



Request for Proposals

Off-grid Refrigeration: Use Case Segmentation

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 lesser developed countries. LEIA will support 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.

LEIA has identified appliance categories that show growth potential in off- and weak-grid areas – one of which is refrigeration. Refrigeration holds the potential to unlock social and economic progress for people living in un- and under-electrified areas. It can facilitate the development of income-generating enterprises, prolong the shelf life of fresh foods, reduce spoilage and waste and reduce the time that householders spend time shopping and/or gathering food.

Background

Highly energy-efficient, affordable, and appropriately designed refrigerators hold unique potential to improve livelihoods and achieve broader development impacts in off- and weak-grid communities. Access to refrigeration can facilitate income-generating activities, prolong the shelf life of fresh foods, diversify and enhance diets, and reduce time spent shopping or preparing food (particularly for women and girls). In addition, 28% of food produced in the developing world is wasted and improved access to cold chain technologies could help avoid nearly a quarter of that waste.

The [2016-17 Global LEAP Awards](#) surfaced information on the highly efficient off-grid refrigerators currently available on the market, and provide insight on the potential is for this technology. However, the low energy refrigeration market remains nascent and the cost of these products is relatively high.

At the May 2018 Efficiency for Access, Off- & Weak-Grid Refrigeration Market Development Roundtable¹, a variety of industry leaders and stakeholders described the limited consumer and market intelligence as a major challenge in the growth of the market. They want to understand what the different use cases are for low energy refrigeration and how to characterise potential consumers. In addition, industry leaders need information to enable them to identify the user segments that are most “market ready”, presenting the highest potential for sales and impact.

The consensus from roundtable participants was that better understanding is needed of:

¹ <http://www.efficiencyforaccess.org/assets/EforA-Refrigeration-Rountable-Summary-22June2018.pdf>





- The commercial viability and potential for common refrigeration use cases.
- The impacts of refrigeration in un- and under-electrified areas
- The ability and willingness of individuals / communities to pay for refrigeration in common use cases.

Requirements

An initial use case segmentation of the off-and weak-grid refrigeration market—built from evidence from previous off-grid refrigeration pilots, projects, case studies and discussions with sector experts—will serve as a foundation for future refrigeration research.

The LEIA team is looking for a researcher, or team of researchers, to develop a typology of the most common use cases for refrigerators and assess the viability of each. This research should highlight potential areas for immediate impact and less fruitful opportunities. Figure 1 shows the key use cases for this research.

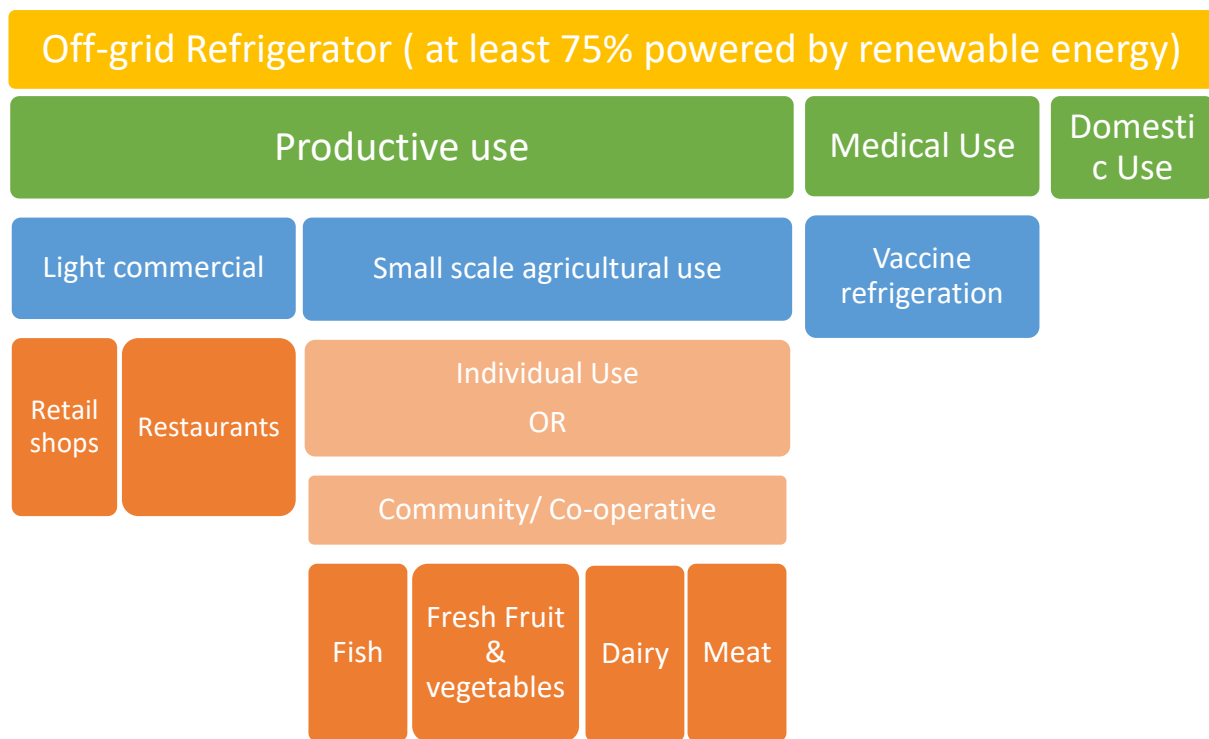


Figure 1: Priority off-grid refrigeration use cases

Figure 1 is not an exhaustive list of use cases as the Coalition is interested of any use case of off-grid refrigeration with potential for developmental. Whenever possible the market should be assessed for those use cases as well.





EFFICIENCY FOR ACCESS

This research effort is intended to be desk based with information drawn from reviews of pre-existing evidence and research on refrigeration in off- and weak-grid areas. Parties will be expected to carry out discussions and interviews with stakeholders including off-grid appliance manufacturers and distributors, development agencies, project implementers, and others.





The criterial research parameters for each use case are:

Profile

1. The variety and quantities of items intended to be stored in the refrigeration solution
2. The profile of the typical user
 - a. Domestic and individual productive use - age, gender, education level, average income, occupation, location
 - b. Community/ Co-operative -Number of members, occupations, location
 - c. Medical uses – size of institution, private vs government, location

Potential Impact

3. The potential number and typology of primary and secondary beneficiaries, the numbers should be disaggregated for inclusivity (i.e. by gender, age, disability, the very poor, any other marginalized groups). Examples of primary and secondary beneficiaries are
 - a. Domestic use- households (primary beneficiary)
 - b. Productive use – owner operator (primary beneficiary), customers and their households (secondary beneficiary)
 - c. Medical use - patients in the catchment area (primary beneficiary)
4. The benefit of the refrigeration solution for this user groups e.g.
 - a. food wastage avoided (by volume) & income savings due to avoidance of food wastage
 - b. increased sales of cold beverages & frozen items
 - c. Income gained from sales of other items in the same retail spaces (other than cold or frozen items)
 - d. Income from new complimentary business lines added
 - e. preservation of vaccine & medicine (quantify extended shelf life), quantify prevention and/or reductions in diseases or prevention
 - f. extend food shelf life
 - g. time savings
 - h. improvement or diversification of diet

Technology and Design

5. Ideal/preferred refrigeration solution configuration (fridge, fridge-freezer, freezer, coolbox, coolbox + ice making)
6. Ideal/preferred design features (e.g. door position, internal partitioning/ shelving)
7. Ideal/ preferred size /size range (internal storage volume) for the refrigeration solution, including size of different compartments if applicable.





8. Ideal vs available power source for the refrigeration solution
9. The maximum tolerable outage time (loss of cooling function)

Cost and Affordability

10. Maximum price point of ideal/preferred refrigeration solution for wide-scale adoption
 - a. Disaggregate price into FOB, cost of energy, cost of financing (where appropriate)
 - b. Is financing (loans by installment or PAYG) desired or needed to achieve affordability
 - c. What financing terms are appropriate (i.e. number of months/years for payback)
11. For productive use categories: assessment of affordability and typical end-user business models based on ideal refrigeration solution

For clarity, the researcher or team contracted for this work will be responsible for the tasks summarised below;

Task 1: Desk based review of pre-existing literature, data, evidence, and research on refrigeration in off- and weak grid areas, from a range of sources to inform the development of questions and selection of interviewees, to ensure that the project builds on existing work and is applicable to the market.

Task 2: Use literature and evidence review to **confirm chosen use cases** or expand the list as appropriate

Task 3: Interview Stakeholder and key informants from different use case segments to gather opinion on ideal/ preferred solutions and to help answer the question in the requirement section above

Task 4: Provide a **summary of the literature review and stakeholder interviews** and a template for use case segmentation

Task 5: Write a report that synthesizes findings from desk research and interviews, the report should:

- a) Summarize each use case and present it in the agreed upon template from Task 4.
- b) Answer the research questions identified under previous tasks
- c) Analyse and comment on the available information, data and evidence supporting the information gathered for this work. Identify gaps in existing





research and knowledge that the Efficiency for Access Coalition could explore further.

- d) Make recommendations for priority “near market” use cases that should be the points of early focus for research. What research would help fill in knowledge gaps about the off-grid refrigerator consumer? What use cases should a company consider when looking to expand or enter into the off-grid refrigeration market?

Geographical scope

A global use case segmentation may not be practical. However, this research effort should be applicable to the regions and countries listed below, as well as any other geographies where there may be potential for the off-grid refrigeration market to develop.

Regions: East Africa, West Africa, Southern Africa, and South Asia

Countries: Democratic Republic of Congo, Ghana, Malawi, Nigeria, Sierra Leone, Zambia, Bangladesh, Myanmar, Nepal, and Pakistan

We envision that the outputs from this research project will inform further field research into refrigeration, which will refine the identified typologies and improve understanding of the use cases for off- and weak-grid refrigeration.

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 increase the understanding of the market potential for off-grid and weak grid refrigeration in the regions outlined above. We also welcome proposals that highlight synergies with existing programmes to avoid duplication.

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

Outputs

The final output of the project will be a short, comprehensive report that segments the market for off and weak grid refrigeration by use case typologies. The report will describe each of the segments, providing the evidence to the market segments and recommendations, as well as any details of successes and failures of previous projects working in these areas. The report should also point to areas for further research.





Delivery Requirements and Timeline

This research effort is intended to last three months with kick-off anticipated for October 2018 and completion in January 2019. The project team will provide fortnightly updates to the LEIA team.

Submission

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 15 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 member if applicable.
- A summary of experience and qualifications of key personnel that will be engaged in the 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 associated with the activities and a daily rate, and any other envisaged costs.
- Detailed timeline for delivery to cover the following milestones and deliverables
 1. Work plan & methodology
 2. List of identified use case typologies
 3. Summary literature review and market scoping by typology
 4. Draft Report with early indications and template for segmentation
 5. Final Report

A committee comprised of LEIA project team will evaluate proposals received from respondents. Selection of the candidate will be based upon the following criteria:

- Robustness of methodology
- Ability to meaningfully address the requirements and yield exploitable results
- Value for money
- Knowledge and experience of the sector

The deadline for application is 28 September 2018. Proposals must be submitted online via the CLASP website.





All questions may be addressed to Makena Ileri at mireri@clasp.ngo. The last date for submission of questions related to this RFP is 21 September 2018. We request all inquiries be made by e-mail and not by phone.

