Electricity Access through Decentralized Distributed Generation: Financing Issues & Challenges

By

Mr. B.V. Rao

Chief General Manager (TS)- IREDA

Place: Jacaranda Hall, IHC, New Delhi

Date:27.02.2014

Decentralized Distributed Generation (DDG)

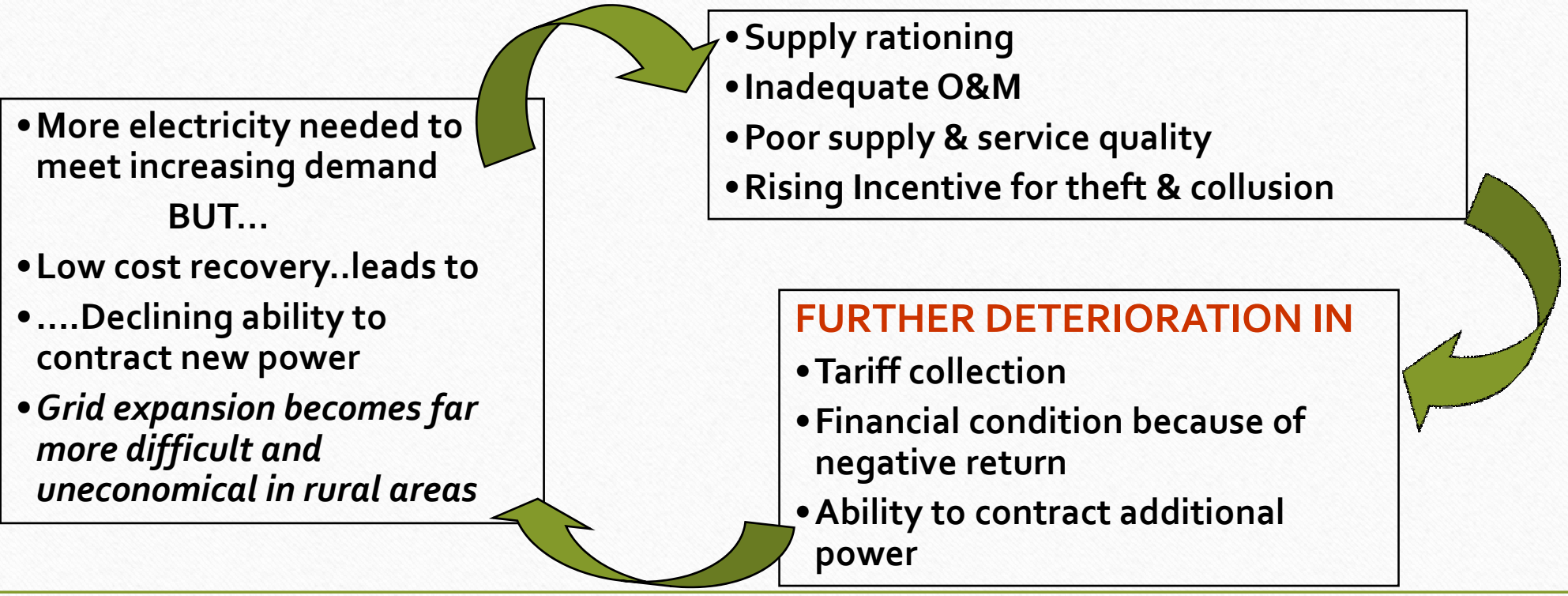
- "Small, modular, decentralized, grid-connected or off-grid energy systems located in or near the place where energy is used."

- "The installation and operation of electric power generation units connected directly to the distribution network or connected to the network on the customer site of the meter."

Challenges to Electricity Access in Rural Areas

- Disincentives
  - High cost of grid extension
  - Poor economic health of utilities
  - Poor revenue realization from the users
- Nearly 28,000 un-electrified villages
- Limited power supply to electrified villages

Cyclic Nature of Electricity Access Conundrum



Requirement of DDG

Cost

- Cost of grid extension to 12 km and beyond is broadly comparable with solar power
- For villages beyond 3 km from the grid (hills) and 7 km(plains) RE is a cheaper option
- No transmission losses-lower costs

Demand driven and tailored to local needs-Scalable as per local requirements

Low gestation periods

Local employment and enterprise opportunities

Scope for DDG

- No grid connectivity for:
  - Nearly 400 million people
  - 75 million rural households
  - 6.5 million urban households
  - over 90% is concentrated in rural India
  - Another 33% of the population may be facing under-electrification
- Many electrified villages also face shortage of electricity
  - Accessing less than 50 kWh of electricity per month/household
- Alternatives include burning kerosene/ biomass for lighting and cooking

Major Challenges to DDG- Mini Grids

- Limited paying capacity in rural areas
- Loads in rural areas are low and inconsistent in nature:
  - Local commercial loads are limited
  - Household loads are very low and not a sustainable viable option
  - Loads in rural areas vary greatly on seasonal, monthly or even hourly basis
- Subsidies given to RE alternatives like diesel and kerosene may be a deterrent for DDG development
- Operational Challenges:
  - Lack of capacity; shortage of trained staff
  - Lack of timely support from equipment manufacturer:
  - Remote locations, poor connectivity

Identifying opportunities

- Community engagement
- Local Operation and Maintenance support
- Innovative business models:
  - BOOM/ BOM/ BM
- Tying up with large commercial load users in nearby vicinity such as Mobile phone towers, India Railways' network of stations, etc.

Electricity Act, 2003- Policy Mandates

- Section 4- National policy on stand alone systems for rural areas

"The Central Government shall, after consultation with the State Governments, prepare and notify national policy, permitting stand alone systems (including those based on renewable sources of ene and non-conventional sources of energy) for rural areas. "

Policy/ Programmes of MoP & MNRE

- MoP
  - RGGVY- 90% of capex is provided as grant
    - REC is the nodal agency
    - Aims to provide grid extension to un-electrified villages, DDG where supply is not feasible
- MNRE
  - Off-Grid Programmes-
    - Remote Village Electrification, Solar, Biomass Gasification, Biogas, wind hybrid, Small Hydro, Biomass Power & Cogeneration & Waste to Energy
  - Decentralized Programmes-
    - Biogas, Solar/ Green Cities, Green Buildings, Solar Energy Systems, National Biomass Cookstoves programme & Akshay Urja Shops

Financing Issues
and
Funding Mechanism

Challenges to attract Funds for DDG development

- Funding of DDG projects
  - RE technology is capital intensive
  - Market returns not high enough to attract investments
  - High Dependence on Government support/ subsidies
- To attract private equity
  - Located in Remote areas
  - Returns are very low
  - Recovery is very difficult

Issues to DDG Financing- Lender's perspective

- Distributed RE projects serving micro-grids are:
  - Small in size: Cost of project ~40 Lakh - 1 Cr
  - Widely dispersed in remote locations
  - High generation cost
- Difficulties in security creation
- Limited income generation activities
- Higher risk perception

Scaling up of Mini-grids to reduce costs

- Need to aggregate number of projects to create scale. Policy framework and Government facilitation to achieve:
  - Standardization of Equipment & Design
  - Presence of Aggregators/ Special Purpose Vehicles/ Legal structures
- Identifying business opportunities like commercial establishments, telecom towers, etc. in the vicinity which will help maintain viability and liquidity

Financial Support/ Incentives

- Incentives:
  - One Time Capital Subsidy
  - Interest Subsidy
  - Tax benefits
  - REC mechanism
- Funding options
  - Government support/ subsidies
  - International and national development organizations
  - Social entrepreneurs and NGOs
  - CSR funds
  - Private Companies looking to tap rural market

IREDA's experience in Local/ Mini Grid Power Systems

- Solar PV power plants in Sunderbans, West Bengal and Rajasthan
- Biomass Gasifiers (less than 1 MW size)
- Solar water pumping systems
- Solar Rooftop Off-grid applications (less than 100 kW)

Conclusion

- Purely market driven projects are not viable
- Government subsidies/ grants to DDG projects in the initial stage
- Subsidies should be shifted from kerosene, fossil fuels to RE technologies as it is one-time assistance, which is not the case for fossil fuels
- In the long run, RE DDG will prove to be more beneficial

Thank you