



Energy Status - Tanzania.

Greenhouse Gas Reduction and
Energy Transformation –
HRC – Hangzough, China 2017

Presentation by
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Areas covered in the presentation

- **Introduction**
- **Tanzania in Brief**
- **Energy Status**
- **Renewable Energies**
- **Policies on Green Energy**
- **The Country in Pictures**
- **Conclusion**

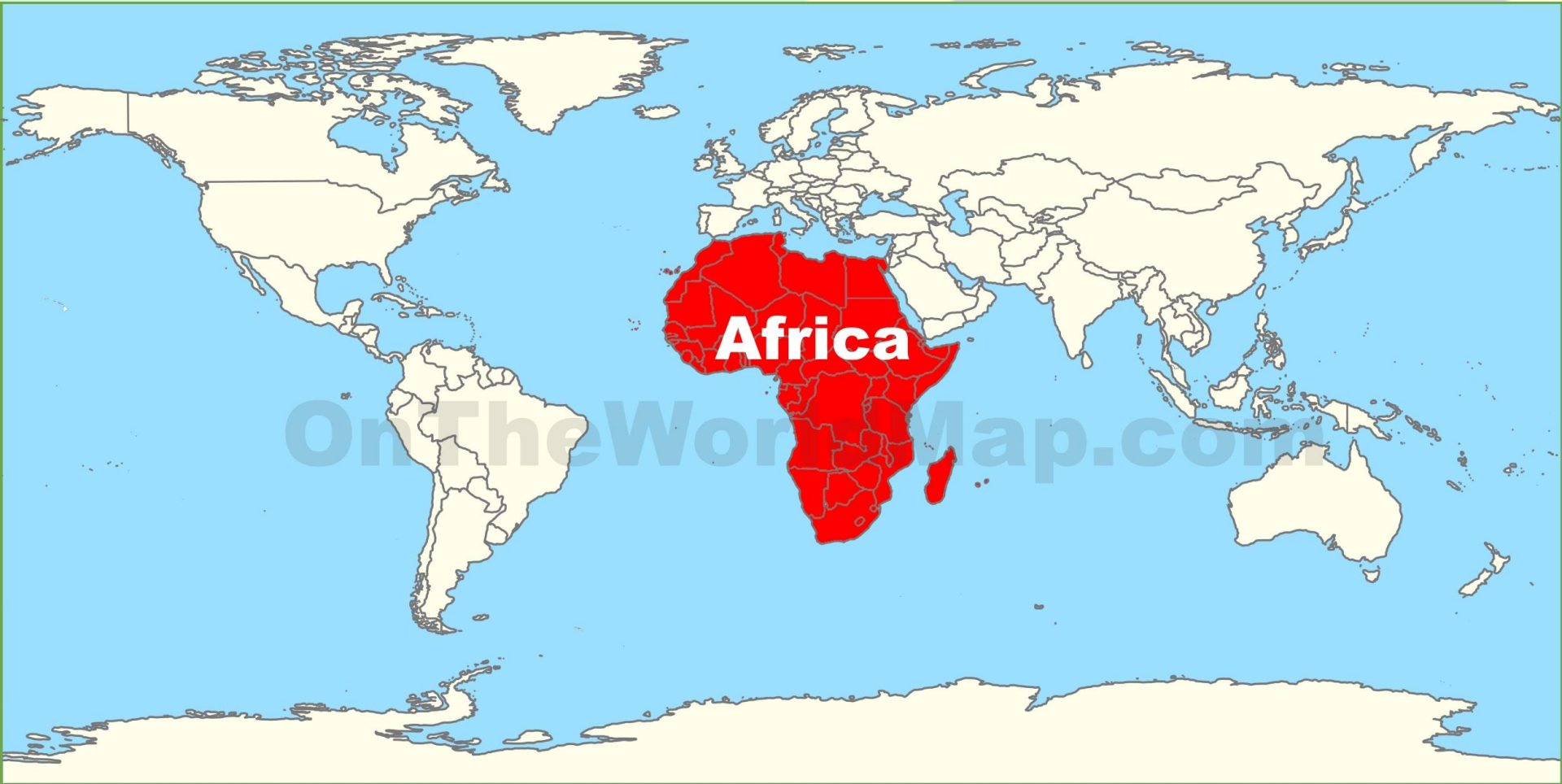


Introduction

- The global greenhouse gases concern in Tanzania is as else where globally.
- There is more to learn from others, especially the likes of China.
- There are more than 660 million people with no access to electricity in Africa.
- Energy poverty has to be addressed hand in hand with economic poverty.
- Together we can make a difference!

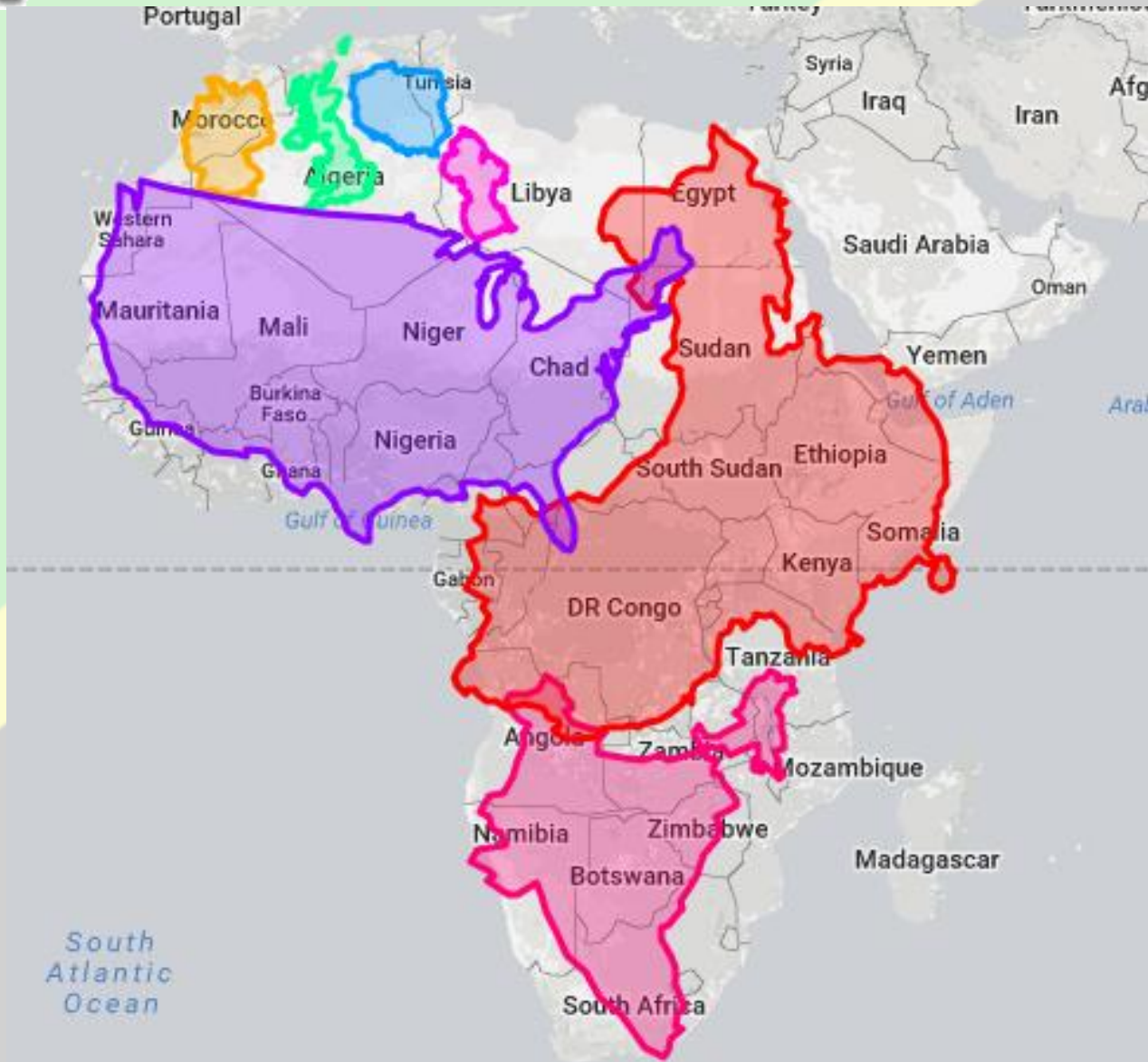


Introduction





Introduction





Introduction





Introduction





Tanzania in Brief

- Tanzania with an area of about 947,303 km²
- Population of over 54 million people
- Tanzania is essentially a tropical country.
- It lies between latitudes 1° and 12° South and longitudes 29° and 41° East.
- Tanzania's GDP Growth was is around 7% for the last 10 years.



Tanzania in Brief





Tanzania in Brief



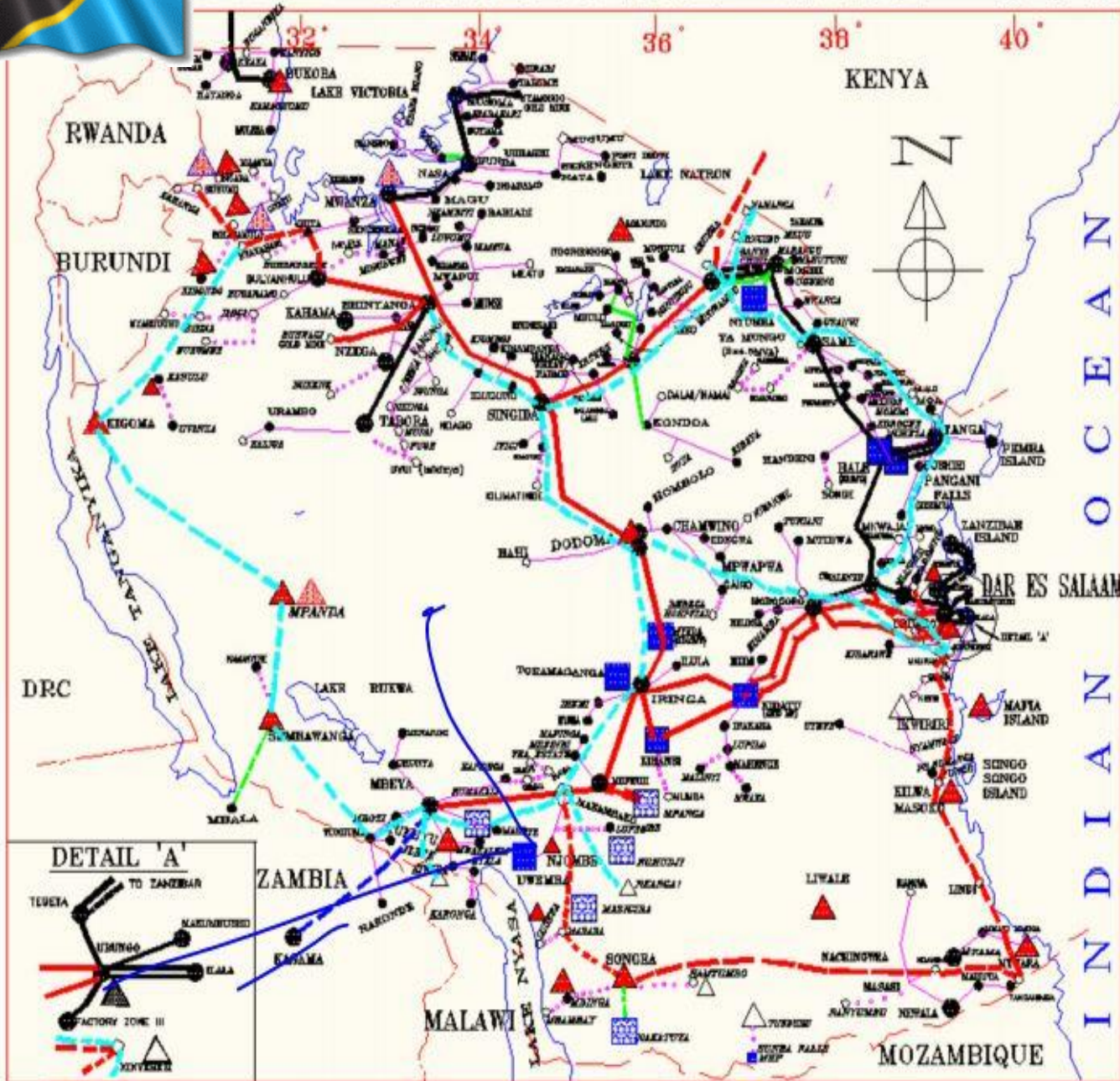


Energy Status

- **TANESCO fully owns Generation, Transmission and Distribution**
- **The transmission system comprise:**
 - **220 kV - 18 lines (2,732 km)**
 - **132 kV – 16 lines (1,543 km)**
 - **66 kV – 5 lines (544 km).**
- **TANESCO imports power from:**
 - **Uganda via 132 kV, (8MW)**
 - **Zambia through 66 kV, (5MW)**



THE NATIONAL GRID SYSTEM



LEGEND

POWER STATIONS

EXISTING	UNDER CONSTRUCTION	PROPOSED	
			HYDRO
			THERMAL
			SUBSTATION

TRANSMISSION LINES

EXISTING	UNDER CONSTRUCTION	KV
		400
		330
		230
		138
		66
		33

TRANSMISSION LINE UNDER CONSTRUCTION

- 400KV - IDINGA - MBERA - DODOMA - SENGIDA - MBINTANGA
- 400KV - SENGIDA - NAMANGA
- 330KV - NTAZANGA - KIGOMA - MPANDA - PUMBATANGA - MBERA
- 138KV KIVUNGI - NAIRO

PREPARED BY: TANESCO

DETAIL 'A'





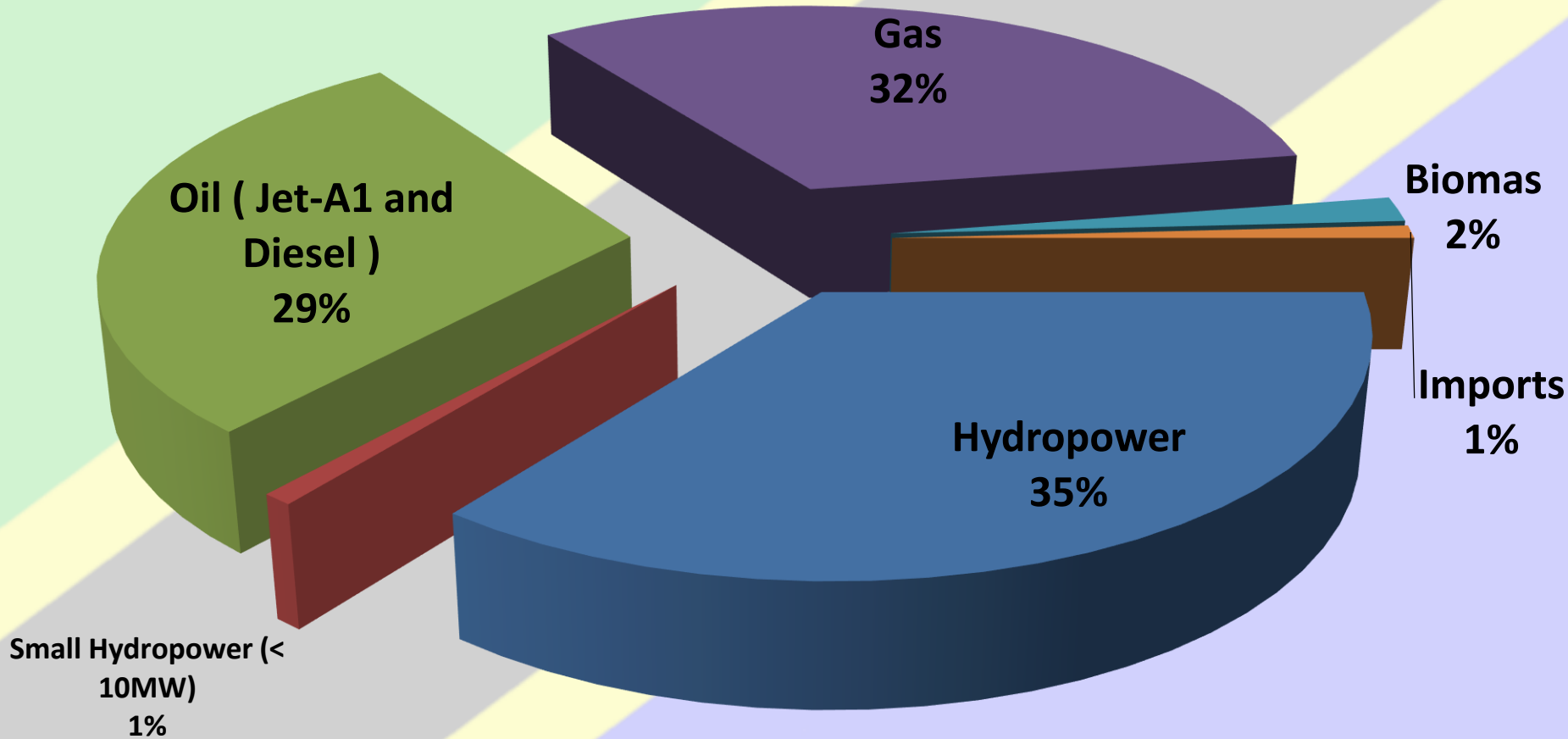
Energy Status

Tanzania's electricity installed capacity on the main grid is around 1,540 MW

- **Hydropower 37%**
- **Thermal 62%**
- **RE Sources and others (Solar, SHP, Sugar & Wood, paper processing Plants) < 1%**
- **Capacity Requirement to meet peak demand in 2020 is 3500 MW**
- **Annual increment of 700MW**



Energy Status





Energy Status

- **Independent Power Producers (IPPs)**
- **Emergency Power Providers (EPPs)**
- **Small Power Producers (SPPs)**
- **Currently, IPPs contribute about 40 % of the national grid's effective generating capacity.**



Energy Status

Table 1. Power Generation Capacity - March 2013.

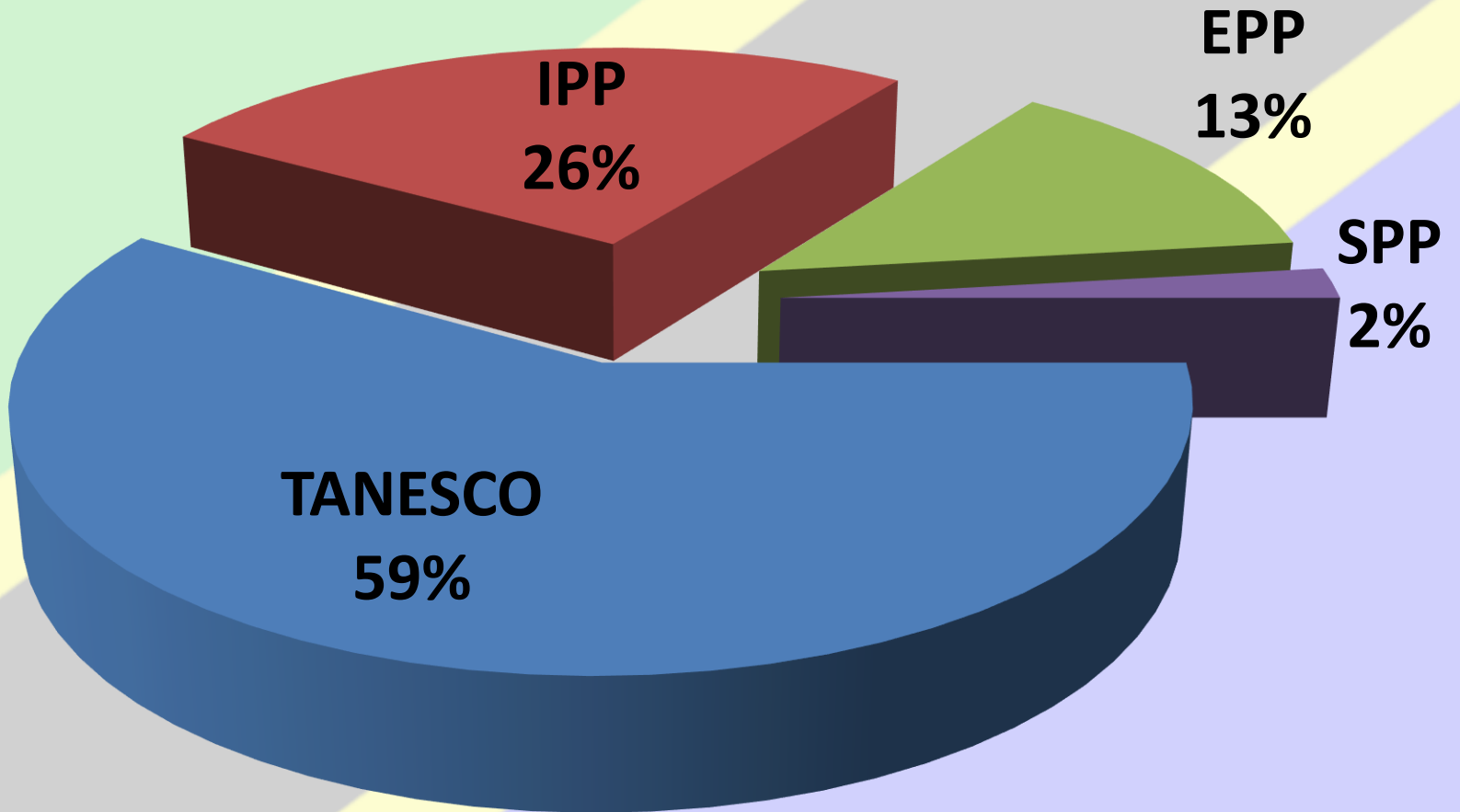
Source	TANESCO	IPP	EPP	SPP	Total	Percent
Hydropower	553.0	-	-	-	553.0	35
Small hydro (< 10 MW)	8.8	-	-	4.0	12.8	0.8
Oil (Jet-A1 and diesel)	88.3	163.0	205.0	-	456.3	29
Gas	252.0	249.0	-	-	501.0	32
Biomass	-	-	-	27.0	27.0	1.7
Imports	14.0	-	-	-	14.0	0.9
Total	916	412	205	31	1,564.1	100
Percent	59	26	13	2	100	

Source: TANESCO 2013.

Note: IPP = Independent Power Producer, EPP = Emergency Power Producer, SPP = Small Power Producer.

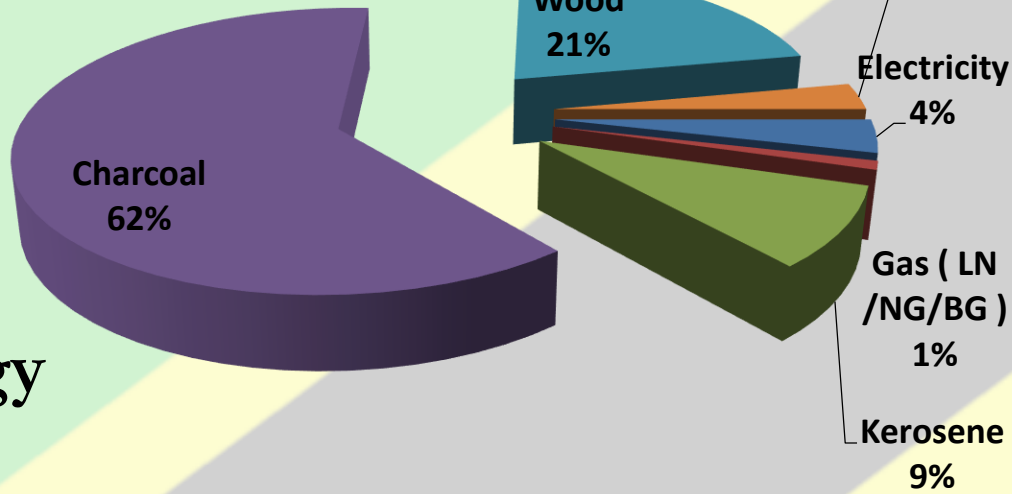


Energy Status



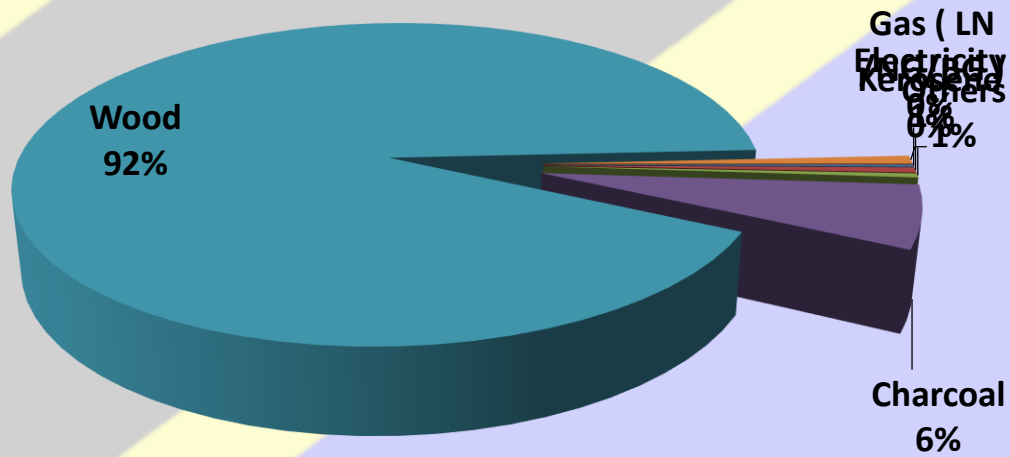


URBAN



Cooking Energy

RURAL





In Tanzania four different price levels exist:

- **Domestic Low Usage Tariff (DI)**: 230V supply with consumption less than 50 kWh per month, is subsidized and includes services
- **General Usage Tariff (T1)**: 230V or 400V supply with consumption above 283kWh
- **Low Voltage Usage Tariff (T2)**: 400V supply with consumption above 7,500 kWh, but less than 500 KVA
- **High Voltage Usage Tariff (T3)**: consumers using 11kV and above.
- The average tariff is 12.6USc/kWh



Cooking Energy

Challenges:

- **Weak Governance and weak law enforcements :**
Access to wood is free
- **Inefficient production and utilization technology**
- **Informal sector and is unregulated**
- **Health and Environmental Impacts**



Renewable Energy

Small Hydro Power

- SPPA signed for four mini hydropower projects- 20.5 MW
- Letters of intent signed for six small hydro projects with a combined capacity of 29.9 MW.
- MEM is conducting small hydro feasibility studies in eight regions: Morogoro, Iringa, Njombe, Mbeya, Ruvuma, Rukwa, Katavi and Kagera.
- Development partners are supporting several mini-micro grid projects throughout the country.



Renewable Energy

Solar PV

- **Solar Insolation: 4-7 kWh/m²/day**
- **Off-grid solar photovoltaic : 5 MWp (megawatt peak)**
- **The potential for grid-tied solar PV : about 800 MW**
- **Off-Grid containerised Solar PV systems.**
- **Roof top installation coming soon (FiT and Net-metering is on final stages for implementation)**



Renewable Energy

Wind Energy

- Singida and Makambako have been identified as having adequate wind speeds for grid-scale electricity generation, 9.9m/s and 8.9m/s respectively, at 30m height.
- Interested Developers : Four companies in different stages of Wind Project development, but only 10MW is expected to be connected to grid soon.
- These companies are considering investments in wind farms in the 50–100 MW range.



Renewable Energy

Geothermal

- **Potential: 650 MW**
- **There are 3 Geothermal sites are grouped into three main prospect zones**
- **Surface Exploration of Ngozi –Sogwe prospect in Mbeya region**
- **Sub-surface exploration / drilling : not yet**



Renewable Energy

Biomass

- Sugar bagasse (1.5 million MTPY);
- Sisal (0.2 MTPY);
- Coffee husk (0.1 MTPY);
- Rice husk (0.2 MTPY);
- Municipal solid waste (4.7 MTPY); and
- Forest residue (1.1 MTPY).



Renewable Energy Challenges

- **Lack of reliable data on Renewable Energy Sources.**
- **Shortage of technical competence on Renewable Energy technologies, application and project sustainability.**
- **High initial costs of Renewable Energy technologies and long time ROI.**
- **Lack of mechanism to implement the environmental protection and renewable energy initiative policies.**



Renewable Energy Challenges

- Transmission lines increases costs very much as the generation plants are very far from the distribution point and houses are very scattered at distribution points.
- The Government priority is “big” power generation plants and grid extension than distributed grid and off-grid projects.



Energy, Climate Change and Environmental Protection Policies

- **National Environmental Policy, 1997.**
- **National Land Policy, Ministry of Lands and Human Settlements Development, 1997**
- **National Biodiversity Strategy and Action Plan – 2001**
- **The Environmental Impact Assessment and Audit Regulations – 2005**
- **National Environmental Action Plan (2012 -2017)**
- **The Tanzania Development Vision 2025**



Energy, Climate Change and Environmental Protection Policies

- **National Energy Policy 2003.**
- **The Environmental Management Act, 2004;**
- **Rural Energy Act 2005.**
- **Energy and Water Utilities Authority Act 2001 and 2006**
- **Electricity Act 2008.**



SAVANNAH





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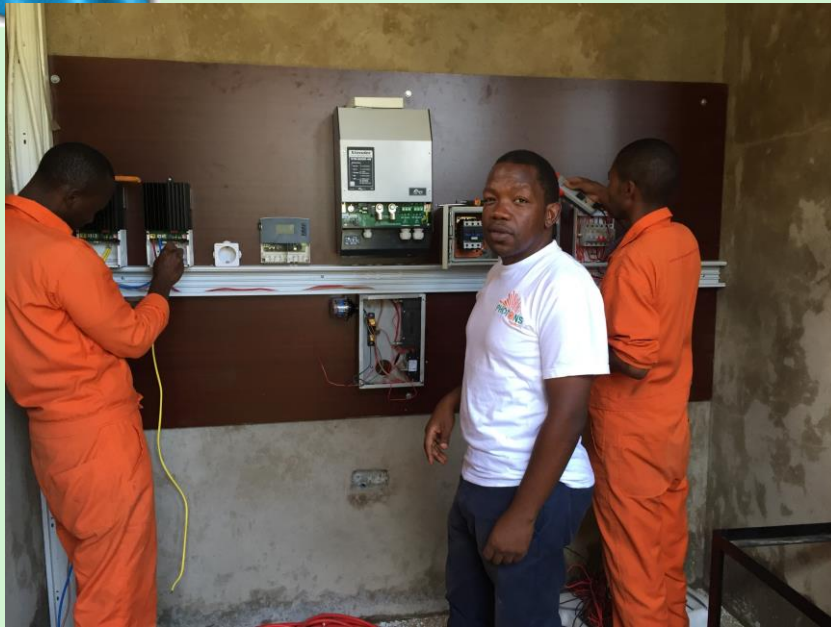








Solar PV Power – Arusha City - Tanzania





Thank You!!!

**You are most welcomed to
Tanzania!**