Decentralized electrification and productive use of electricity in Africa

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Electrification: A long term foundational investment

Only 1 out 10 rural United States had access to electricity. Electrification expansion in rural areas became major agenda for American.
Success often came from governments arbitrage.

**Figure B1.1.1** Vietnam: Access to Electricity

Source: World Bank, World Development Indicators.
Most of the energy goes to economic production

Source: Energy for Growth Hub
Adding customers is not profitable for most utilities

Present Value of Gross Profit from an Additional User, before Connection Costs

Solving a different problem?
“... The main focus of the event is on off-grid solar standalone. While there is growing consensus that end user subsidies are needed, the sector has little experience to date on how to design a successful and sustainable subsidy mechanisms...”
Two Routes to Address the Electricity Access Gap

Access deficit in Africa

- Access in 2016 was 43%
- Should have been 60%

Low uptake is one important reason

Uptake <60%

Targeting symptomatic barriers
(for example, high connection charges, household income fluctuation, poor housing quality)

Increase in access

- Higher uptake and access
- Financial viable utilities

Economic transformation
(Jobs and rising income)

Productive Use

Reliability

Complementary Factors
(for example, market and credit access)
Productive use in the context of off-grid solutions
Off-season agriculture in Gabar, Senegal

1. Highly popular and desired
2. Produce onions for export to cities (High value crop needed to break even)
3. Backup oil-powered generators for morning watering (lack of power storage)
4. Maintenance and repairs in event of breakdowns
Productive use in the context of off-grid solutions

What to pay attention to?

1. Predominantly rural, agricultural, need higher value crops, modernization of rural economy (e.g., agroprocessing)

2. Decentralized means generation cost can vary drastically -- Government regulations to have more flexibility, not one-size fits all.

3. Capacity and reliability - the technology to be dependable

4. Complementarity (Bundling or targeting)
   - Access to credit
   - Skills (Train or attract)
   - Access to market (e.g., feeder roads, proximity to cities)

5. Feasibility studies (Supply side not covered in this talk)
   - Identify profitable activities – not just modernizing existing occupations