FORT COLLINS 2019 SYMPOSIUM ON MICRO GRIDS
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ASSESSMENT OF COMMUNITIES FOR MINI-GRIDS ELECTRIFICATION-THE DOS AND DON'T

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Presentation Outline

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Country Brief

- **Land Area:** 238,533 sq km

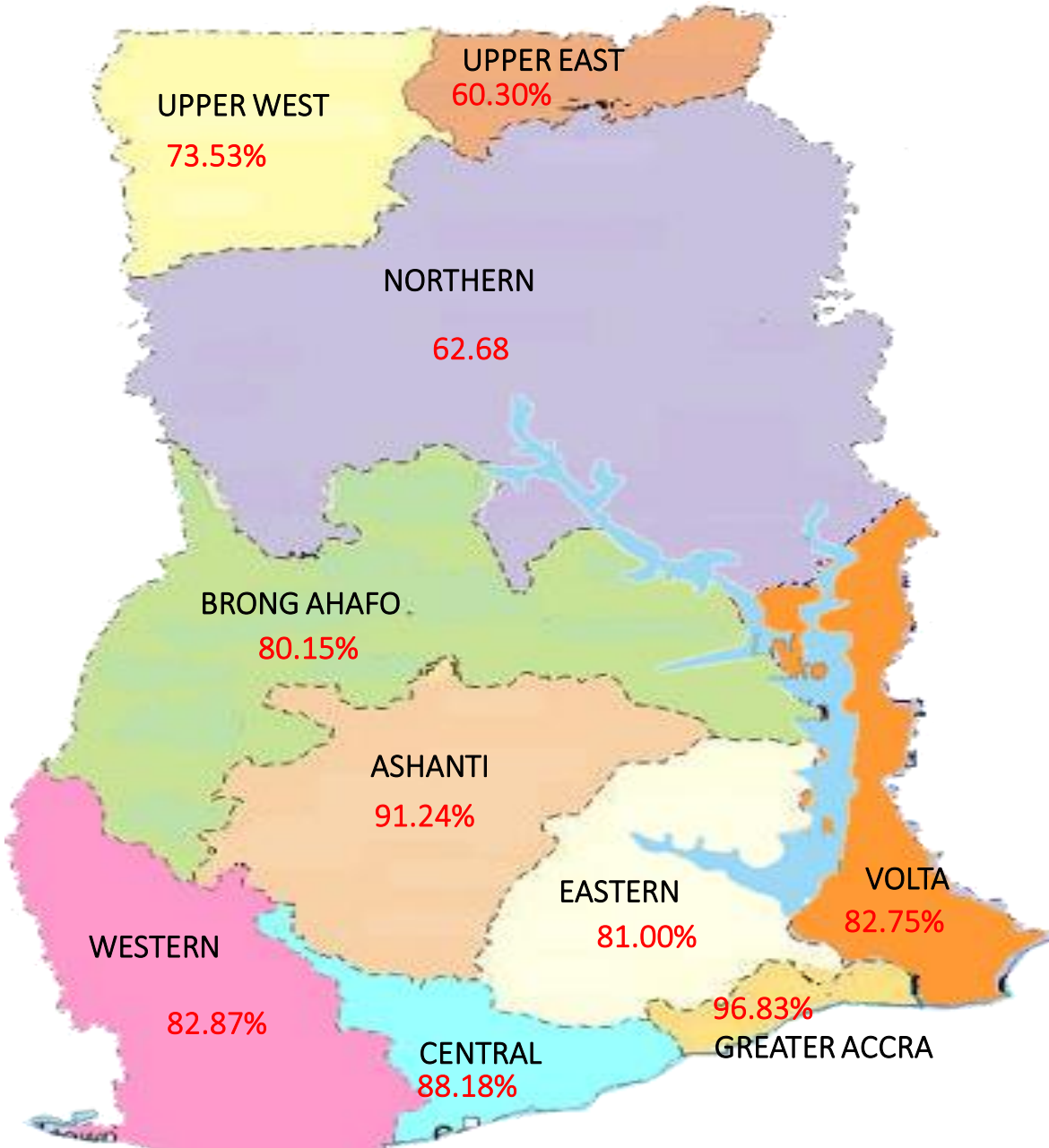
- **Population:** 28,102,471 (July 2018 est.)

-**Electricity Access:** 84.32% (2018)

-**Consumption/Capita:** 542.5kWh (2018)

- **Av. GDP Growth Rate:** 6.3% (2018 est.)

Major Export: Cocoa, Gold, Timber, Bauxite, Manganese & Oil



National Electrification Policy -1989

- National Electrification Scheme (NES) instituted in 1989 to achieve universal access of reliable electricity supply over a 30-year period (1990-2020)

RATIONALE

- Stimulate socio-economic development and promote growth of agro-based & small scale industries nationwide
- Reduce rural urban migration in search of jobs
- Improve quality of life and standard of living of rural folks

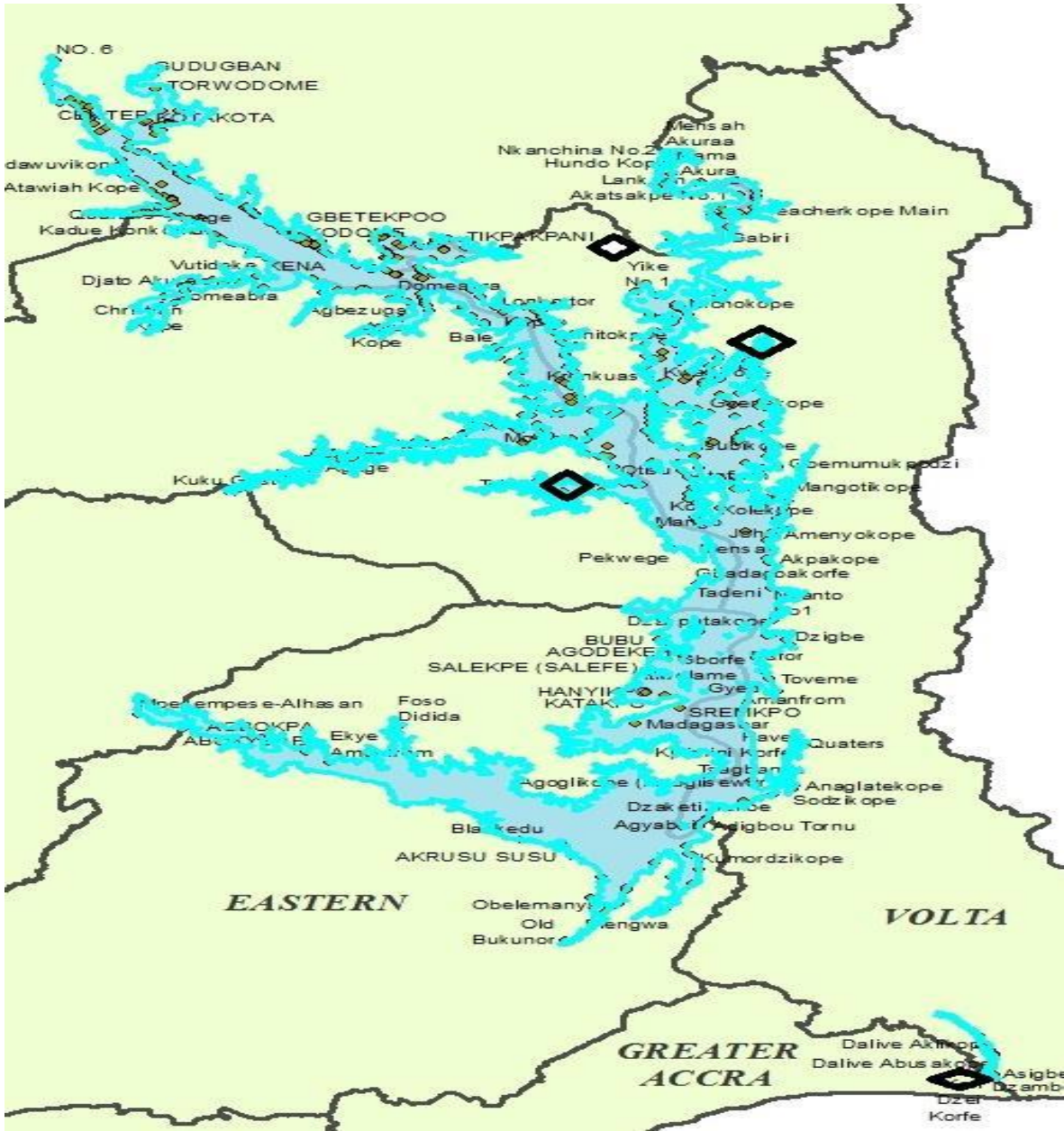
- In 1989 National Electricity Access was about 25% with only 5% Rural Penetration.

- As at the end of 2018, national electrification rate of 84.3 % and a rural electrification rate of 71%. Ministry of Energy, 2018

Rationale for Mini-grid In Ghana

- Island and lakeside communities with population between 500 and 2000 exist in Ghana.

- High cost of grid extension for last mile electrification.



Key Issues To Constrain Mini-grids Development

- Policies & Regulations frameworks
- Delivery models
- Human capacities and Institutional arrangements
- Cost and Tariff frameworks
- Social Acceptability
- Procurement Models
- Boundary issues for grid, mini-grid and standalone

Policy Choices & Delivery Models

- ***Public model*** – Ownership, operations and maintenance (O&M) of assets by parastatal GENSCO & DISCOS.
- ***Private model*** - Ownership of assets and O&M by one or more private firms.
- ***Mixed Model 1*** – e.g., DISCOS builds and owns systems; O&M is outsourced to the private sector, either through a concession or a management contract.
- ***Mixed Model 2*** *(PPA model)* - Private sector builds and owns the generation part and sells power under a power purchase agreement (PPA).
- ***Community Model –*** The community or a community-led cooperative builds, owns and operates the mini-grid, possibly with some functions being outsourced.

Pricing/Tariff Regulation and Trade-offs

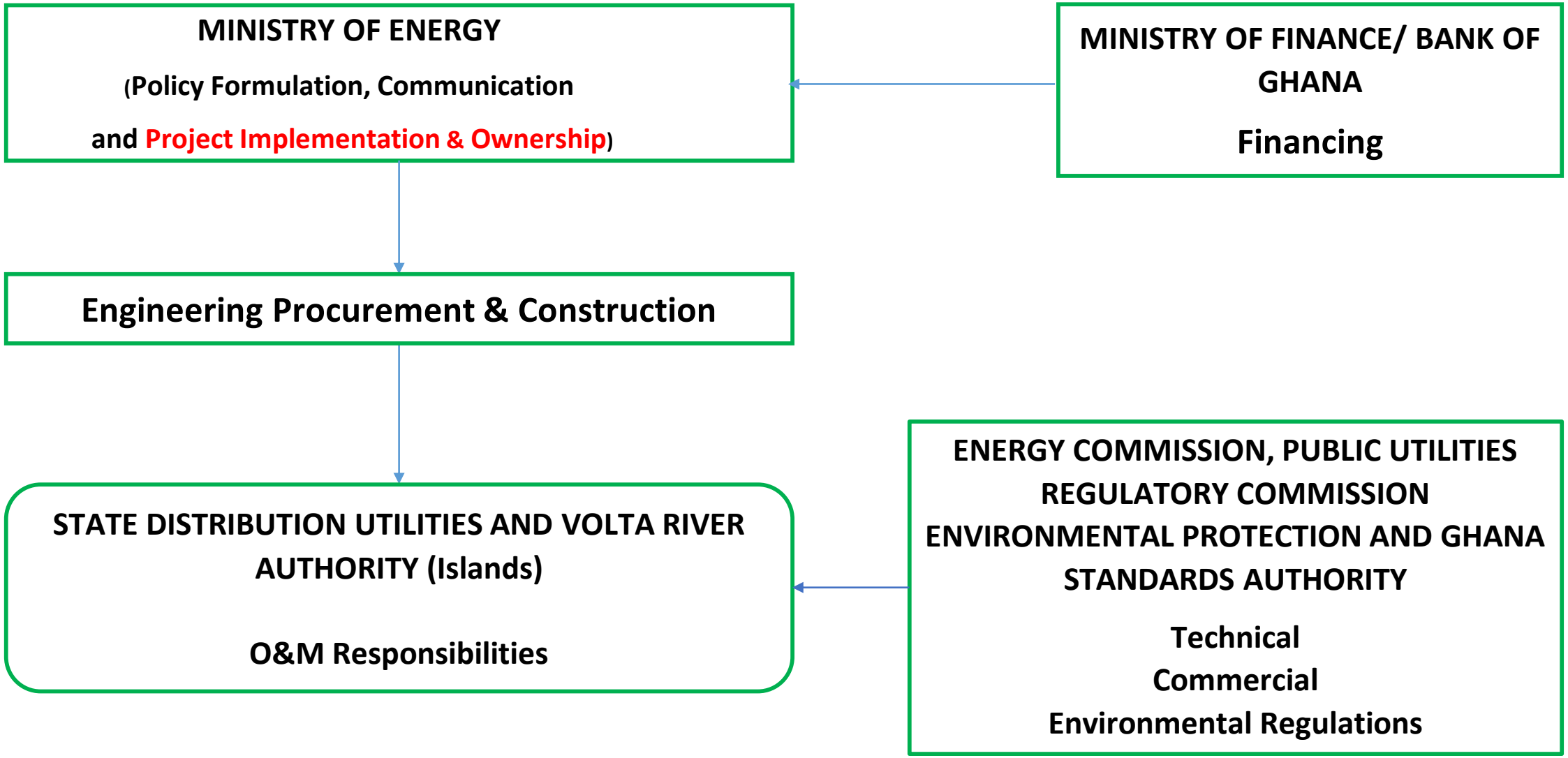
- A **cost-reflective tariff (C-RT)**, encompassing all costs necessary to develop and operated a mini-grid in a specific location for a given period, which is likely to be over $1.00/kWh.

- The **Uniform National Tariff (UNT),** which is applied to all of the customers in the lowest consumption category, which is around $0.05/kWh.

- Cost-Reflective Tariff (C-RT) >UNT

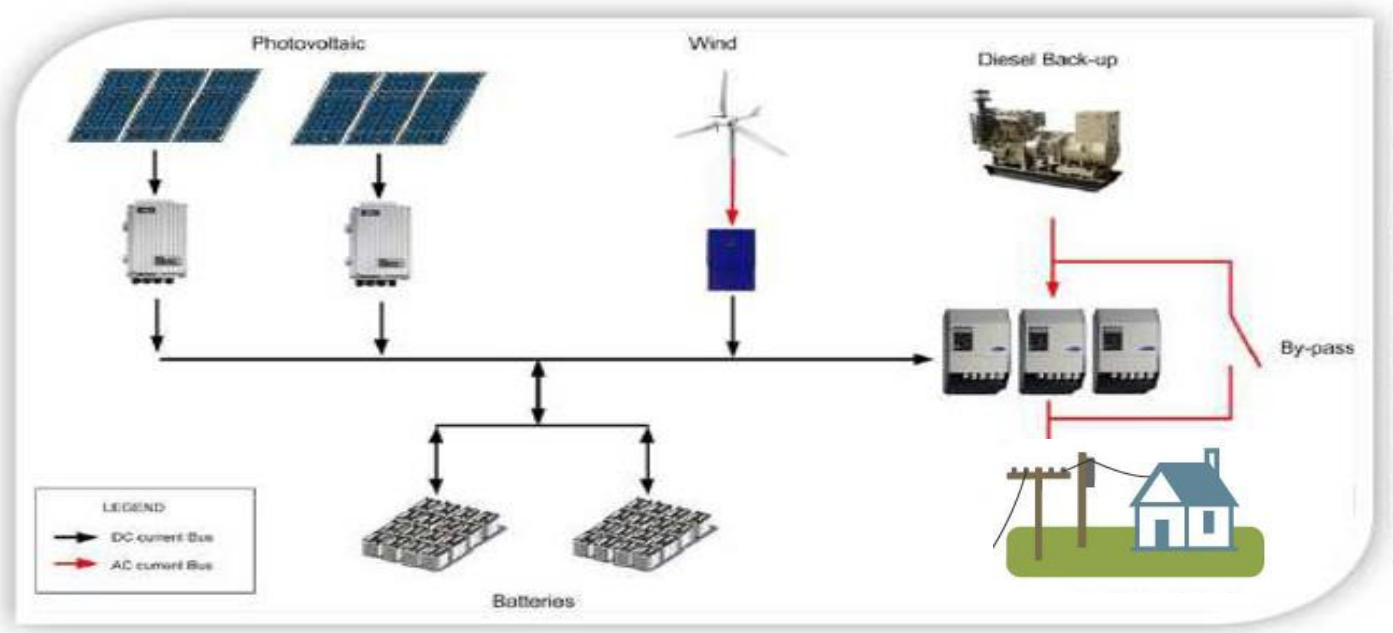
- Costs not met by tariffs have to be met by subsidies.
    1. Direct customers (increase towards C-RT)
    2. Indirect customers (cross-subsidy)
    3. Tax-payers (including non-customers) through external subsidy
    4. Donors through donor external subsidy.

Institutional Arrangements



Technical Solutions For Mini Grid Electrification

- **Mini-grid Systems**
- Using RETs, Diesel Hybrids
- Controllers & Inverters
- Battery Storage
- Distribution Network & Streetlights



MINI-GRID

PRE DESIGN
Policy
Socio- Economic
Study
ESIA
Sensitization
GIS survey
Land

DESIGN
Socio Economic Issues
Productive Uses of Energy
Environmental Mitigation
Technical & Technological Issues
Commercial Issues

Proc. & Construction
Methods of Procurement
Direct or Third Party

Operation & Maint.
Public
Private

Ownership
Public
Private
Others

MG Electrification Project (G-D-C Subsystems)

Storage

Diesel Genset

Control Systems

Sensitization

Ongoing Mini Grid Projects

Project	Target	Expected Completion Date	Status	Funding
SREP	55	2023	Preparatory activities completed	CIF, AfDB, GoG
SECO	3	2020	EPC Awarded	Swiss Govt.
AUDA	5	2020	Preparatory activities completed	AU. Others
SH	30	2022	Preparatory activities ongoing	China
USTDA	45	-	FS ongoing	USTDA

Conclusions and Way Forward

- Detailed preparatory activities are key to successfully MG projects.
- Challenges in the MG sector present great opportunities for scale and acceleration for universal access.
- Demarcation of boundaries for grid, mini-grids and standalone systems essential for investment planning and execution.
- Mindful of the risks, policy choices and regulatory regimes should guide stakeholders particularly investors, developers and financiers in their decision making.


Thank You!