Financing Mini-grids in Africa

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Introduction to Energy 4 Impact

Formerly known as GVEP International

Non-profit firm focused on off-grid energy in SSA

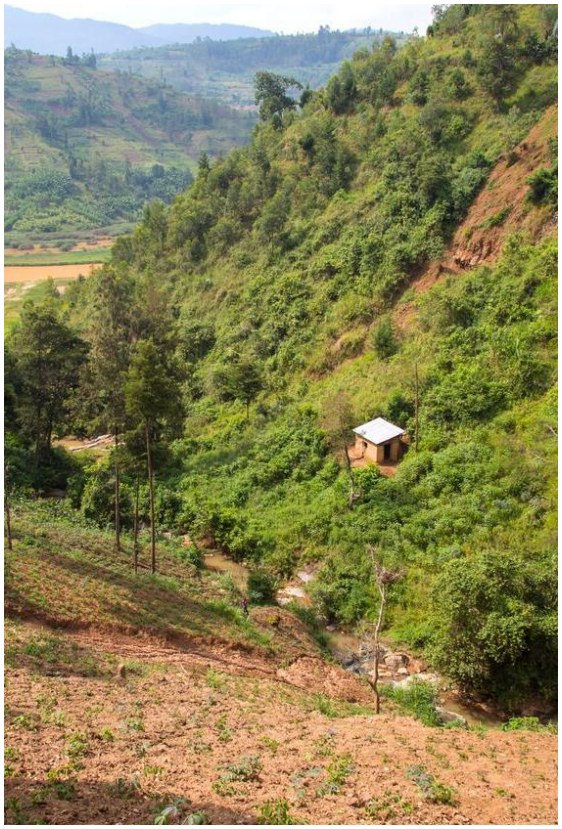
Provides business, technical, financial advice to SMEs and micro enterprises

Supported 40 mini-grid developers over last 10 yrs

Managing four mini-grid donor programs

Launch of SE4All Green Mini-grid Help Desk

http://greenmini-grid.se4all-Africa.org



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Agenda

Mini-grid types

Challenges

Financial solutions

Guarantees

Financing trends

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Mini-grid Types

- **Project Development Stage**
  - Early stage development
  - Late stage development
  - Implementation
- **Type of project**
  - Size and customer model
  - Technology
- **Type of Developer**
  - Origin (local/international)
  - Motivation (profit/non-profit)

Mini-grid Types – Project Development Stage

	Early stage dev	Late stage dev	Implementation
Project milestones	Feasibility study Site identification / initial community engagement Demand assessment Renewable resource assessed - hydro, biomass Technical design Anchor clients or small business users identified	Land rights approved ESIA completed Water rights secured Licences secured Tariffs approved Rules for community engagement Tender for equip. supply	Construction started Financing secured PPA secured Arrangements with small business users in place eg contracts, payment systems Mini-grids in operation and looking to expand
Financing	Grants or equity	Grants, equity, possibly debt	Grants, equity or debt

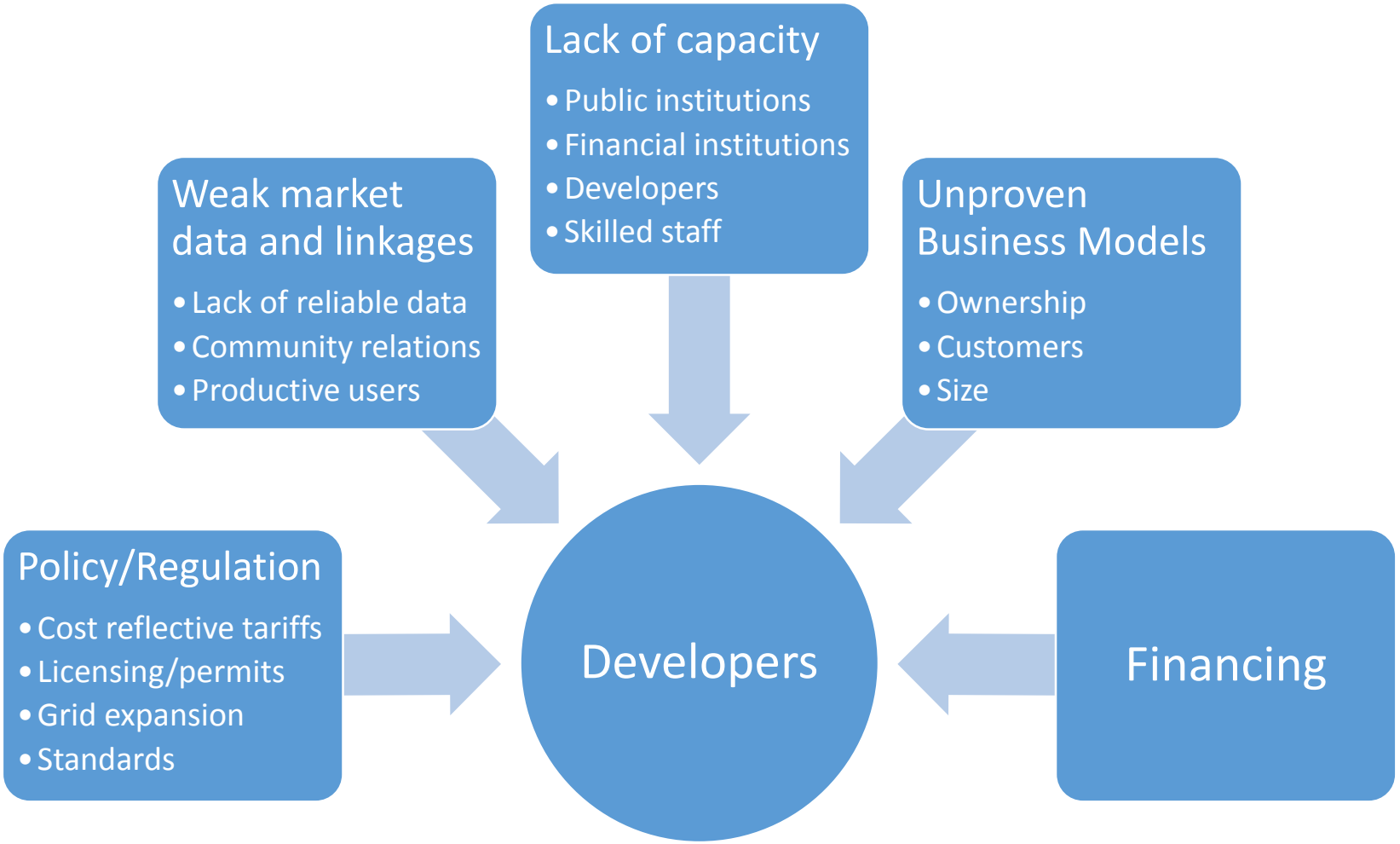
Mini-grid Types – Size and Customer Model

	Type 1	Type 2	Type 3
Size	1-10 MW	100kW – 1MW	<100 kW
Main customers	Anchor load eg state utility, semi-industrial	Small business or anchor load	Households or small business
PPA/FIT	Yes	Yes/No	No
Financing	Commercial equity and debt, grants for connections Corporate or asset finance or project finance	Grants and equity generally required Corporate or asset finance	Grants and equity generally required Corporate or asset finance

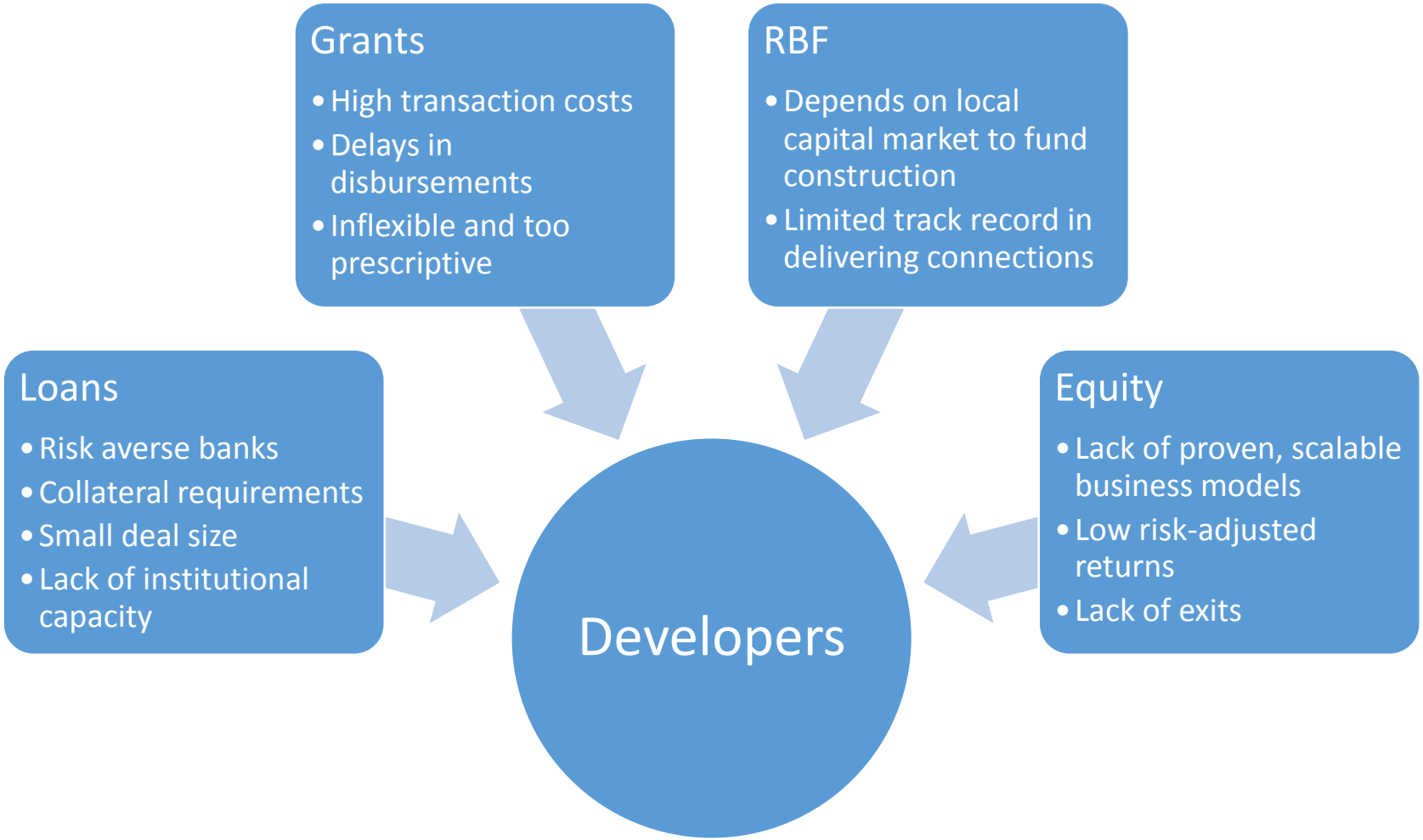
Mini-grid Types – Technology

- **Solar**
  - Daytime demand load
  - Energy storage or diesel for evening consumption
- **Hydro**
  - Demand projections – demand not scalable up nor down
  - Hydrology flow data
  - Seasonality of flow
- **Biomass**
  - Securing feedstock
  - Logistics costs
  - Seasonality of biomass

Mini-grid Challenges



Mini-grid Challenges - Financing



Financial Solutions

Grants and subsidies	Equity	Debt
Grants for feasibility studies Construction grants for capex – focus on distribution assets Results-Based Financing eg for new connections Promotion of productive users - technical assistance / purchases of electrical equipment Providers: DFIs, host governments, trusts and foundations, philanthropists	Seed capital Expansion capital Investments in operating assets Providers: angel investors, VC, impact investors, trusts and foundations, global utilities, private equity, family offices, crowd funding, DFIs (direct or via funds)	Concessional or commercial loans Green credit lines to local banks Loan refinancing facilities Loans to end users for electrical equipment Providers: DFIs, banks, foundations, family offices, crowd funders

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Corporate versus Project Finance

Corporate Finance	Project Finance
Investment based on historical track record of developer and income projections of portfolio	Investment based on income projections of individual mini-grid or group of mini-grids
Suitable for Type 1, 2 and 3 mini-grids	Most suitable for Type 1 mini-grids with anchor clients that offer long-term contracted revenue streams
More freedom for developer on how they use funds eg between different projects	Funds only to be used for project(s) specified in financing agreement
Balance sheet impact on developer	Project risks shared between stakeholders
Shorter time to execute financing	Financing takes longer to execute
Simpler / less due diligence	Complex / more due diligence
Lower up-front costs	Higher up-front costs
Shorter-tenor financing	Longer-tenor financing

Guarantees


Risk Guarantees
• Demand growth
• Non payment or late payment of PPA
• Arrival of grid
Loan Guarantees
• Alignment of interest btw partner banks and mini-grids
FX Risk Hedging
• Natural hedging
• Local currency loans
• Hedging cost
Guarantees

Mini-grid Financing Trends

- New types of investors include global utilities, manufacturers, IPPs
  - Project investments
  - Corporate investments
  - Developers of own projects
- Bundled finance for similar mini-grids - technology, location, business model
- End user financing
  - Funded by developers themselves
  - Partnerships with financial institutions

Thank you!

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