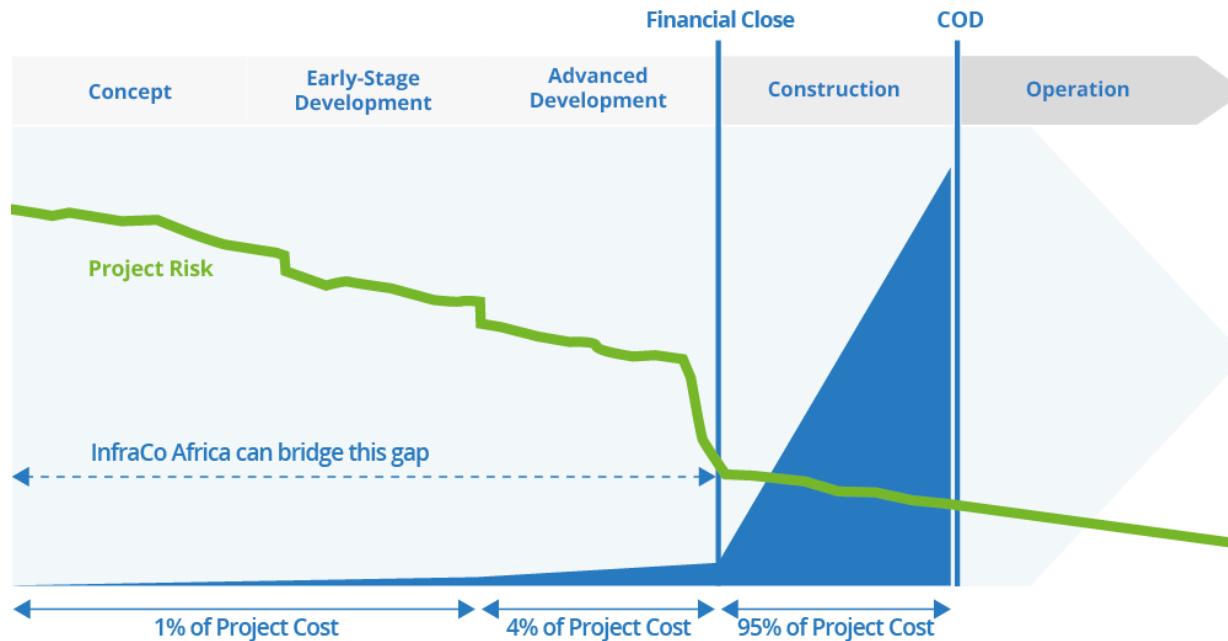




Renewable Energy and Mini Grids in East Africa – The  
Technical Challenges and Opportunities for Developers,  
Investors and Off-Takers



**InfraCo**  
**AFRICA**



Early-stage infrastructure projects are a risky business:

- Scarce risk capital
- Limited local development teams
- **Information gaps and asymmetry**
- Constrained host government capacity
- Corruption and vested interests
- **First mover (dis)advantage** – positive externalities
- **Disenfranchised local communities**

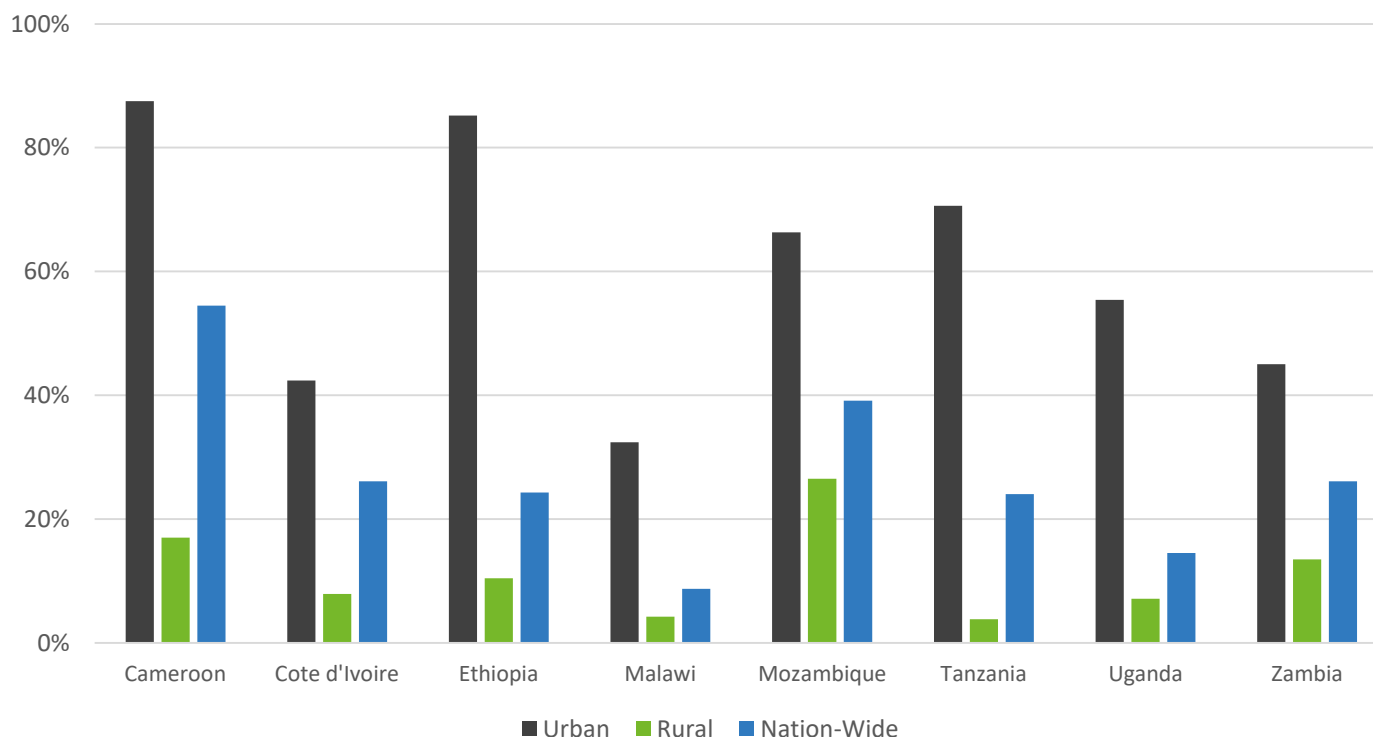


InfraCo Africa’s mandate:

- Enabling and not replacing the private sector
- Transforming markets by being the first
- Generating new opportunities by powering businesses
- Stimulating investment by developing attractive deals
- Ultterior motive..... Alleviating poverty in Africa



Figure 1: Electrification rates in some of InfraCo Africa focus countries



- 621 million people are without access to the national grid (32% in SSA)

- Grid is slow, high cost and impractical

Thus, decentralised approach emerging:

- Government's in Africa looking towards off-grid solutions (e.g. Ghana ECG *"we want users to consider the National Grid as a back-up solution, not as the main power supplier"* )
- Donors actively promoting (e.g. Energy Africa Access, SE4ALL)

## Commercial Model Comparisons and Considerations



*RVE.SOL generating clear water to increase demand and revenue streams*



*PowerGen with their PAYG mobile money system*

Key model variances:

- Tariff structure, payment method, demand side management
- Target market
- Ownership model
- Technology choice and design
- Size of generation unit

Key to success for distributed mini-grids:

- differentiated innovative tariff structures that focus on end users payment ability;
- Pre-payment system to reassure investors;
- a strong emphasis on demand stimulation along with 'ethical' control;
- controlling capex and opex relative to revenue;
- relatively small generation capacity but able to scale easily and standardising of units

## Link between Regulation and Commerciality

African Governments are increasingly aware and implementing appropriate legislation. Countries fall broadly into three categories: 1) those who have developed a full mini-grid framework such as **Kenya and Ghana**, where they regulate the tariff; 2) those who have developed some specific policies that facilitate the mini-grid market. For example, **Tanzania and Nigeria** allow projects under 100 kW to be exempted from tariff approvals, and Senegal and Nigeria are using cluster approaches (determining tariff caps by applying the cost-plus approach to groups of mini-grids) and IT platforms to minimise tariff approval costs. 3) the final category are those countries where there is little specific regulation in place, such as **Zambia**.

For these countries, the regulatory process is emerging as a direct response to mini-grid projects engaging with government. In all cases, **regulation is a key challenge and can only be mitigated through extensive engagement with the various government/regulation bodies and close collaboration with donor organisations**. This represents a similar risk to those when developing a full IPP.

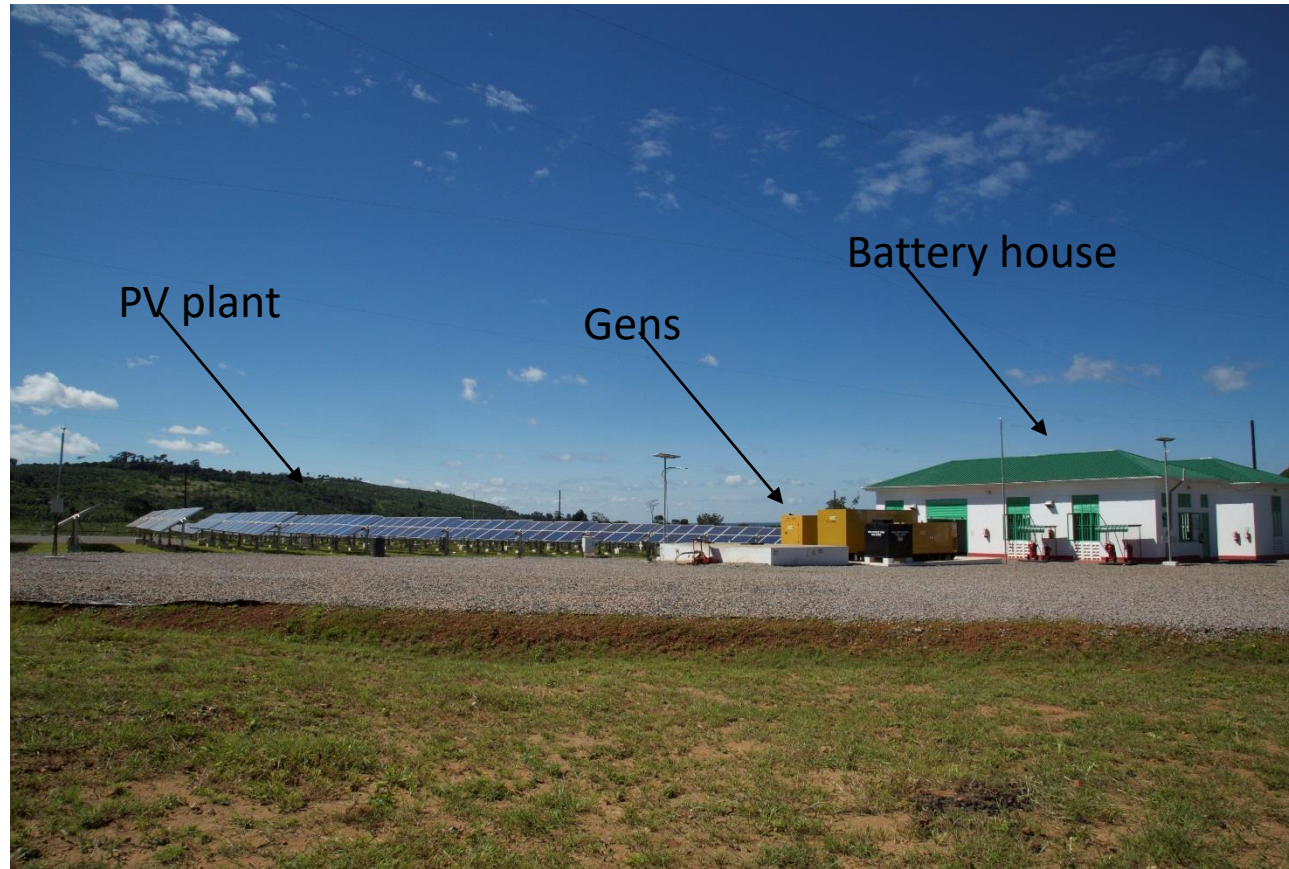


Steve Njovu - is a shop owner in Mugurameno. He was the first SMG customer to purchase a fridge. He is now able to sell cold drinks and perishables (e.g. meat) which is proving very profitable. Steve has recently requested provisioning of a second fridge to support the continued growth of his enterprise.

Cost reflective tariffs	Imposed tariffs
Economically efficient	Socio-political driver
Willingness and ability to pay	Will almost certainly require subsidies
May not require the regulator's approval	Will require regulatory oversight
Approach adopted in Tanzania (varies by size)	Approach adopted by Kenya (may be some variation by size)

**Governments want low tariffs more than they want people to have power!**





**Kalangala Infrastructure Services:** a pioneering mixed utility company that has responded to the complexity of Bugala Island's needs.

KIS:-

- 1- operates **two modern roll-on roll-off ferries**;
- 2- has upgraded the island's **66km** Luuku - Mulabana **main road**;
- 3- is **distributing clean water** to 19 villages on the island;
- 4- and has developed **1.6MW of hybrid solar-diesel power** and recently taken over operation of the Kalangala Town Council (KTC) grid.

**Fully regulated**





**InfraCo Africa is providing the capital needed to rapidly scale-up this business with the goal of deploying up to 30 containers across rural Tanzania**

### Fully regulated but because rental, no regulatory requirements



**Standard Migro Grid:** an innovative power solution :-

**1- that provides Value through Time Based Energy Services**

**2- that maximizes revenues**

Via optimal system utilization.

**3- that is designed in Africa, for Africa**

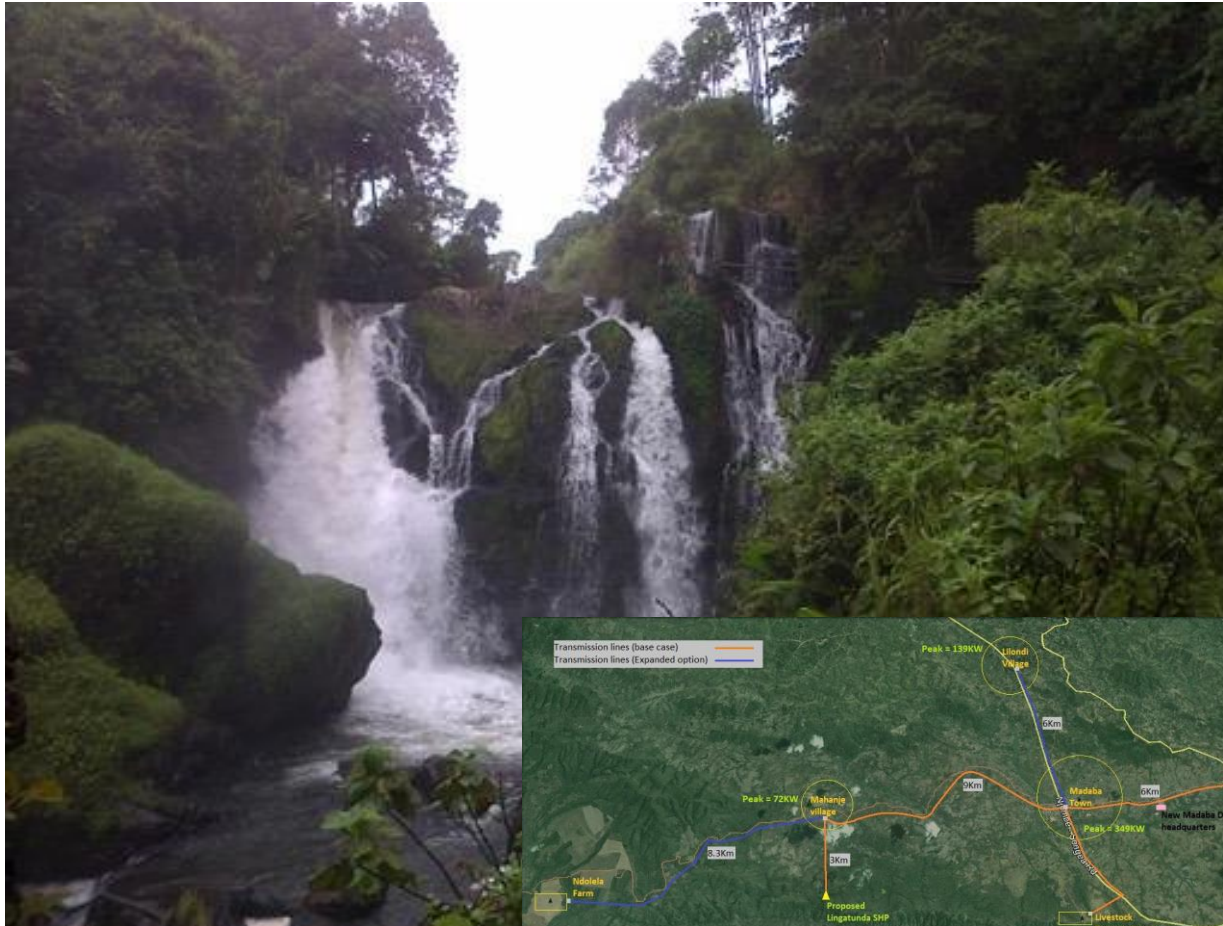
and has been developed to respond to the unique challenges and risks of deploying commercially viable energy assets in rural Africa environments.

**InfraCo Africa is providing capital to deploy up to 150 systems across rural Zambia**

**Unregulated mini-grid because new in country, therefore default to utility scale regulation**



## Generating new opportunities by powering businesses - Virunga



**Virunga:** a rural utility mini hydro based who :-

- 1-Satisfies rural domestic and productive uses of power
- 2- Focuses on **decentralised** generation and production avoiding high transmission costs
- 3- **Involves local communities** in all its projects (shareholding)

InfraCo Africa is providing capital to develop and construct the 1<sup>st</sup> project of a 48MW portfolio in Tanzania

Fully regulated with specific mini-grid regulation





Thank you,

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