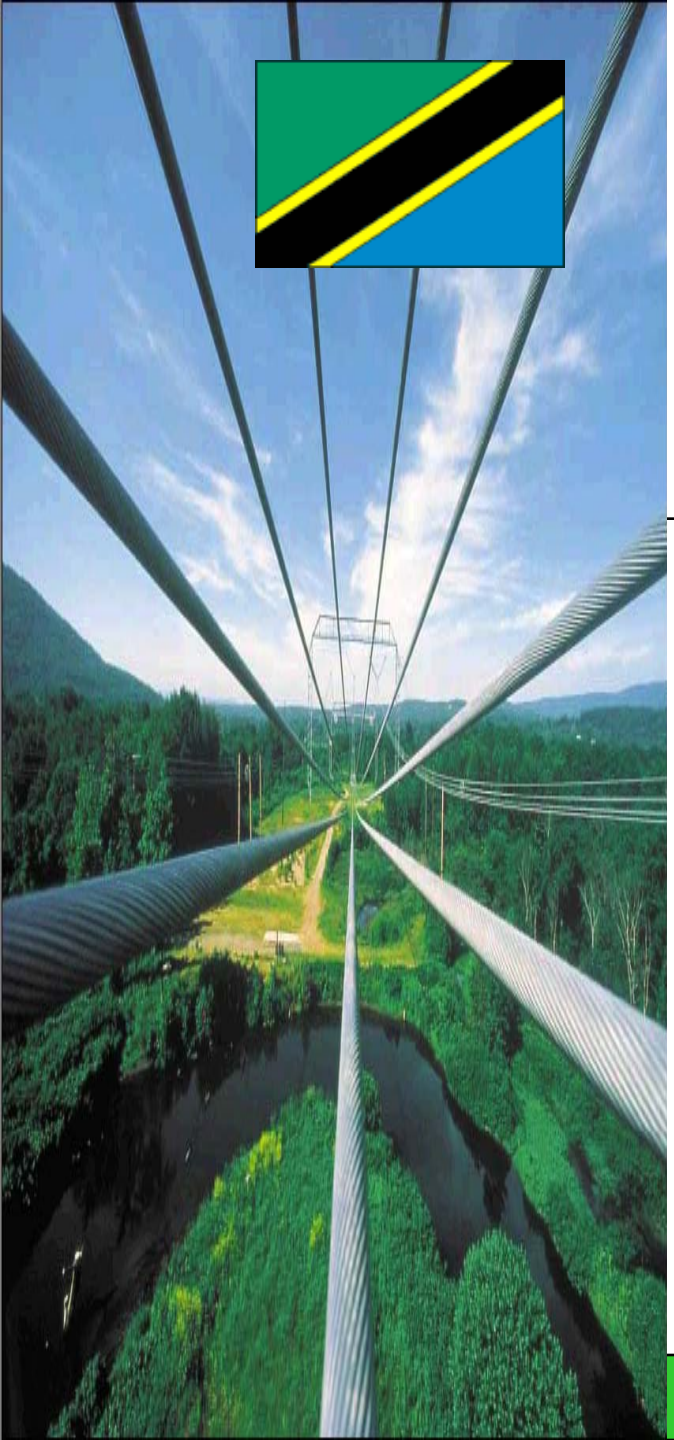


DEMAND SIDE MANAGEMENT PROGRAM IN TANZANIA

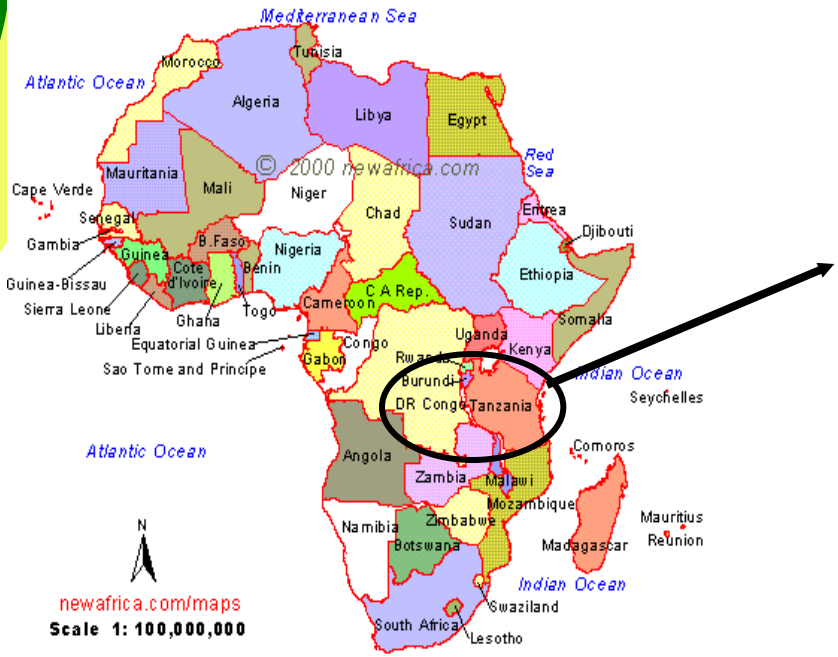
Presentation to Workshop on Global Energy Efficiency Washington, DC – 8th March 2010

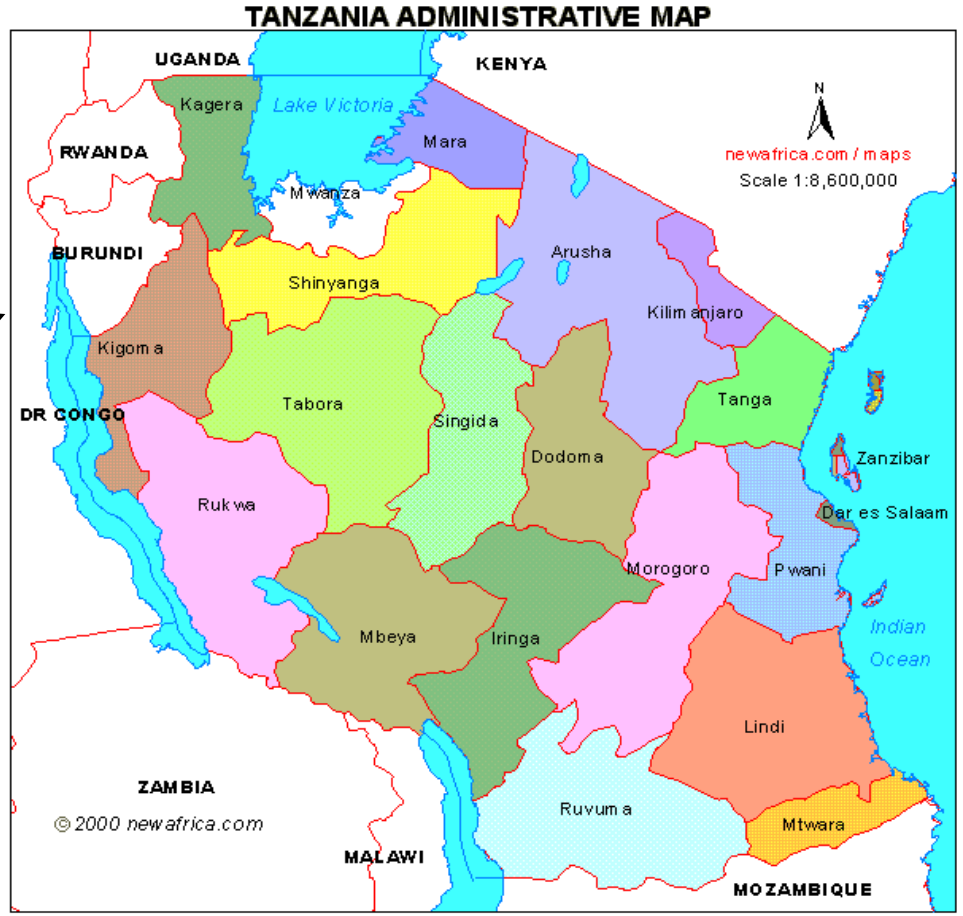
John Kabadi
Tanzania Electric Supply Company Ltd.

USAID FROM THE AMERICAN PEOPLE

USEA United States Energy Association

Introduction – Location





Introduction cont……

- Tanzania is located between Longitude 29º and 41º East, and Latitude 1º and 12º South.
- It has Total Area of 945,000 km²
- Inland Water covers 59,050 km² of the total Area
- The capital city of the country is Dodoma (Central Tanzania), while the Commercial capital is Dar es Salaam.
- The country is estimated to have 35 Million people (2002 census). Mainland – 34 million, Zanzibar ~ 1 million.
- Population ratio, Male – 16,829,861 and Female – 17,613, 742.
- The total population consists of 136 Dialects United by Swahili Language.

Company Overview

- TANESCO is 100% state-owned and vertically integrated company
- TANESCO core business: to generate, transmit, distribute electricity in mainland and sell bulk power to Zanzibar Island
- Other businesses: to plan and implement various power investment projects.
- 1992 government policy allowed private sector participation
- Generation has attracted private sector participation
- 1997 TANESCO was specified for privatization after the 1992 policy and in 2002 -2006 under management contract 2002 – 2006
- Tanesco de-specified in 2005 to allow investments

Introduction Cont ……..

- Bad hydrology for the last few years forced change in generation mix.
- TANESCO has faced time lags in the implementation of new capacity additions (Generation and Transmission).
- Shortage of Funds, mostly due to capacity and energy charges paid to Songas and IPTL.
- Dilapidated power infrastructures (Gen + Tras/Distr)
- Continued growth of demand for electricity than firmly available energy.
- Intermittent power shedding and rationing.

N.B. MD 750MW
Capacity Firm: 699 MW, Installed 1008 MW
No Reserve Margin

Potential Resources

S/	RESOURCE	PROVEN TOTAL POTENTIAL	DEVELOPED
1	Hydro Power	4,700MW, (firm Capacity (3,200)	12% (562 MW)
2	Natural gas	Songosongo-30mill.m3, Mnazi Bay-15mill.m3	361 MW
3	Coal	13200 Million Tons (300 Million Tons at Kiwira Field).	0.04% /annum
4	Biomass wood	1.8 Billion, m3	2.2% /annum
5	Biomass residues	- Crop residues= 15Million Tons/annum - Animal droppings=25Million Tons/annum - Volatile solids of sisal waste= 0.2Million Tons/annum. - Forest residues=1.1 Million Tons/annum	- About 1,000 biogas digester units of 50m3. - 22.75 MW electricity from steam and sisal plants. - 3.5MW from forest residues.
6	Wind	Speed 0.9 – 9.9 m/s	129 windmills (8.5kWp) (studies for electricity generation are being undertaken)
7	Solar	Approximately 215 W/m2/day	More than 2MWelect.
8	Geothermal	There are indications of potential	Studies are being undertaken.
9	Nuclear	Uranium potential exists	Exploration in progress
10	Tidal wave	There are indications of potential	Studies are being undertaken

Salient Features

• The demand for electricity in Tanzania has been increasing rapidly due to the growing economic and due social conditions in the country.

•The projected growth of 10% per annum will bring this demand to approximately 1005MW in 2011.

•Drivers for the power demand growth include: TANESCO accelerated electrification program of connecting 100,000 new customers annually starting in the period of year 2007 to 2011; mining growth in the north-western part of Tanzania projected to be about 22% p.a.

- **Regulatory & Legislative Environment**
  - Regulated by the Energy and Water Utilities Authority (EWURA)
  - Reporting ministry: Ministry of Energy and Minerals

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

DSM Program

DSM Objectives

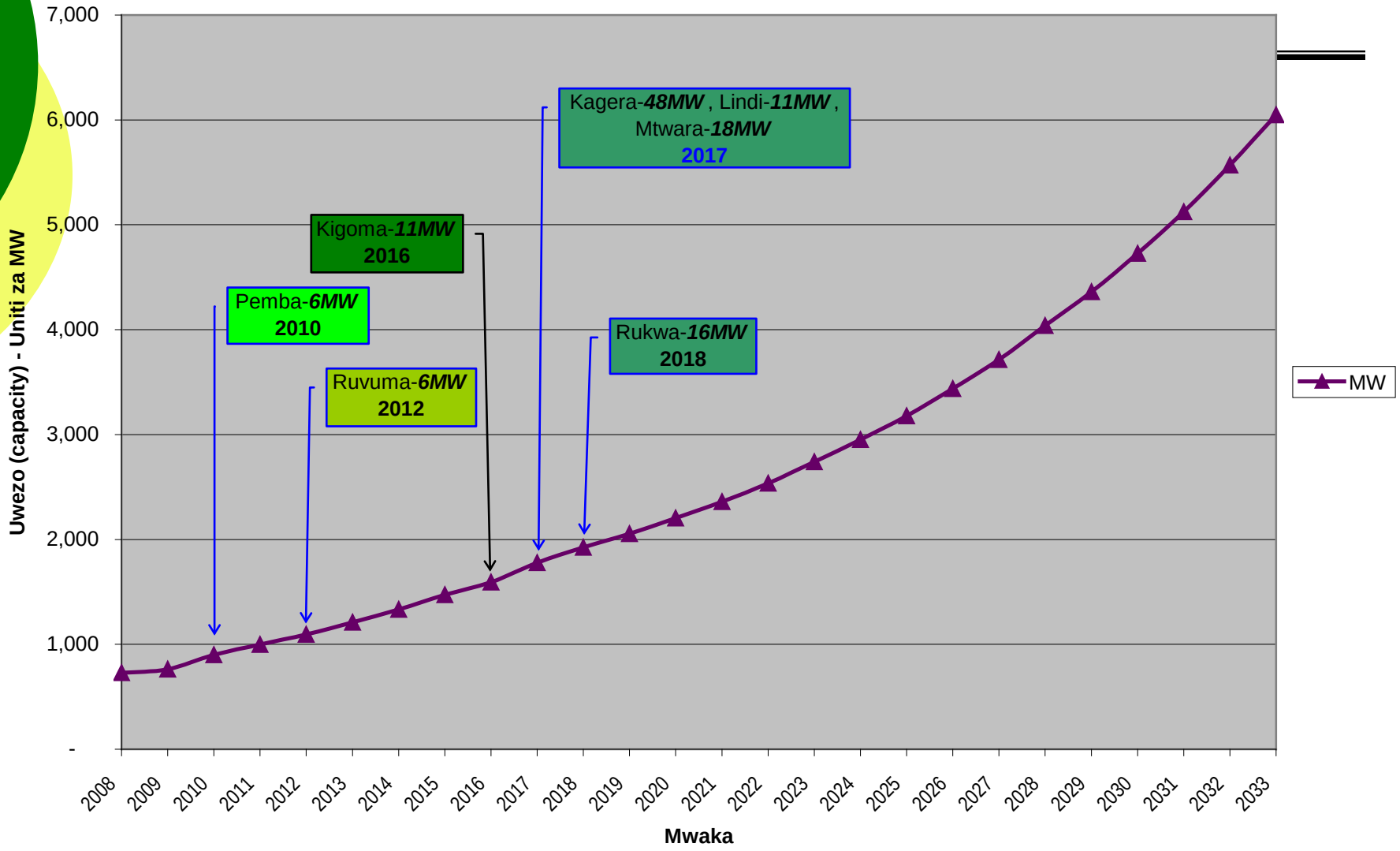
- Provide a cushion against hydrological risks
- Provide Industries/Factories with high Power Factor.
- Convince Industries/Factories use of efficient motors more reliable power supply systems
- Provide good timing and sequencing of new viable investments for the projects.

Background of DSM in Tanzania

- 1995 under ESMAP funds, TANESCO engaged a consultant to come up with the DSM program.
- 1995/1996, TANESCO carried out DSM program in major industries/Factories. Activities looked at:
  - 1. Power Factor correction
  - 2. Efficient Motors
  - 3. Use of CFL
- 1997 funds were depleted and the program paralyzed.

- N.B. 25MW were realized

Future Demand



Short – Term Generation Plan

Year	Plant	Fuel	Capacity (MW)	Cumulatve Capacity (MW)	Demand (MW)
2011	Cogeneration	Biogas	40	966	1005
	Mwanza	HFO	60		
	Ubungo	Gas	100		
2012	Kisasida	Wind	50	1016	1102
2013	Kinyerezi	Gas	240	1556	1219
	Mnazi Bay	Gas	300		
	Kiwira	Coal	200		

Way forward

- It is noted that in there will be a power capacity gap if all projects are delayed as planned. This gap can only be removed/reduced if DSM program is revived.
- TANESCO has secured funds from IFC to engage a consultant who will advise TANESCO on DSM power station units that will be made up of DSM technologies rolled out as technology matures and enough verification methods developed.
- Initially will be made up of CFL's, Commercial Lighting (retrofits), Solar Water Heating are aimed at hardwiring the energy savings into the grid.
- Switching from traditional light bulbs to CFLs is an effective, accessible change that TANESCO can make to reduce energy use at home and prevent greenhouse gas emissions that contribute to global climate change.
- Advise CFL standards to be used as the one with relative ease of implementation,
- Use of renewable energy in street lighting
- Disposal of replaced incandescent lamps.

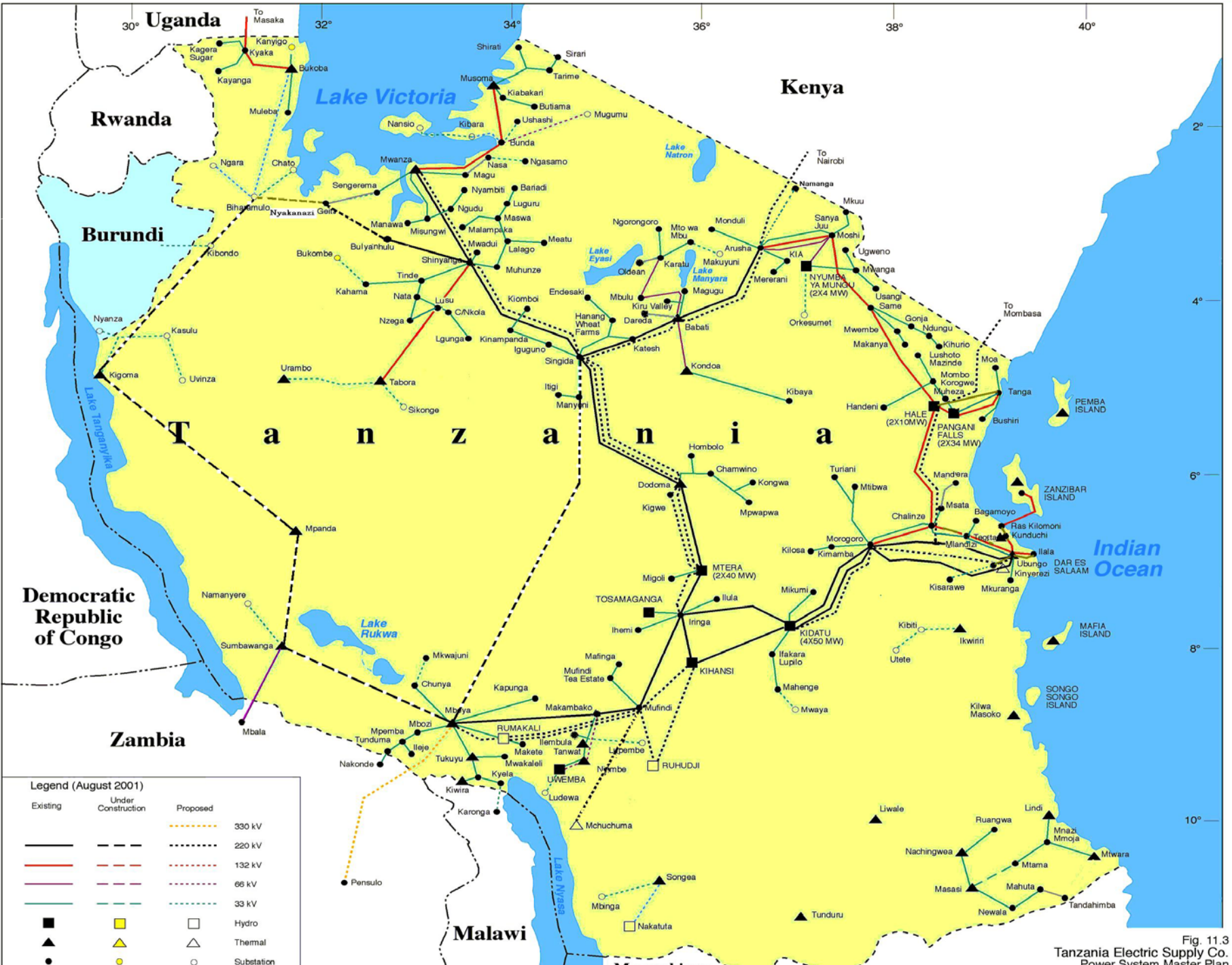


Fig. 11.3
Tanzania Electric Supply Co.
Power System Master Plan

Questions

Thank You - Ahsante