



# Affordable, Efficient Appliances

November 12, 2020

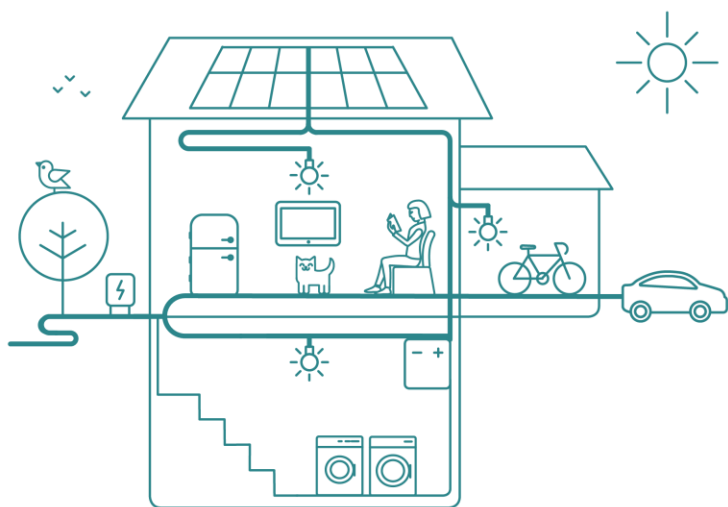


Efficient Appliances for People & the Planet



# Affordable, low-impact, high-quality appliances, lighting & equipment

## Climate



- Save money
- Reduce energy demand
- Mitigate climate change

## Clean Energy Access



- Reduce energy supply cost
- Increase energy access
- Improve quality of life

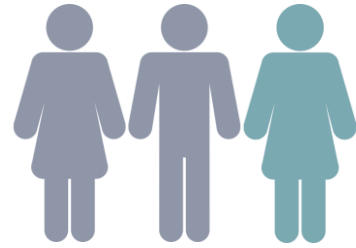
# Advancing Access to Clean Energy for All



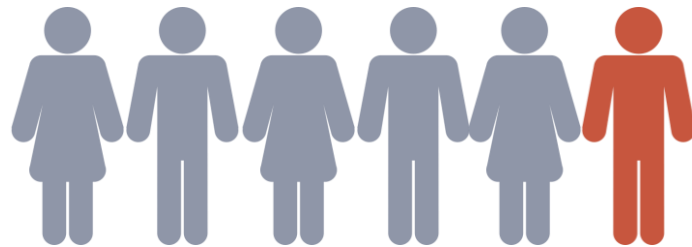
## High Performing Appliances Help Achieve UN Sustainable Development Goals



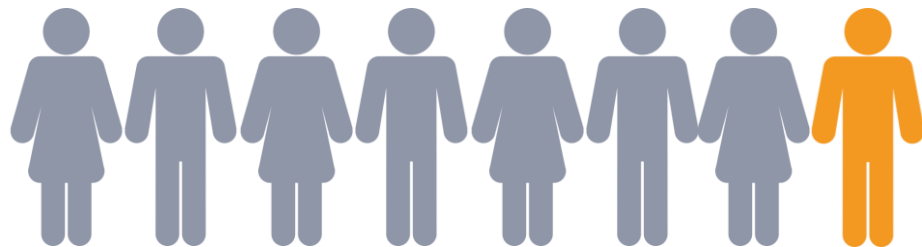
# Appliance Ownership in Sub-Saharan Africa



**1 in 3 households own a television**



**1 in 6 own a refrigerator**

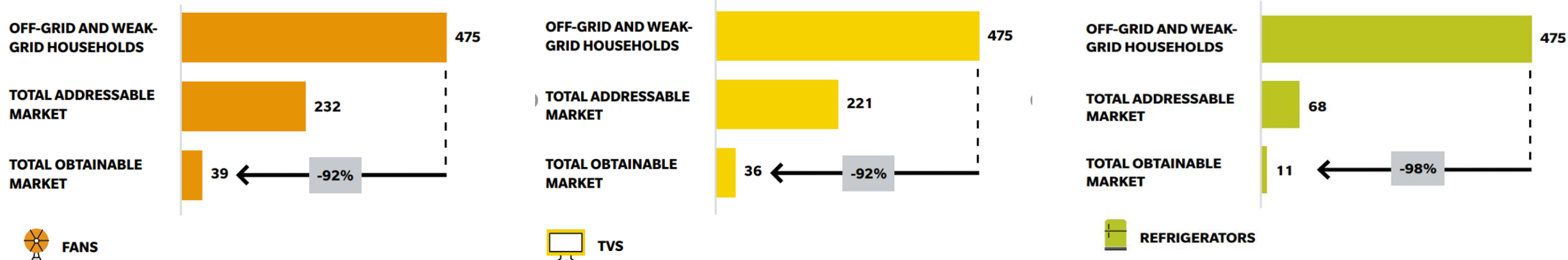


**1 in 9 own a computer**



**In rural areas, access is even lower—just 4% of rural households own a refrigerator**

# Addressable vs. Obtainable Appliance Market South Asia and Sub-Saharan Africa



The total obtainable market is significantly smaller than the addressable market, largely due to limited access to finance and consumer accessibility.

# Cost of Appliances Compared to Monthly Disposable Income of Lowest Income Half

## COST OF FAN FOR OFF-GRID CUSTOMER (USD)



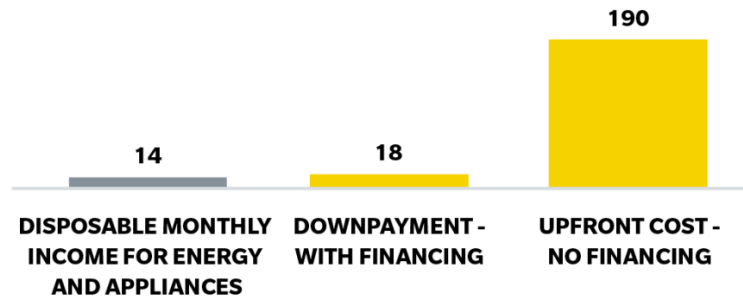
Fan specifications:  
23 Watt, 634 mm



## COST OF TELEVISION FOR OFF-GRID CUSTOMER (USD)



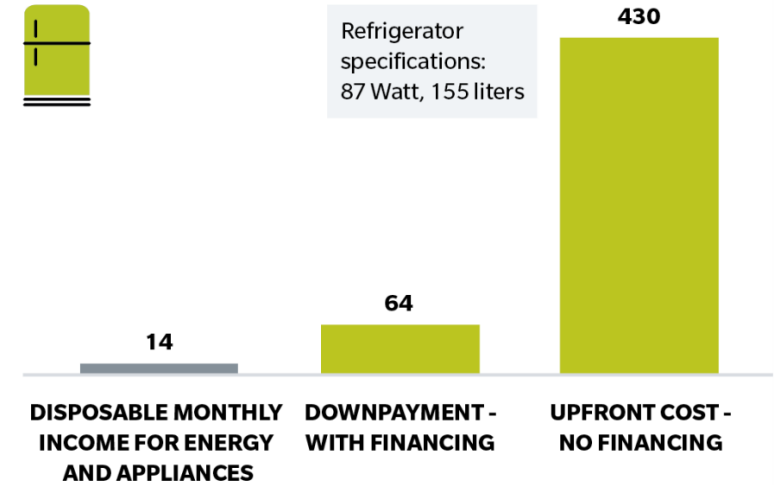
Television specifications:  
42 Watt, 25 inch



## COST OF REFRIGERATOR FOR OFF-GRID CUSTOMER (USD)



Refrigerator specifications:  
87 Watt, 155 liters

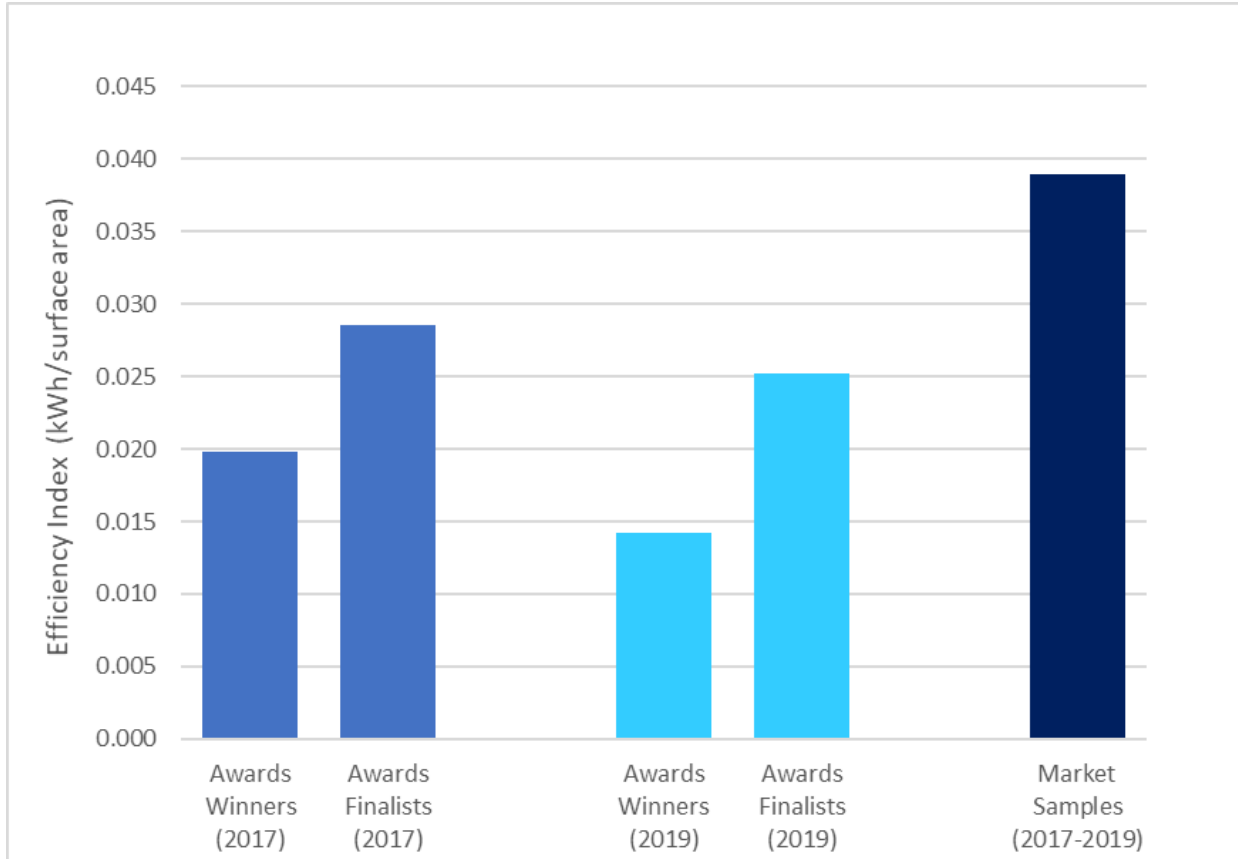


**Consumer affordability is the most significant constraint for the growth of the off-grid appliance market**

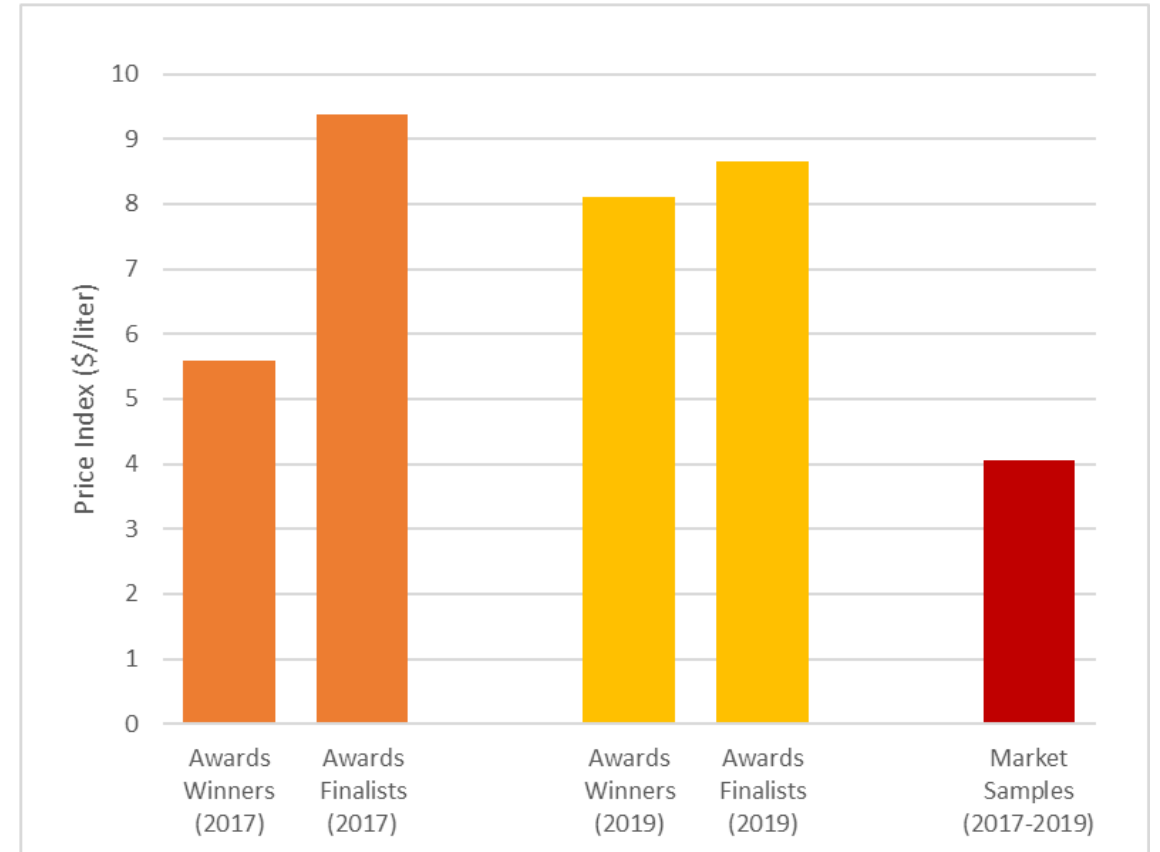
# Efficiency & Cost Trends of Off-Grid Refrigerators



## Efficiency Trends



## Cost Trends



Source: Global LEAP Awards & Equip Data

# Uptake of “productive use” appliances can generate income and improve livelihoods

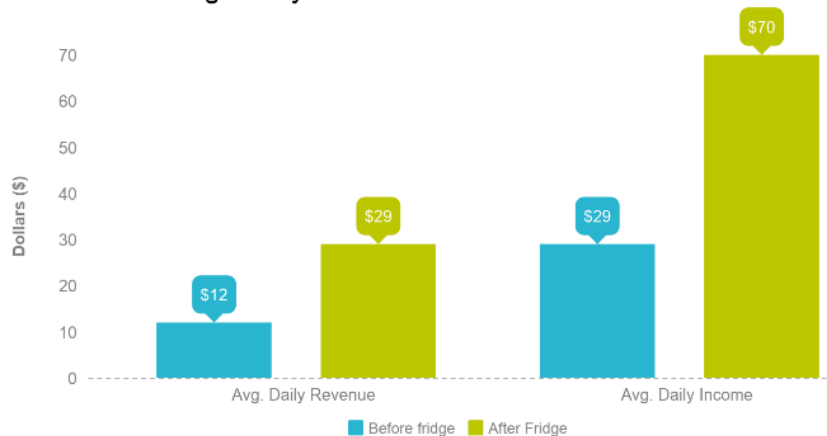
## Refrigerators

Data collected from 36 entrepreneurs in Uganda showed that average daily revenue and average daily income from drinks increased

**50%**  
of entrepreneurs

reported expanding into a new business line, with fruit juice being the most common new product sold

Average Daily Revenue and Income from Drink Sales



## Solar Water Pumps

Results from interviews with **375 SWP consumers** across Kenya, Tanzania, and Uganda indicate SWPs have a positive impact on customers' lives.

**81%**

of customers reported **positive quality of life impact.**

**25%**

Of Kenyan solar water pump customers **live below the \$3.10 per day poverty line**, relative to 53% nationally.

**47%**

of customers used **buckets and water cans** as their former irrigation method.

**70%**

Of customers **got a loan** to purchase their solar water pump.

**75%**

Of customers said their productivity increase or experienced no change since using their solar water pump.



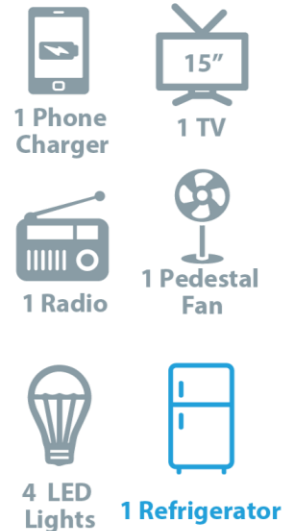


# How to improve affordability

# Appliance Efficiency Helps Drive Solar Energy System Affordability

## 8.57x

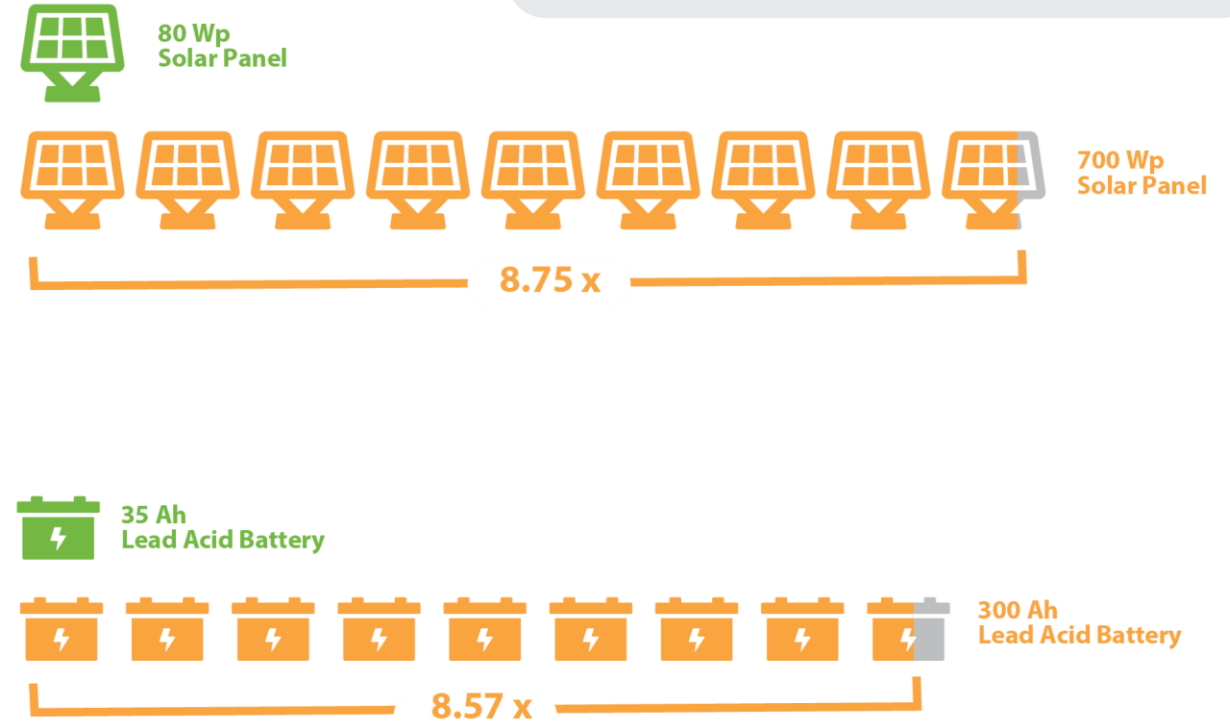
The energy system size needed to power an inefficient refrigerator is **8.57x** larger than the system needed to power a super-efficient refrigerator



### Energy System Requirements

**KEY**

- Energy system needed to support an appropriately-designed, super-efficient refrigerator
- Energy system needed to support a conventional on-grid refrigerator



# Efficiency significantly reduces lifetime costs with grid and mini grid connections

Fridge Lifetime Cost 10 yrs / 1\$ Tariff



Lifetime cost difference between High cost / High EE and Low cost / Low EE

**\$2,585**

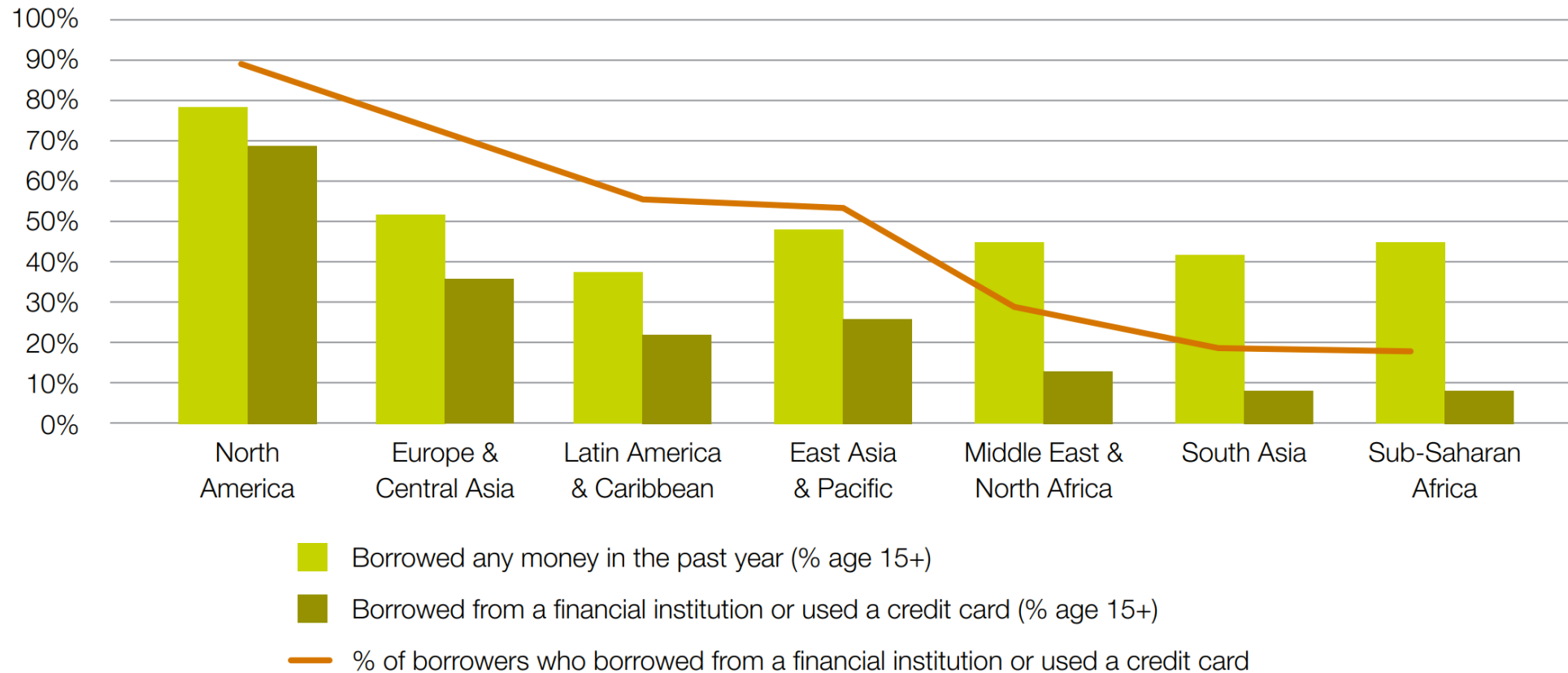
Fridge Lifetime Cost 10 yrs / 0.5 \$ Tariff



Lifetime cost difference between High cost / High EE and Low cost / Low EE

**\$943**

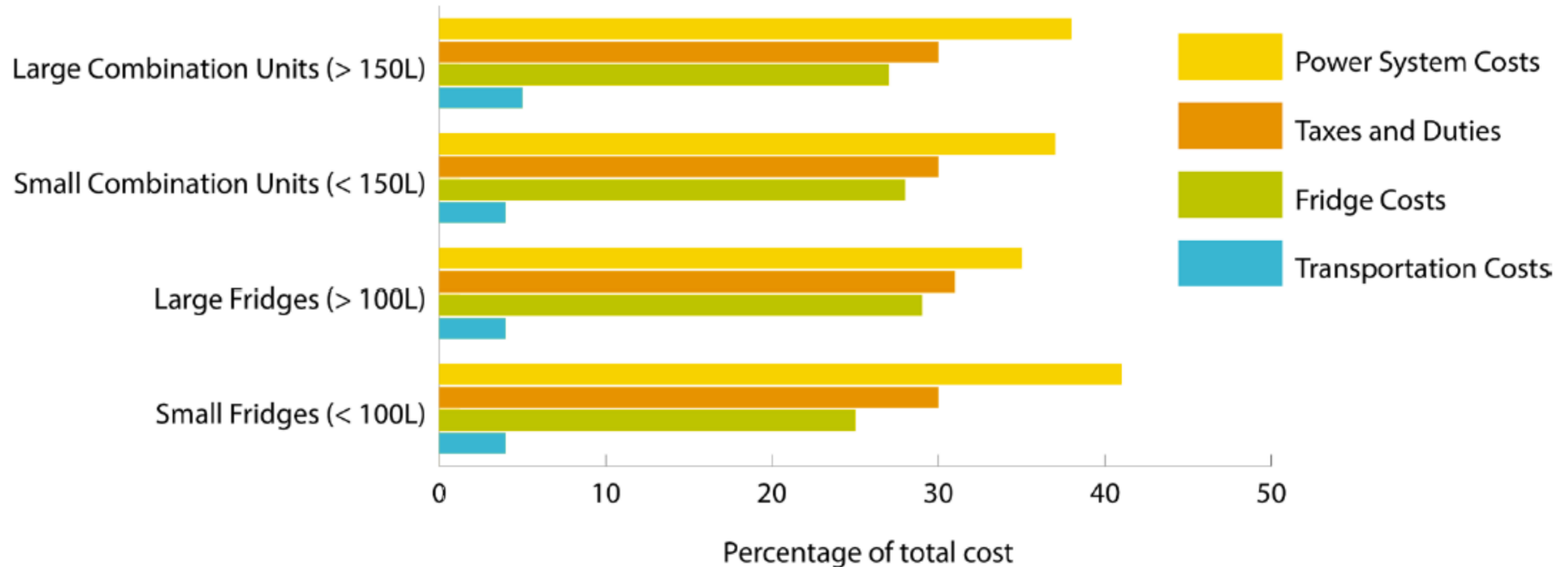
FIGURE 1. **Borrowing and formal borrowing across regions, 2017**



Source: Demirgüç- Kunt et al., 2018.



# Reduce taxes and duties for efficient appliances



Source: Schatz Energy Research Center, Efficiency for Access, Global LEAP

# Consumer Incentives

## Ghana Refrigerator Rebate Scheme

- A “rebate and turn in” programme
- Target: replace 15,000 refrigerators
- Rebate amount: ~\$60 for a two or three star rated fridge and \$90 for a four or five star rated fridge
- 5,000+ old, inefficient refrigerators replaced
- 35,000 MWh annual estimated savings



# Awards + Procurement Incentives

1. Identify Best-In-Class Consumptive + PUE Products
2. Bring Those Products To Market At Scale



POWERING AGRICULTURE



**>\$4M**  
disbursed

**101**  
participating  
companies

**280,000+**  
products sold

**1,200,000+**  
end-users



# Bulk Procurement

## Unnat Jyoti by Affordable LEDs for All (UJALA)

- Bulk procurement through competitive bidding
- An LED bulb cost roughly ₹300 when the program launched in 2015.
- Today, an LED bulb can be purchased for ₹65 to ₹70 through the program and ₹120 to ₹130 in the retail market.
- **UJALA reduced annual household electricity bills by 15%, saving consumers over 16 billion INR/year**
- India is now the second largest LED market in the world





Thank you!



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