

# THE UNITED REPUBLIC OF TANZANIA

## MINISTRY OF ENERGY AND MINERALS



## ENERGY SECTOR CONTEXT

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# COUNTRY PROFILE





## COUNTRY PROFILE Continues

- LOCATED IN EAST AFRICA (long. 290 and 410 East, Latit.10 and 120 South)  
BORDERD WITH -Kenya and Uganda(**North**), **West-** With Rwanda, Burundi and Democratic Republic of Congo, **South-** Zambia, Malawi and Mozambique and the Indian Ocean **to the East**
- TOTAL AREA 945,234 km<sup>2</sup>
- POP. OF 42 MIL. PEOPLE (2010 est.)
- 80% OF POP LIVE IN RURAL AREAS
- OFFICIAL LANGUAGES- SWAHILI AND ENGLISH
- AGRICULTURE CONTRIBUTE >½ OF GDP
- NATURAL RESOURCES:
  - MINING** - Gold, Diamond, Tanzanite, Various other gemstones, Natural gas, Iron ore and Coal.
  - WILDLIFE & TOURISM** - 12 National Parks, 13 Game reserves, 38 Game Controlled Areas and 120 National Cultural Heritage Sites.

# COUNTRY PROFILE *Continues*

- GDP PER CAPITA, USD 524 (2010 EST)
- GDP GROWTH RATE = 4.9%
- HIGHEST MOUNT IN AFRICA – KILIMANJARO (5892m or 19,341 feet) above sea level
- THE COUNTRY IS A **UNITED REPUBLIC**, BETWEEN TANZANIA MAINLAND (TANGANYIKA) AND ZANZIBAR
- TANZANIA IS A MULTICULTURAL SOCIETY WITH 120 TRIBES
- POLITICAL STRUCTURE
  - ✓ Multi party political system/democracy.
  - ✓ The President of Tanzania is both head of state and head of government.
  - ✓ Executive power is exercised by the government.
  - ✓ Legislative power is vested in both the government and parliament.
  - ✓ The Judiciary is independent of the executive power and the legislature.

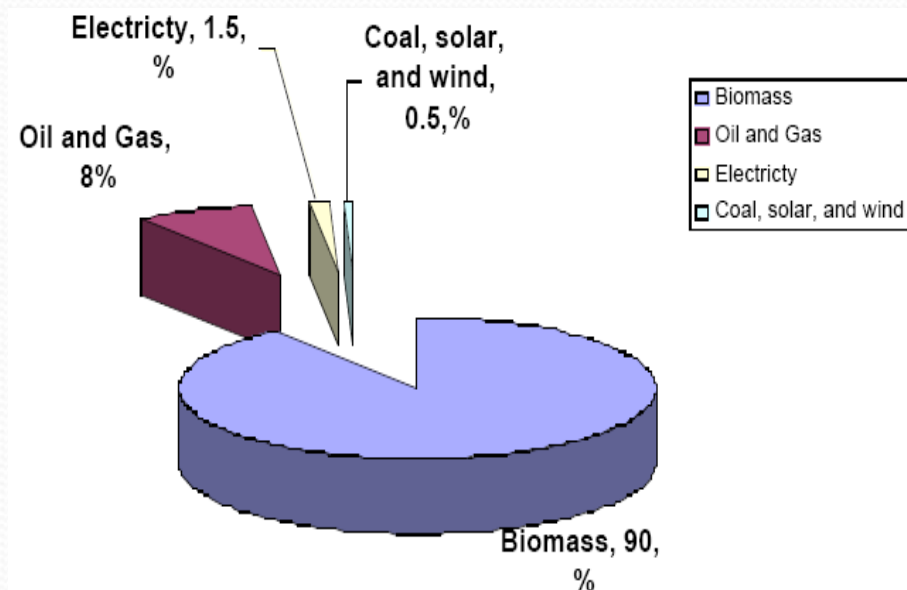


# ENERGY POLICY & MEASURES

- 1<sup>ST</sup> NATIONAL ENERGY POLICY - 1992 AND REVISED IN 2003.
- The National Energy Policy of 2003 govern the Energy sector
- VISION: effectively contribute to the growth of the national economy and thereby improve the standard of living for the entire nation in a sustainable and environmentally sound manner.
- MISSION: to create the conditions for the provision of safe, reliable, efficient, cost-effective and environmentally appropriate energy services to all sectors on a sustainable basis.
- POLICY OBJECTIVES: The national energy policy objectives are to ensure availability of reliable and affordable energy supplies and their use in a rational and sustainable manner in order to support national development goals.

# ENERGY CONSUMPTION & SUPPLY PATTERN

- Estimated national energy consumption is 22 Million tonnes oil equivalent per annum (2009)
  - Low per capita consumption of Modern Energy (Electricity and Petroleum)
  - Biomass fuels (i.e. wood and charcoal and agricultural and animal residues) account for over 90% of primary energy supply
- Oil and Gas 8%
  - Electricity 1.5%
  - Solar and wind <1% of primary energy





## **CONSUMPTION & SUPPLY PATTERN-Continues**

- Growth in **Power demand** is 10 -15% per annum
- About 18% of Population has access to electricity
- the per capita electricity consumption is 81/KWh per annum growing at the rate of 11 - 13 %
- Total grid **installation grid capacity** is 1370.4 MW (2012)
- **Hydro** contributes 561 MW Diesel and Gas 742.9MW, Interconnector 14MW and Cogeneration 12.5MW
- **Co-generation** (Sugar & Wood, paper processing Plants) accounts for: 43 MW
- Average **connections** per annum is 50,000 customers (plan 100,000 customers/annum)
- Average power **generation** approximately 700 MW
- **Peak** power demand 833 MW
- **Customers** connected 868,953 (2010)



# LOCAL ENERGY POTENTIALS

- 1. Hydropower:** 4.7 GW or 3.2 GW – firm capacity.  
Developed 561MW equivalent to 12%.
- 2. Coal:** Potential 1.9 Billion tonnes; of which 304 Million tonnes are proven
- 3. Natural gas:** 7.5 Trillion Cubic Feet (Proven)
- 4. Biomass:** Tanzania has a forest area of about 35.5 million hectares of which around 80,000 hectares are plantation forest and 70,000 hectares are privately owned
- 5. Solar:** Average solar installation is  $> 200 \text{ Wp/m}^2$
- 6. Wind:** Speed variable but speeds greater 8m/s are documented
- 7. Geothermal:** Potential as high as 650MW. Under assessment
- 8. Others studies on:** Uranium, bio fuels, and ocean based energies studies are going on.

# GRID & OFF-GRID INSTALLED CAPACITIES

GRID			
ENERGY SOURCES	INSTALLED CAPACITY (MW)	ENERGY SOURCES	INSTALLED CAPACITY (MW)
(Thermal) Diesel & Gas	782.9	Diesel	35
		Gas	18
Hydro	561	Hydro	1.25
Interconnector	14	Interconnector	-
Coal	-	Coal	6
Biomass (wattle)	12.5	Biomass (wattle)	2.75
Co-generation (bagasse)	-	Co-generation (bagasse)	39.6
Biomass (Sisal waste)	-	Biomass (Sisal waste)	0.5
<b>TOTAL</b>	<b>1370.4</b>	<b>TOTAL</b>	<b>103.10</b>



## ENERGY DEMAND AND SUPPLY OUTLOOKS

- Petroleum Import demand and Supply – 1.7 to 1.8 million metric tons annually.
- Tanzania Power System Master Plan (PSMP) gives an outlook of the Electricity Subsector. (gives detailed **assessment of load demand projections**, available **options** for meeting the demand and requirements for a new higher voltage **backbone transmission** system for the country).
- Recent Update reflects changed economic conditions in Tanzania, driven by government policy guidelines. These includes, **the Tanzania VISION-2025**, the **Mini-Tiger plan**, the **Five Year Development Plan (FYDP)**, and the **2003 Policy documents** all target to have an accelerated economic growth in the range of 8%-15%,
- The FYDP targets to improve key infrastructure networks, including power infrastructures to attain low cost energy service that will allow more inflow of foreign direct investment (FDIs) to Tanzania and to increase per capita electricity consumption from current 81kWh to 200kWh.

## ENERGY DEMAND AND SUPPLY OUTL. *Cont...*

- Energy (electricity) Needs Assessment from the PSMP (key results of the energy needs assessment based on assumptions and approaches used in the forecast study)

National	2010	2010	2015	2020	2025
Totals	Actual	Un-Constr.			
Grid Sales – GWh	4,034	4,174	8,473	14,127	20,087
Losses(Tx,Dx, Loadshed) – GWh		1,410	1,992	3,233	4,546
Net Generation – GWh	4,175	5,585	10,465	17,360	24,633
Coincidental Peak – MW	832.6	1,024	1,712	2,859	4,067



# CHALLENGES FACED IN FORMULATING ENERGY POLICY

- High speed of the sector growth
- Low human capacity in Policy development
- Limited flow of private capital investment in the power sector resulting to failure to reach the government strategies as stipulated in the energy policy;
- Scarcity of resources allocated to the sector from the Government Budget to implement the initiated plan in the sector referred as Policy failure;
- Limited long-term financing especially for small/isolated rural energy projects so as to reach 80% of rural households.

# SUBJECTS OF INTEREST

- Energy Policy Formulation and Review process.
- Linkage of Modeling of Energy Resources and Energy Policy Analysis.
- Each Energy Subsector (Electricity, Renewable, Gas and Petroleum Products) having its own Policy. (How many Energy Policy should be in Energy Sector)
- Strategizing and Monitoring operationalization of the Policy
- Energy demand and supply forecasting
- Energy Balance and Energy Mix Methods





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