EFFICIENCY FOR ACCESS

Linking renewable energy and cooling: Examples of technology and business model innovations

December, 2019



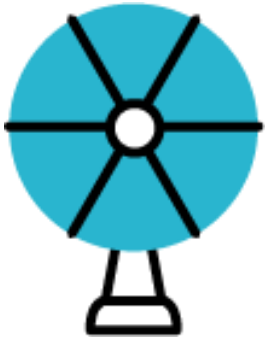
Global LEAP Awards + RBF

1. Identify Best-In-Class Off-Grid Appliance Products

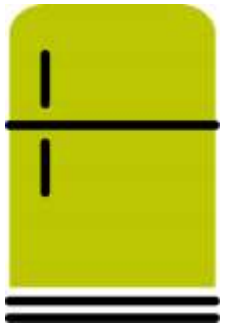
- Identify and promote leaders in early-stage product markets & encourage new entrants
- Develop technical foundation for long-term market growth (e.g., test methods)

2. Bring Those Products To Market At Scale

- Create clearer path to market for Global LEAP Awards Winners and Finalists
- Reduce financial risks associated with large-scale appliance procurement









Global LEAP-RBF for Off-Grid Fans in Bangladesh

200,000+
best-in-class off-grid fans

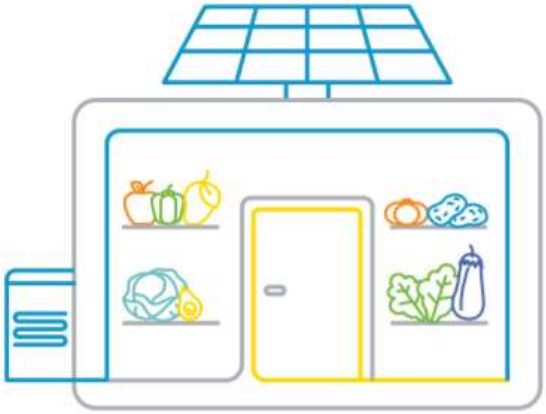
500,000+
beneficiaries



- Global LEAP administered two increasingly successful rounds of off-grid fan competitions in 2016 and 2017
- With support from EnDev, over $1.5 million in incentives was allocated to support procurement of these best-in-class fans in Bangladesh

https://globalleapawards.org/fans

Global LEAP Off-Grid Cold Chain Challenge (OGCCC)





An international competition to identify and promote the most energy-efficient, sustainable and cost-effective technologies that can meet the cold storage requirements for fresh fruits, vegetables and dairy products

Business Models

- Cooling as a Service (CaaS)
- Pay-as-you-store
- Leasing Models

https://globalleapawards.org/ogccc

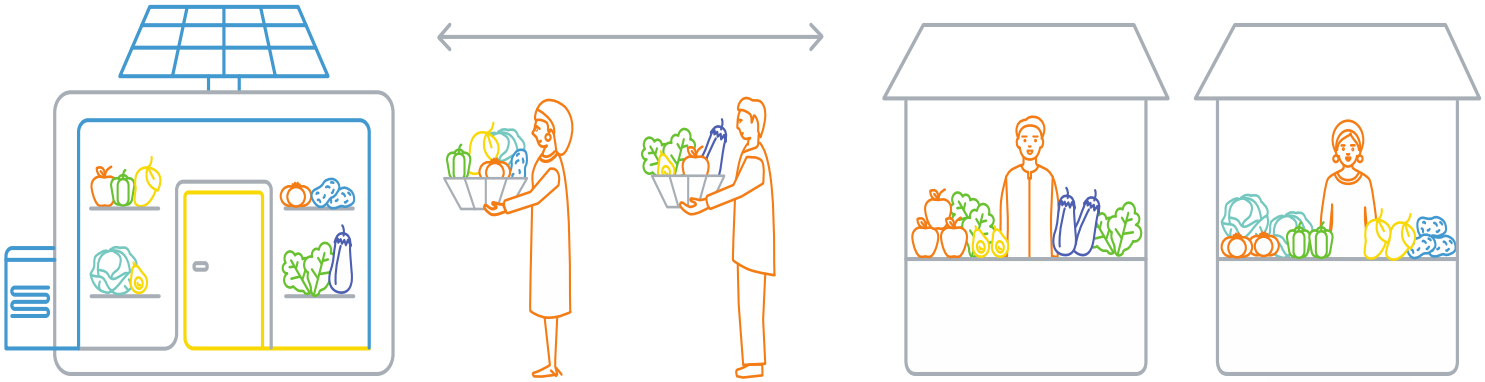
Off-grid Cold Storage Business Models

Cooling as a Service (CaaS)

- Cooling as a Service is a business model whereby the customer pays for cooling on a usage basis rather than purchasing the cooling equipment directly.[1] This model creates incentives that optimize efficiency and maintenance. In off-grid settings this approach to cooling is particularly attractive due to its low capital intensity and minimal technical capacity requirement for the end user. A traditional **unit sale** business model is uncommon outside of donor supported NGOs and governments. In the off-grid cold storage sector we see companies experimenting with two distinct types of service models:

Pay-as-you-store

- **Pay-as-you-store models** charge customers per day for an allotted space within the cold storage unit, typically delineated with some type of reusable tray, or crate. This business approach is particularly attractive for small market vendors without access to electricity or safe storage who would like to prolong the shelf life of the perishable goods the sell.



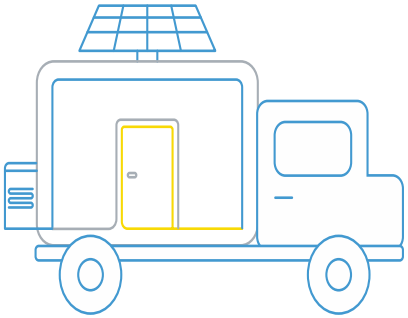
Leasing models

- **Leasing models** are usually offered to larger farms or farming cooperatives that act as aggregators for their members.

- **IoT and Maintenance** - Advanced sensing and IoT controls allow leasing models to be monitored in real time and controlled remotely. This limits leasing risk for the company allows for preventative maintenance. The user benefits from reduced operational oversight, better unit performance and lower operating costs.



- **Portability shared user base** - Some companies build their unit's so they are easily transported. This allows the owner of the unit to take advantage of multiple growing seasons in different geographies, reducing the time it takes to pay off the unit. Users benefit by only paying for cooling during the time of year they need it.





1. KCEP. 2018. Cooling as a Service (Caas). https://www.k-cep.org/wp-content/uploads/2018/07/Cooling-as-a-service-Knowledge-brief-6.7.2018_Final_online_v1.pdf

OGCCC – Finalist, EcoZen



- EcoZen cold unit made the journey to sub-Saharan Africa from the company's headquarters in Maharashtra state, India
- The farm currently produces eleven different types of herbs, each with their own specifications for harvest and storage temperature. "Reliable, Efficient, Cost-Effective"

E4A | Off-Grid cold chain solution in rural Kenya

Field Testing Solar Refrigerator in India Weak/Off-Grid Conditions

Inconsistent product performance risks exploitation of vulnerable consumers

DD-SF200 / 268 – Ideal for "bottle cooler" purposes for kirana shops, dhabas and vendors

DEVIDAYAL SOLAR SOLUTIONS

Model : DD-SF200

Net capacity: 200 Ltr

Temperature: -18 to 8C

Power Supply: Solar DC 12V

Solar panel*: 2 x 150 Wp

Advance Lead Acid Battery*: 150 Ah

Compressor: 95W DC

Weight: 35 Kg

Dimensions: 870mm x 535 mm x 838 mm



* Panel and battery sized under STC. Can be scaled depending on end-use. Battery & panel sold separately.

Devidayal Solar Solutions Pvt Ltd 15

Commercial Pilot to Test

- Technical Improvements
- Understand Consumer behaviors
- Measure economic/ livelihood impact

E sgrant@clasp.ngo
W clasp.ngo
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