




Division of Technology, Industry and Economics 

Clean Energy Hybrid Mini-Grids in Remote Areas – an Investment Opportunity?

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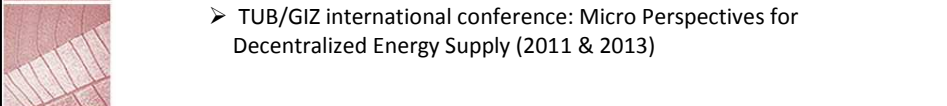
Background

Potential market for mini-grids:

- 1.4bn people in rural areas, most with no access to electricity
- 60% of people in Africa in rural areas
- 3,000 inhabited islands in Indonesia/Philippines
- mini-grids to provide 40% of new capacity by 2030

Increasing international attention:

- 4th Clean Energy Ministerial, New Delhi, April 2013
- UK Department for International Development (ICF, 2013)
- Powering Africa Strategy Summits (2011 & 2012)
- TUB/GIZ international conference: Micro Perspectives for Decentralized Energy Supply (2011 & 2013)





Viabale Business Model - Challenges



- High up-front costs
- Long-term revenues
- Role of public funding
- Local management of operations
- Risks from political/regulatory uncertainty



Viabale Business Model – Key Factors



- Understand customer demand
- Raise customer awareness
- Maximize and optimize revenues
- Minimize cost exposure
- Minimize risks



Bottom-up Approach

- What is the demand – 24/7?
- Sufficient scale for returns – ABC?
- Brownfield / greenfield
- Need for hybrids
- Community ownership
- Technology selection – local resources



Mini-grid Power Back-up Options

- Batteries
- Fuel cells
- Diesel generators
- Local renewable resources
- Bio-energy



Use of Bio-energy?

- Land-use planning
- Technology options and potential
- Implementation options and impacts
- Stakeholder engagement
- Assessment tools
- Certification and standards



WORKING TOGETHER FOR SUSTAINABLE DEVELOPMENT



Role of the Public Sector

- Guarantees for initial investment
- Policy framework
- Tariff structure
- Economies of scale
- Public-private-partnership



Preparing for Investment

Feasibility depends upon:

- Technology to match needs
- Stable policy framework
- Sufficient capacity building
- Understanding local conditions
- Price sufficient for re-investment
- Experience of practical implementation in targeted local communities



Proposed UNEP Demonstration

- Assessment of likely demand
- RE hybrid based on local resources and bio-energy
- Selection of 3-5 countries
- Implementation of different financial models
- Measurement of impact
- Development of a best practice approach for future mini-grid providers

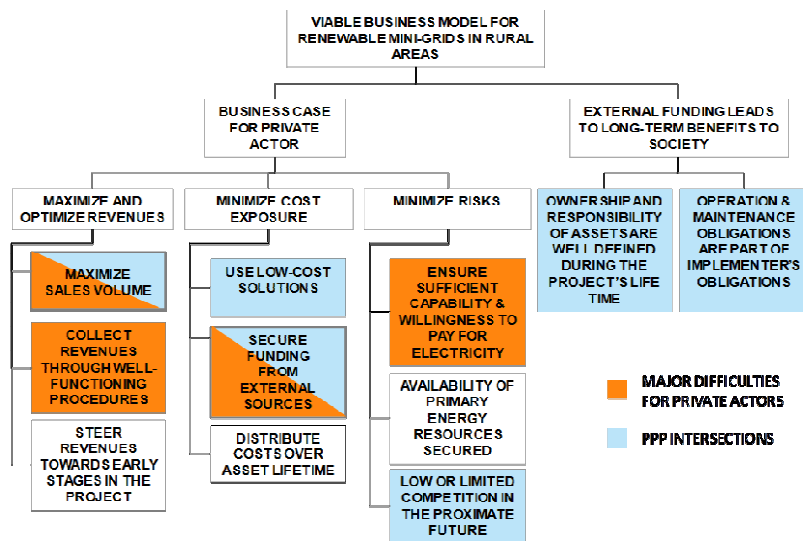


Target Groups

- Local communities
- Technology providers
- Local financiers
- National policy-makers
- Local government
- Local suppliers and installers
- International organisations



Key Requirements from Public and Private Sector





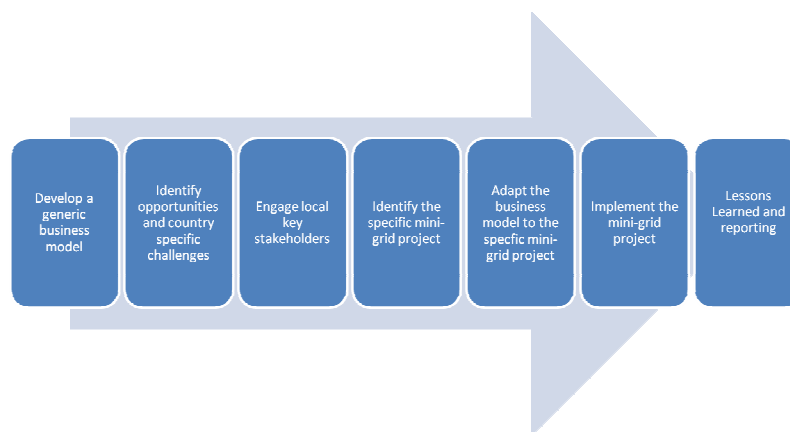
Current Target Countries

Mini-grids for “remote areas” - rural areas in Africa, islands in Asia:

- Kenya
- Tanzania
- Uganda
- Namibia
- Philippines
- Indonesia



UNEP Approach





Intended Outcomes

- Increased local access to energy supply from connection to a local minigrid
- Financiers aware and interested
- Customer demand
- National policy to encourage mini-grid installation
- Reduced CO2 emission outlook
- Social, gender and economic upliftment
- Sustainable demonstration => replication potential