

***Towards a Light Handed Regulatory System  
for Promoting Grid and Off Grid Small  
Power Producers (SPP):  
An Update on the Tanzania SPP program***

**AFTEG and the African Electrification Initiative (AEI)**

Room J 4-044

*World Bank*

*Washington, D.C.*

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*Anastas Mbawala, Director Electricity, Energy and Water Utilities Regulatory Authority  
(EWURA), Tanzania*

*Chris Greacen, Consultant, AFTEG, World Bank*

# Outline

- Small Power Producer (SPP)– project examples
- Overview of Tanzania SPP regulations
  - Tanzania Legislative Framework
  - Goals, definitions
  - Table of SPP documents
  - Tariffs for different SPP cases
    - Main grid, mini grid, wholesale and retail sales
  - Required permissions and approvals, procedures for application; process rules
- Current situation: challenges and successes
  - PPAs, generators in the pipeline
  - Challenges
  - Thai/Tanzania technical assistance

# Pilot Sisal Biogas Plant 150 kW– HALE -TANGA - TANZANIA



# Processing of Sisal Leaves



**Production of 1 ton of dry fibre generates about 24 tons of sisal waste**







# Micro hydropower



- 40 kW
- Mae Kam Pong, Chiang Mai, Thailand

# Rice husk-fired power plant

- 9.8 MW
- Roi Et, Thailand





# Biomass (wood chips)

A large pile of wood chips is shown under a covered structure, likely a storage or processing area. The structure has a curved, translucent roof supported by green metal poles. In the background, there are trees and a building. Several people are visible near a yellow tractor or similar machinery on the right side of the image.

- 1 MW
- Landhanavi, Sri Lanka
- Wood is grown specifically for electricity production



# Wind





# Solar Photovoltaic (PV)

- 1 MW
- Chachensao, Thailand





# Tanzania SPP Legislative Framework

- National Energy Policy, 2003
- Rural electrification policy statement
- Energy and Water Utilities Regulatory Authority Act
  - Establishing EWURA
- Rural Energy Act (2005)
  - Establishing REA & REF
- The Electricity Act, 2008

# Legislative Framework, cont

## ❖ Energy Policy Statement No. 36

- ❑ *Establish norms, codes of practice, guidelines and standards for renewable energy technologies, to facilitate the creation of an enabling environment for sustainable development of renewable energy sources*



# Legislative Framework, cont

The Electricity Act (2008) provides for SPPA and SPPT

## ❖ Definitions

❑ *Standardized Small Power Purchase Agreement (SPPA): Means agreement between utility entity and a developer entered for purposes of selling power to the grid not exceeding 10 MW but not less than 100 kW.*

❑ *Standardized Small Power Purchase Tariff (SPPT): Means the tariff agreed on in the SPPA*

❖ License exemption for projects less than 1 MW (generation or distribution)

# A goal: Light-handed regulation

1. Minimize amount of information that is required.
2. Minimize the number of separate regulatory requirements and decisions.
3. Use standardized documents, and make use of documents used by other agencies, to the maximum extent possible (reduce need for case-by-case negotiation)



# Table of SPP documents

	Main grid	Mini-grid
Process Guidelines (roadmap)	✓ <i>Guidelines for Developers of Small Power Projects (SPP) in Tanzania</i>	
Process rules	◇ <i>Rules for Developers of Small Power Projects (SPP) in Tanzania</i>	
Interconnection Guidelines	✓ <i>Guidelines for Grid Interconnection of Small Power Projects in Tanzania (Parts A, B, C)</i>	
Interconnection rules	◇ <i>Guidelines for Grid Interconnection of Small Power Projects</i>	
Standardized PPA	✓ <i>Standardized Power Purchase Agreement for Purchase of <b>Grid-Connected</b> Capacity and Associated Electric Energy Between Buyer and a Small Power Project</i>	✓ <i>Standardized Power Purchase Agreement for Purchase of <b>Off-Grid</b> Capacity and Associated Electric Energy Between Buyer and a Small Power Project</i>
Tariff methodology	✓ <i>Standardized Tariff Methodology for the sale of Electricity to the Main Grid in Tanzania Under the Standardized Small Power Purchase Agreements.</i>	✓ <i>Standardized Tariff Methodology for the Sale of Electricity to the Mini-grids Under the Standardized Small Power Purchase Agreements</i>
Tariff calculations for year 2009	✓ <i>Detailed Tariff Calculations under the SPPA for the Main Grid for year 2010</i>	✓ <i>Detailed Tariff Calculations under the SPPA for the Mini-grids for year 2010</i>

✓ = Approved and available at: [www.ewura.go.tz/sppselectricity.html](http://www.ewura.go.tz/sppselectricity.html)

◇ = Awaiting final approval and gazetting (public consultation completed)

# Tariffs determined by SPP type

	<b>Connected to main grid</b>	<b>Connected to isolated mini-grid</b>
<b>Selling wholesale (to DNO*)</b>	Case 1	Case 2
<b>Selling retail (directly to final customers)</b>	Case 3	Case 4

\* DNO: Distribution Network Operator (currently TANESCO)

# Tariff Case 1: Selling Wholesale to Main grid

$$C_{case1} = \frac{C_{lrmc} + C_{srmc}}{2}$$

Where  $C_{lrmc}$  is the long run marginal cost as defined by Tanesco’s long-term power plan; and  $C_{srmc}$  is the budgeted cost of thermal generation in the next year.

**Note: the actual calculations are somewhat more complicated, taking into account:**

- **Transmission losses**
- **Seasonality**
- **Price floor & cap**

They are available in: *Standardized Tariff Methodology Under the Standardized Small Power Purchase Agreements* available from EWURA. Order 08-015 on Dec 30.2008

Tariff – case 1: Main Grid	Tariff 2009 (TZS/kWh)	Tariff 2010 (TZS/kWh)
Annual Average	85.49	110.30
Dry season (Aug – Nov)	102.58	132.36
Wet season (Jan-Jul and Dec)	75.94	99.27

Note: \$1 US = 1497 TZS (November 2010)



# Tariff Case 2: selling wholesale to a mini-grid

$$C_{case2} = \frac{C_{LmrcGrid} + C_{AveMini}}{2}$$

Mini-grid SPP receives the average of Tanesco’s main grid and mini-grid avoided costs.

$C_{LmrcGrid}$  = long run marginal cost for grid-power (adjusted for losses)

$C_{AveMini}$  = average incremental cost of mini-grid power (levelized cost of electricity from a new mini-grid diesel generator).

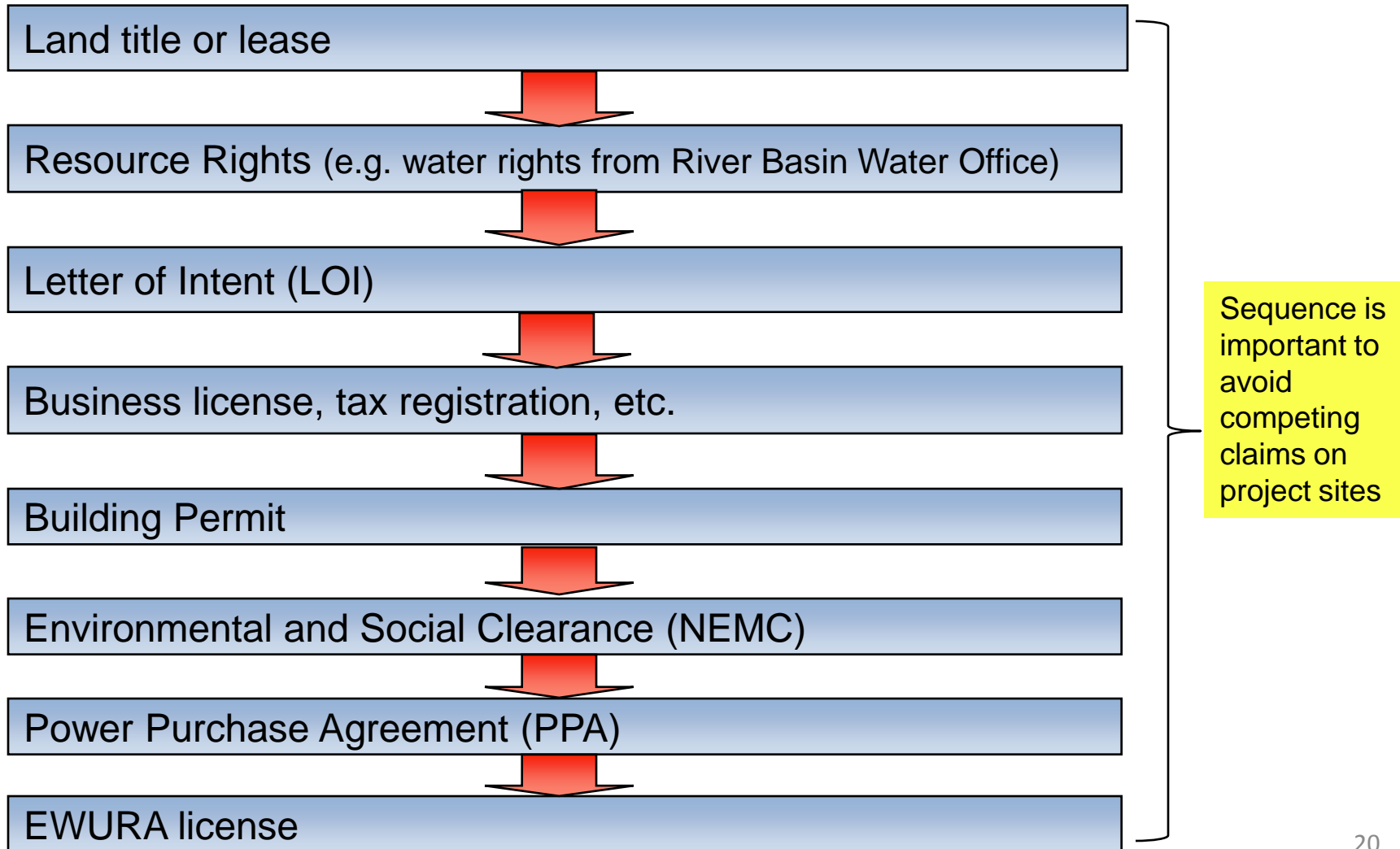
Tariff – case 2 (2009)	Tariff 2009 (TZS/kWh)	Tariff 2010 (TZS/kWh)
Tariff (no seasonal variations)	334.83	368.87

Note: \$1 US = 1497 TZS (November 2010)

## Tariff Cases 3 (isolated) and 4 (main grid): selling at retail to end use customers

- Tariff is proposed by SPP generator, subject to EWURA review
  - Less oversight demanded in cases in which community is in agreement with proposed tariff
  - Where possible, EWURA draws on financial analysis submitted to REA for rural electrification subsidy

# Necessary permits, clearances and procedures for application





# Where we are now...

- Completed
  - All documents passed public review and most are approved for use.
  - Several PPAs signed with TANESCO and licenses applied

# SPPs In Operation

<b>Project</b>	<b>MW</b>	<b>Type of Resource</b>	<b>Status</b>
ACRA Tanzania	0.3	Hydro	In Operation / Community based
TANWAT	2.34	Biomass -wood	Selling 1 MW (2010)
TPC Co-Generation	15	Bagasse	Selling 10 MWe to TANESCO (2010)
Katani Power Plant	0.3	Biomass - Waste	Operation - Pilot

# SPPs in Preparation

Project	MW	Type of Resource	Status
Sao Hill Energy	15	Biomass - wood	Applied Licence
Chipole – Own use & sell to the grid	0.4	Hydro	In operation – additional 3MW planned
Mwenga	3.36	Hydro	PPA Signed with TANESCO
Ngombeni Mafia	1.4	Biomass	PPA Signed with TANESCO. Under construction
Kilombero Sugar Co.	10.6	Bagasse	Applied Licence
Tanzania Sisal Board	0.5	Biogas	Applied License
Kitonga Mini Hydro	10	Hydro	Applied License
Andoya Hydro Electric Co.	0.5	Hydro	Business plan
Kilocha Hydro	12	Hydro	In discussion with REA
Kilombero Mngeta	3	Hydro	In discussion with REA

# Where we are now...

- Completed
  - All documents passed public review and most are approved for use.
  - Several PPAs signed with TANESCO and licenses applied
- **Ongoing**
  - **TANESCO in process of establishing SPP cell**



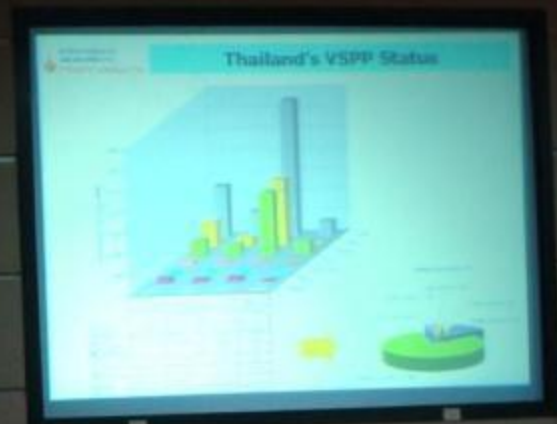
# South-south policy/technology transfer:

*Technical Visits of Delegations  
from the Tanzania to Sri Lanka and Thailand*











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# Where we are now...

- Completed
  - All documents passed public review and most are approved for use.
  - Several PPAs signed with TANESCO and licenses applied
- Ongoing
  - TANESCO in process of establishing SPP cell
  - SPP Working Group composition and function
  - Discussions between EWURA and REA on how to coordinate better, done, but may be refined further.
  - Determine tariff review methodology for projects selling electricity at retail



# 5. Challenges / Opportunities



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## Challenge

- ❑ Inadequate financial resources to support the initiative
- ❑ Inadequate private sector participation in investment
- ❑ High interest rates loans from commercial banks
- ❑ Land ownership and water rights for SPPs projects especially wind farms & mini-hydro plants
- ❑ Low Tariff and non-cost reflective

## Response

- ❑ WB has established a facility, engage interest of other financial institutions
- ❑ Conducive Environment, rules and publicize
- ❑ Promote other sources mix grant and loans
- ❑ Include land ownership & water rights in RE Policy
- ❑ Adapt policy in future?

# Challenges .....cont. 2

## Challenge

- ❑ Lack of experience of key project promoters with skills in project management
- ❑ Lack of Renewable Energy Policy
- ❑ Lack of interest on the part of potential Off-takers (TANESCO)

## Response

- ❑ Capacity building (REA)
- ❑ Government needs to set policy targets, etc.
- ❑ Improving through regular discussions with utility



# Reflections

- ❑ Renewable Small Power Projects can enhance efforts towards electrification of Rural areas
- ❑ Though generally expensive SPPs can be developed much faster hence increase capacity
- ❑ Private investments can be quickly organised and also benefit local entrepreneurs
- ❑ Light handed regulation will reduce regulatory burden hence benefit both investors and the country
- ❑ Good Policy, Cost reflective Tariff and well designed FiT can attract foreign and local investors

# Thank you

For more information, please contact

[mbawala@ewura.go.tz](mailto:mbawala@ewura.go.tz)

[chrisgreacen@gmail.com](mailto:chrisgreacen@gmail.com)

SPP regulations available at:

[www.ewura.go.tz/sppselectricity.html](http://www.ewura.go.tz/sppselectricity.html)



# *What are the Guidelines for Developers of Small Power Projects in Tanzania?*

- Audiences: **SPP developers**, EWURA, Tanesco, REA, bankers...
- Purpose: Guide to steps necessary to acquire necessary permits and clearances to develop and operate a SPP
  - Selling electricity to the DNO (Tanesco) main grid
  - Selling to an isolated mini-grid and/or
  - Selling directly to retail customers (main grid-connected & isolated SPPs)
- Guidelines: roadmap to rules. There will be a separate 'rules' document.

# Contents of *Guidelines for Developers of Small Power Projects in Tanzania*

1.	Introduction.....	3
A.	Tariff for Electricity Sold to the Main Grid (Case 1).....	5
B.	Tariff for Electricity Sold to Isolated Mini-grids (Case 2).....	6
C.	Electricity Sold to Retail Customers (Cases 3 and 4).....	6
2.	Necessary Permits and Licenses and Procedures for Application.....	8
A.	<u>Land Title Deed or Lease</u> .....	9
B.	<u>Document demonstrating rights to resource (if applicable)</u> .....	10
C.	<u>Letter of Intent (LOI)</u> .....	10
D.	<u>Business Registration, License, Tax Payer ID, VAT certificate</u> .....	13
E.	<u>Building permit</u> .....	13
F.	<u>Environmental and social clearance</u> .....	14
G.	<u>Power Purchase Agreement (PPA)</u> .....	15
H.	<u>EWURA license</u> .....	17
	Appendix 1: Template -- Request for Letter of Intent to Interconnect an Embedded Generator to the DNO.....	18
	Appendix 2: Template for Letter of Intent.....	19
	Appendix 3: Information to be Exchanged between DNO and Generator.....	22
	Appendix 4: Application for Interconnection and Sale of Electricity.....	25
	Appendix 5: Interconnection Certificate Template.....	27
	Appendix 6: Registration Form for SPP facility less than 1 MW in generation capacity.....	28
	Appendix 7: Application form for EWURA license for grid-interconnected SPP greater than 1 MW in installed capacity.....	30
	Appendix 8: Form for annual reporting SPP Reporting to EWURA.....	34
	Appendix 9: Guidelines for Tariff Applications for Electricity Sold by SPPs Directly to Retail Customers.....	36

# Definitions

- **DNO:** the licensee responsible for the operation of a distribution network in Tanzania. (Currently Tanesco)
- **SPP:** a power plant using a renewable energy source or waste heat, or cogeneration of heat and electricity, with an export capacity of up to ten (10) MW
- **Embedded Generator:** a single generator or a group of generating plant of total export capacity between 100 kW and 10 MW, connected to a Distribution Network in Tanzania, at 33 kV or below.

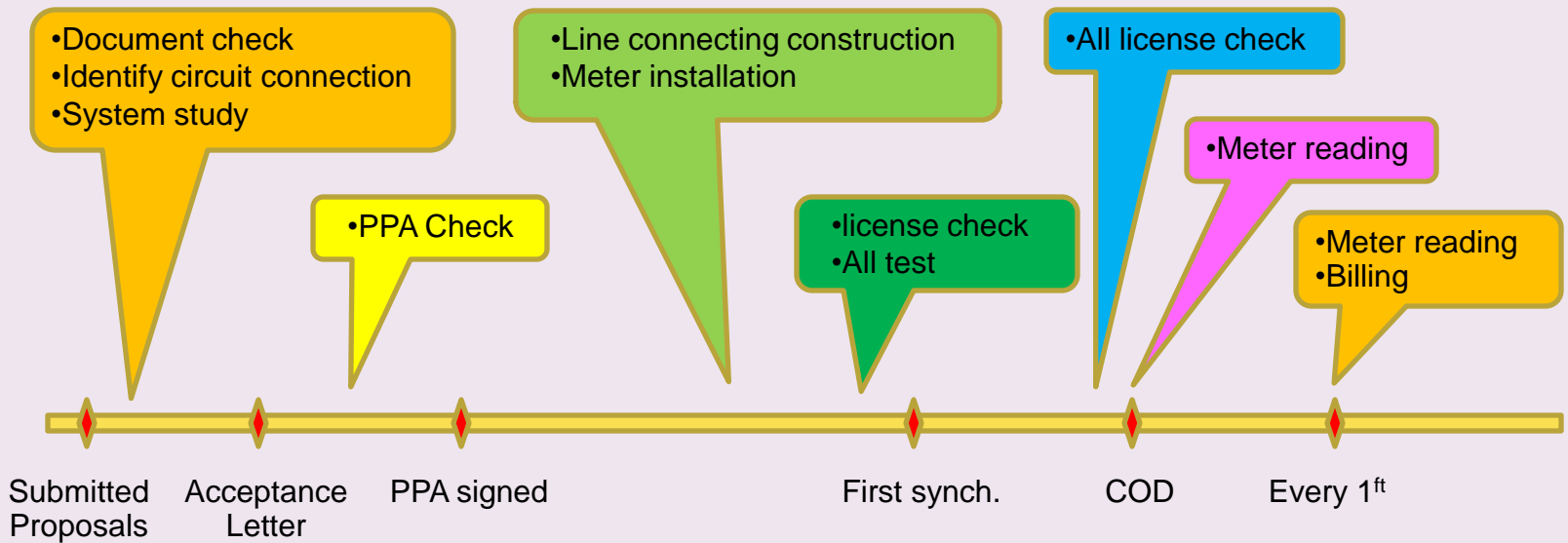


# Proposed rules regarding LOI process: response times, cost estimates

- ***Acknowledgement of receipt:*** *The rules require that within seven days of receiving the LOI request, the DNO will acknowledge receipt of the request.*
- ***Notice of decision:*** *Within 30 days of receiving the complete LOI request, the DNO will send the project developer notice of its decision.*
- ***Reasons for disapproval by DNO stated:*** *If DNO disapproves of the project, the reasons for disapproval must be clearly stated in writing.*
- ***Reservation of Network Capacity:*** *The LOI in the case of sites operating on hydroelectric or wind power, or any other primary source of energy which is site-specific by way of its availability, will also imply the exclusivity of the interconnection to the Developer, within the period of validity of the LOI.*
- ***Estimate of interconnection costs:*** *Within 30 days of sending the LOI, the DNO shall send the Seller a rough initial estimate of the interconnection costs.*



# VSPP project sequence

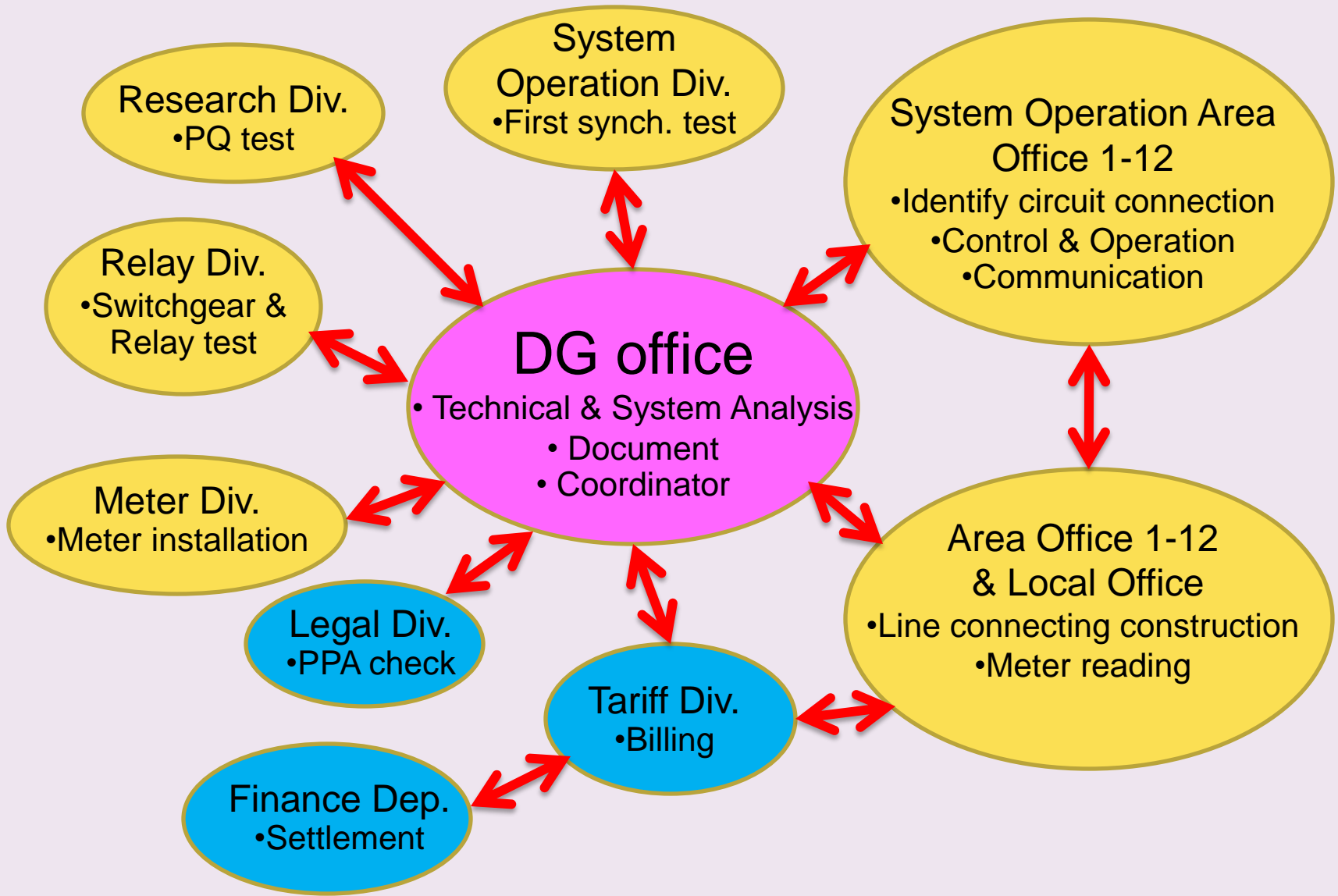


VSPP will get first settlement within 3 month after COD.



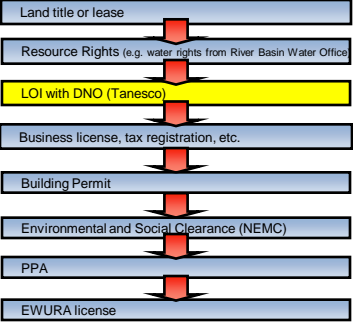
# Coordination among PEA divisions

การไฟฟ้าส่วนภูมิภาค  
PROVINCIAL ELECTRICITY AUTHORITY



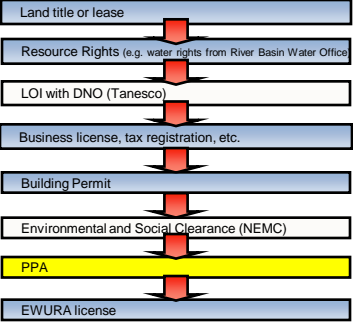
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# LOI request to TANESCO

1. Name and Address
2. Locations
3. Fuel type (hydro, biomass, wind, gas, etc.)
4. Power capacity (MW), planned power export (MW), annual energy generation (GWh).
5. Copy of deed of title or lease agreement
6. Rights to resource



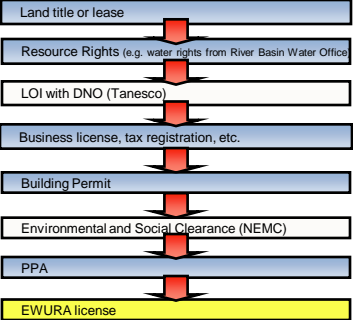
# Standardized Power Purchase Agreement (PPA)

- To initiate the PPA agreement process, the Seller completes and submits to TANESCO an “Application for Interconnection and Sale of Electricity”
  - technical engineering information (one-line diagrams, specifications of key equipment) that DNO needs in order to determine if the proposed project is in compliance with the *Interconnection Rules and Guidelines*



# Granting/rejecting a PPA based solely on technical considerations

- *The rules specify that the DNO's decision to sign or reject the standardized PPA is based solely on its evaluation of whether the design of the Seller's facility is in compliance with the "Guide for Grid Interconnection of Embedded Generators to the Main Grid and Isolated Mini-Grids in Tanzania".*



# EWURA license

- SPPs up to 1 MW are exempt from EWURA's licensure requirements
  - Must submit completed registration form
    - Location, business registration, capacity of facility, GWh/yr, date of planned construction
- Non-exempt (>1 MW)
  - Submit license application
    - Same as registration, plus
      - Section on managerial competence
      - Feasibility study
      - Business plan
      - Permits and clearances (NEMC, water rights, etc.)
  - Where possible, EWURA draws on financial analysis submitted to REA for rural electrification subsidy