




# **MINI-GRIDS ENVIRONMENT IN TANZANIA**

**PRESENTATION TO THE PROJECT STEERING  
COMMITTEE OF THE AFUR  
MAINSTREAMING MINI-GRID TARIFFS**

**26<sup>th</sup> August 2021**



- BACKGROUND**
- INTRODUCTION**
- THE CURRENT MINI-GRID ENVIRONMENT IN TANZANIA**
- MINI-GRID TARIFF MODELS / TOOLS**
- CHALLENGES FACING MINI-GRIDS**

## ***Legislation Mandate for Tariff Setting for the mini-Grid***

- The Energy Policy, 2015 promotes private sector participation;
- The Electricity Act (Cap.131) mandate the Authority to regulate tariff;
- The Energy and Water Utilities Regulatory Authority Act (Cap.414) mandate the Authority to determine rates and charges for regulated goods and services;

- Tanzania, like many other African countries, is endowed with vast energy resources and yet, majority, particularly in rural areas, are not connected to clean energy sources.
- According to the REA, access to electricity is
  - Tanzania Mainland – 78.4%
    - Urban – 99.6%
    - Rural – 69.8%
- Households Connected to Electricity:
  - Tanzania Mainland – 37.7%
    - Urban – 73.2%
    - Rural – 24.5%

- Traditionally, TANESCO was responsible for electricity generation, transmission, distribution and supply;
- In 2008 EWURA approved Small Power Projects Framework – **light-handed regulatory approach**;
- In Tanzania, mini-grids can be grouped into two:
  - Small Power Producers (SPPs)
    - Connected to the main / mini-grid of DNO
    - Sell directly to final customers;
  - Very Small Power Producers (VSPPs) – produce and sell directly to final customers.

# **THE CURRENT MINI-GRID ENVIRONMENT IN TANZANIA**

- Regulatory tools consist of the following:
  - Acts: Cap. 414 and Cap. 131;
  - Energy Policy of 2015;
  - Standardised Power Purchase Agreements (SPPAs) – for grid and isolated grids;
  - Standardised Tariff Methodologies (STMs)–for grid and isolated grids;
  - Tariff Model for VSPPs;
  - The Electricity (Development of Small Power Projects) Rules, 2020;
  - Procedures for Grid Interconnection of SPPs in Tanzania.

# STATUS OF PROJECTS

## Status of SPPs

Status of Projects	Number of Projects	Total Capacity (MW)
Signed SPPa and operational	9	26.6
Signed SPPA but not operational	6	19.2
Expected to sign SPPa	7	10.4

## Operational SPPs

S/N	Name of SPP	Technology	Capacity
1	Andoya	Mini-hydro	1.0
2	Mwenga	Mini-hydro	4.0
3	Matembwe	Mini-hydro	0.4
4	Yovi	Mini-hydro	1.0
5	Tulila	Mini-hydro	5.0
6	Darakuta	Mini-hydro	0.3
7	Luponde	Mini-hydro	0.9
8	TPC Ltd	Biomass	9.0
9	Kigoma solar	Solar	5.0
Total Capacity			26.6



- Very Small Power Producers (VSPPs) – produce and sell electricity directly to final customers.
- As of July 2021, a total of 122 VSPPs have been registered:
  - Generation: 63 projects
  - Distribution: 59 Projects
- Some are operational and others are at different stages of development;

# MINI-GRID TARIFF MODELS

- EWURA uses an excel based tariff model to determine for SPPs and VSPPs.
- Under SPPs, there are 4 cases

	Connected to Main Grid	Connected to Mini-Grid
Selling Wholesale to DNO	Case 1	Case 2
Selling retail (directly to final customers)	Case 3	Case 4

**Case 1 – Tariff is based on main grid avoided cost of the DNO**

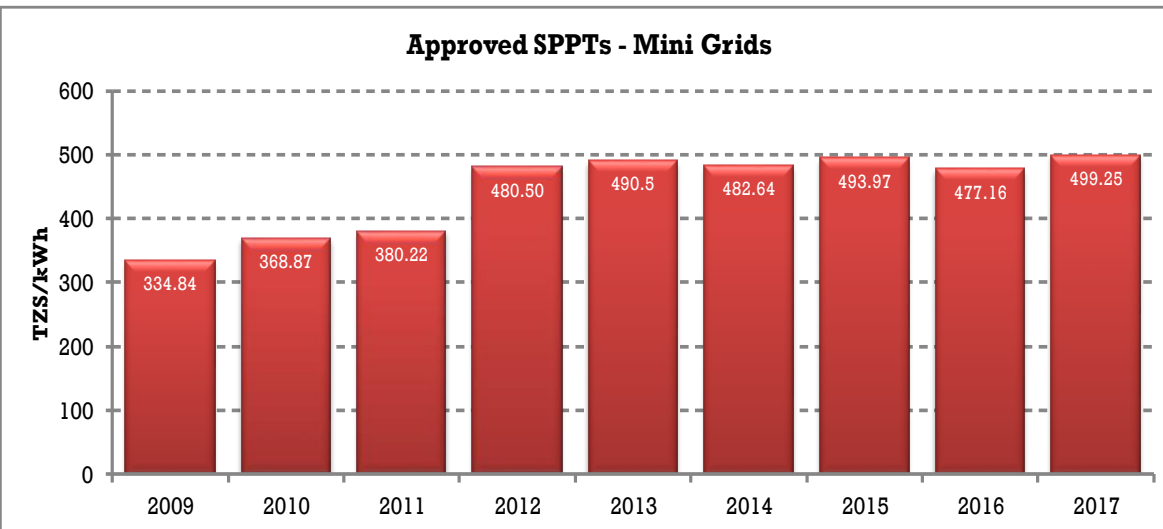
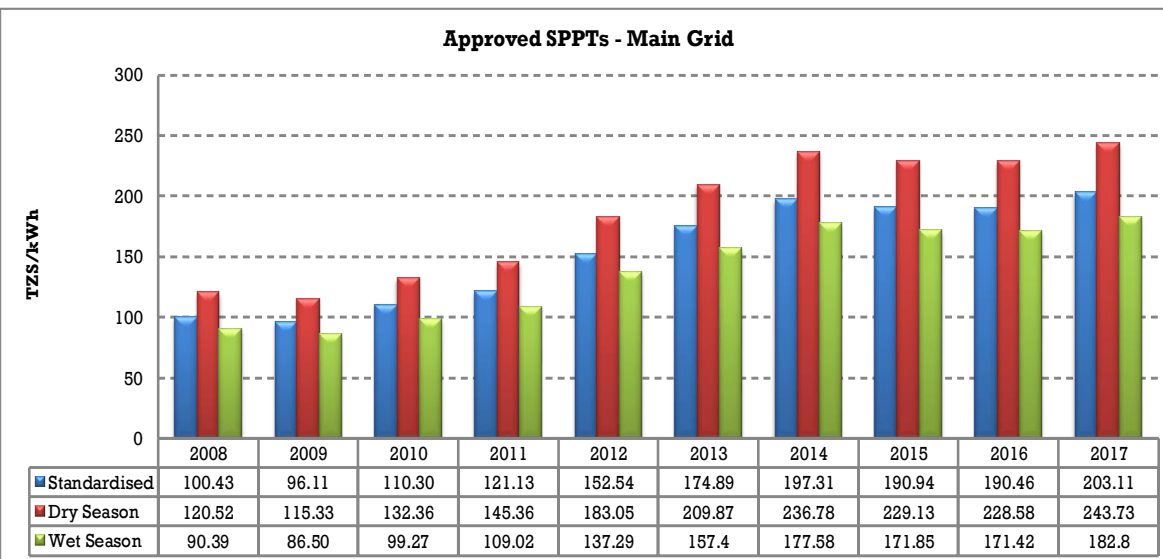
**Case 2 – Tariff is based on mini-grid avoided cost of the DNO**

**Case 3 and 4 – The developer must submit to EWURA an application for a cost-based tariff**

# Approved Tariffs – First Generation

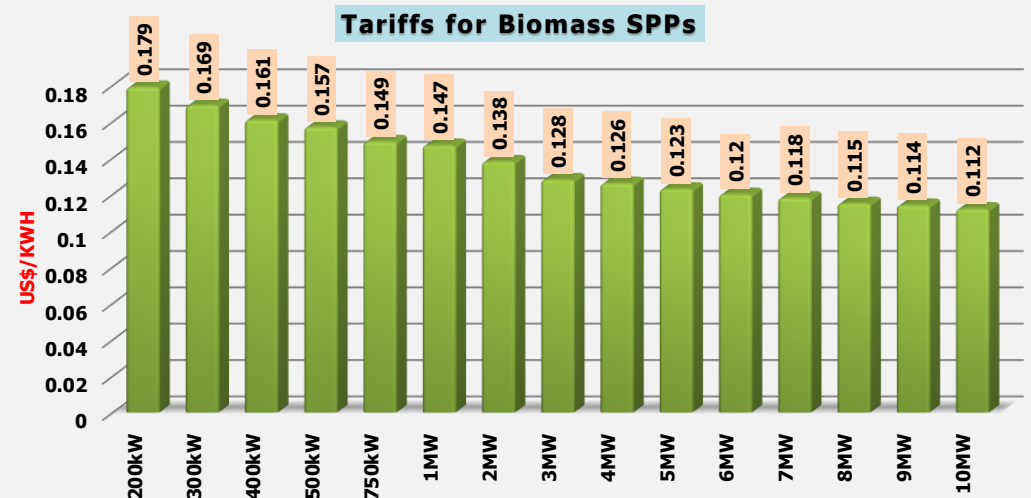
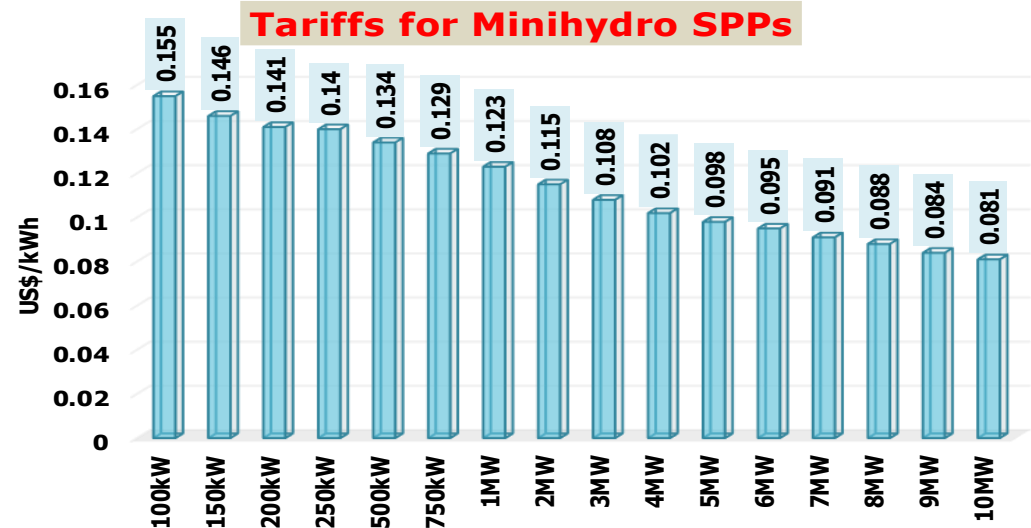
## First Generation SPPs:

Tariffs for grid and mini-grid connected SPPs are based on avoided cost of the DNO



# Approved Tariffs – Second Generation

From April 2015 EWURA introduced technology specific tariffs for mini-hydro and biomass.



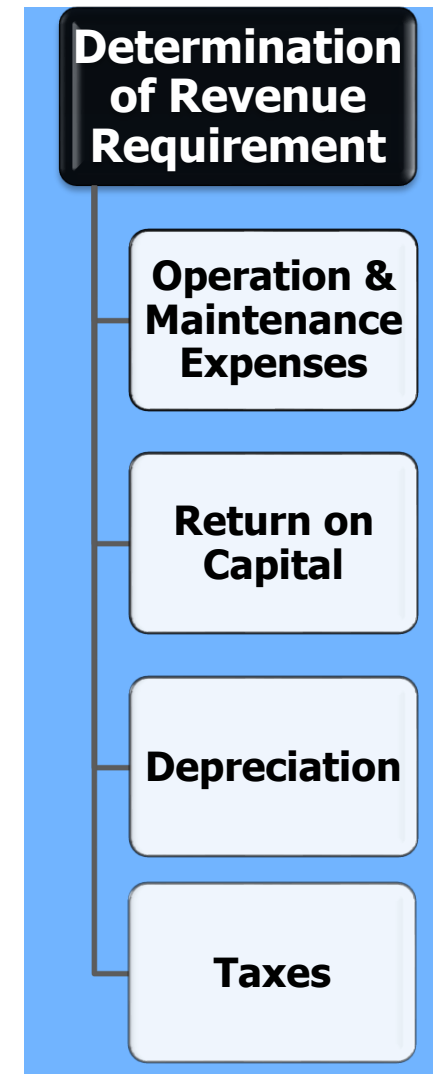
# Approved Tariffs – Second Generation

<b>Description</b>	<b>Approved Tariff (US\$/kWh)</b>
Standardized Small Power Purchase Tariff for Solar and Wind projects of up to 1MW connected to the Main Grid	<b>0.165</b>
Standardized Small Power Purchase Tariff for Solar and Wind projects of up to 1MW connected to the Mini Grid	<b>0.181</b>

Tariffs for wind and solar projects with capacity above 1 MW will be determined by **competitive bidding mechanism**.

# THE VSPPs MODEL

- The model is flexible:
  - Considers different scenarios;
  - Ability to adapt to different mini-grid structures, locations and policy environments;
- The VSPP RR building blocks:
  - Operating costs;
  - Return **on** capital ( $WACC \times RAB$ );
  - Return **of** capital (depreciation);
  - Taxes – pre-tax WACC.



# KEY ASSUMPTIONS FOR VSPPs

Item	Value
<b>Installed Capacity</b>	Energy produced shall not be more than the energy required to meet the demand for four years
<b>Depreciation</b>	Straight line method
<b>Return on Equity</b>	18.5%
<b>Debt to Equity</b>	70:30
<b>Interest rate</b>	Not more than 9%
<b>OPEX</b>	Not more than 8% of CAPEX
<b>Capacity factor</b>	
<b>Micro / Mini-hydro</b>	not less than 55%
<b>Biomass</b>	not less than 85%
<b>Solar</b>	not less than 23%
<b>Wind</b>	not less than 25%
<b>Thermal</b>	not less than 95%
<b>Capacity degradation</b>	0.5%



# CHALLENGES

# CHALLENGES

- VSPPs developers have complained about the non-cost reflective tariffs – government policy for uniform tariff in the country.
- Tariff affordability:
  - Cost reflective tariffs are high in rural areas due to low demand/consumption (low economies of scale);
  - Low income - most customers in rural areas have seasonal income mostly during the post harvest periods.

# CHALLENGES

- Unfavorable financing terms / options:
  - Financing terms are stringent
  - Limited financing options for small players in the industry – due to low tariffs
- Lack of capital – equity injection is a problem to most developers;



**THANK YOU**

