Interconnected Mini-Grids: A key component of Africa’s Energy Future?
Intergovernmental organization established in 2011 headquartered in Abu Dhabi, UAE

**Mandate:** To promote the widespread adoption and sustainable use of all forms of renewable energy worldwide

**Membership:** 163 Members and 21 States in Accession
IRENA’s Work on Energy Access

- Annual reporting of off-grid renewables statistics
- Contribution to SDG 7 tracking report
- Capacity building on data collection and reporting
- Analysis of mini-grid policies and regulations
- Country-level technical assistance
- Tracking investments in off-grid renewables
- Platforms for investment mobilization
- Entrepreneurship Support: ECOWAS and SADC RE Entrepreneurship Support Facility
- Impact of off-grid access on jobs and gender
- Assessment of applications in agriculture and health
- Mini-grid Technology Innovation Outlook
- Quality and standards
Key Drivers for Interconnected Mini-Grids

- Transitioning to integrated electrification planning
- Improving quality of supply
- Increasing electricity access through grid densification and intensification
- Reducing technology costs
- Retaining C&I consumers
- Reducing technical and commercial losses
- Enhancing resilience of supply
- Unlocking private capital in distribution sector

IRENA (2019), Innovation landscape brief: Renewable mini-grids
The policy and regulatory landscape varies for each combination of configuration and business model.
Policy and regulatory conditions for interconnected mini-grids

- Framework for partnership between utilities and mini-grid operators (e.g., sub-concession, franchisee)
- Engagement of consumer groups (e.g., communities, market associations)
- Legal provisions (e.g., duration, tender design) and streamlined regulatory requirements
- Clear processes and procedures

Legal and licensing provision

Cost-recovery and tariff regulation

- Ensure cost-recovery through tariff and viability gap funding
- Revenue requirement and tariff determination approach will dictate suitable business model
- Need to balance investor risk with long-term view of distribution sector (e.g., multiple tariff regimes)

Centralized grid arrival/interaction

Public financing design

- Energy access will require viability gap funding
- Role of utilities in structuring transaction
- Different public financing needs compared to off-grid mini-grids
- Participation of local private sector

IRENA publications available here: www.irena.org
Quality Infrastructure for mini-grids

Source: IRENA (2020), Quality Infrastructure for Smart Mini-Grids

QI to be incorporated into policy and regulatory instruments
Puerto Rico Regulation for Mini-grids

After hurricane Maria in 2017, Puerto Rico looked to implement more resilient energy systems in their communities.

The 2018 regulation defines ‘renewable microgrids’ as those that can generate 75% of their energy from renewables. It identifies the applicable codes and standards.

Below, the Commission establishes the list of Codes and Standards with which all microgrids must comply. It remains the responsibility of each microgrid owner and operator to ensure that its microgrid system is in compliance with any and all Codes and Standards that may be applicable to it.

1. Latest National Electrical Code;
2. Latest National Electrical Safety Code;
3. IEEE Standard 1547-2014;
4. IEEE P2030.2, P2030.7;
5. IEC 61850-7-420; Power Utility Automation
6. IEC/TS 62898-1 and 62898-2; Guidelines for microgrid projects planning and specification

Source: NFPA, 2018; CEPR, 2018, WRI 2017, Magnaray International, African enterprise investor
Secondary and tertiary measures to strengthen ecosystem

- Mini-grid policy and regulatory landscape does not adequately address secondary and tertiary measures.
- All of these have a strong bearing on the scalability of renewable energy mini-grids, and the socio-economic outcomes of deployment policies.
- Interconnected mini-grids will require active participation of distribution utilities with a strong economic case.
- The precise role interconnected mini-grids will play in a given concession area will depend on a comprehensive analysis that identifies least-cost approaches to service existing consumers, as well as meet electrification targets.

THANK YOU