

Decentralised Off-Grid Electricity Generation and the Poor

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Paul Cook
University of Manchester

Access to Electricity

- Estimated 1.6+ billion without access to electricity
- The without are in rural and urban areas
- Success stories with liberalised electricity systems
- Still struggling, mainly South Asia and sub-Saharan Africa
 - Zambia
 - Botswana
 - India

Liberalisation of Conventional Electricity Markets

- The model and its effects
 - freeing up public funds
 - facilitating public-private partners
 - exposing niches
 - environmental concerns

Generation and Competition

Monopoly	Purchasing Agency	Wholesale Competition	Retail Competition
Monopoly in generation, transmission and distribution	Competition in generation – single buyer.	Competition in generation - Spot market or pool. Choice for distribution companies.	Competition in generation - Spot market or pool. Choice for distribution companies.
No choice for retailers	No choice for retailers	Choice for retailers.	Choice for retailers.
No choice for end- consumers	No choice for end- consumers	No choice for end-consumers.	Choice for end-consumers.

What is the Rural Electrification Problem?

- We know what rural electrification is supposed to do
 - improve opportunity for education
 - improve health
 - improve income generation
- We know the constraints
 - dispersed and poorer communities
 - often remote and inaccessible
 - poor quality supply where exists
 - limited effect on income generation

Finding Solutions

- Technologies available
 - gas turbines
 - reciprocating engines
 - micro turbines
 - photovoltaic
 - wind
 - fuel cells
 - small hydro/other renewables
- Public policy commitment
- International aid
- Private investment

Solution is Complex

- Fit for purpose
 - idea of staged reform
- Business models accounting for context, technology and socio-economic factors
- Scaling-up
 - EPSRC funded research – 2009-2014
 - University of Dundee
 - The Energy Resources Institute
 - University of Manchester
 - University College London