



# **JICA KNOWLEDGE CO-CREATION PROGRAM**

## **ENERGY POLICY FORMULATION**

### **COUNTRY REPORT – ZAMBIA**

#### **(YEAR 2016)**

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**29<sup>th</sup> May - 25<sup>th</sup> June 2016**

## PRESENTATION OUTLINE

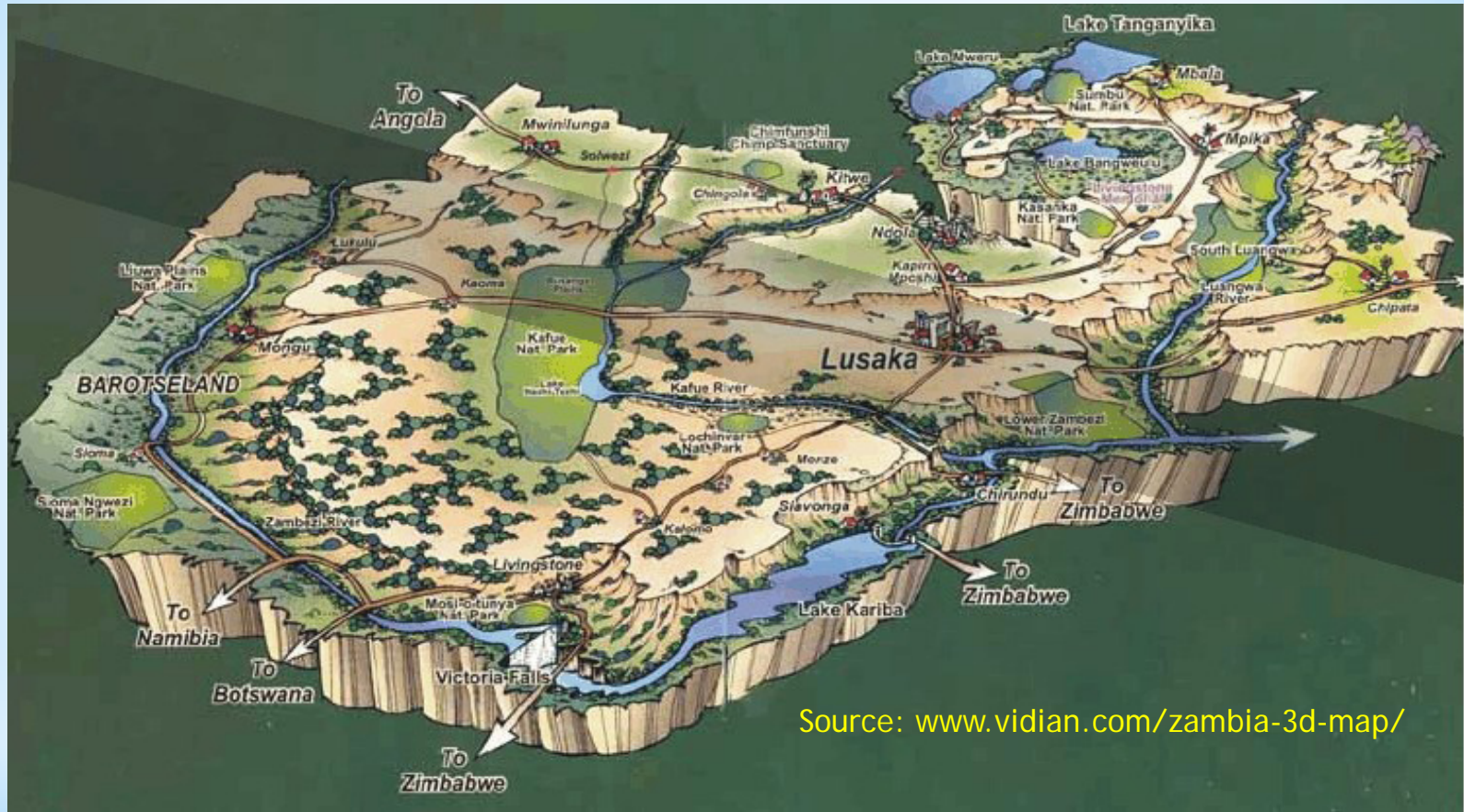
- COUNTRY INFORMATION
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## COUNTRY INFORMATION



- Landlocked country in Southern Africa with a tropical climate
- Lies between latitudes 8° and 18°S, and longitudes 22° and 34°E
- Formerly Northern Rhodesia, independent 1964
- One of the world's fastest economically reformed countries; world bank 2010
- Soccer: 2012 Africa Cup of Nations winners

## COUNTRY INFORMATION continued. . .

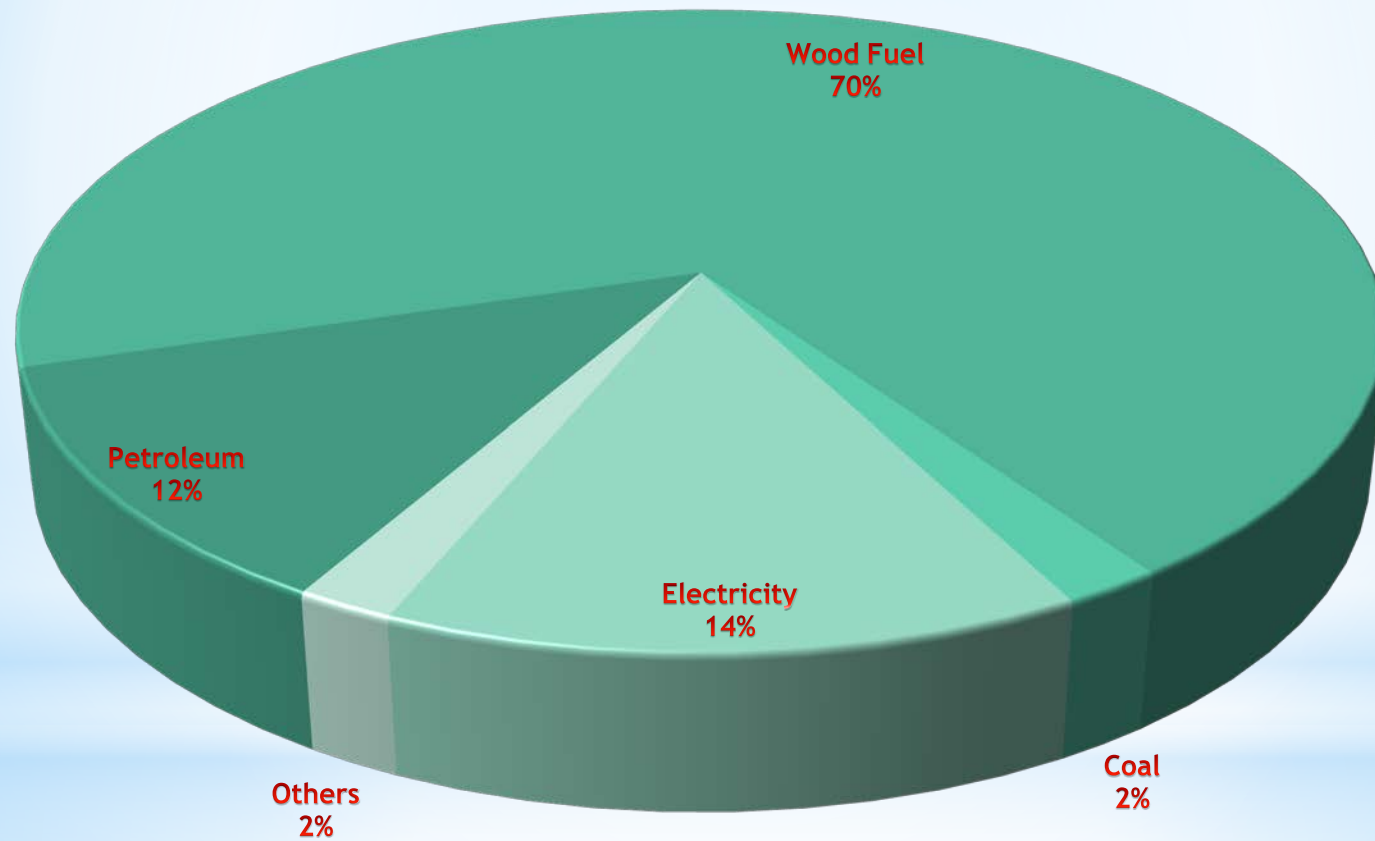


Source: [www.vidian.com/zambia-3d-map/](http://www.vidian.com/zambia-3d-map/)

- Land area 752,618 sq km
- 73 Ethnic groups with English as the official language
- Industry mining (copper), agriculture, construction, tourism, chemicals and food processing
- Has a Population of 16 452 896 as at 1<sup>st</sup> January 2016
- And the GDP stood at US\$ 27.07 Billion (2014, World Bank)

## OVERVIEW OF ENERGY SECTOR IN ZAMBIA

### National Energy demand by source



## LEGISLATION IN ENERGY SECTOR

- National Energy Policy (2008)
- The Electricity Act (No. 15 of 1995)
- Energy Regulation Act (No. 16 of 1995)
- Petroleum Act (No. 8 of 1995)
- Petroleum (Exploration and Production) Act (No 10 of 2008)
- Zambia Tanzania Pipeline Act (No 18 of 1967 and No. 13 of 1994)
- Rural Electricity Authority Act (No. 20 of 2003)
- The Grid Code (Statutory Instrument No. 79 of 2013)
- Water Resources Management Act (No. 21 of 2011)

## Strategies and Papers in the energy Sector

- Vision 2030
- Sixth National development Plan
- Power System Development Master Plan (2003 - 2030)
- Transmission system development master plan
- Framework & Package of Incentives for private sector Participation in Hydropower and Transmission Lines Development (1998)
- Renewable Energy strategy (under development as at April 2016)
- Rural Electrification Master Plan

## Energy Policies in Zambia

- The First National Energy Policy (NEP) was adopted by Cabinet in 1994
  - It sought to promote optimal supply and utilisation of energy
  - Socioeconomic development in a safe and healthy environment
  
- Second National Energy Policy was in 2008
  - It set out Government's intentions that were aimed at ensuring that the sector's potential to drive economic growth and reduce poverty was fully harnessed.
  - It went on to include an implementation strategy, with an action plan for implementation.



## The 2008 National Energy Policy

### Diversification of the country's energy mix through use of Renewable Energy

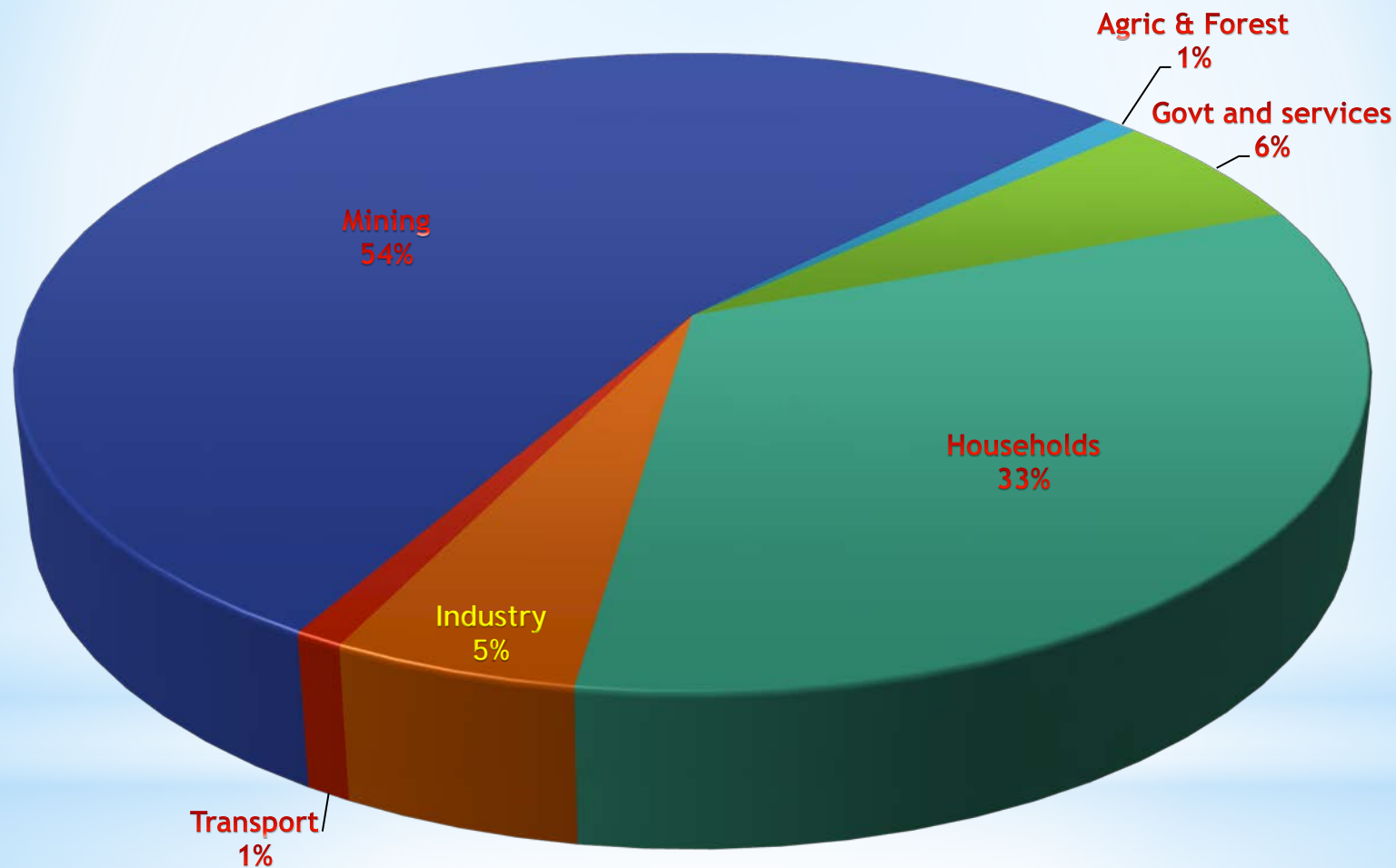
- Energy from various sources which are dependable at lowest economic, financial, social and environmental costs consistent with national development goals (6NDP, Vision 2030, Renewable Energy Strategy, GET FiT/RE FiT strategies)
- Expand generation and transmission capacity to 4,337MW by 2030 (PSDMP, Vision 2030 and Framework & Package of Incentives for private sector Participation in Hydropower and Transmission Lines Development)
- Increase access to electricity. 91% in Urban and 51% in rural, and 66% national wide level by 2030 (REMP, vision 2030, PSDMP, SE4ALL)
- Uniform Petroleum Pricing (UPP) implemented
- Development of 4 Strategic Petroleum Depots (Lusaka, Solwezi, Mongu and

## The 2008 National Energy Policy Continued . . .

- Solar & Wind resource mapping are on-going
- SI No. 32 & 33 of 2008 Tax waiver offered on energy efficient equipment
- Review of Second National Energy Policy
  - Plans are in infancy to review the 2008 National Energy Policy
  - Incorporation of the Renewable Energy Strategy
  - Review of the OPPPI guidance document: Framework & Package of Incentives for private sector Participation in Hydropower and Transmission Lines Development (1998)

## THE ELECTRICITY SECTOR IN ZAMBIA

### Electricity consumption by group



## Electricity Sources in Zambia

Source	Details
Hydropower	Installed capacity 2,318MW <ul style="list-style-type: none"> <li>• Potential 6,000MW</li> </ul>
Biomass	40MW by Zambia Sugar Company 1MW project under development by CEC
Thermal	Abundant Coal reserves <ul style="list-style-type: none"> <li>• 300MW Maamba under construction</li> <li>• 340MW EMCO under feasibility study</li> </ul>
Geothermal	Kalahari Power <ul style="list-style-type: none"> <li>• 10MW potential as indicated by initial studies</li> </ul>
Solar	Solar insolation of 5.5 kWh/m <sup>2</sup> /day <ul style="list-style-type: none"> <li>• Mpanta at MW for REA</li> <li>• IDC 300MW</li> <li>• MEWD 300MW</li> </ul>
Wind	Wind Resource Mapping on-going <ul style="list-style-type: none"> <li>• average speed of 2.5 m/s</li> </ul>

## Operational Hydropower Stations

Station	Capacity (MW)	Type	Owner
Kafue Gorge Upper	900	dam	ZESCO
Kariba North Bank	600	dam	ZESCO
Kariba North Bank Extension	360	dam	ZESCO
Itezhi-Tezhi	120	dam	ZESCO
Victoria Falls	108	run-of-river	ZESCO
Mulungushi	32	dam	LHPC
Lunsemfwa	24	dam	LHPC
Lunzua	14.8	run-of-river	ZESCO
Lusiwasi	12	dam	ZESCO
Chishimba Falls	6	run-of-river	ZESCO
Musonda Falls	5	run-of-river	ZESCO
Shiwa Ngandu	1	run-of-river	ZESCO
Zengamina	0.7	Run-of-river	Zengamina

## Operational Thermal Power Stations

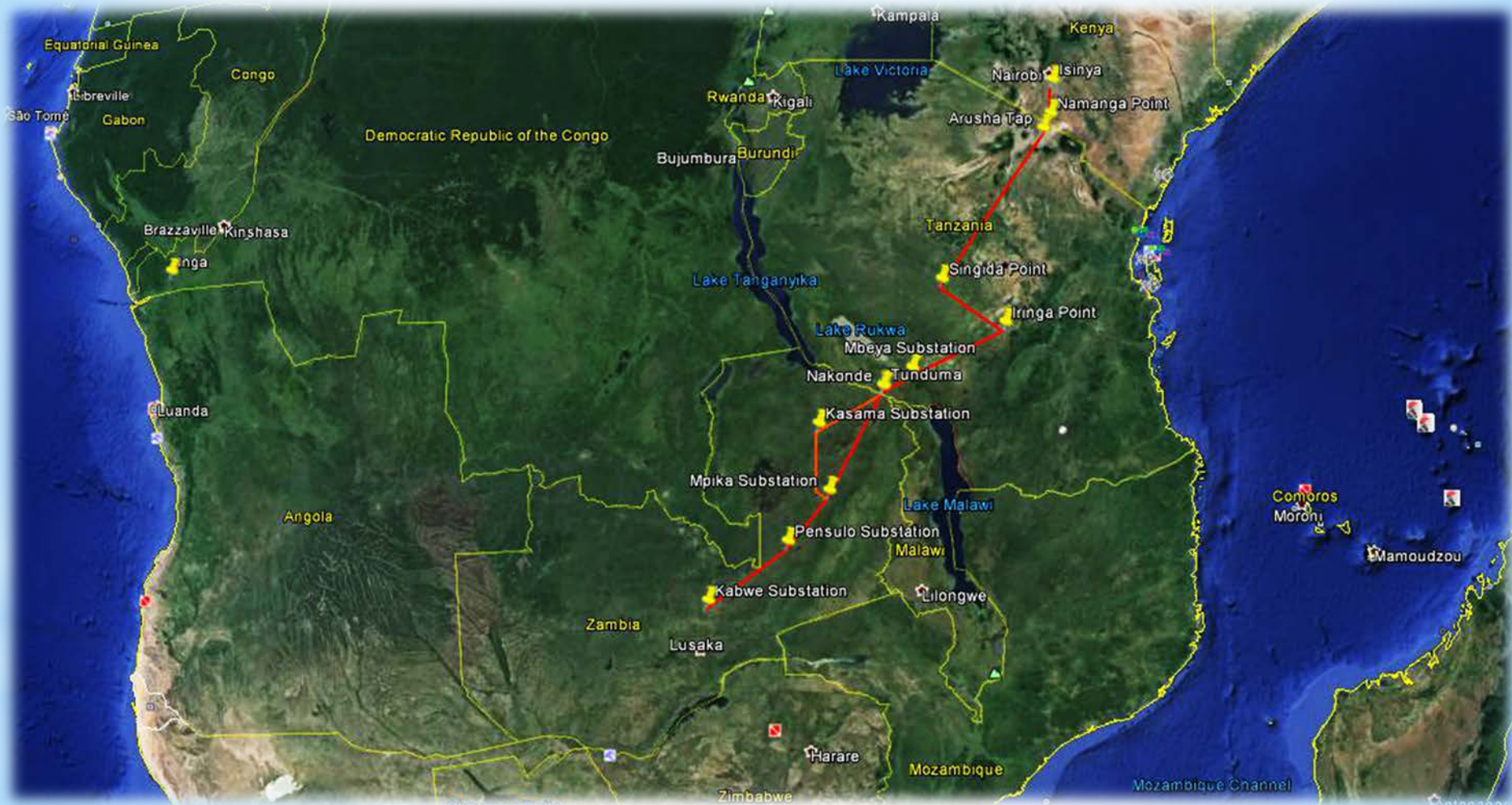
Station	Capacity (MW)	Type	Owner
Ndola HFO	50	HFO	Ndola Energy Company
Zambezi	2.35	Diesel	ZESCO
Kabompo	1.55	Diesel	ZESCO
Mwinilunga	1.5	Diesel	ZESCO
Lukulu	1.5	Diesel	ZESCO
Luangwa	1.5	Diesel	ZESCO
Shangombo	1	Diesel	ZESCO
Chavuma	1	Diesel	ZESCO
Mufumbwe	0.9	Diesel	ZESCO
Nakambala	40	Biomass	Zambia Sugar

## Hydropower Projects - 7,190MW

No.	Name of Site	Capacity (MW)	River	Status Of Site	Developer
1.	Kabompo Gorge	40	Kabompo	Pre-construction	CEC
2.	Kabwelume Falls	96	Kalungwishi	IA Signed	LPA
3.	Kundabwika Falls	151	Kalungwishi	IA Signed	LPA
4.	Chavuma Falls	14	Zambezi	Feasibility	Sinohydro
5.	Chanda Falls	1	Kashiji	Feasibility	Sinohydro
6.	Ngonye Falls	40	Zambezi	Feasibility	Western Power Ltd
7.	Muchinga	230	Lunsemfwa	Feasibility	LHPC
8.	Lufubu	163	Lufubu	Feasibility	LPC
9.	Luchenene	34	Luchenene	Pre-feasibility	Power Min Zambia
10.	Iyendwe	80	Lufubu	Pre-feasibility	Trans-sahara
11.	Mwambwa	85	Mwambwa	Pre-feasibility	Eleqtra
12.	Mutinondo	43	Mutinondo	Pre-feasibility	Power Min Zambia
13.	Mulembo/Lelya	330	Mulembo	Prefeasibility	Mchimadzi Ltd
14.	Mambilima Falls I	126	Luapula	IGMOU/Feasibility	GRZ/DRC
15.	Mambilima Falls II	202	Luapula	IGMOU/Feasibility	GRZ/DRC
16.	Mambilima Falls V	372	Luapula	IGMOU/Feasibility	GRZ/DRC
17.	Mumbotuta Falls	490	Luapula	IGMOU/Feasibility	GRZ/DRC
18.	Batoka Gorge	2,400	Zambezi	Feasibility	ZRA
19.	Devil's Gorge	1,000	Zambezi	Pre-feasibility	ZRA
20.	Mpata Gorge	543	Zambezi	Pre-feasibility	ZRA
21.	Kafue Gorge Lower	750	Kafue	Pre-implementation	ZESCO

# Transmission Project

## The Zambia Tanzania Kenya (ZTK) Power Interconnector



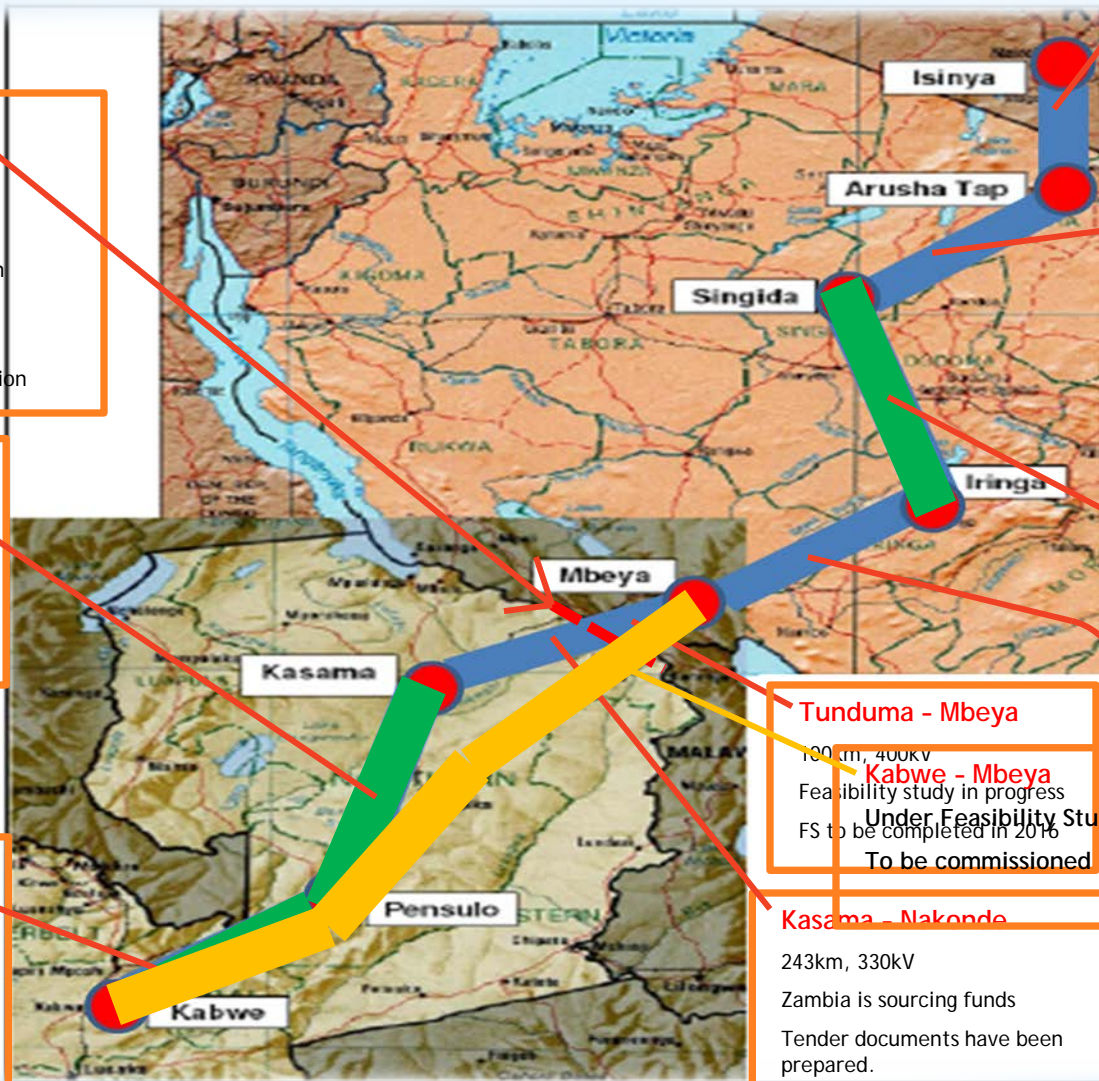


## Transmission Project

### Objectives of the ZTK Project

- Increased power **Interconnections** across Africa;
  - ✓ NEPAD objective
  - ✓ Extended power pool
  - ✓ Enhance **security** and **reliability** of electricity supply
  - ✓ Consequently link with the Pan Arab Interconnector via Ethiopia - Egypt Interconnector
  
- Encourage investment in new generation by linking generating companies with customers through provision of power transmission capacity;
  - ✓ Extended Market
  - ✓ 2400MW Batoka, 1000MW Devils Gorge, 543MW Mpata Gorge, 1190MW Luapula/Mubotuta
  
- Enhance electricity **Trade** and Foster **Economic Development**
  - ✓ Increased access to Electricity through Rural Electrification

**Progress on the ZTK Project**



**SAPP/EAPP Interface**  
 2 Options  
 HVDC Back to Back  
 US\$ 520million  
 Resistant to fault propagation  
 FACT  
 US\$ 320million  
 Susceptible to fault propagation

**Pensulo - Kasama**  
 381km, 330kV  
 Single Circuit line  
 Commissioned in December, 2015  
 Cost of US\$ 153 million

**Kabwe - Pensulo**  
 330kV line  
 Single circuit line existing  
 Feasibility studies underway for the second line  
 No funding for second Line (ZTK)

**Namanga - Isinya**  
 96km, 400kV  
 Construction to started in March, 2016  
 Financed by AfDB and GoK  
 US\$ 50M  
 To be completed in 2018

**Singida - Namanga**  
 414km, 400kV  
 Construction was planned to commence in March, 2016  
 Financed by AfDB and JICA  
 Cost US\$ 91M  
 construction to be completed in 2017

**Iringa - Singida**  
 442km, 400kV  
 Financed by World bank, JICA, AfDB and EIB  
 To be completed in 2018

**Tunduma - Mbeya**  
 100 km, 400kV  
 Feasibility study in progress  
 Under Feasibility Study  
 FS to be completed in 2016  
 To be commissioned by 2019

**Mbeya - Iringa**  
 292km, 400kV  
 Feasibility study completed in 2012  
 World Bank and AFD have expressed interests  
 Estimated US\$ 110 million

**Kasama - Nakonde**  
 243km, 330kV  
 Zambia is sourcing funds  
 Tender documents have been prepared.  
 Estimated cost is USD 200M

## CHALLENGES

- Rapid growth in the energy sector
- Inadequate community sensitisation on tariffs and cost of producing power
- Low financial capacity by Independent Power Producers
- Inadequate local financing institutions

## AREAS OF INTEREST

- Policy formulation
- Energy markets
- Financing models for energy projects

ありがとうございました  
Thank You

