Experimental Evidence on the Demand for and Costs of Rural Electrification

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Rural Electrification Authority (REA) transformers

In our experiment, we provided households in randomly selected transformer communities with an opportunity to connect to the national grid at a subsidized price.

The experiment generated random variation in:

1. Effective connection price (at the community-level)
2. Number of households connecting to the grid at the same time from each community
We define “under grid” households

Legend

Transformer & 600 meter radius
Households (scaled by household size)
Businesses
Public facilities (e.g. schools, health)
Electrified households
Electrified businesses
Electrified public facilities

Note that the price of a connection is ~$400.

Source: Lee et al. (2015).
Other under-grid households in Africa

95 Million People May Live "Under the Grid" in 5 Power Africa countries.

- **Nigeria**: 63 million
- **Kenya**: 21 million
- **Tanzania**: 6 million
- **Ghana**: 6 million
- **Liberia**: 0.3 million

Source: Center for Global Development (CGD).
Step 1: IPA distributes subsidies to households
Step 2: REA extends national grid to households
Step 3: IPA provides “ready boards”
Step 4: Kenya Power installs prepaid meters
Figure 6—Experimental estimates of the welfare implications of rural electrification

Panel A

Panel B

→ Total Cost 4.5x Consumer Surplus
Figure 7—Timeline of the rural electrification process

Panel A: Household

- A1. Payment: 56 (0)
- A2. Wiring: 24 (25)
- A3. Waiting period: 188 (79)

Panel B: Supplier

- B1. Design: 57 (17)
- B3. Construction: 40 (27)
Figure 8—Discrepancies in costs and poles, by contractor

- Average discrepancy in poles: -21.3%
- Average discrepancy in costs: +1.7%