



**EFFICIENCY
FOR
ACCESS**

Energy Efficiency and Health Access: A Preliminary Assessment

International Conference on Renewable Energy for Healthcare

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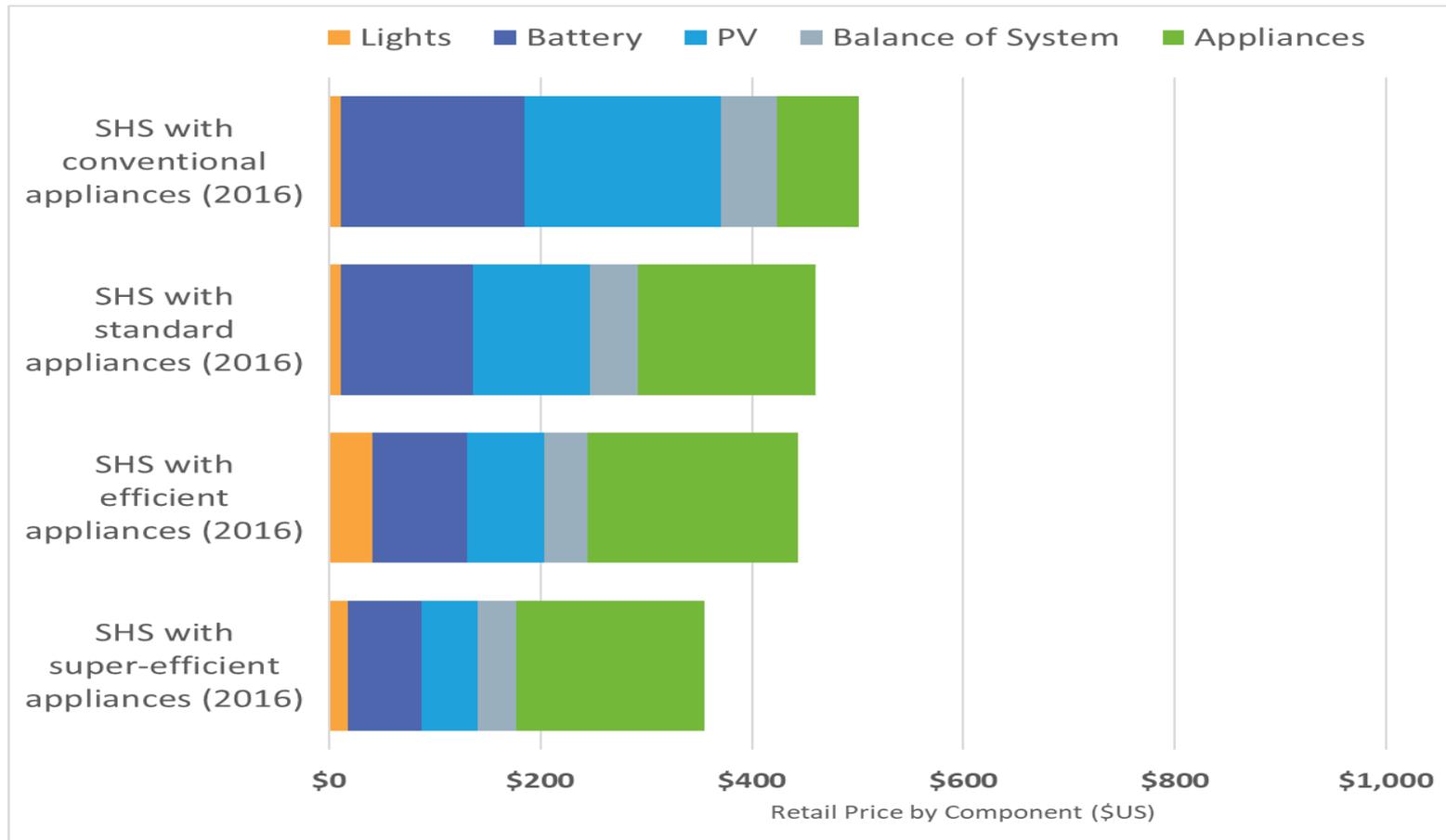


About the Efficiency for Access Coalition

The **Efficiency for Access Coalition** is a collaborative effort to harness the power of energy efficiency to accelerate universal energy access. The Coalition supports a slate of research, innovation and market scaling interventions that will enable entrepreneurs, policymakers, investors, and other partners working in energy access to better utilize appliances to improve the lives of the world's poorest people. Coalition partners include UK aid, Power Africa, Lighting Global, Rockefeller Foundation, Shell Foundation, Sida, EnDev, and Good Energies Foundation.



Efficient Appliances Drive Cost & Performance Benefits for Off-Grid Energy Systems



Source: Schatz Energy Research Center & CLASP

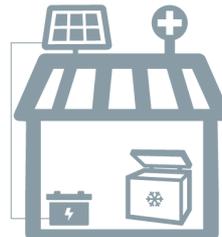
Energy Efficiency Can Reduce the Cost to Deliver Basic Medical Services

- Interventions focused on medicine and vaccine cold chains provide critical refrigeration services to off-grid PHCs. However, these interventions often utilize inefficient refrigerators paired with oversized energy systems.
- Solar panels and batteries are the biggest cost drivers for distributed solar energy systems. Super-efficient refrigerators can deliver the same service while using significantly smaller – and substantially less expensive – energy systems.

Baseline Off-Grid PHC



Off-Grid PHC with conventional solar vaccine refrigerator



Off-Grid PHC with super-efficient solar refrigerator

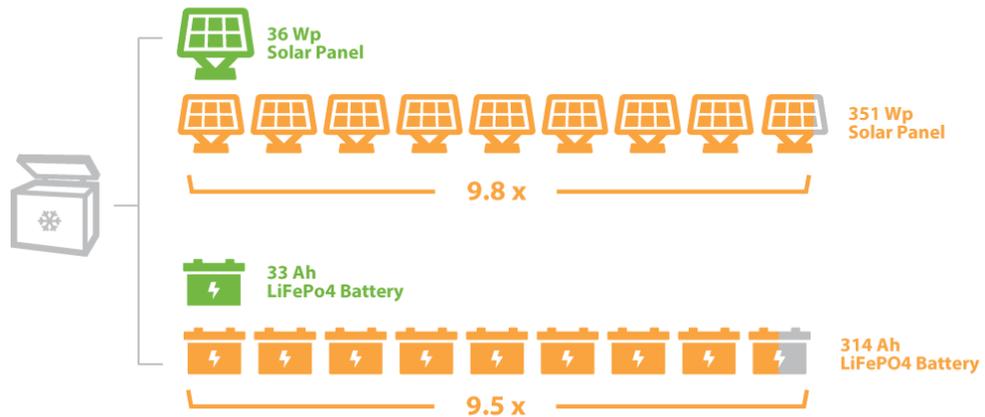


The super-efficient refrigerator requires just **10% of the solar panel and battery capacity** as the conventional solar vaccine refrigerator

Size of Solar System to Operate a 180L Refrigerator

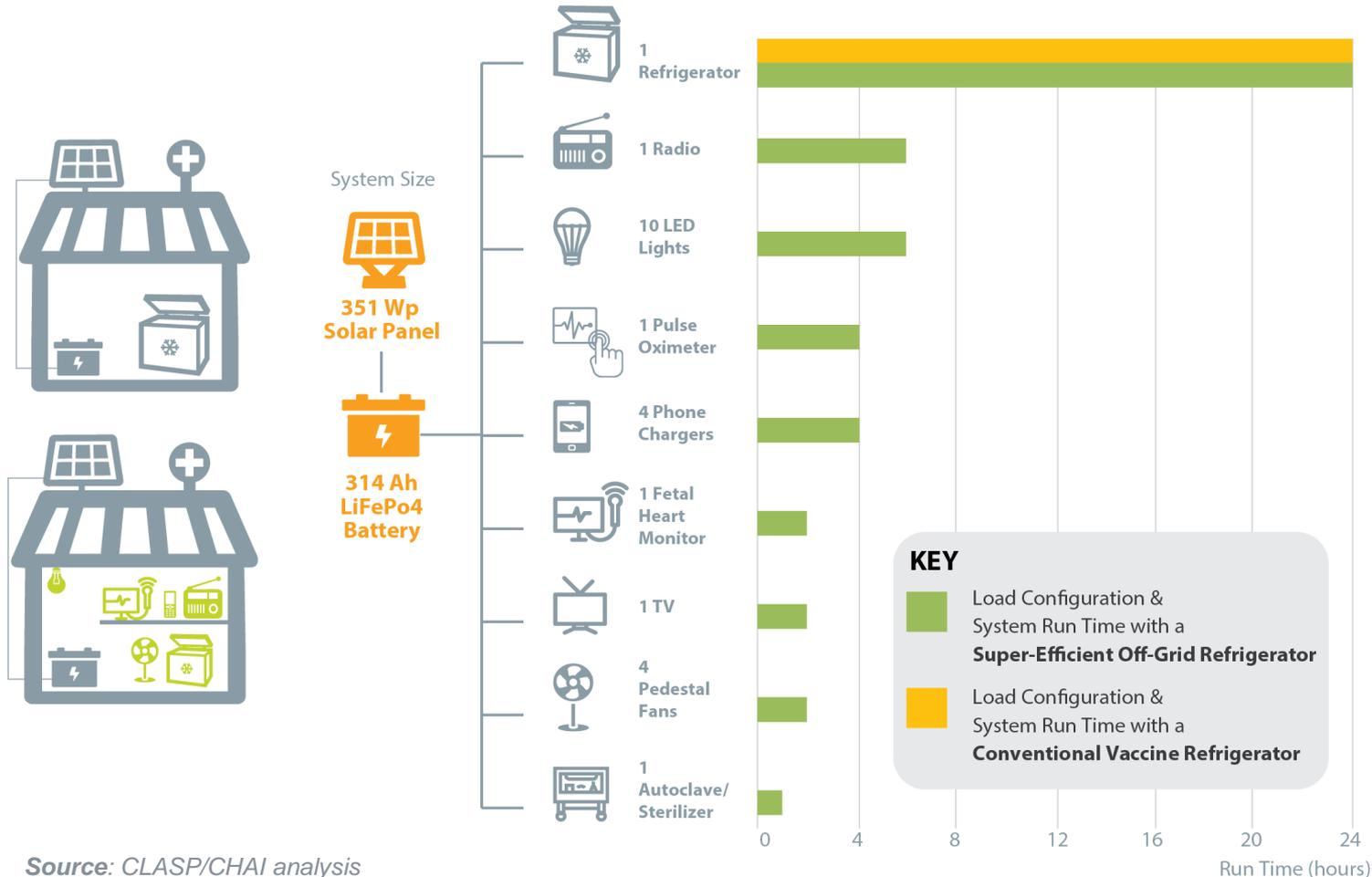
KEY

- Energy system needed to support **super-efficient solar refrigerator**
- Energy system needed to support **conventional solar vaccine refrigerator**



Super-Efficient Appliances Can Enable Cost-Effective, Holistic Clinic Electrification

- ▶ The same size energy system required to power an inefficient vaccine refrigerator could power a far more expansive load when a super-efficient refrigerator is used alongside a suite of other super-efficient appliances and medical devices.



Source: CLASP/CHAI analysis

Medical device sample sizes: 12 refrigerators; 11 autoclaves; 6 fetal heart monitors; 5 pulse oximeters

Super-Efficient Appliances Can Enable Cost-Effective, Holistic Clinic Electrification [cont.]

- Inefficient models of the appliances shown on the previous slide would require **twice the amount of solar panel and battery capacity** to operate compared to super-efficient models.
- Energy efficiency is thus the central design principle for unlocking **an expanded, holistic set of health services at least cost.**

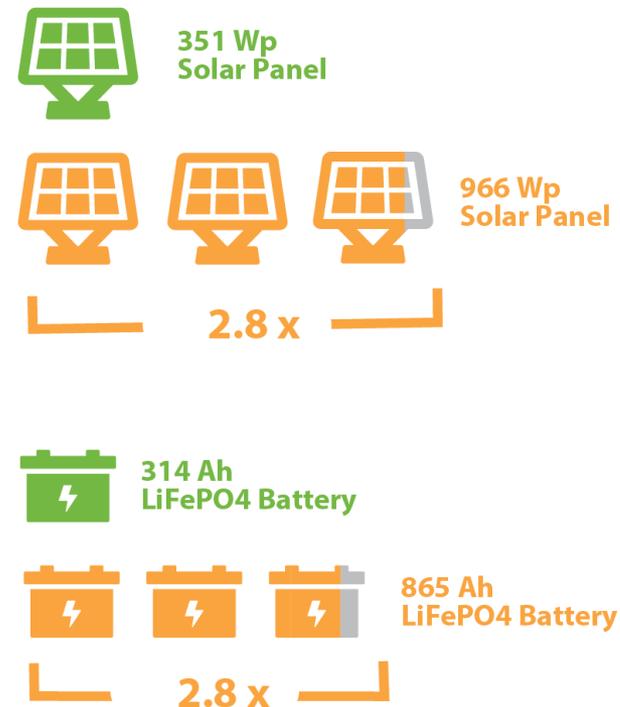
KEY

Energy system needed to support appropriately-designed, super-efficient appliances

Energy system needed to support conventional on-grid appliances



Energy System Requirements



Source: CLASP/CHAI analysis

Medical device sample sizes: 12 refrigerators; 11 autoclaves; 6 fetal heart monitors; 5 pulse oximeters

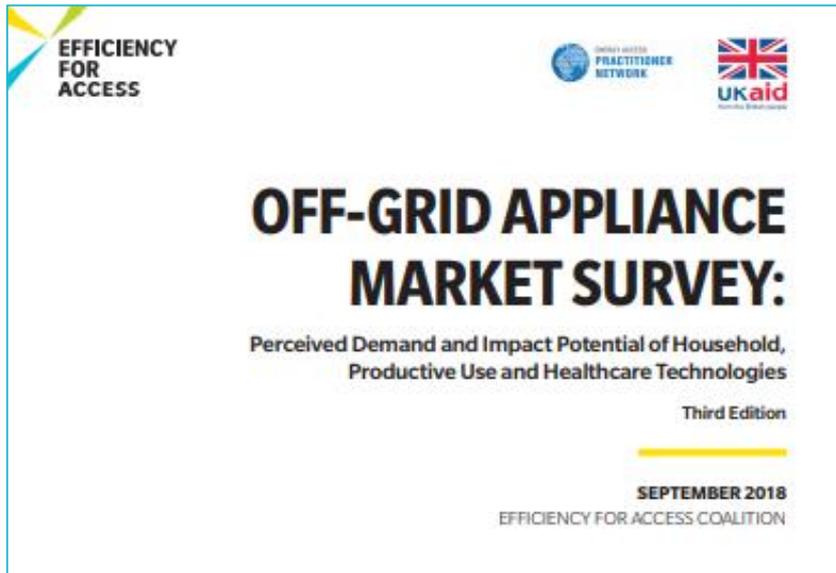
Unlocking the Potential of Energy Efficiency Will Require Technical Research and Awareness Raising

- ▶ Preliminary feedback from industry consultations undertaken by E for A Coalition in partnership with Clinton Health Access Initiative indicate the following:
 1. Reliable data on energy requirements for currently available products is hard to find:
 2. Little to no data exists on clinic-level daily energy demand or usage patterns
 3. Overall, energy efficiency is not a priority in current clinic electrification efforts:

“In our experience, device distributors rarely know or market power consumption...we consistently found typos on manufacturer's datasheets with power consumption and few devices stating power consumption.” – **Off-grid energy system specialist**

“[Energy efficiency] hasn't been identified as a key constraint for health outcomes until recently...It hasn't been our organizational focus and clinicians aren't focused on this either.” – **Off-grid medical device manufacturer**

E for A Coalition Market Research Shows Divergent Perceptions of Demand for Specific Devices



Focus Areas



Household use



Business / productive use



Healthcare / clinic use

Key Findings

- Overwhelming consensus around the need for basic lighting in healthcare settings, but unclear patterns of demand for specific medical equipment
- Refrigeration, portable ultrasound machines, and vital sign monitors scored highest for medical equipment
- Also strong demand for equipment that improves water supply (purifiers and pumps)

Download the report from:
www.efficiencyforaccess.org/publications



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