

Experimental Evidence on the Demand for and Costs of Rural Electrification

*Lee – Miguel – Wolfram
Berkeley*

Discussant:
Rocco Macchiavello
Warwick & IGC

IGC Energy Conference

London, November 12-13, 2015

Project

- **Remarkable Data Collection**

- (1) 150 Rural communities in Busia and Syaia – Western Kenya;
- (2) Likely, broadly representative of other parts of rural Kenya;
- (3) Geo-coded locations of households / business within 600 mt. of transformers: “off-grid” vs. “under-grid”

- **Experiment: Goals**

- (1) trace out the demand curve for electricity connections;
 - (2) trace out the economies of scale in costs from coordinated connections;
 - (3) measure the social and economic impacts of electrification.
-

Data Collection & Findings

- **Data Collection**

- (1) Discuss within 600m of transformer (and then sampling at least 1600m away)
- (2) Discuss theft (visible connection)

- **Results:**

- (1) Demand / WTP is low ...
 - (2) ... at least relative to the costs of providing access
 - (3) Estimates suggest 70% should be connected to bring mg. cost < highest wtp.
-

Why such a low demand ?

1. (Expected) Reliability in provision
 2. Theft (and expectation that it is tolerated)
 3. Adaptation: sunk investments to get by w/out
 4. Not having \$ to pay
 5. Not having \$ to pay to take advantage of it
 6. Intra-household: who pays vs. who benefits?
 7. ...
-

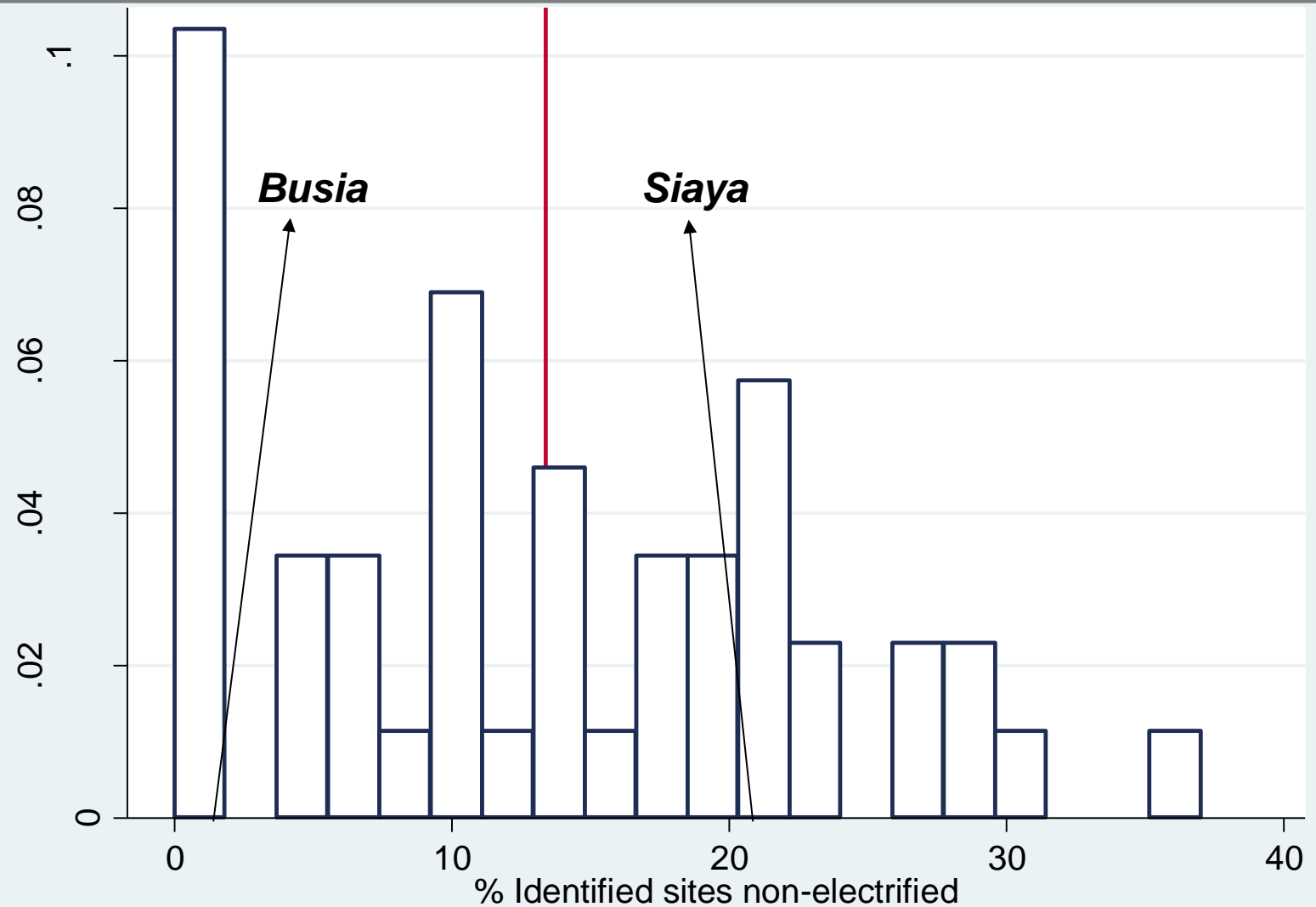
Generating Demand, Lowering Costs

- Are there positive externalities in demand ?

[i.e., is take up positively correlated with distance to nearest connected]

- Learning
 - Keeping up with the Joneses
 - Competition (businesses)
-
- How effective would be price discounts offered to groups ?
Should discounts be targeted to end-of-line HH ?
-
- How should contractors be incentivized ?
-

Context I ?



Context II ?

Energy Act 2006 established REA (Rural Electrification Authority): an agency independent from Kenya Power

Table 1: Evolution of reform implementation between 1990 and 2004

| | Percentage of sample (Number of countries covered by the sample) | | |
|---|---|--------------|--------------|
| | Electricity | Telecoms | Water |
| Countries with IRA in 1990 | 4% (141) | 5% (153) | 1% (115) |
| Countries with IRA in 2004 | 54% (134) | 67% (153) | 23% (120) |
| Average Year of Establishment of IRA | 1998 | 1998 | 1999 |
| Countries with Private Participation in 1990 | 4% (135) | 9% (129) | 3% (125) |
| Countries with Private Participation in 2004 | 37% (136) | 60% (144) | 36% (125) |
| Average Year of "Privatization"* | 1998 | 1997 | 1998 |

Source: Estache and Goicoechea (2005)