

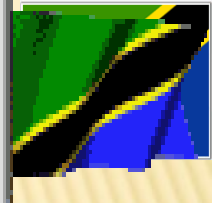


INVESTMENT OPPORTUNITIES IN THE ENERGY SECTOR IN THE UNITED REPUBLIC OF TANZANIA

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MINISTER OF ENERGY AND MINERALS
UNITED REPUBLIC OF TANZANIA

WASHINGTON DC, USA

MONDAY, 09 JUNE 2014



POLICY, LEGAL AND REGULATORY FRAMEWORKS OF THE POWER SUB-SECTOR

◆ TANESCO Act, 1964

◆ Petroleum (Exploration and Production) Act, 1980

◆ EWURA Act, 2001

◆ National Energy Policy, 2003

◆ Occupational Safety and Health Act, 2003

◆ Environmental Management Act, 2004

◆ Income Tax Act, 2004

◆ REA Act, 2005

◆ Electricity Act, 2008

◆ Petroleum Act, 2008

◆ Public-Private Partnership Act, 2010

◆ Natural Gas Policy, 2013

◆ Natural Gas Act (under preparation)

CURRENT POWER SITUATION



Generation:

- ✗ The installed capacity in the main grid is 1,583 MW. Hydro (35%), Natural Gas (33%) Oil (32%)
- ✗ Off-grid stations total capacity is 76.4 MW
- ✗ Highest grid system demand is 898.72 MW recorded in November 2013.

Transmission System :

Transmission network comprises of:

- 2,732 km of 220 kV lines
- 1,555.8 km of 132 kV lines
- 578.7 km of 66 kV lines

Total= 4,866.5 km by the end of November 2013.

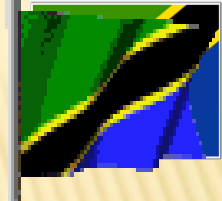
Distribution System :

Comprises of:

- 17,021 km of 33 kV lines
- 5,375 km of 11 kV lines
- 34,513 km of LV
- 11,124 distribution transformers



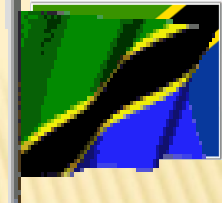
ENERGY RESOURCES POTENTIAL



ENERGY SOURCE	POTENTIAL	DEVELOPED TO POWER
Coal: Kiwira, Mchuchuma, Ngaka, Rukwa and around Lake Nyasa	5-7 billion tons	None
Natural Gas	46.5 tcf	501 MW
Geothermal: 58 sites including: Songwe (mbeya), Luhoi (Rufiji), Manyara, Lake Natron and Kisaki.	>3,000 MW	None
Hydro	4.7 GW	562 MW



ENERGY RESOURCES POTENTIAL.....



ENERGY SOURCE	POTENTIAL	DEVELOPED TO POWER
Wind: Makambako, Singida, Litembe(Mtwara), Mkumbara (Tanga), Gomvu (Dar), Karatu (Manyara) and Mafia	Average wind speed 5 - 8m/s	None
Solar	Average daily solar isolation of 4.6/kWh/m²	About 6 MW
BIO-ENERGIES	UNLIMITED	35 MW from bagasse and woody residue

DISCOVERIES

6/9/2014

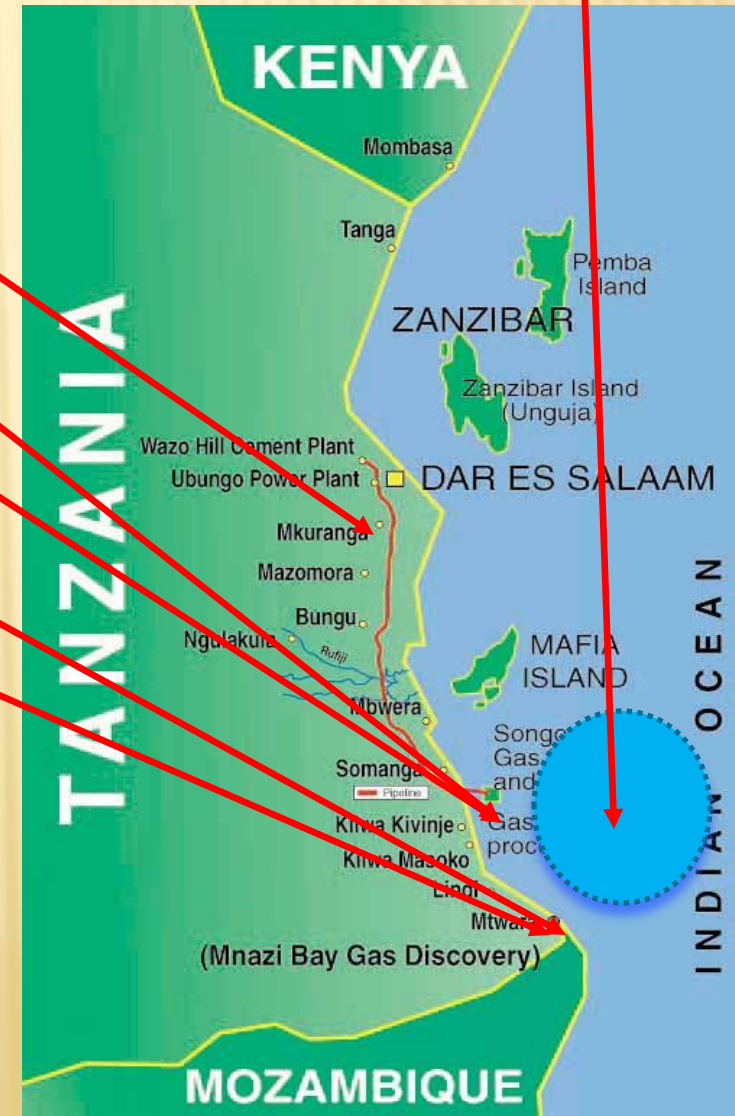


Deep Sea (2010-12) : 38.5 TCF

- Mkuranga** 2007 (0.2 TCF)
- Kiliwani** 2008 (0.07 TCF)
- Songo Songo** 1974 (2.5 TCF)
- Mnazi Bay** 1982 (5 TCF)
- Ntorya** 2012 (0.178 TCF)

Total GIIP onshore = 8 TCF

TOTAL GIIP (December 2013): 46.5 TCF



COALFIELDS OF TANZANIA

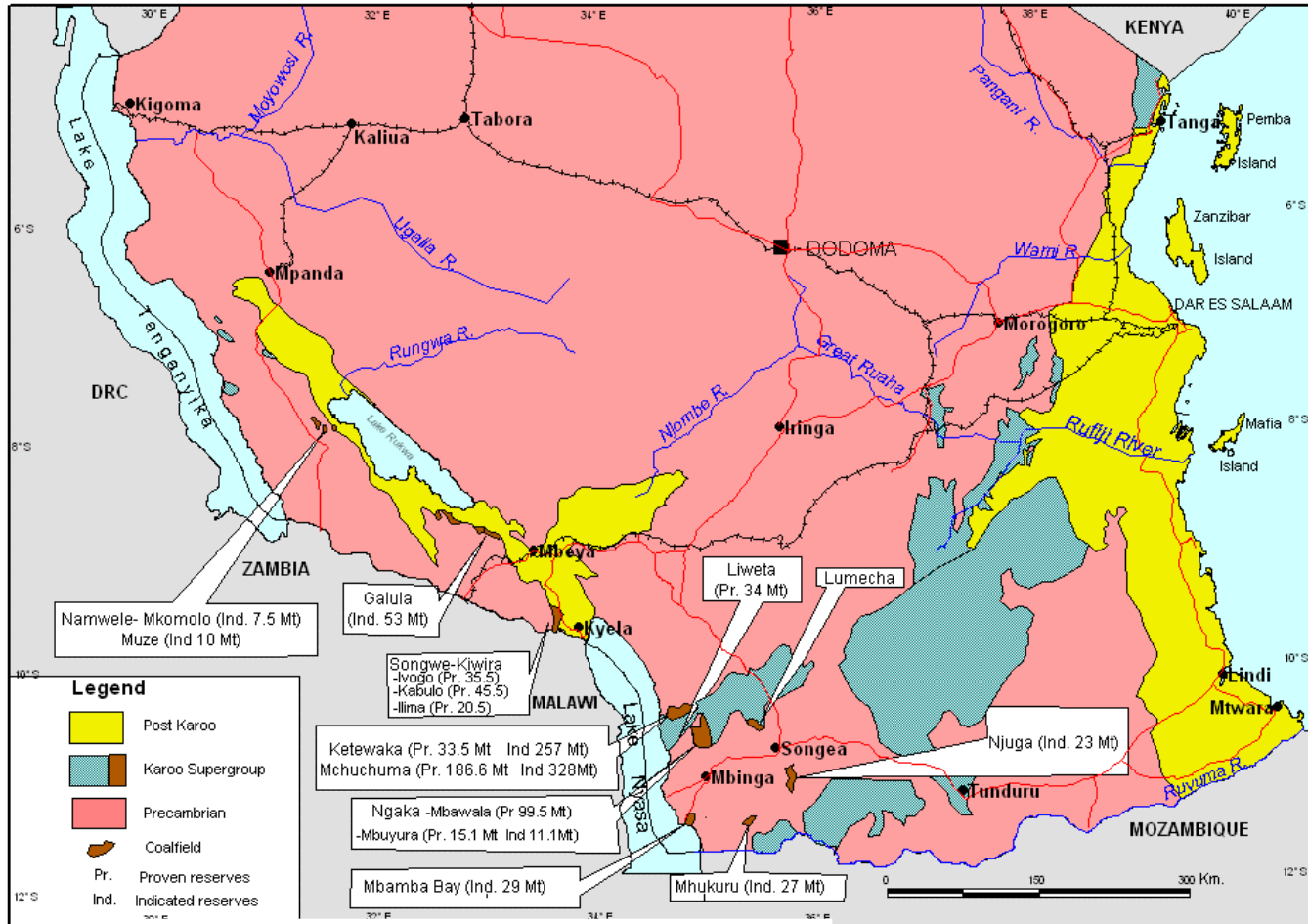


Fig.



URANIUM DEPOSITS

◆ MKUJU PROJECT: 137.3 Million Lbs

Namtumbo - 35.9 MILLION LBS

Tunduru - 101.4 MILLION LBS

◆ MANYONI PROJECT: 19 Million Lbs (57 M tonnes)

Prospecting Licenses (Regions):

Arusha, Dodoma, Iringa, Lindi, Ruvuma, Mbeya, Morogoro, Mtwara, Rukwa, Shinyanga, Singida and Tanga

4. Namibia: 4,496 tons, 8.4% world's production

5. Niger: 4,198 tons, 7.8%

11. Malawi: 670 tons, 1.2%

12. South Africa: 583 tons, 1.1%



RENEWABLE ENERGIES

RENEWABLE ENERGY SOURCES WORLDWIDE AT THE END OF 2008 (SOURCE: REN21)



Solar

7.2 TW



Hydro

870 TW



Wind

32 TW



Geothermal

15 TW

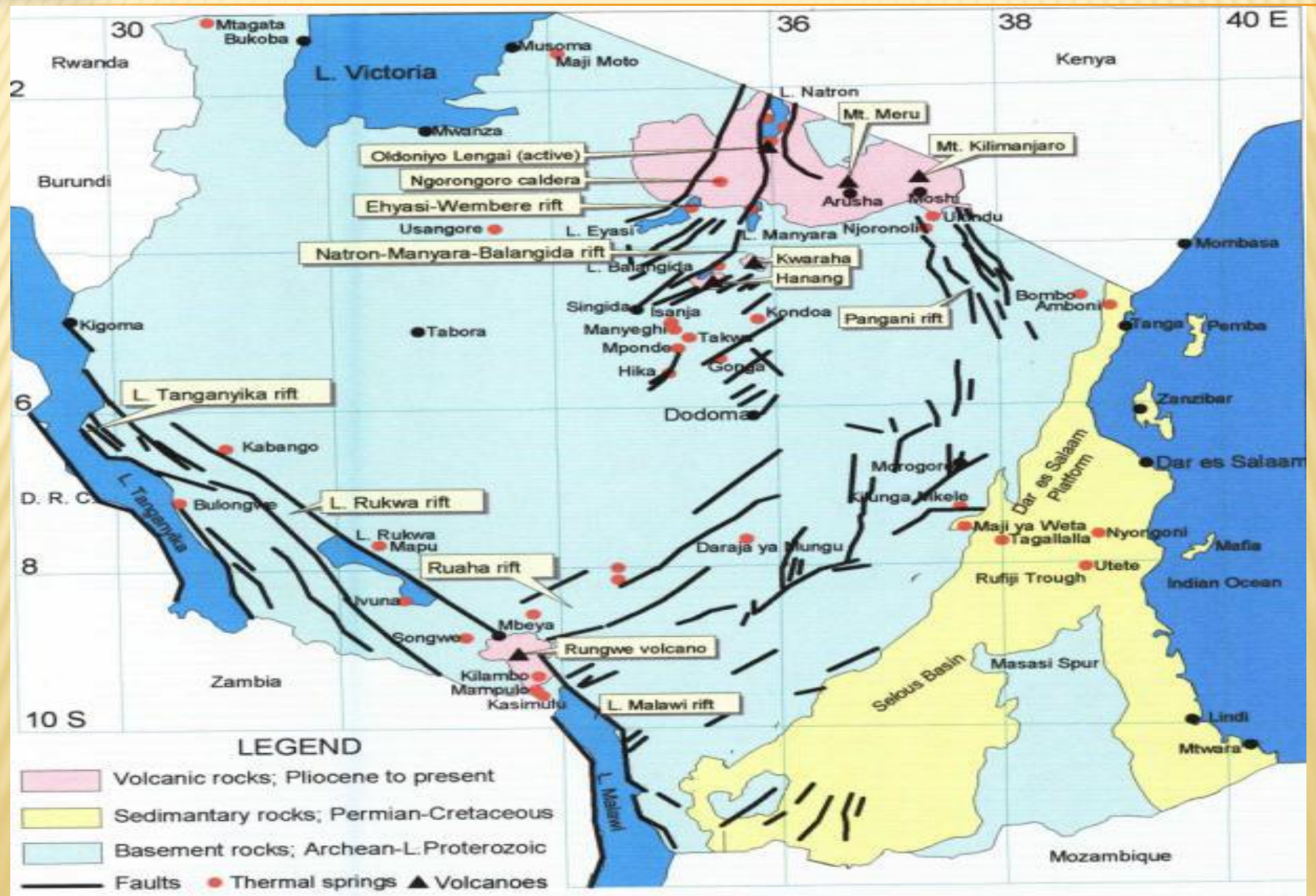


**Global
Consumption**

Available renewable energy The volume of the cubes represent the amount of available geothermal, hydropower, wind and solar energy in TW, although only a small portion is recoverable. The small red cube shows the proportional global energy consumption



GEO THERMAL POTENTIAL IN TANZANIA

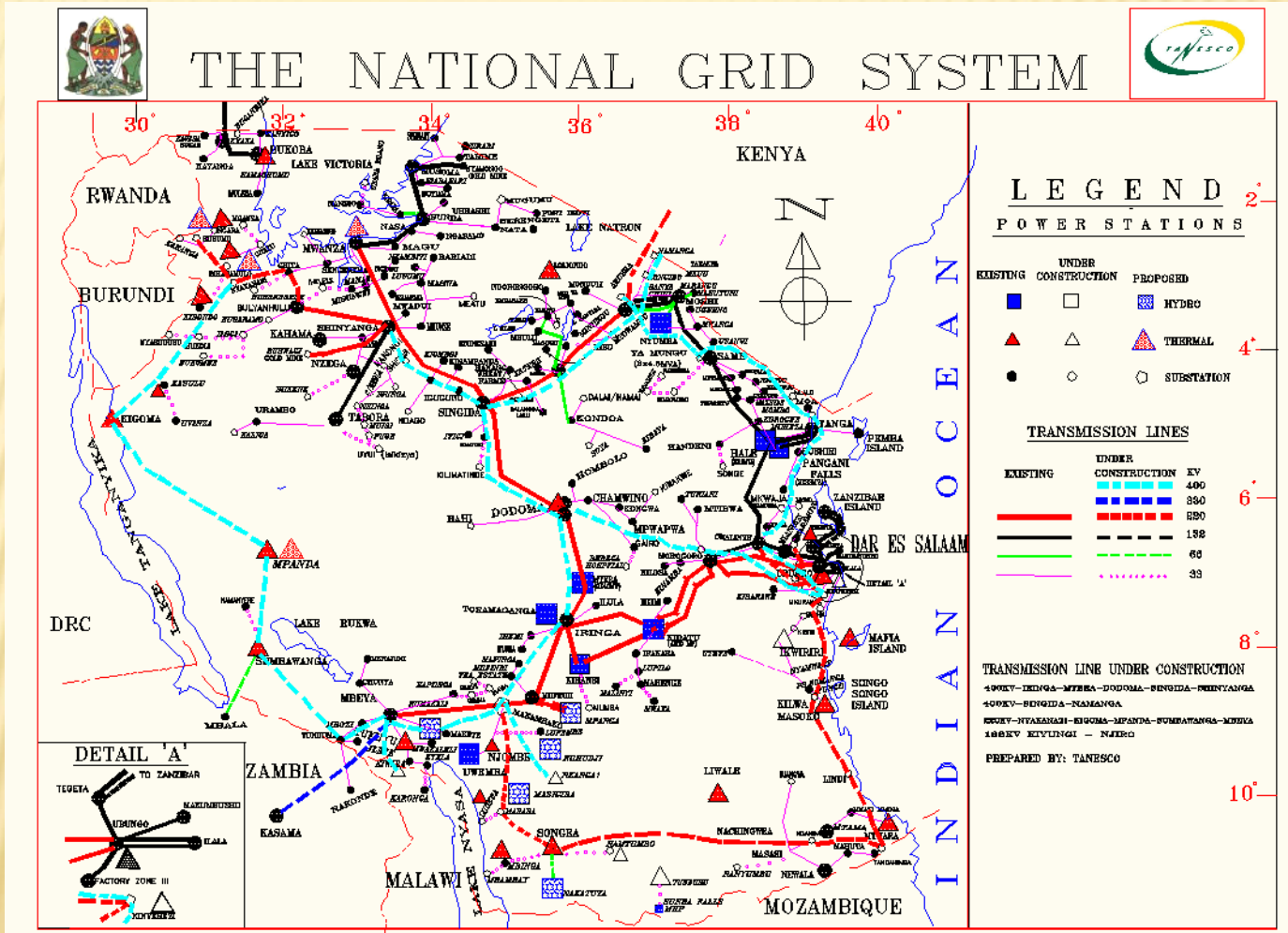


TRANSMISSION PROJECTS



Transmission Projects	Distance (km)	Year
400kV Singida – Arusha - Namanga	414	2016
220kV Kiwira – Mbeya	100	2016
400kV Kasama (Zambia) - Mbeya – Iringa	540	2018
400kV Shinyanga – Mwanza	140	2018
220kV Geita – Nyakanazi – Rusumo	228	2018
220 kV Kihansi -Ruhudji – Mufindi	250	2025
400kV Ngaka – Makambako	200	2017
220kV Somanga – Lindi - Mtwara	358	2017
400kV Mtwara – Songea	656	2021
400kV Nyakanazi– Kigoma – Sumbawanga	808	2015
400kV Mchuchuma – Mufindi	200	2018
220kV Rumakali – Makambako	200	2020

FUTURE GRID MAP BY 2035



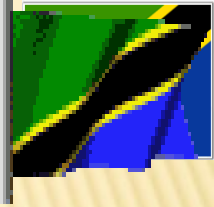


REFORM OF TANESCO

- ◆ **DIFFERENCE BETWEEN REFORM AND OWNERSHIP**
- ◆ **REFORMED TANESCO – KEY PLAYERS**
 1. PUBLIC SECTOR
 2. PRIVATE SECTOR
 3. PRIVATE-PUBLIC PARTNERSHIP (PPP Act 2010)
- ◆ **DIALOGUE ON THE REFORM BY STAKEHOLDERS:
ROADMAP, March 2014**
- ◆ **GOVERNMENT’S APPROVAL: June 2014**



IMPROVEMENTS ON REVENUE COLLECTIONS



NEW REVENUE COLLECTION MECHANISMS

- ◆ **Installation of Prepaid meters**
- ◆ **Purchasing of Electricity through mobile phones and ATM (Banks)**
 - ◆ **Automatic Meter Reading (AMR)**
- ◆ **Electronic Payments & Applications for New Clients**



LOSS REDUCTION AND ENERGY EFFICIENCY PROGRAMME

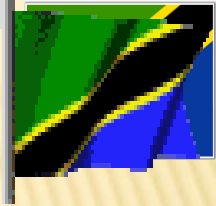


Existing Projects:

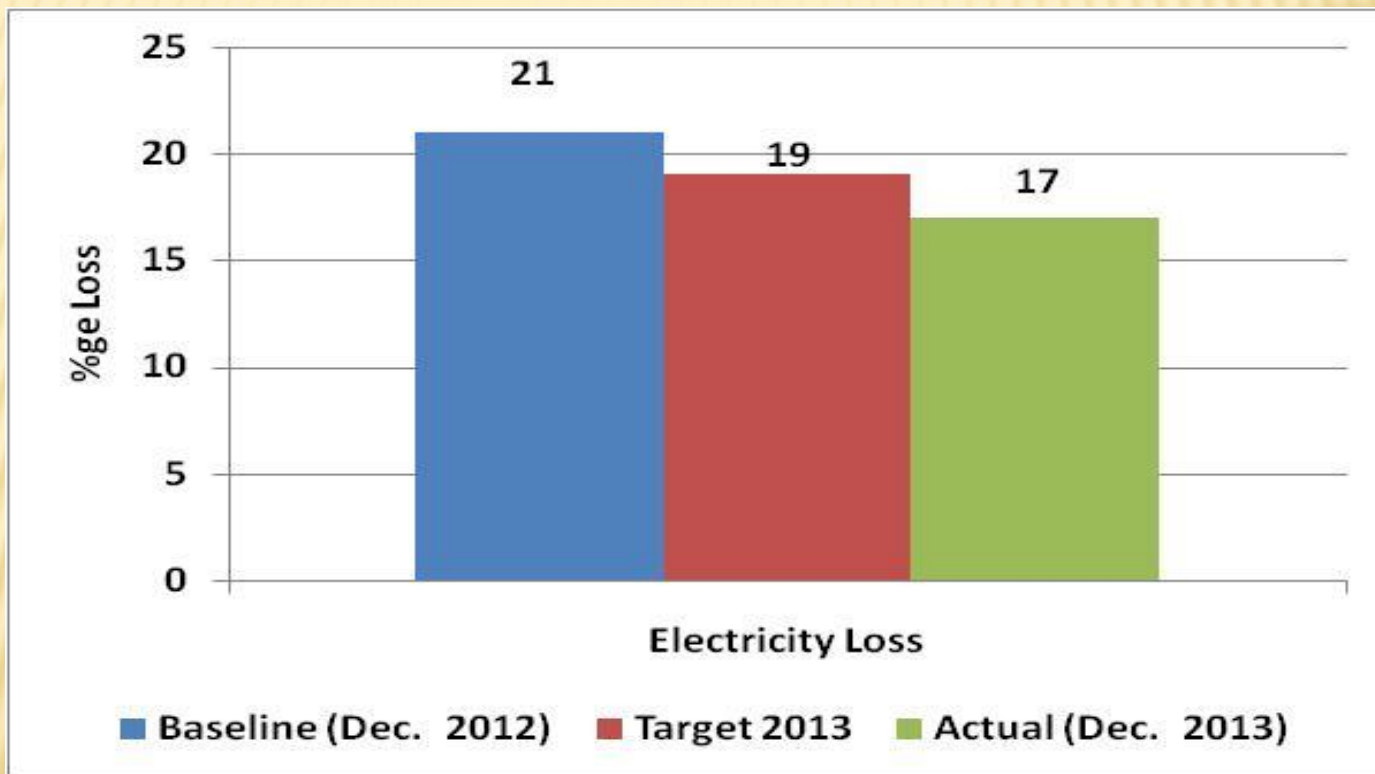
- Power factor Correction Program
- Public awareness Campaign via Media and Exhibition

Projects to take off by January 2015:

- Time Of Use Pricing
- Distribution of Compact Fluorescent Lamp to D1 and T1 customers - (CFL)Program



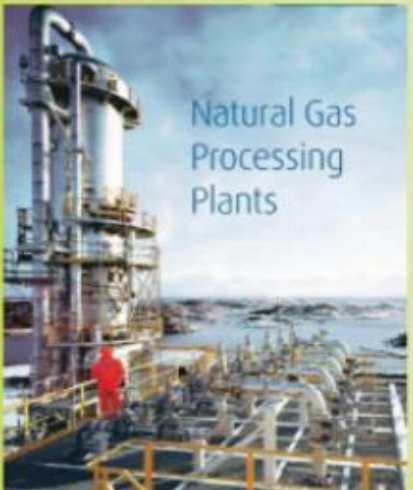
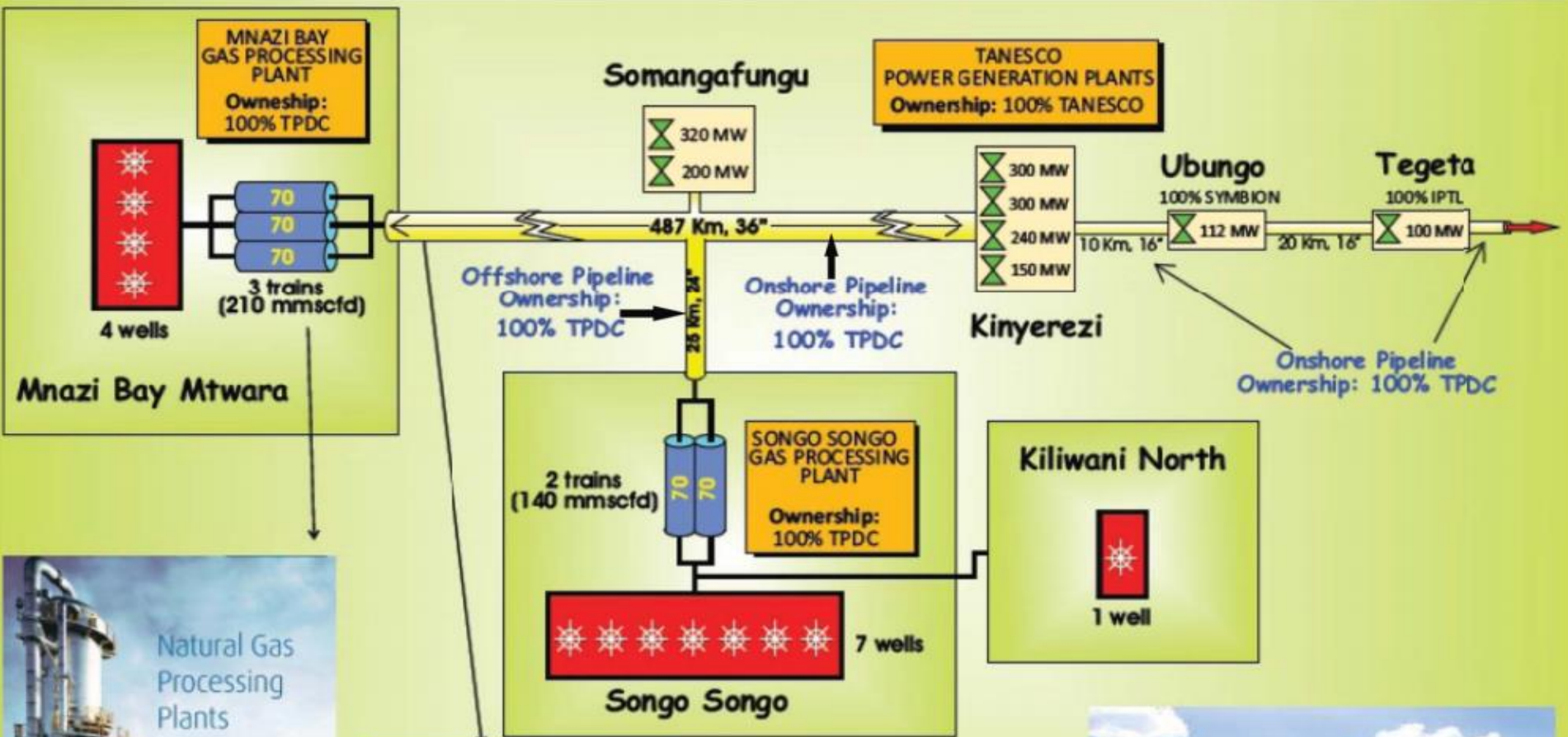
RECENT IMPROVEMENTS... - LOSS REDUCTION



decrease: 19%
Above Target (BRN): 11%



SCHEMATIC DIAGRAM SHOWING THE NATURAL GAS PROCESING PLANTS IN MTWARA AND SONGOSONGO AND THE UNDERCONSTRUCTION PIPELINE TO DAR ES SALAAM





UTILIZATION OF THE NATURAL GAS

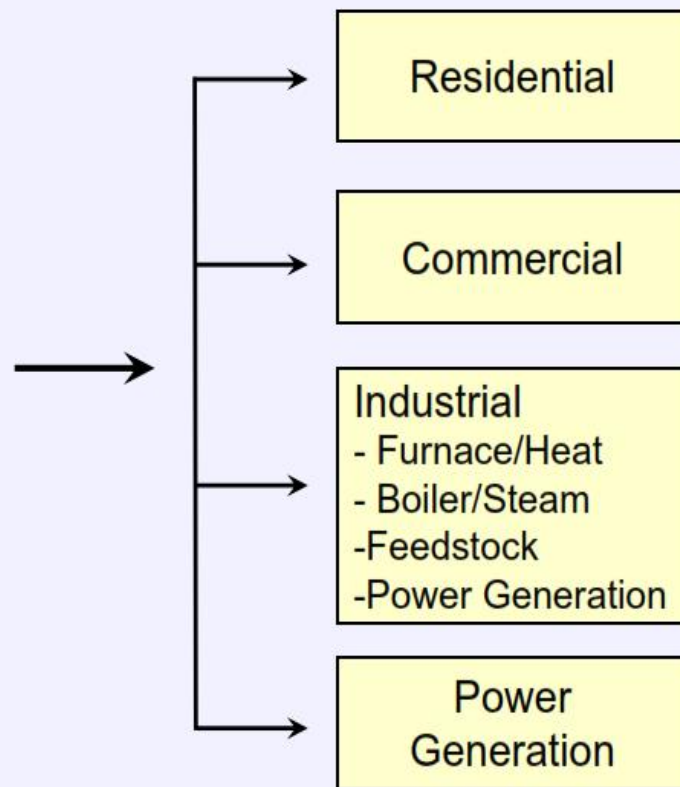


- Power generation: 3,000 MW
- LNG (Onshore)
- Smelting plants
- Cement industries
- Other industries
- Household (Homes)
- Motor vehicles (CNG)
- Fertilizer production
- Methanol plants
- Plastics industries
- Other Petrochemical Industries

Natural gas important for all consumers



Natural Gas





LIQUEFIED NATURAL GAS (LNG)

TAKES UP ABOUT 1/600TH THE VOLUME OF NATURAL GAS IN THE GASEOUS STATE

Natural Gas is condensed into a liquid at close to atmospheric pressure (maximum transport pressure set at around 25 kPa (4 psi) by cooling it to approximately $-162\text{ }^{\circ}\text{C}$

1 TRAIN: 1 MILLION TONS PER ANNUM – 150 mcft/day – 25 yrs = 4.8 tcf



DEEP SEA DRILLING INVESTMENTS





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