



# **CURRENT STATUS OF ENERGY SECTOR IN TANZANIA**

**EXECUTIVE EXCHANGE ON DEVELOPING AN  
ANCILLARY SERVICE MARKET**

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## **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

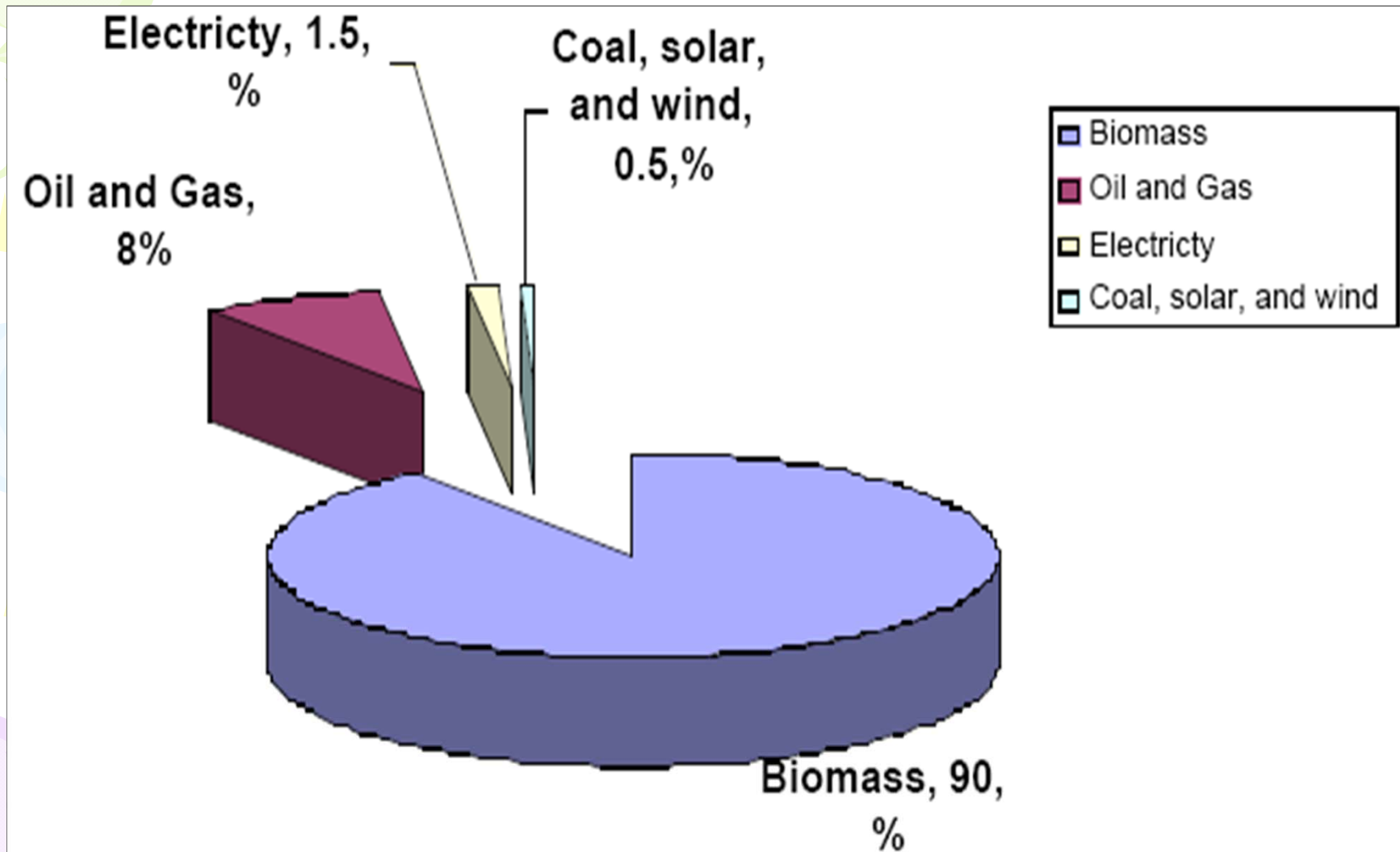
- Tanzania is gifted with diverse energy sources most of which are untapped, these include biomass, hydro, uranium, natural gas, coal, geothermal, solar and wind.

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

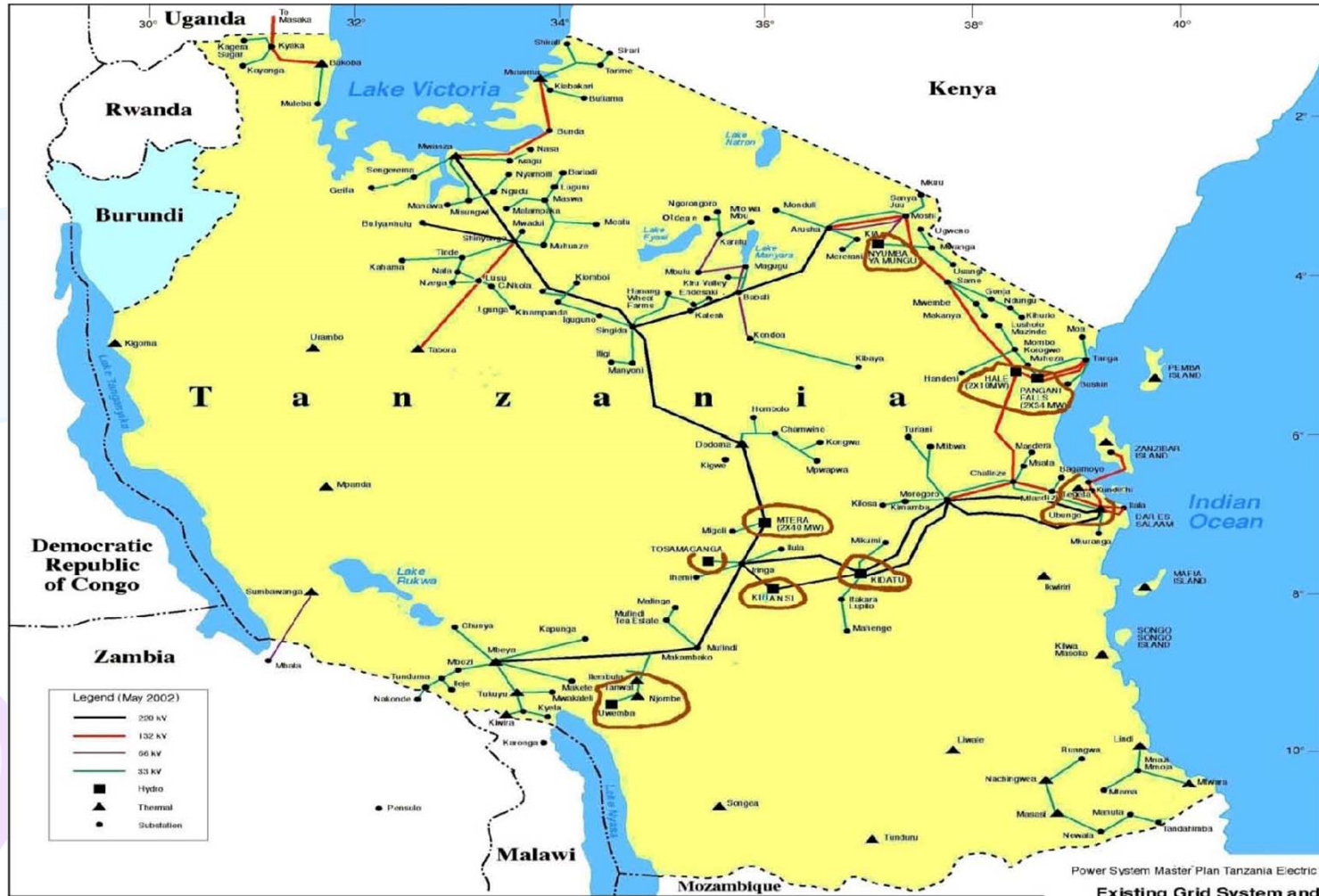


Fig. 3.1  
Power System Master Plan Tanzania Electric Supply Co.  
Existing Grid System and Plants



## **Current Power Situation - 2**

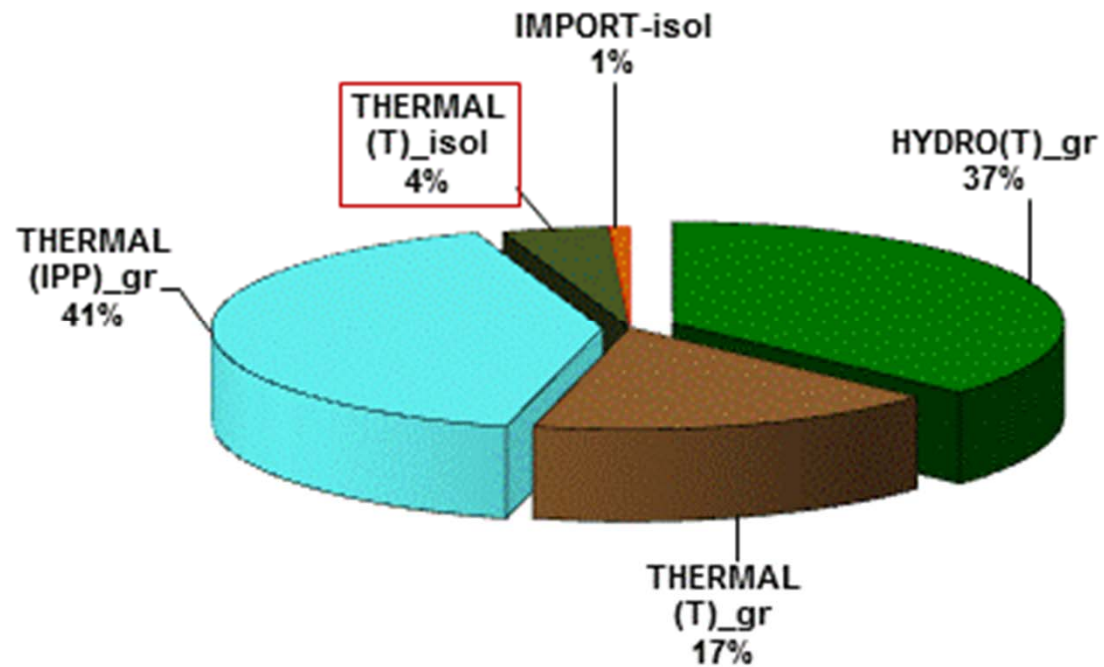
### **Exiting Grid Transmission and Supply Sources**

- ❑ **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

GRID & OFF-GRID INSTALLED CAPACITY - 2012 BY OWNERSHIP

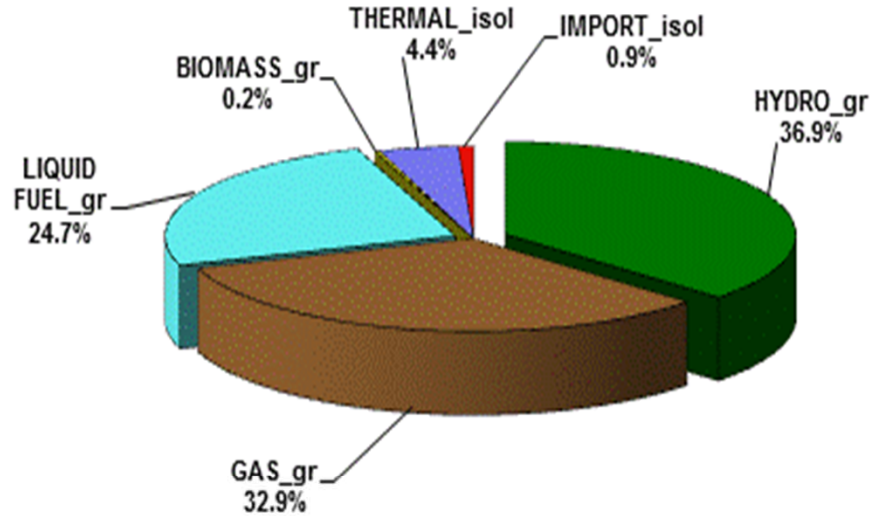


TANESCO GRID & OFF-GRID INSTALLED CAPACITY (100%) = 1521.85 MW

# Current Power Situation - 4

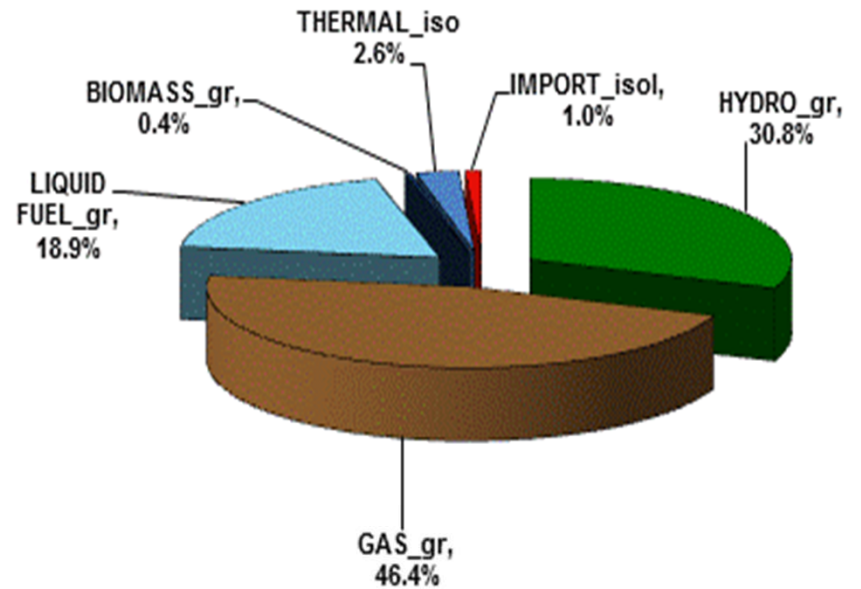
## Generation Capacity Vis. Fuel Type

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 losses (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.



A decorative graphic on the left side of the slide features three balloons: a light green one at the top, a light blue one in the middle, and a light purple one at the bottom. Each balloon is attached to a streamer with several yellow triangular flags. The balloons are partially overlapping and have a soft, glowing effect.

## 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***