges.

To catalyse public sector support and private sector investment, research that characterizes and quantifies the market opportunity, and the associated barriers, for LEIA technologies is essential. Such work is needed for both global and key national markets. While valuable, work to date is limited, inadequate, or inaccessible.

Background

Highly energy-efficient, affordable and appropriately designed appliances hold unique potential to improve livelihoods and achieve broad development impacts in off- and weak-grid communities. The LEIA programme is commissioning research to gather market data on appliances, perform analysis and modelling to characterize these markets, and present the current state of play, trends, opportunities, and threats.

This research project will build on the 2016 [State of the Off-grid Appliance Market Report](#) that was published by Global LEAP. This project will summarize and distill existing research and build on the existing body of knowledge using a variety of research methods including desk research, stakeholder consultations, surveys, modeling, and potentially field work. The research undertaken will culminate into the flagship publication for the off-grid appliance sector.

Scope of Work

To catalyse public sector support and private sector investment, research that characterizes and quantifies the status of current markets and the potential size of these market opportunities (as well as the associated barriers) for technologies used in weak- and off-grid energy environments is essential. Such work is needed for both global and key national markets. While valuable, work to date is limited, inadequate or inaccessible. CLASP is seeking a researcher, or team of researchers, to assess the global off and weak-grid appliance marketplace, and its key actors, trends, drivers, and challenges.

The markets for appliances that are primarily powered from solar home systems and mini-grids are at varying levels of maturity. The priority products in scope for this report are appliances that are available on the market and whose energy requirements exceed what can be delivered through pico-solar products, this includes fans, televisions, refrigerators, and solar water pumps. There is also relatively little data available on the market size and potential of smaller appliances and electronics that are approaching commoditization (e.g. radios, mobile phones, hair clippers), while not the focus of this report, these products should also be considered in the report as they drive demand for off-grid energy systems and help familiarize customers with the technology.

This report will focus on identifying the key characteristics, size, location, and the growth potential of markets for fans, televisions, refrigerators, and solar water pumps intended for use in off- and weak-grid areas of developing countries. Information will be sought and analysed in terms of its bearing on the following key elements: market size and opportunity, business and financing models, policy environments, and end of life.

Through this, the report will provide the first comprehensive overview of the state of play for these markets with relevance to industry, donors, policymakers, investors, financial institutions, researchers,

and more. Below is a list of research questions that the consulting team will explore through this project. Each question is ranked as low, medium, and high to indicate the priority and the corresponding amount of effort that should be allocated in the project.

The key regions in scope for this project are sub-Saharan African and South Asia. Within these regions, 8-12 priority countries will be agreed upon in collaboration with CLASP and the EforA Coalition. The LEIA program currently has projects underway in Tanzania, Sierra Leone, Nigeria, Myanmar, Pakistan, Kenya, and Uganda.

Market Size

- Estimate the current sales of off-grid appliances, categorized by appliance type, geography, and means of sale/distribution. When possible, these numbers will also be broken down by energy source that is used to power the appliance (e.g. solar home system, AC mini grid, DC mini grid, weak-grid). Note that LEIA is collaborating with GOGLA to collect this information for radios, televisions, fans, refrigerators, and solar water pumps from GOGLA, IFC, and Lighting Global affiliates, which will inform this analysis. **High**
- Estimate the current market size of incumbent appliances where possible, such as hand/power or fossil-fuel powered water pumps and kerosene or gas powered refrigeration. **High**
- Estimate the growth (or contraction) of the total addressable market over the next five years, this includes both sales and the number of manufacturers and distributors. Indicate the main market drivers from both private and public sectors. **High**

Market Characteristics

- For each major appliance type, indicate the degree to which the overall market is segmented by quality / price and whether there is an easily distinguishable differentiation between lower cost / lower quality "generic" and higher cost / higher quality "branded" market segments? **High**
- Identify and prioritize the pre-conditions/characteristics that would constitute viable markets for off-grid appliances. How prevalent are these across South Asia and sub-Saharan Africa? **High**
- Identify emerging technologies and trends in off-grid appliances. (i.e. beyond TVs, fans, and refrigerators what appliances are off-grid customers demanding or what technologies are needed for small scale off-grid agriculture to see significant productivity gains?). LEIA has recently completed a [market survey](#) to identify the appliances in greatest demand by off-grid customers that will inform this analysis. The findings from that report will be integrated into this report, accompanied by additional observations gathered through the course of the project. **High**
- CLASP will provide some baseline data on the retail prices for appliances (televisions, fans, refrigerators, and solar water pumps) in key markets. How are prices projected to change for key appliances and what would cause those changes? What are the cost implications for improving durability and quality? Note that this will also reference and build on the recent publication on [off-grid appliance data trends](#). **High**
- Discuss implications and special considerations for appliances that are used in weak-grid environments (e.g. voltage fluctuations, energy losses through conversions) **Medium**

Business Models & Financing

- What are the different business models used to sell off and weak-grid appliances? What are the relative strengths and weaknesses of each? **Medium**
 - What are the different consumer financing models for off-grid appliances (e.g. pay as you go, cash payment, traditional loans, grants, results based financing)? Are the models different for consumers weak-grid consumers (e.g. consumers who are purchasing a solar home system as a back-up energy source). What are the challenges and opportunities for the leading finance models? **High**
 - What are the leading points of sale for off- and weak-grid products? What is the breakdown across retail outlets, direct sales, small markets/ informal sellers, online, etc? **Medium**

- Do financing models differ across appliances and geographies? **Low**
- Map out the supply chain for off-grid appliances. How (if at all) does this differ from conventional appliance supply chains and from the supply chain for solar home systems and off-grid lighting products? **High**

Policy

- Map out the duties and VAT incentives that are applicable to off-grid appliances. Do these duties vary significantly by region/country? Are there any countries that have tariff regimes specific to solar/DC appliances? Are there any countries that have tariff regimes for productive use appliances typically different than for household appliances? **High**
- Map out the roles and responsibilities of different agencies involved in creating and enforcing policies in key markets. **Medium**
- Collate knowledge from key market actors of existing policy based incentives (e.g. VAT exemptions and subsidies) for appliances sales/market building and gather their views on what policies they see as helpful and unhelpful to developing markets for high efficiency off-grid appliances and productive uses. **Medium**
- What can policymakers do to create opportunities for in-market assembly of off- and weak-grid appliances? **Medium**
- Make recommendations for policies that will enable further development of the off-grid appliance market. Identify the potential market impacts from implementing these policies (e.g. changes in sales volumes). These recommendations may vary by technology and/or region. **High**

Consumer Perspective and Impacts

- What are the social, environmental, economic and inclusivity impacts of appliances? How are consumers and small businesses using appliances to generate income and improve livelihoods? Note that CLASP will provide preliminary impacts data from fans, televisions, and refrigerators as well as stories / profiles that have been collected from end-users. **High**
- What is the income distribution of households/small- and micro-businesses that are purchasing off-grid appliances? **Medium**

End of Life

Note: Relative to the other components of this report, this section will be short and will include a broader discussion of the environmental implications of disposal and recycling e-waste, refrigerants, and other appliance components in emerging vs. developed markets. It will also identify relevant initiatives and programs that are addressing end of life, e-waste, and circular economy.

- Is there a strong secondary market for off-grid appliances? **Low**
- What companies and/or countries have policies and plans for recovering and/or recycling solar products, including off-grid appliances? Are there any best practices or models that can be recommended? **High**
- Does the useful life of an off-grid appliance/appliances sold in developing countries differ from more traditional appliance markets? What are the factors (e.g. region, climate) that lead to divergence? **Low**

Delivery

This project will be highly collaborative and the LEIA team will be actively involved in the research design, stakeholder outreach, data collection, and analysis. CLASP will give the consulting team access to the following data sets that can be used to answer these research questions. CLASP will also connect the consulting team with key stakeholders in the off-grid appliance sector.

- Preliminary aggregate non confidential data on the number of fans, tvs, and refrigerators that are sold by GOGLA members
- Market surveys that include data on the size, rated power consumption, retail price, power

configuration, warranty, and more that has been collected from retailers in India, Kenya, Myanmar, Nigeria, Pakistan, Sierra Leone, Tanzania, Uganda, and online sources.

- Results from laboratory testing of over 300 products, including TVs, fans, and refrigerators
- Results from three surveys distributed to energy access practitioners asking them to rank off-grid appliances in terms of perceived demand and impact
- Sales and pricing data from the Global LEAP RBF program
- Data from the recently published [off-grid appliance market survey](#) and [off-grid appliance data trends](#) reports.

The research team is expected to develop and deliver the following:

- Inception report – including work plan, methodology, and literature review
- A list of stakeholders to interview and an interview guide
- Annotated outline of report
- A draft report that will be reviewed by the LEIA team, the Efficiency for Access Coalition, and other key stakeholders
- All raw data from interviews and that behind any graphs or figures included in the report, a separate file containing all graphs, figures and photographs used in the report and access to any models developed
- An in-person or web-based presentation of the draft report to the project team and Efficiency for Access Coalition
- A final report, with accompanying slide deck and executive summary, that conveys relevant data with charts and infographics where possible.
- An in-person or web based presentation of the final report to EforA coalition members and other key stakeholders

Proposal

Technical and financial proposals are invited from interested parties that can deliver on the scope of work described above. The proposal should include a list of indicative resources that will be used to gather evidence and key stakeholders that will be consulted.

The project team is open to innovative and alternative approaches to research delivery that will increased the understanding of the market for off- and weak-grid appliances. We also welcome proposals that highlight synergies with existing programs to avoid duplication.

Parties should also indicate the proposed costs to undertake the work. Proposals must detail knowledge of the off-grid appliance sector and experience in undertaking research of this nature.

Deliver Requirements and Timeline

It is envisioned that the project will kick-off in December 2018 and the final report will be published in May 2019. The intention is to publish an update to this report in 2021, but for this proposal bidders should only budget for one report.

Parties that wish to respond to this RFP must complete the [LEIA prequalification questionnaire](#). This is a requirement for all sub-recipients of UK DFID funding.

The proposal should not exceed 30 pages in length and must include the following elements:

- A detailed approach and methodology for implementation and management of the project. Include a description of the role of each team members if applicable.
- A summary of experience and qualifications of key personnel that will be engaged in this assignment. This should include details of previous relevant research projects and experience working with off-grid appliance market actors.

- A proposed budget for the work, including a costed breakdown (in days) of the level of effort for each team member by activity, their daily rates, and any other costs.
- Detailed timeline for delivery to cover the following milestones and deliverables listed in the delivery section.

A committee will evaluate proposals received from respondents. Selection of the consultant will be based upon the following criteria:

- Robustness of methodology
- Relevant knowledge and experience
- Value for money
- Past performance on related projects

The deadline for application is November 21 2018. Proposals must be submitted online via the CLASP website.

All questions may be addressed to Jenny Corry Smith at jcorry@clasp.ngo. The last date for submission of questions related to this RFP is November 14 2018. We request all inquiries be made by email.