

**EFFICIENCY
FOR
ACCESS**

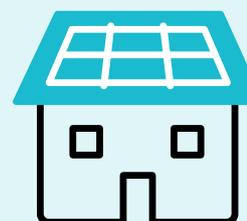
Off- & Weak-Grid Refrigeration

**Global Market Development Roundtable
Workshop Report
June 2018**



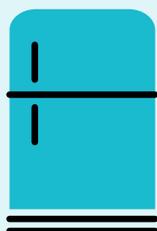
BACKGROUND

The Efficiency for Access Coalition is scaling up and bringing together a range of institutional efforts that use energy efficiency as a tool for driving rapid and sustainable progress in delivering clean energy access to the world's poor. Due in large part to the improved efficacy and cost of the super-efficient LED, the quickly emerging off-grid solar market has delivered energy access to tens of millions of off- and weak grid households and businesses globally.



Coalition members recognise the latent demand for more and greater modern energy services and are seizing this opportunity to scale up markets and reduce prices for new super-efficient products (including fans, televisions, refrigerators, water pumps, and more), supporting technology innovation, and improving sector coordination.

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.¹



The global market for off-grid refrigeration is in the early stages of development, but the commercial opportunity is substantial. A 2016 study by Global LEAP estimated that the annual market for off- and weak-grid refrigerators could be \$1.1 billion. However, overall market penetration remains low — less than 40% in Nigeria and 30% in India — and is even lower in rural areas at just 6% in Bangladesh and 1% in Kenya.²

On 28-29 May 2018, the Efficiency for Access Coalition hosted a “Global Market Development Roundtable” to discuss opportunities to advance markets for off- and weak-grid refrigeration.

¹ International Institute of Refrigeration. (2009). The Role of Refrigeration in Worldwide Nutrition [PDF].

² Global LEAP. The State of the Global Off-Grid Appliance Market. (2016). Retrieved from Global LEAP website: <https://bit.ly/2libedo>

WORKSHOP OUTCOMES

The two-day workshop took place in Amsterdam ahead of the 2018 GOGLA annual general meeting. This setting provided an opportunity to engage a variety of industry leaders including product designers, manufacturers of both on- and off-grid appliances, distributors, pay-as-you-go (PAYGO) solar home system providers, and other development and technology specialists.

More than 45 participants took part in a wide-ranging discussion that covered eight categories of typical market barriers. Participants collectively identified and prioritised actions in each area for the Coalition to consider and take forward. These are summarised below, with highest-priority activities listed first:

Consumer & Market Intelligence

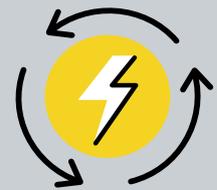


- Conduct in-field “sales experiments” with commercial products to get a more accurate understanding of willingness to pay and other influencing factors

- Develop a typology of the most common use cases for refrigerators, assessing the viability and potential of each
- Evaluate and quantify the value proposition of refrigerators for domestic use
- Assess cultural behavioural issues that may impact refrigerator uptake and usage patterns

Research & Development

- Develop a cost optimisation algorithm to manage thermal storage, electrical energy storage, and PV supply
- Develop a standard API for communication between power supply and loads
- Develop diagnostics for monitoring and predicting product failures
- Develop a solution for handling motor inrush current and controls to manage multiple units in mini-grid environments



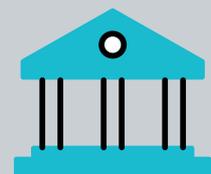
Testing & Quality



- Facilitate testing for low-volume products through financing and access to test laboratories
- Develop a simplified test protocol that can adequately characterise refrigerator performance in a short time
- Develop an independent product endorsement and registration scheme

Policy Environment

- Map out taxes, duties, standards and the policy environment for off-grid appliances across key markets
- Advocate for the development of incentives and enabling policies for off-grid appliances



Distribution & Warranty



- Develop certification schemes for technicians involved in set-up and repair of systems
- Support the development of remote monitoring systems to improve

after sales services

- Focus standards on the durability of products at the design stage to minimise the need for repair and maintenance

Consumer Finance & Business Models



- Research alternative uses of donor funds (e.g. first-loss loan guarantees to commercial lenders, pilot-sales support) to generate information about refrigerator value proposition
- Define possible use-cases and business models for refrigeration as a community resource
- Define and measure the development impacts of refrigeration for productive uses to influence impact-based finance
- Understand risks to consumer financing and how to reduce these

Environmental Sustainability

- Provide grants for research and development into biodegradable components
- Develop test protocols for durability
- Create good practice guides for sustainable design
- Develop models for refund and take-back leasing schemes to minimise e-waste
- Produce environmental sustainability metrics and associated targets



Supply Chain

- Map out the supply chain for both on- and off-grid refrigeration
- Identify quality standards and other requirements for off-grid refrigerators, and describe how they differ from requirements for on-grid refrigerators
- Provide large manufacturers with compelling market data to encourage their participation in off-grid product development



89% of attendees rated the event as **excellent or good**.

75% said their **expectations were fulfilled**.

“Congratulations for the initiative and the great event. It has been a unique opportunity to meet key players in the industry and to contribute to the future of off-grid refrigeration.”

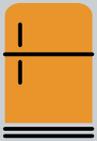
– Gabriel F. M. Saud, Head of Business Unit,
Embraco Business Innovation

Attendees commented that the **in-depth breakout sessions were most effective**, leading to fruitful idea generation and prioritisation of actions that the Efficiency for Access Coalition can support.



LOOKING AHEAD

In the coming months the Efficiency for Access Coalition is prioritising a number of activities to support the off- and weak-grid refrigeration market. These include the following:



Convene a Refrigeration Technical Working Group. Initial work activities to include refinement of an appropriate test method and development of a R&D Roadmap. All interested stakeholders are invited to participate. To sign up or for more information, contact info@efficiencyforaccess.org.



Identify, reward, and promote best-in-class off- and weak-grid refrigeration products through the **2019 Global LEAP Awards**. More information about the refrigerator competition [will be made available soon](#).



Initiate research activities that address underlying barriers to market scaling, such as consumer preferences and willingness-to-pay.



Size and segment the current and potential market for off- and weak-grid refrigerators.



[Procure and test the performance of refrigerators currently available](#) in selected off- and weak-grid markets to understand baselines. Initial test results will be available on efficiencyforaccess.org by the end of 2018.

Interested parties are encouraged to sign up for email updates on the Efficiency for Access website (efficiencyforaccess.org) and follow [@EforA_Coalition](https://twitter.com/EforA_Coalition) on Twitter. EforA Coalition members are currently engaged in a variety of ongoing refrigeration-related activities. Please contact info@efficiencyforaccess.org to learn more.



UK aid, Power Africa, Lighting Global, Rockefeller Foundation, Shell Foundation, Sida, EnDev, Good Energies Foundation, and more join together under a scaled-up Efficiency for Access – **a coalition promoting energy efficiency as a potent catalyst in global clean energy access efforts.**

The Efficiency for Access Coalition is coordinated jointly by **CLASP**, an international appliance energy efficiency and market development specialist not-for-profit organisation, and UK's **Energy Saving Trust**, which specialises in energy efficiency product verification, data and insight, advice, and research.

