



Introduction to Distributed Generation (DG)

*Facilitating the integration of
Distributed Generation in Sub-Saharan Africa*

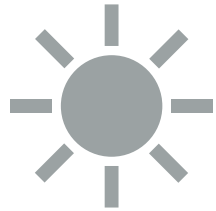
19- 23 August 2024

GET.transform is supported by





Outline



Changing Energy
Landscape



Defining DG



DG
Implementation Stats

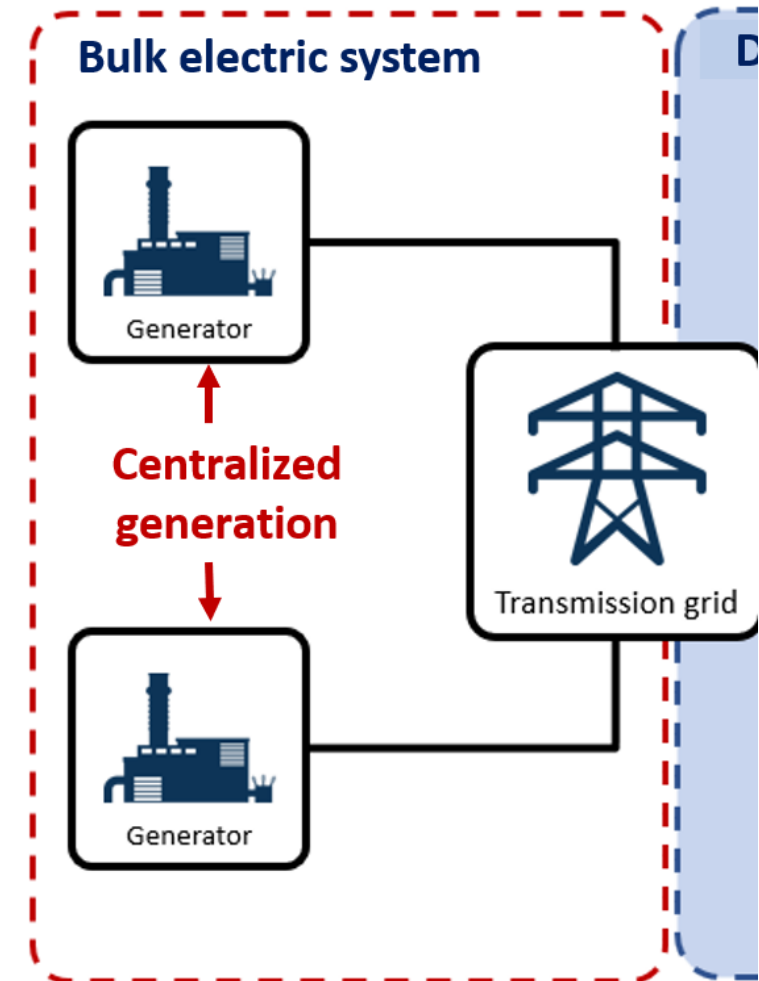


Mapping your way
through DG

Changing Energy Landscape

Traditional Centralised Energy

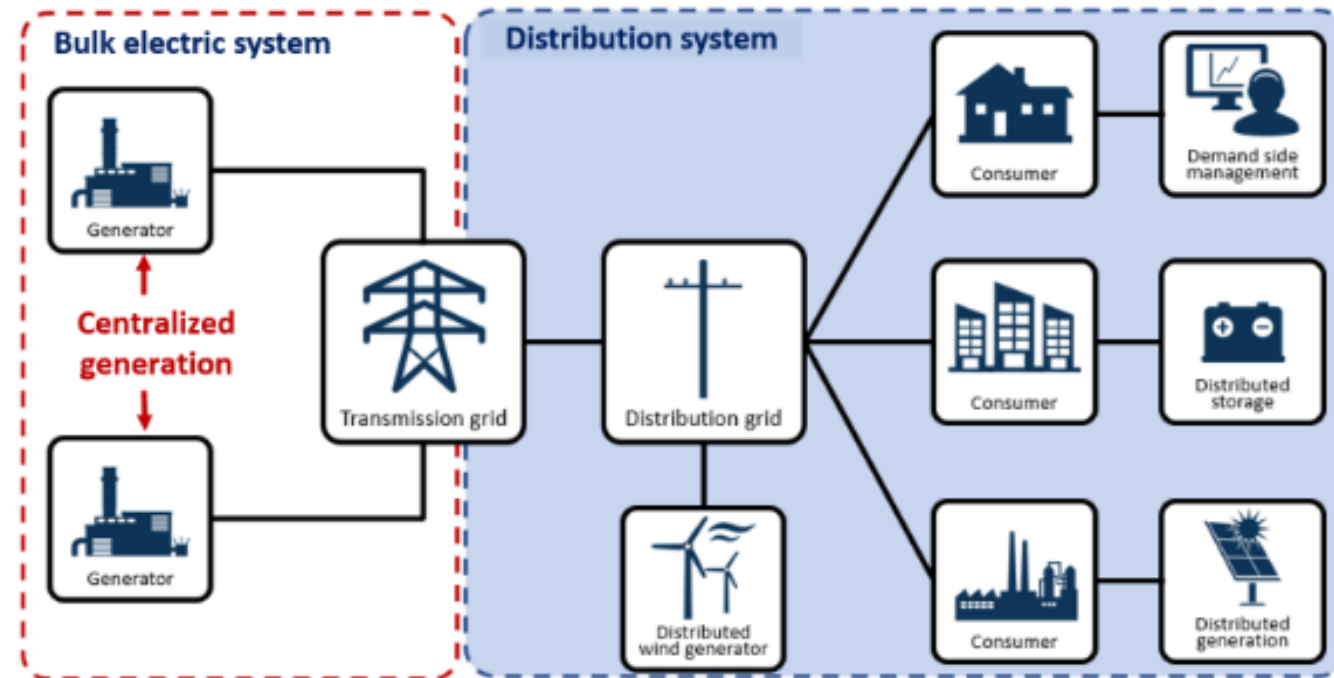
- Large power generation plants supplying multiple end-users.
- Carried over long-distance transmission lines.
- System is a unidirectional power flow



Changing Energy Landscape

Modern Decentralised Energy

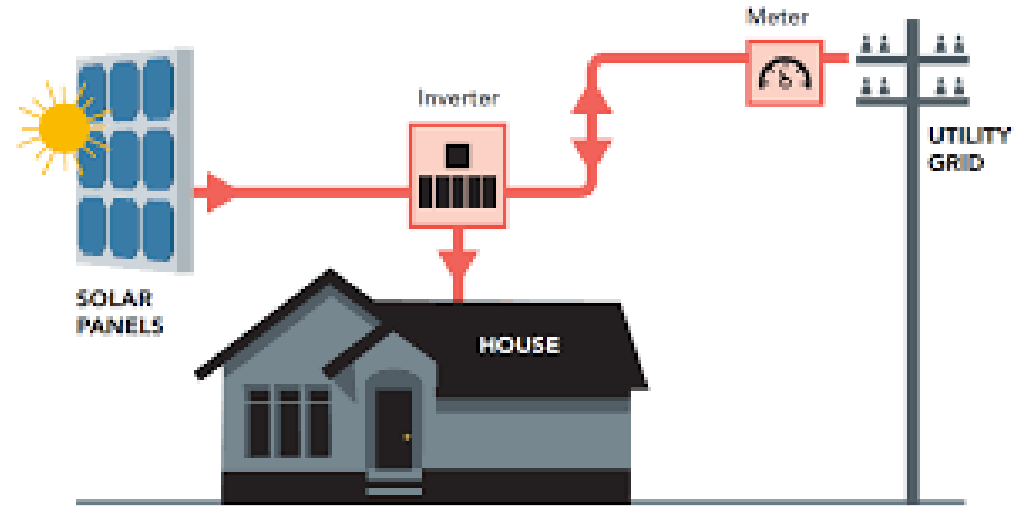
- Smaller-scale power generation units
- Connected at the network distribution level.
- Bidirectional power flow



Defining DG

Distributed Generation (DG)

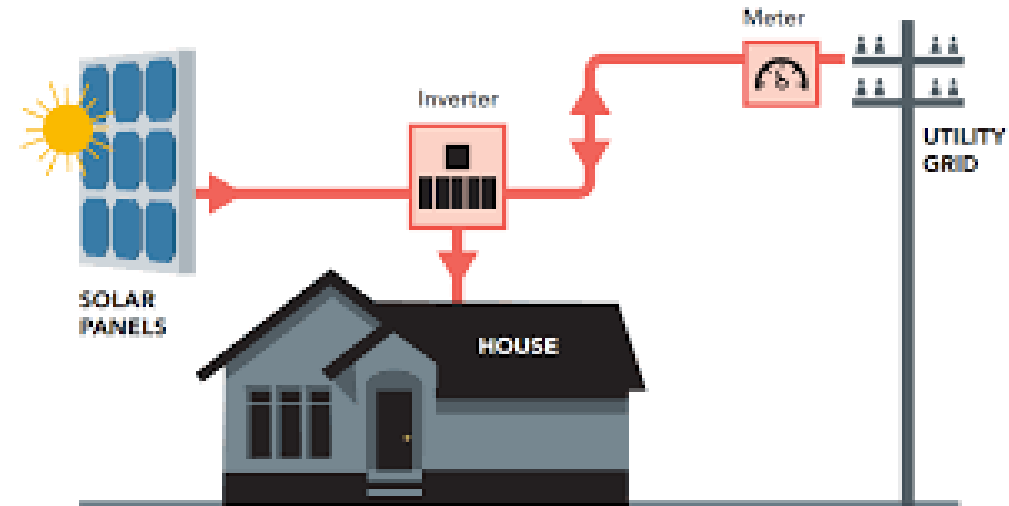
- Decentralised approach
- Power is produced at or near the consumption location
- System connected at distribution networks



Defining DG

Distributed Generation (DG)

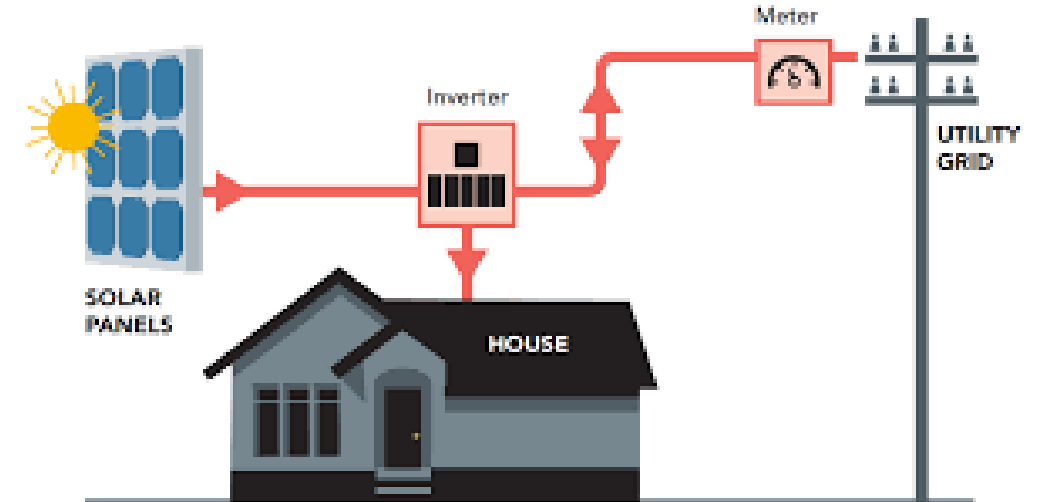
- Electricity generation from renewable sources, with or without storage.
- Connected to the **distribution grid**.
- **Self-consumption** and **may export surplus electricity** to the grid.
- Various consumer sites (residential, commercial, rural, public, industrial)



Defining DG

Distributed Generation (DG)

- Commonly referenced as:
 - Net metering
 - Onsite Generation (OSG)
 - Embedded Generation (EG)
 - Distributed Energy (DE)



Defining DG

Types of DG Systems



Solar photovoltaic (PV)



Wind Turbines



Microturbines



Combined Heat and
Power (CHP)



Natural-gas-Fired
Fuel Cells



Emergency Backup
Generators

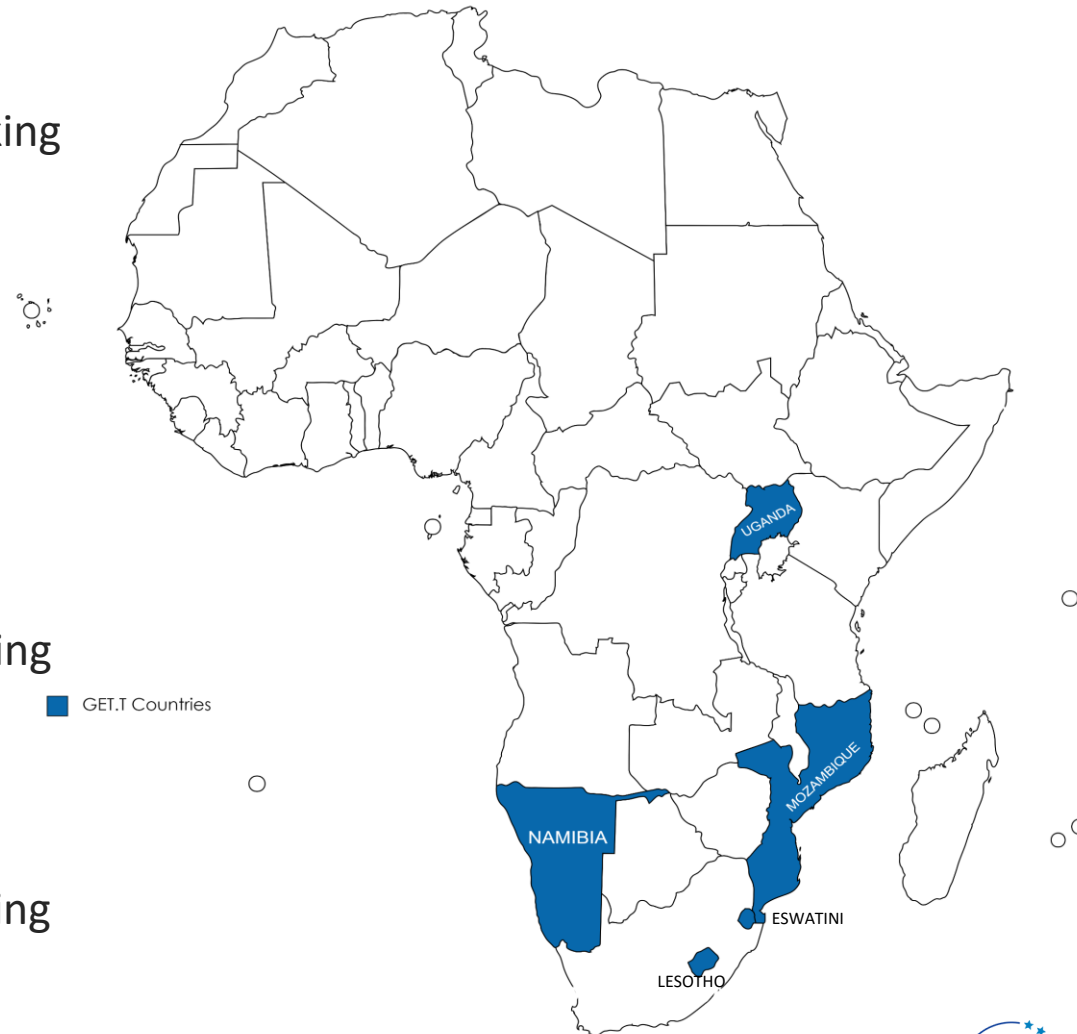
Solar PV is the most prevalent DG System.

The decreasing price of solar panels is among the contributing factors.



Case Studies

- **Globally:** DG installed capacity of **~770 GW**, making up **~45%** of global RE installed capacity
- **South Africa:** DG installed capacity of **~4.8 GW**, making up **~8%** of national installed capacity
- **Namibia:** DG installed capacity of **~70 MW**, making up **~11%** of national installed capacity
- **Eswatini:** DG installed capacity of **~22 MW**, making up **~9%** of national installed capacity



DG Driving Factors

Price

- Rising electricity prices

Unreliable grid power

- Potential for power outages

Environment

- Awareness of the need to reduce greenhouse gasses

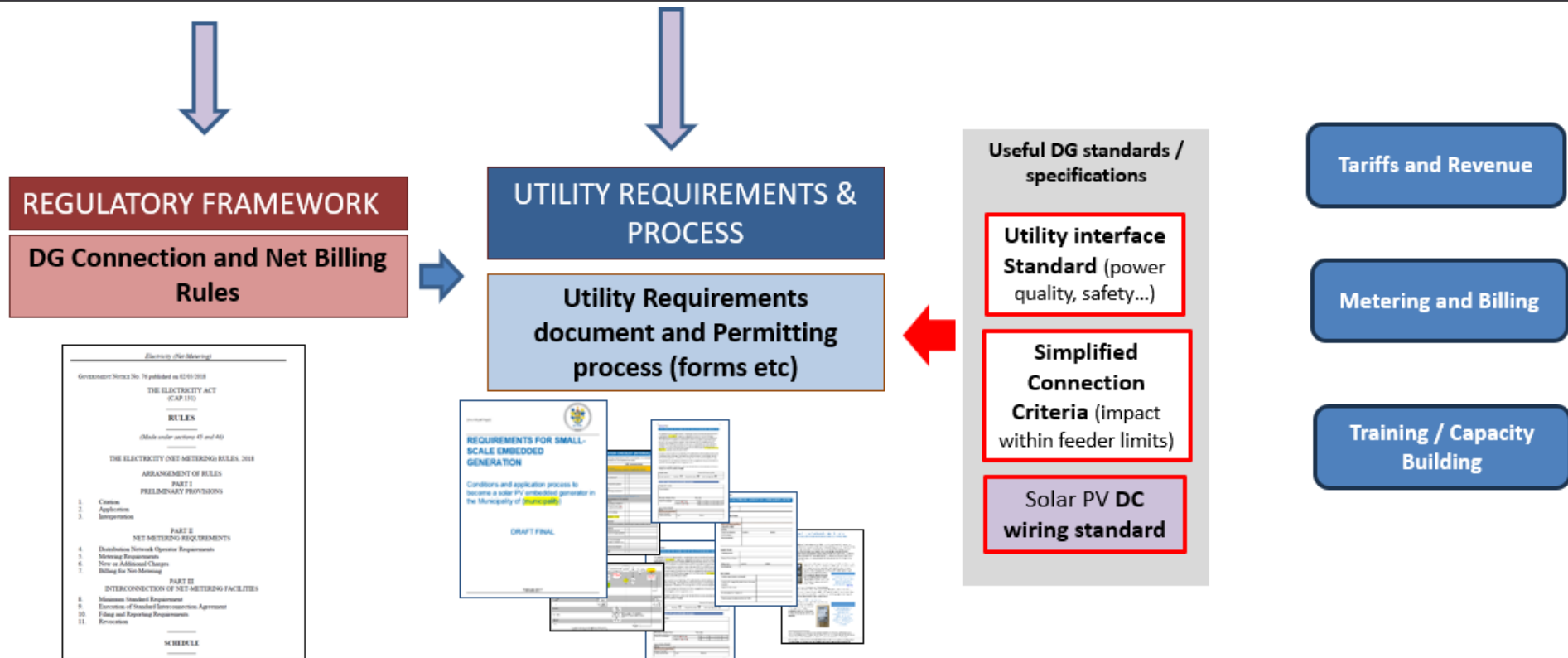
Cost of DG

- Decreasing DG technology costs

Mapping your way through DG

Hi-level Enabling Environment:

Electricity Act, Electricity Regulation Act, Policies, Renewable Strategies, Masterplans, IRPs etc





Summary

- There is a rapid uptake of DG which is driven by various factors including grid instability and price reduction in solar PV technology.
- Nations need relevant legislation to enable DG
- www.dg-africa.net



Thank you for your attention.

Oratiloë Sathekge
Sustainable Energy Africa
oratiloë@sustainable.org.za