



INVESTMENT OPPORTUNITIES IN THE ENERGY AND WATER SECTORS



**ZAMBIA INVESTMENT
FORUM 2011-
MALAYSIA**



Energy Profile

- Wood fuel (firewood and charcoal) principal source of energy in Zambia, with the largest consumer group being households in both rural and urban areas (only 27% have access to electricity).
- Petroleum 12%. The largest consumer is the transport sector, followed by mining.
- Coal accounts for 5% of national energy requirements: the largest consumer is the mining industry, followed by the manufacturing sector
- The huge potential for renewable energy sources such as solar, biomass, geothermal among others remains largely untapped.



Energy Profile cont...

- A supportive policy and institutional framework has been put in place to facilitate the development of the energy sector. The Energy Policy seeks to create a conducive atmosphere which will among other things lead to increased power generation and transmission capacity and wider utilization of renewable energy resources.



Electricity



- Potential capacity is 6000 MW
- Total Installed capacity is 1948 MW

Power Plant	Capacity (MW)	Type
Kafue Gorge	990	Hydro
Kariba north Bank	690	Hydro
Victoria Falls	108	Hydro
Lunsemfwa & Mulungushi	46	Hydro
Small hydros	24	Hydro
Insolated generation	10	Diesel
Gas Turbines (standby)	80	Gas



Investment opportunities



- Main hydro power projects
 - Kafue Gorge Lower
 - Batoka gorge
- Transmission line inter-connectors
 - Zambia-Tanzania-Kenya interconnector
 - Batoka gorge



Potential large hydro power projects for development



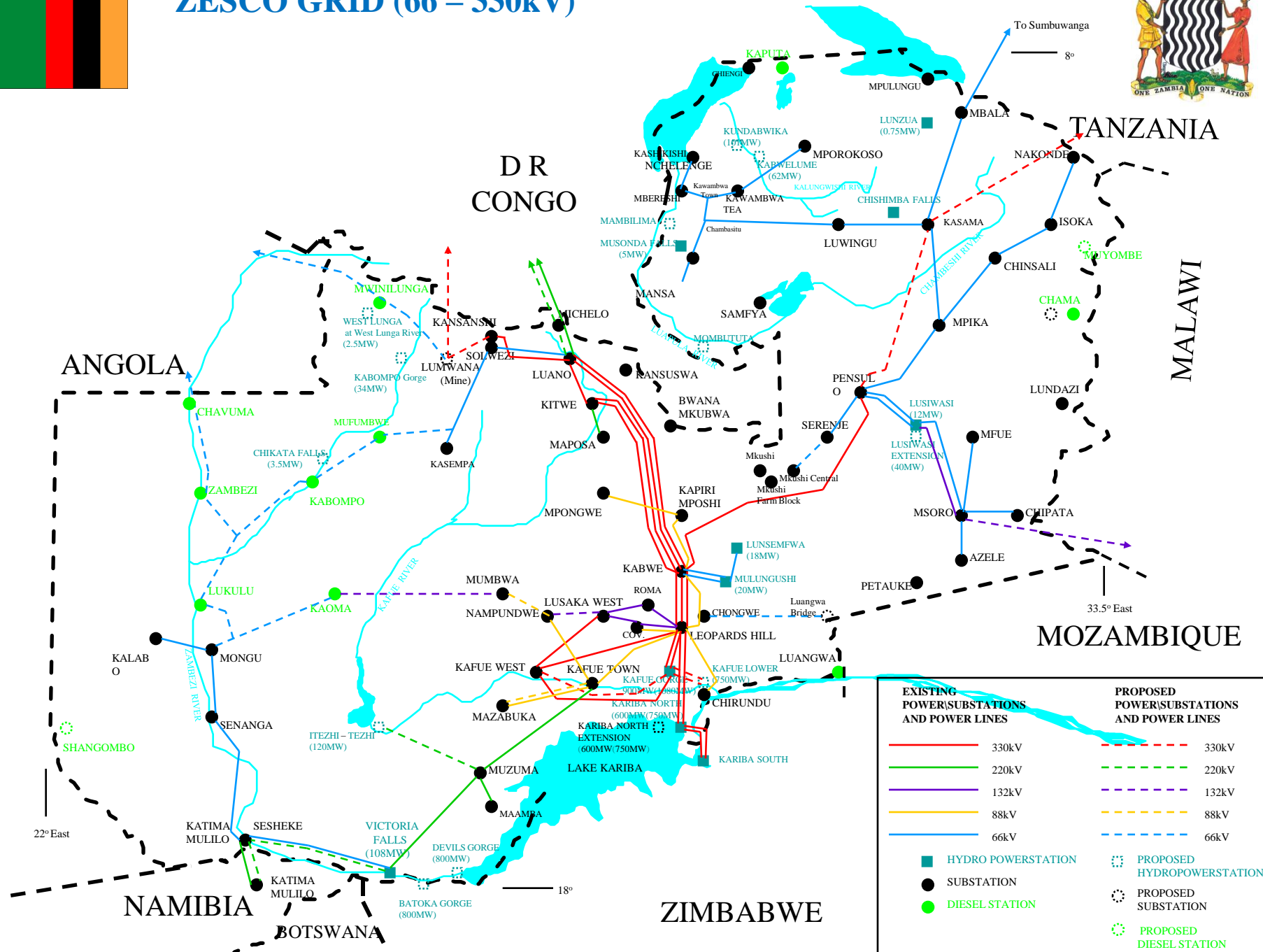
Project name	Estimated Capacity	Location	Status
Kafue Gorge Lower	600 MW	Kafue River	Taken (SINOHYDRO and China-Africa Development Fund).
Mombututa & Mambilima	950 MW	Luapula River	Taken (to be developed by CEC)
Lusiwasi Hydro	40 - 50 MW	Lusiwasi River	Taken (to be developed by ZESCO)
Batoka Gorge	800 MW	Zambezi River	Open for investment
Devils Gorge Hydro	800 MW	Zambezi River	Open for investment
Mpata Gorge	550 MW	Southern Province	Open for investment
Chavuma Falls Hydro	10 MW	Zambezi River	Open for Investment
Lufupa Hydro	2.5 MW	Lufupa River	Open for Investment

Potential large hydro power projects for development

Project name	Estimated Capacity	Location	Status
Kariba North Bank	360 MW	Zambezi River	ZESCO
Lunzua	15 MW	Luapula River	ZESCO
Itezhi Tezhi	120 MW	Kafue River	ZESCO and TATA



ZESCO GRID (66 – 330kV)



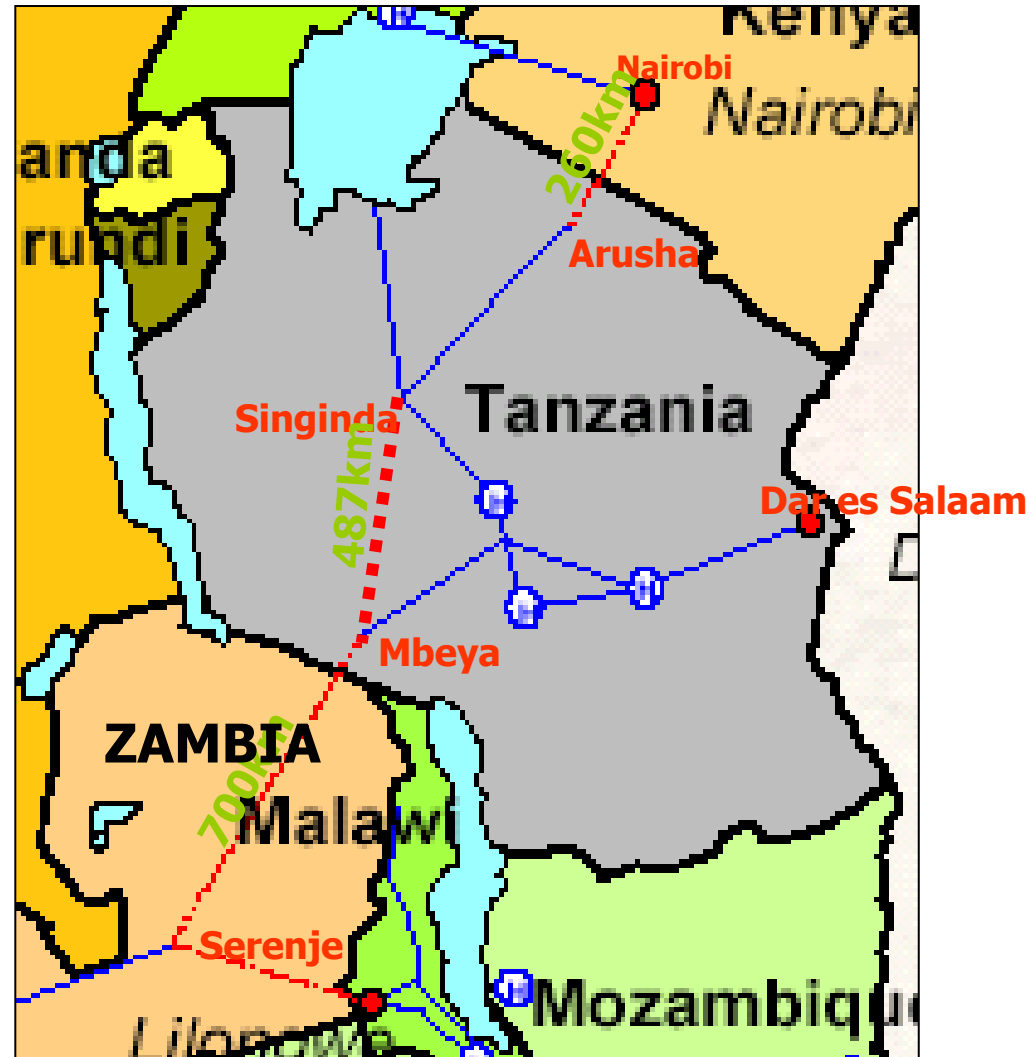
EXISTING POWER/SUBSTATIONS AND POWER LINES		PROPOSED POWER/SUBSTATIONS AND POWER LINES	
—	330kV	- - -	330kV
—	220kV	- - -	220kV
—	132kV	- - -	132kV
—	88kV	- - -	88kV
—	66kV	- - -	66kV
■	HYDRO POWERSTATION	□	PROPOSED HYDROPOWERSTATION
●	SUBSTATION	○	PROPOSED SUBSTATION
●	DIESEL STATION	○	PROPOSED DIESEL STATION



Zambia-Tanzania-Kenya Interconnector Project

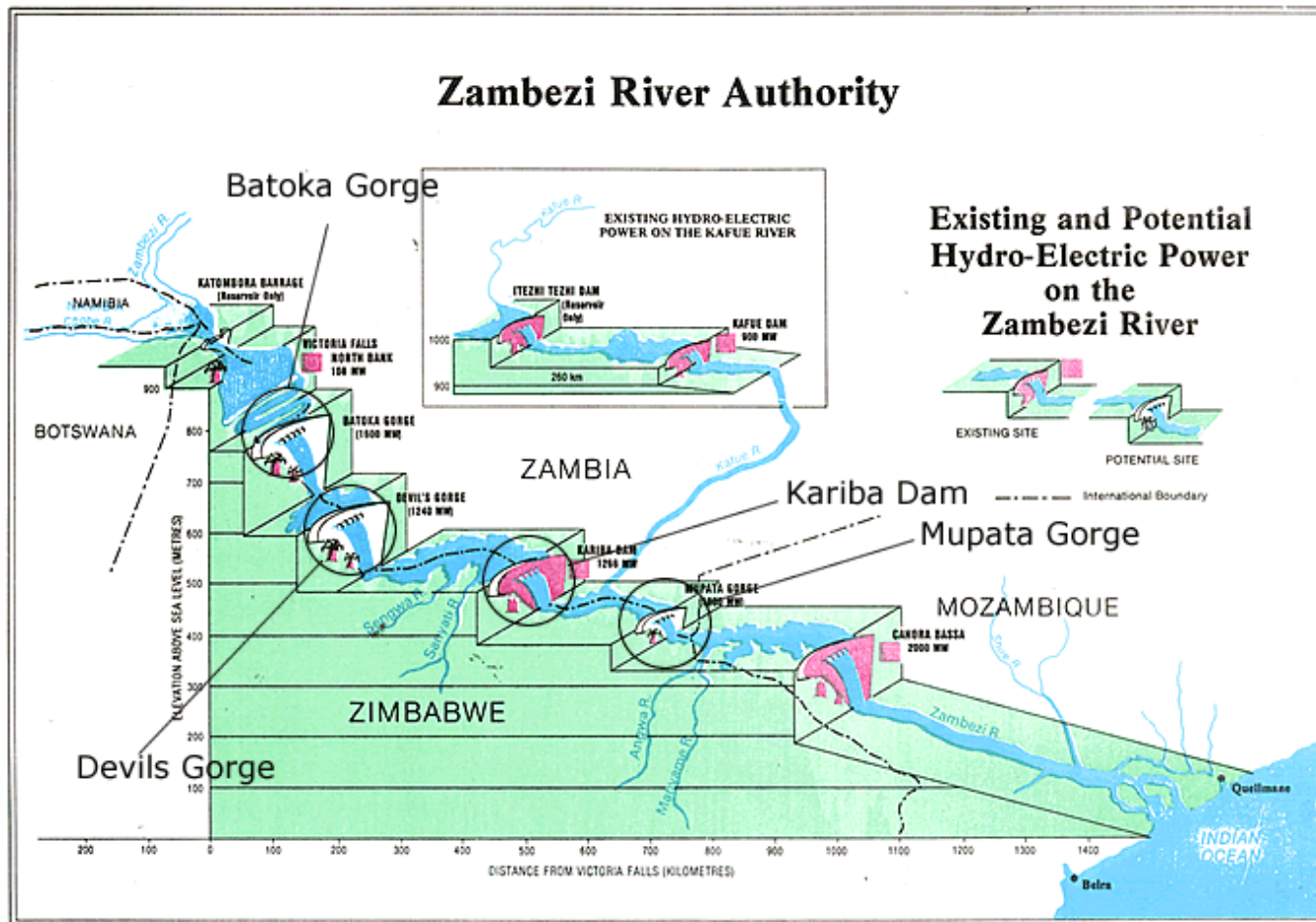


- ❑ Distance: 1 600 kms (Pensulo - Zambia to Nairobi-Kenya)
- ❑ Routing: Pensulo-Mbeya-Singinda-Arusha-Nairobi
- ❑ Capacity: 200 MW (increasing to 400 MW)
- ❑ 330 kV Double Circuit
- ❑ Cost Estimates:
 - US\$ 358 Million (Phase 1: 200 MW)
 - US\$ 302 Million (Phase 2: 400 MW)
- ❑ Possible Extensions: Tanzania-Rwanda, Kenya-Uganda, Rwanda-Eastern DR Congo
- ❑ Rwanda Has Formally Requested to Join The Project
- ❑ Uganda Has Expressed Interest in The Project





Batoka Gorge



SCHEME	Installed Capacity (MW)	Estimated Project Costs (Million US \$)
Batoka Gorge	1600	2500
Devils Gorge	1200	1450



Petroleum and Gas

- The Oil and Gas sector in Zambia has commenced attracting the attention of the sector investors following encouraging results of the Microbial Testing of the soil samples obtained in the following provinces, North Western, Eastern, Western, Northern and Southern.



» The country has since been divided into 41 Oil Blocks for purposes of awarding tenders for exploration of oil and gas in Zambia and licenses are being given.



Petroleum and Gas cont...

- Downstream -there is potential for long- term commingled feedstock supply every 2 years.
- There are also opportunities in construction of a new refinery and/or partnering with government on investment in the existing one
- Also construction and rehabilitation of fuel storage depots to assist the country store the much needed fuel strategic reserves.



Coal



- Zambia's proven reserves of coal justify the development of coal fired power plants.(79 million tonnes in Maamba, Southern Province)
- The estimated investment in modern coal fired power plants is estimated to be between US\$ 2 million and US\$ 3 million per MW.
- Currently one project which is a Public Private Partnership to set up a 300 MW coal powered thermal plant.



Uranium

- In Zambia, uranium has been discovered in valleys with no economic activities, and neither farming can take place in those areas because of unfavourable weather and non availability of relevant infrastructure
- Zambian uranium deposits (mines) all have the potential to process their ores through these various stages to produce a “yellowcake” product which can be shipped to the Enrichment and Fabrication facilities.
- Uranium mining and processing can therefore be considered as a Priority Sector because it is energy mineral like coal which will end up in a nuclear plant for the generation of electricity



Investment in Renewable Energy



- Development of mini grids e.g. solar, small hydro and biomass
- Setting up manufacturing plants for renewable energy technologies i.e. wind mills, biogas digesters, solar systems and gasifiers.
- Renewable energy enterprises in rural areas providing both sale and back up services.





Biofuels



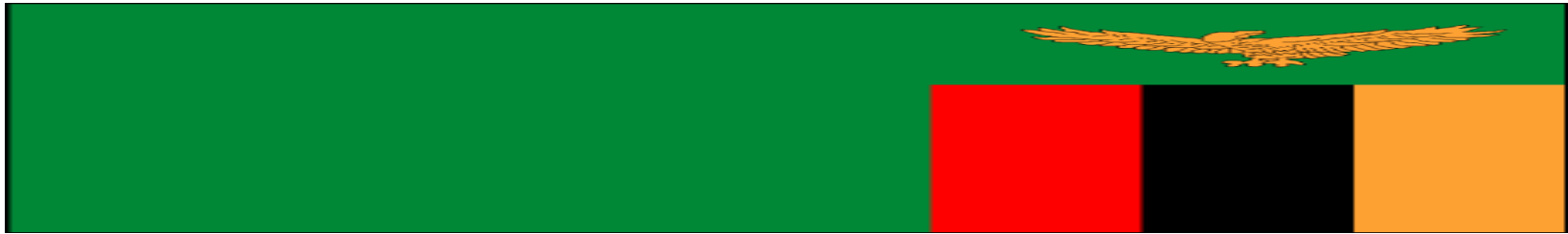
- Zambia has vast land for production of energy crops.
- Currently Sugar cane and Jatropha are currently the major crops being considered for ethanol and biodiesel production respectively.
- Other crops are sweet sorghum, soya and palm oil. Maize has been excluded for ethanol production because it is the country's staple food.
- Investment opportunities include:
 - feedstock production, refining and blending, cogeneration and gel fuel production.
 - supplying relevant technologies and additives for use in the biofuels industry



Investment in Water Sector

Investment in water sector is required in the construction of infrastructure such as :

- Development of water resources (boreholes) which can be sold to water utilities for water supply.
- Construction of Multi purpose Dams (Agriculture, Recreation and Hydro)
- Construction of water treatment plants
- Supply of water treatment chemicals.



- Investment in human capital development specifically for the water sector in the areas; training of water engineers, water treatment personnel, hydro technicians, hydrologists
- Development of software for management of water resources and for management of distribution network for water supply systems for example automation of water distribution networks



THANK YOU



FOR YOUR ATTENTION