

CURRENT STATUS OF ENERGY SECTOR IN TANZANIA

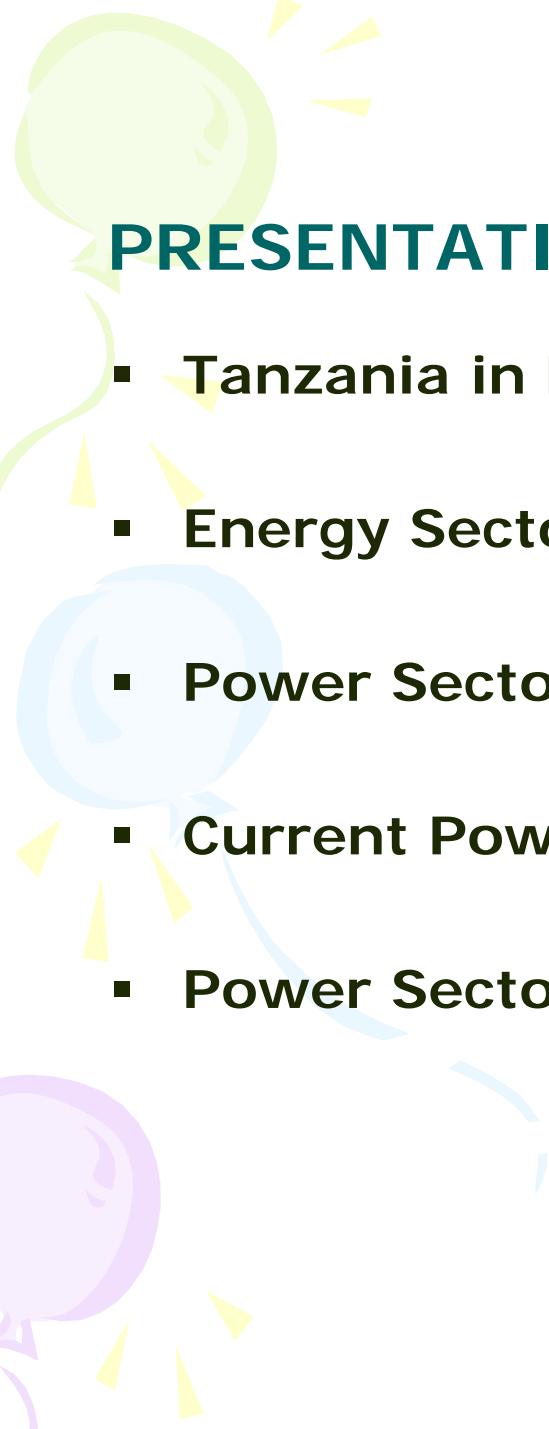


EXECUTIVE EXCHANGE ON DEVELOPING AN
ANCILLARY SERVICE MARKET

USEA – WASHINGTON DC

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TANZANIA**



PRESENTATION OUTLINE

- **Tanzania in Brief**
- **Energy Sector Overview**
- **Power Sector Overview**
- **Current Power Situation**
- **Power Sector Challenges and Strategies**



Tanzania in Brief

History

A union between Tanganyika and Zanzibar

It has 29 administrative regions, 24 in the mainland and 5 in Zanzibar Island

Location

South of Equator 02 00 S - 06 00 S and East of Greenwich 30 00 E - 35 00 E

Neighbouring countries

North: Kenya and Uganda

West: Rwanda, Burundi and Democratic Republic of Congo (Zaire)

South: Zambia, Malawi and Mozambique

East: Indian Ocean

Total area 945,000 sq.km

land area 883,000 sq. km. (93.4%)

and water 62,000 sq. km. (6.6%)

Population 44,929,002 people (Preliminary results of National Population & Housing Census -October 2012)

THE MAP OF AFRICA



Tanzania Map



Tanzania Energy Sector Overview

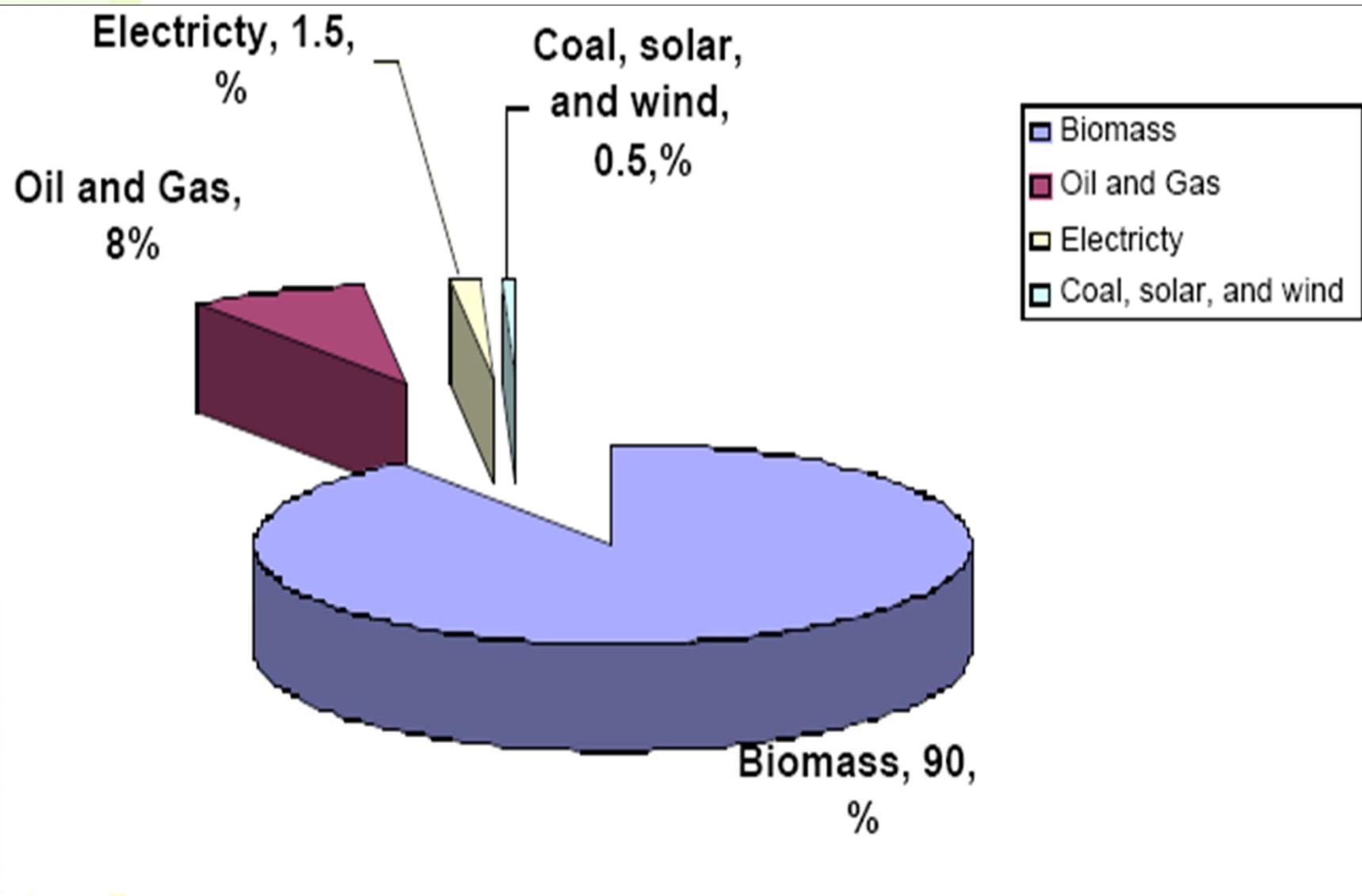
Tanzania is gifted with diverse energy sources most of which are untapped, these include biomass, hydro, uranium, natural gas, coal, geothermal, solar and wind.

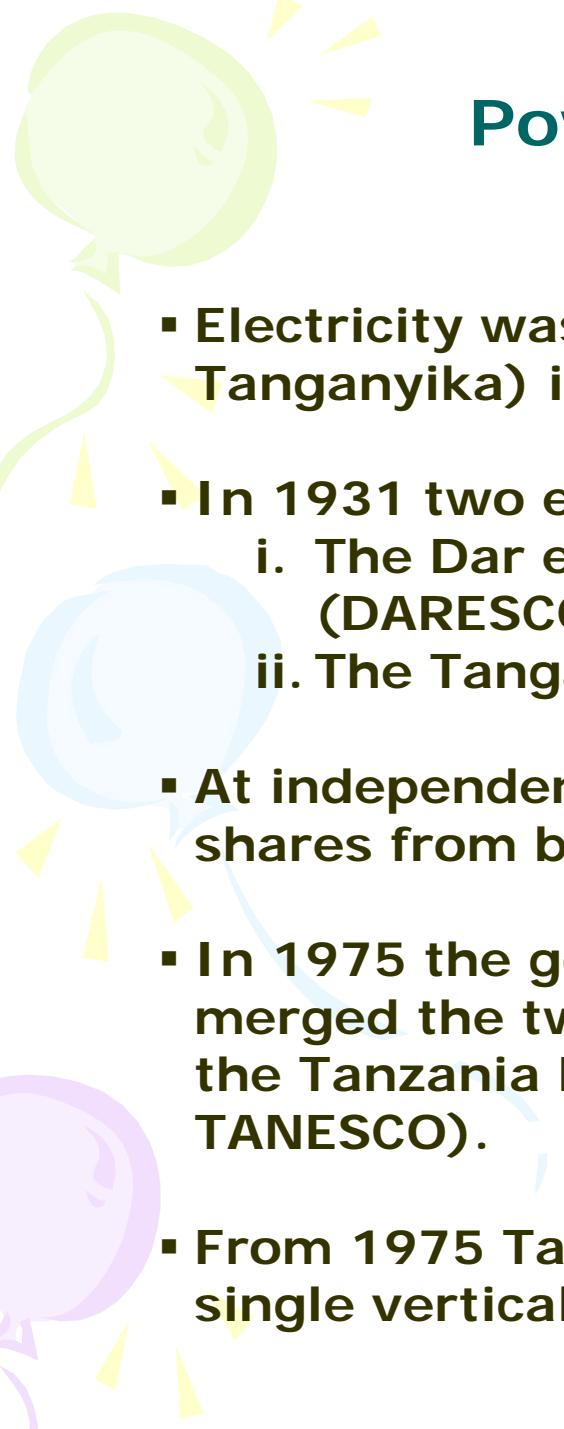
The primary energy supply includes *biomass (90%); petroleum products (8%); electricity (1.5%)*, and the remaining (0.5%) is contributed by coal and other renewable energy sources.

More than 80% of energy delivered from biomass is consumed in rural areas; heavy dependence on biomass as the main energy source contributes to deforestation, while the importation of oil costs about 25% to 35% of the nation's foreign currency earnings.

To-date only about 18.4% of the country's population has gained access to electricity. Extending the National Grid to many parts of the country including rural areas is not financially and economically feasible.

Energy Sector in Tanzania

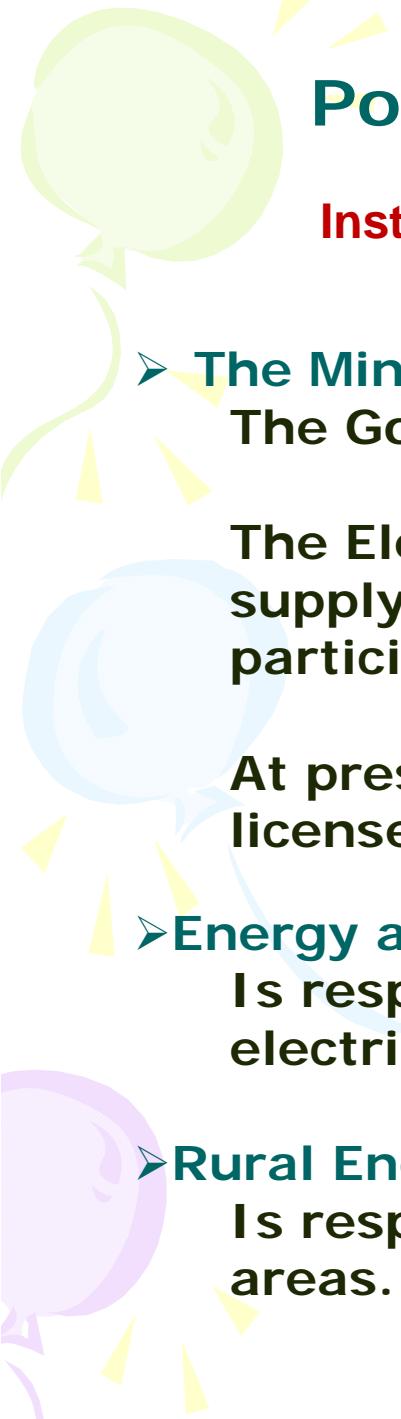




Power Sector Overview - 1

Power- sector reform

- Electricity was first introduced in Tanzania (then Tanganyika) in 1908 by colonial authorities.
- In 1931 two electric companies were established:
 - i. The Dar es Salaam and District Electric Supply Company (DARESCO)
 - ii. The Tanganyika Electric Supply Company (TANESCO)
- At independence (1961) the government acquired some shares from both of the utilities
- In 1975 the government acquired all shares of all and merged the two utilities to form a state owned utility called the Tanzania Electric Supply Company Ltd (also known as TANESCO).
- From 1975 Tanzania's power sector was dominated by a single vertically integrated national utility, TANESCO



Power Sector Overview - 2

Institutional Set-up and Actors in the Energy Sector

- **The Ministry of Energy and Minerals (MEM)**

The Government through MEM formulates energy policy.

The Electricity Act focuses on restructuring the electricity supply industry - attracting private sector and other participation thus bringing the end of TANESCO monopoly.

At present the electricity sector's act provides separate licenses for generation, transmission and distribution

- **Energy and Water Utility Regulatory Authority (EWURA)**

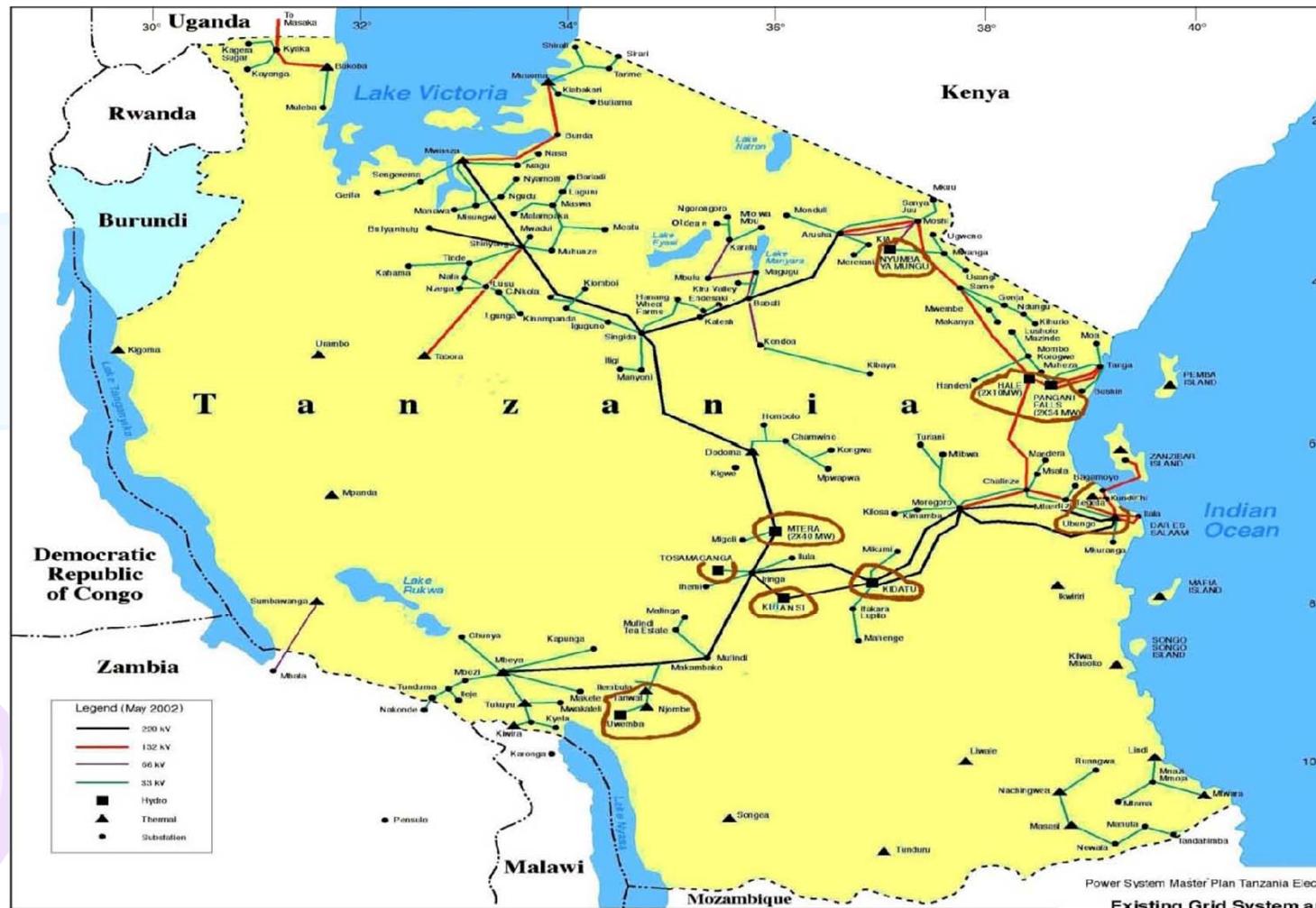
Is responsible for technical and economic regulation of the electricity, petroleum, natural gas and water.

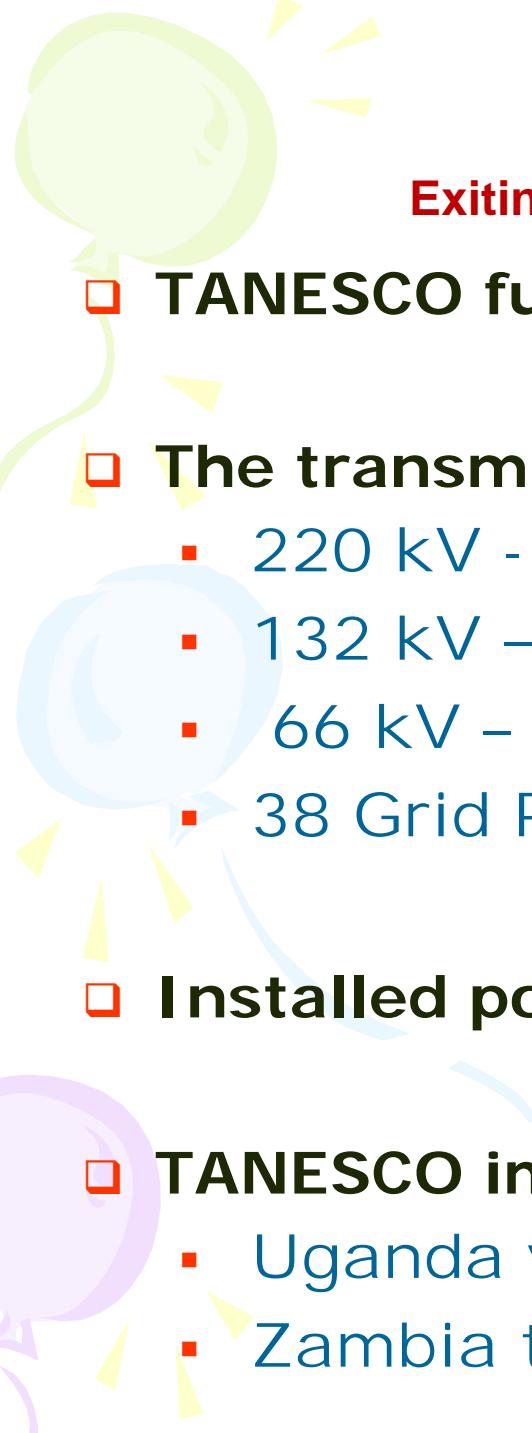
- **Rural Energy Agency (REA)**

Is responsible for boosting modern energy services in rural areas.

Current Power Situation - 1

TANESCO's Grid Power Network





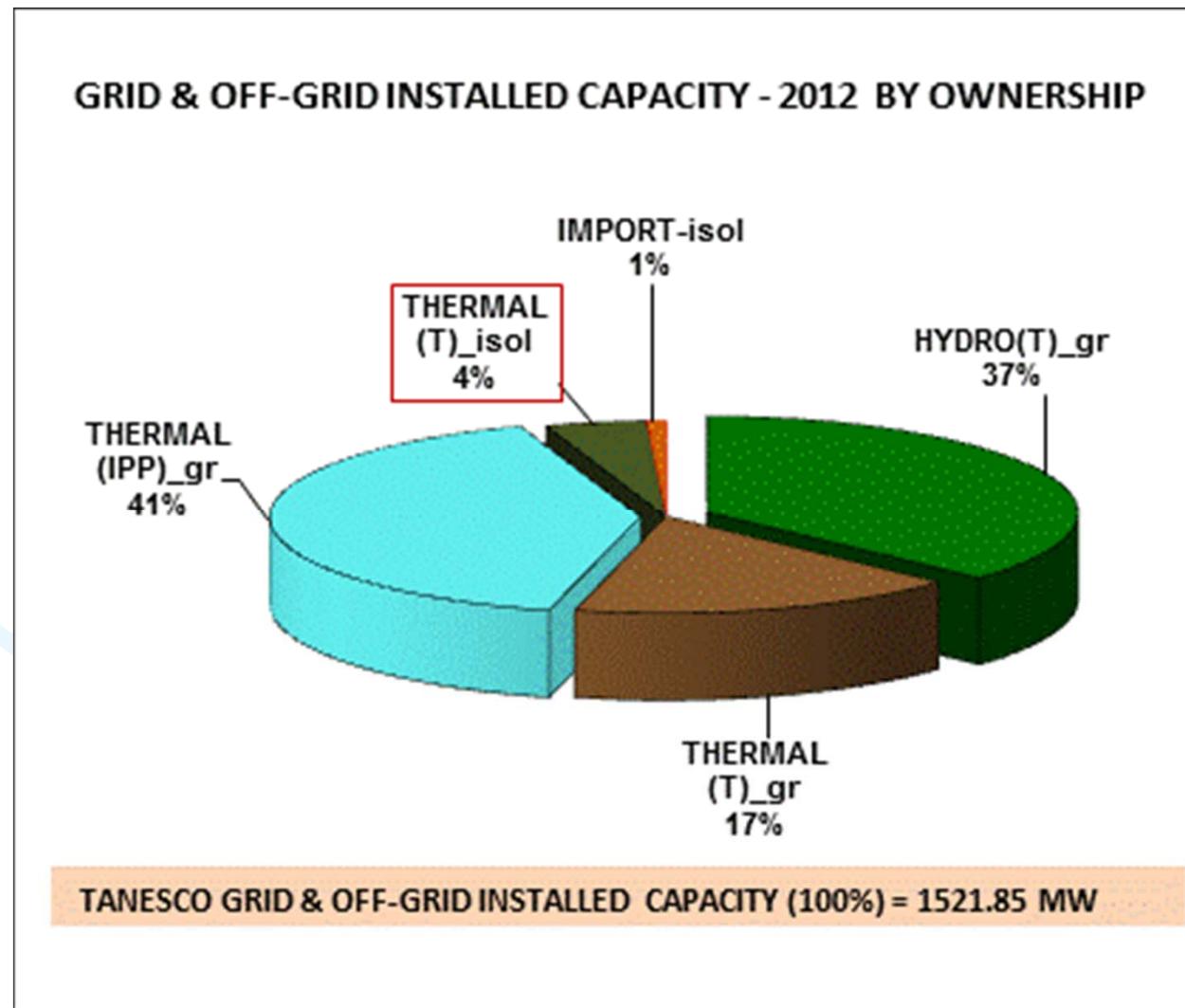
Current Power Situation - 2

Existing Grid Transmission and Supply Sources

- TANESCO fully owns 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).
 - 38 Grid Primary substations of 2,189MVA
- Installed power capacity in Tanzania – 1,509.85MW**
- TANESCO imports power from:**
 - Uganda via 132 kV, (8MW)
 - Zambia through 66 kV, (5MW)

Current Power Situation - 3

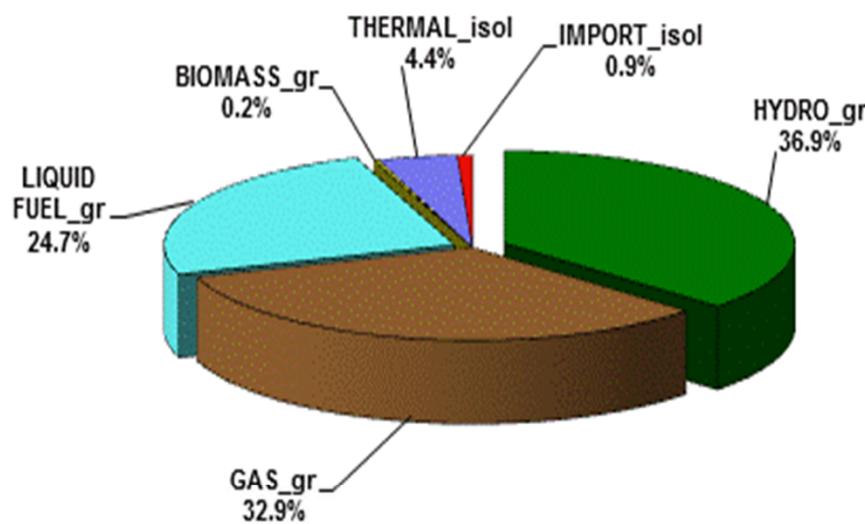
Generation Capacity Vis. Generators ownership



Current Power Situation - 4

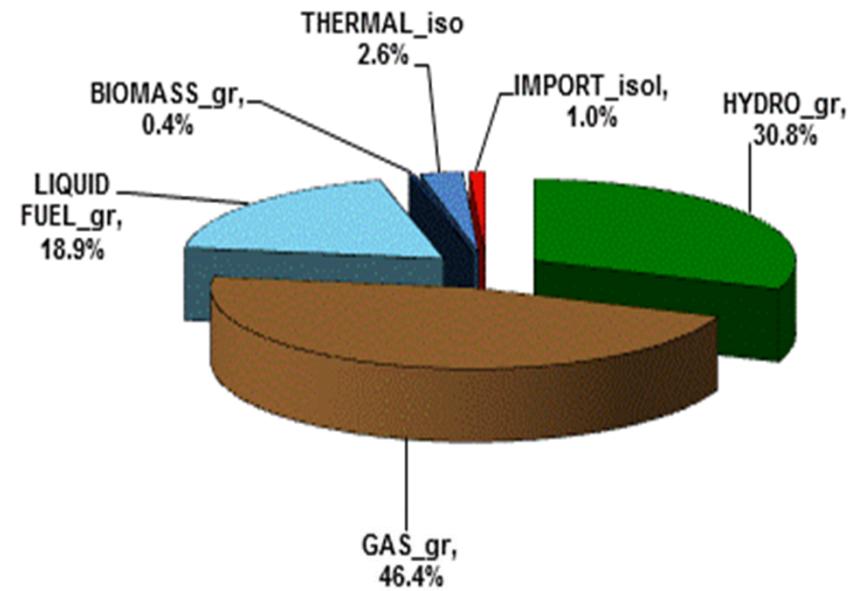
Generation Capacity Vis. Fuel Type

GRID & OFF-GRID INSTALLED CAPACITY - 2012 BY FUEL TYPE



TANESCO GRID & OFF-GRID INSTALLED CAPACITY (100%) = 1521.85 MW

GRID & OFF-GRID PRODUCTION 2012



TOTAL PRODUCTION (100%) = 5,740.84 GWh



Current Power Situation – 5

Power Demand

The Current Unconstrained Peak Demand Stands At 950 – 1,000MW.

Growth In Power Demand Is 10%-15% Per Annum.

Due To Recent Recurring Droughts (2010, 2011 & 2012) - Recorded Suppressed Peak Demand is 851.35MW (October 2012).

The Annual Energy Consumption for the Country is 5,740.84GWh (2012)

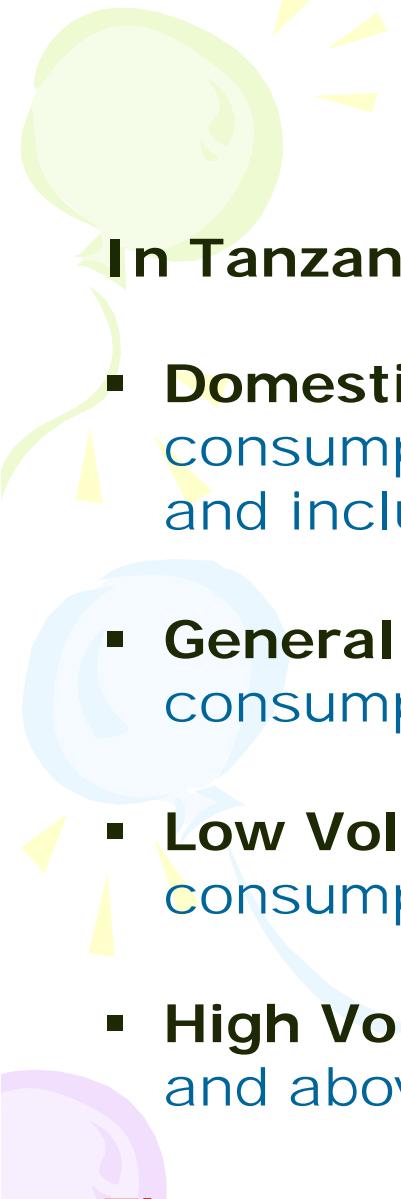
The Highest Energy Demand Stands at 16.9 GWh/Day.

Only 14% of the Country is Electrified (12% of Urban And 2% of Rural)

Access To Electricity Is About 18.4%.

Current Total Number of Customers Is 1,032,000

Maximum Number of Connections per Annum Achieved is 90,000



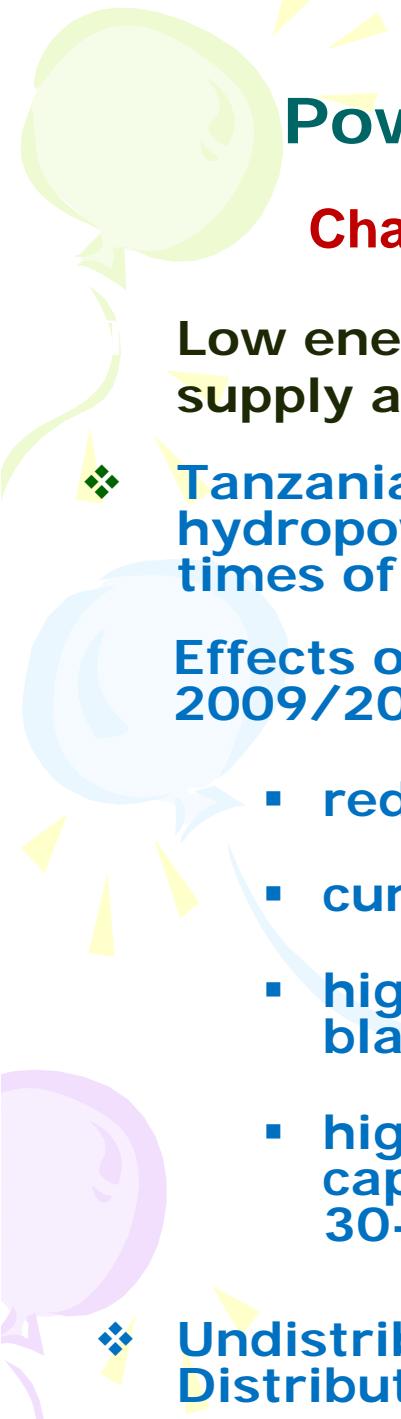
Current Power Situation – 6

Electricity Prices

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



Power Sector Challenges and Strategies -1

Challenges - 1

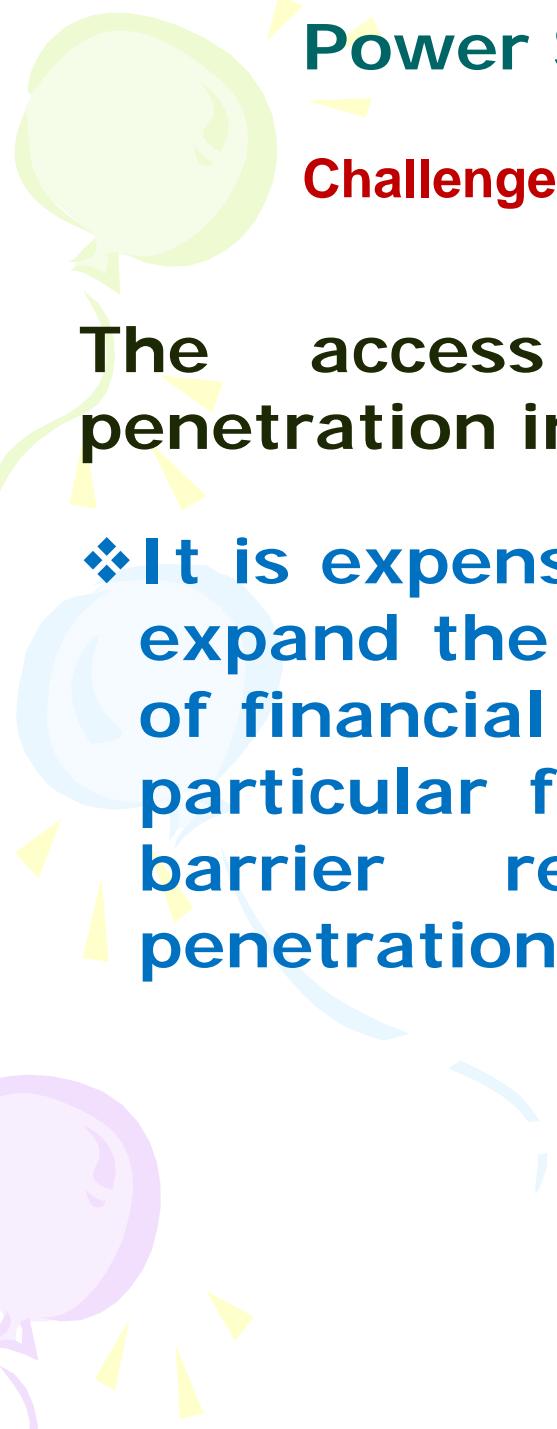
Low energy security, unreliable energy supplies, poor quality of supply and high electricity loses (21-23%)

- ❖ **Tanzania's electricity sector has been heavily dependent on hydropower energy whose energy cannot be ascertained in times of drought.**

Effects of droughts faced during 1992/1993, 2005/2006, 2009/2010, 2010/2011 and 2011/2012

- **reduced reserve capacity**
- **curtailed loads (in 2012 unsaved energy 66.3GWh)**
- **high frequency of power outages (in 2012 - 6 system blackouts – total outage duration of 20.3 hours)**
- **high generation costs from IPP's. (by end of 2011 lease capacity of 317MW use liquid fossil fuel which cost from 30-43 USc/kWh)**

- ❖ **Undistributed generation; old and overloaded Transmission and Distribution Systems cause high technical losses.**



Power Sector Challenges and Strategies -2

Challenges - 2

The access to electricity and electricity penetration in Tanzania are significantly low:

- ❖ It is expensive to extend the national grid and expand the distribution system due to scarcity of financial resources from the government, in particular foreign currency is always a major barrier responsible for low electricity penetration rate.



Power Sector Challenges and Strategies -3

Strategies: Generation Expansion Projects

- ❑ **Mwanza HFO (60 MW)** – 2013
- ❑ Mtwara-Dar es salaam (532 km) gas pipeline project -784 MMcf/d (3,900 MW) - 2014
- ❑ **Kinyerezi I Dual Fuel Plant (150MW)** – 2014
- ❑ **Kilwa (Somanga) Gas Plant (IPP 210MW)** – 2014
- ❑ **Kinyerezi II Gas Plant (240MW)** – 2015
- ❑ **Mnazi bay Gas Plant (300MW)** – 2016
- ❑ **Kiwira Coal Plant (200MW)** – 2016
- ❑ **Kinyerezi III Gas Plant (300MW)** – 2016
- ❑ **Ngaka Coal Plant (200MW)** – 2016
- ❑ **Private producers providing less than 10MW (SPP)**



Power Sector Challenges and Strategies -4 Strategies: Transmission Expansion Projects

- 132kV Ubungo – Mtoni (46km)** – 2013
- 220kV Makambako – Songea (320km)** – 2015
- 400kV Iringa – Shinyanga (648km)** – 2015
- 220kV Kiwira - Mbeya (100km)** – 2016
- 400kV Singida – Arusha – Nairobi (577km)** – 2016
- 400kV Kasama - Mbeya (220km)** – 2016
- 400kV Mbeya – Iringa (280km)** – 2016

Power Sector Challenges and Strategies – 5

Strategies - *Electricity Connection - on MV and LV lines:*

The aim of the Government is to make electricity available for social-economic growth for all in Tanzania.

Before January 2013, the charges for electricity connections were uniform for all areas

- ✓ USD 284 without pole and USD 845 with one pole

From January 2013 the Government reduced the cost and issued new charges:

for service line within 30m and with one pole:

- ✓ For Rural areas the connection fee dropped by about 60% and 75% .
- ✓ For Urban areas the connection fee dropped by about 29% and 60%.
- ✓ Special attention to Southern regions (Lindi & Mtwara) – dwellers will pay USD 62 for both single and three phase

TANESCO plans to increase its customers base to 1,500,000 by 2015.

TANESCO has set a target of 250,000 grid connections per annum and 30% access by 2015.



**Thank you for your attention !
Welcome to Tanzania the land
of Kilimanjaro**