



# ENERGY STATISTICS IN ZAMBIA

BY

Harriet Zulu

**Principal Energy Officer**

DEPARTMENT OF ENERGY



# PRESENTATION OUTLINE



- Overview the Energy Sector
- Generation capacity
- Electricity consumption by sector
- Petroleum sub sector
- Challenges in the power sector
- Measures for the sector
- Conclusion



# DEMOGRAPHIC DATA

- Land locked
- Area – 752, 614 km<sup>2</sup>
- Population – 14 million (2010)
  - 40% urban
  - 60% rural
- 16 people per km<sup>2</sup>
- GDP 1849 per capita



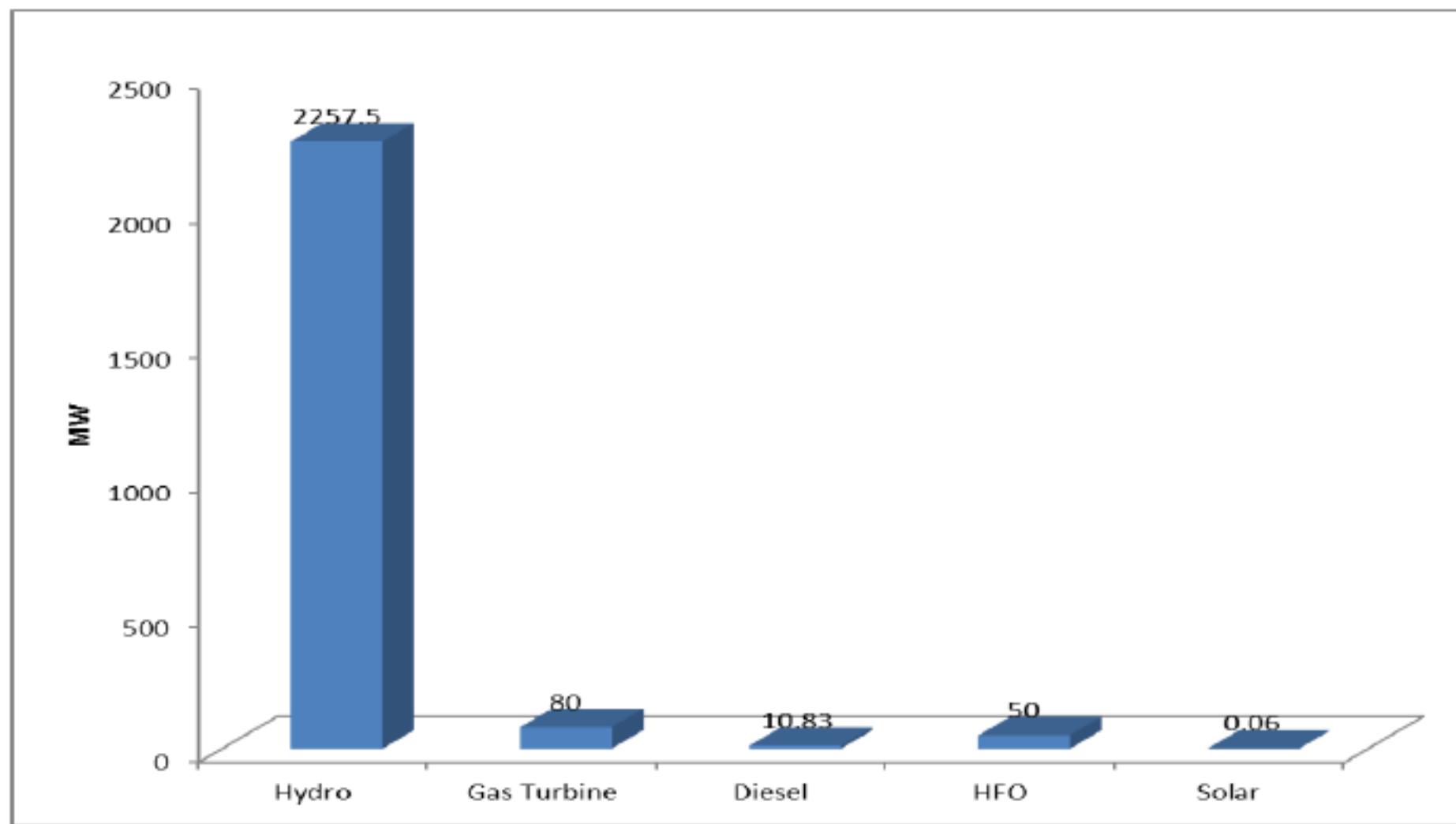


# OVERVIEW OF ENERGY SECTOR

- Major source of energy in Zambia is wood fuel (i.e. firewood and charcoal), with the largest consumer group being households in both rural and urban areas;
- Electricity installed capacity is 2,451 MW
  - 96% hydro, 2.1% thermal (HFO and Diesel) and 1.7% renewable comprising of solar and small hydros
  - “Renewable hydro” = up to 20 MW
- 25% of population have access to electricity (Urban 48% & Rural 4.5%)
- Solar potential: 6-8 hrs/day, with energy output of 5.5kwh/m<sup>2</sup>/day
- Electricity tariff: US\$0.067



# Installed capacity (MW) by type





# Generation capacity (MW)



## INSTALLED CAPACITY

PROJECT	PROJECT OWNER	SOURCE	CAPACITY (MW)
Kafue Gorge	ZESCO	Hydro	990
Kariba North Bank	ZESCO	Hydro	720
Kariba North Bank Extention	ZESCO	Hydro	360
Itezhi Tezhi	ZESCO/TATA	Hydro	120
Victoria Falls	ZESCO	Hydro	108
Small (Lusiwasi, Chishimba, Musonda and Lunzua)	ZESCO	Hydro	39
Thermal Diesel	ZESCO	Hydro	10.8
Total Installed			2,347



# Generation capacity (MW) cont...

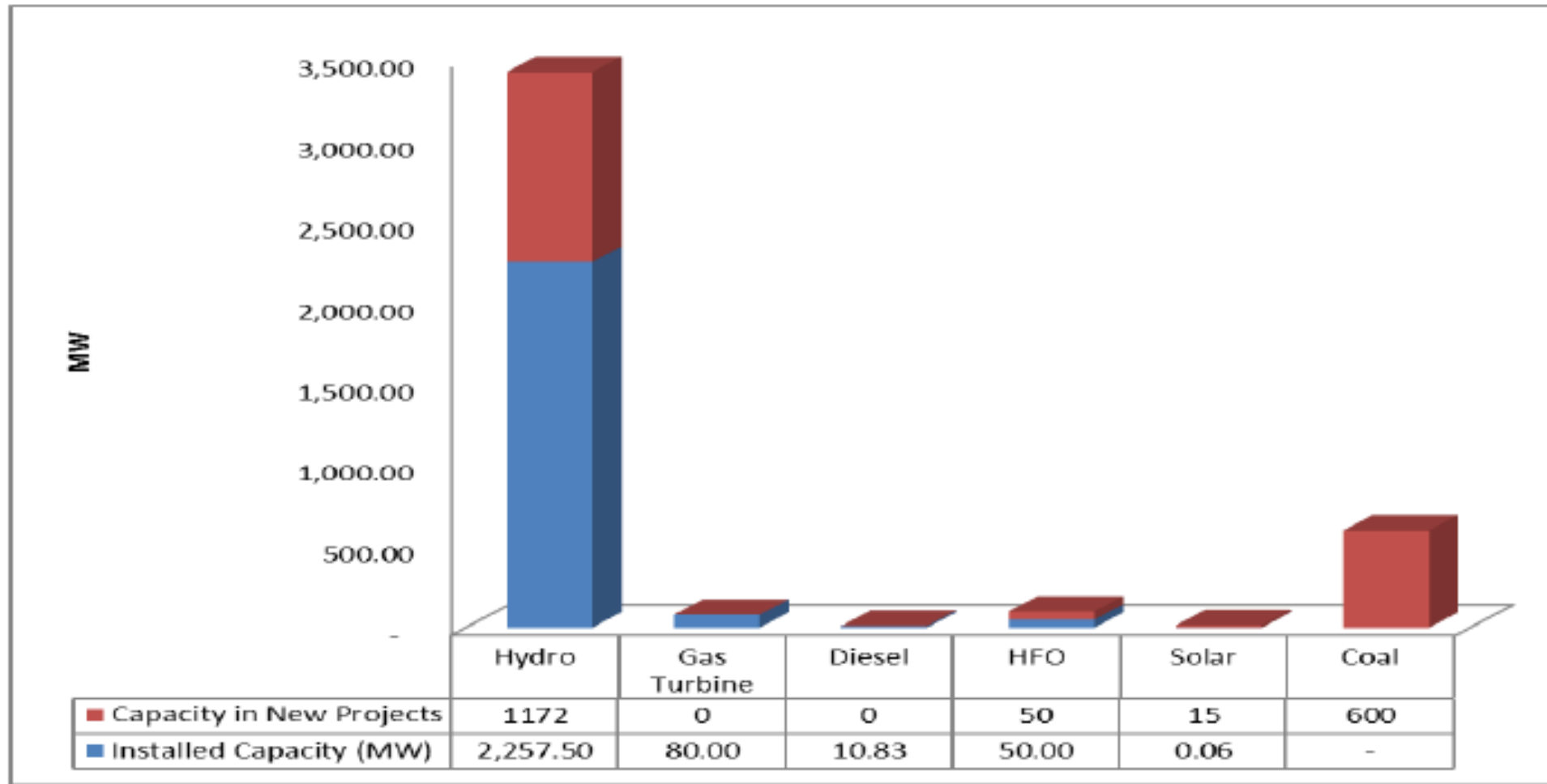


## INSTALLED CAPACITY BY IPPs

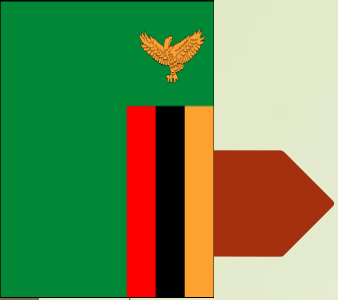
PROJECT	PROJECT OWNER	SOURCE	CAPACITY (MW)
Zengamina Generation station	Zengamina	Hydro	0.75
Lusemfwa Generation station	Lusemfwa Company	Hydro	23.2
Bancroft	CEC	Gas Turbine	20
Luano	CEC		
Luanshya	CEC		10
Ndola Energy	Ndola Energy Company - IPP	Thermal	50
Solar Offgrid systems	REA	Solar	0.06
<b>Total Installed (MW)</b>			<b>104.81</b>



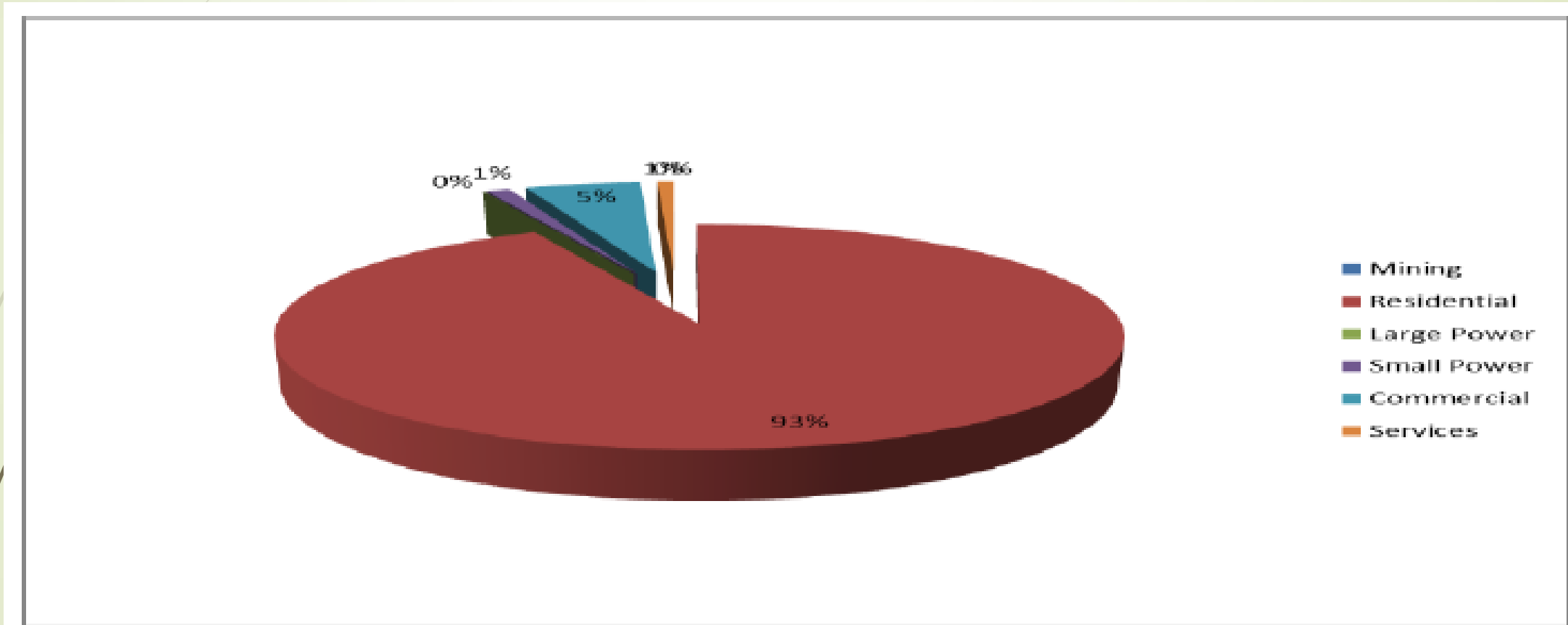
# Expected generation by 2019



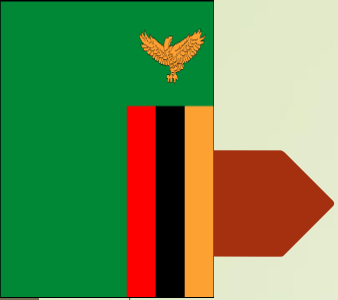




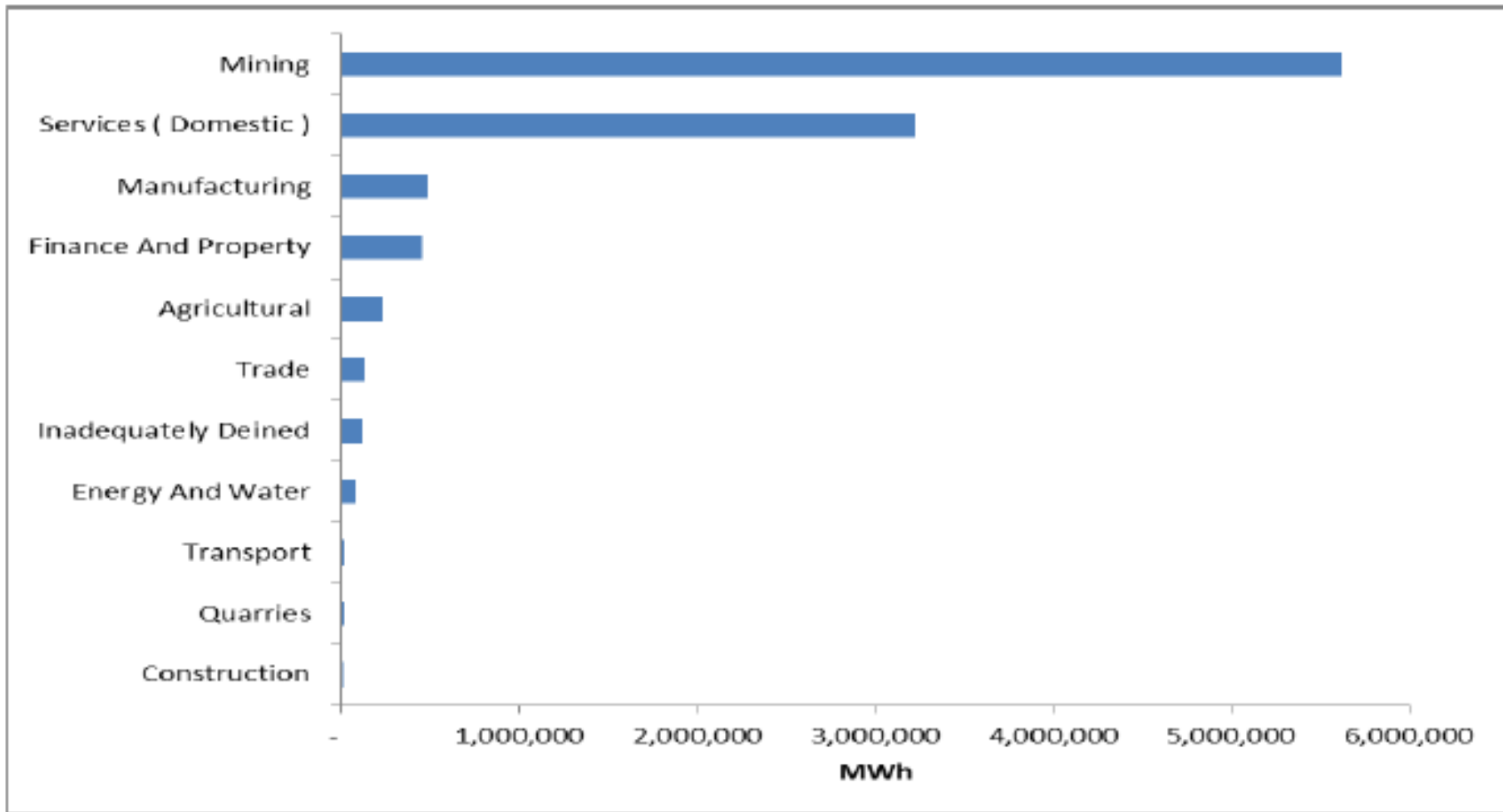
# Electricity consumers by tariff category

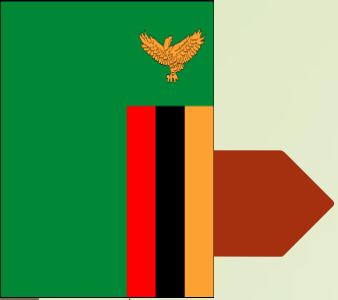


Total customers – 611,302

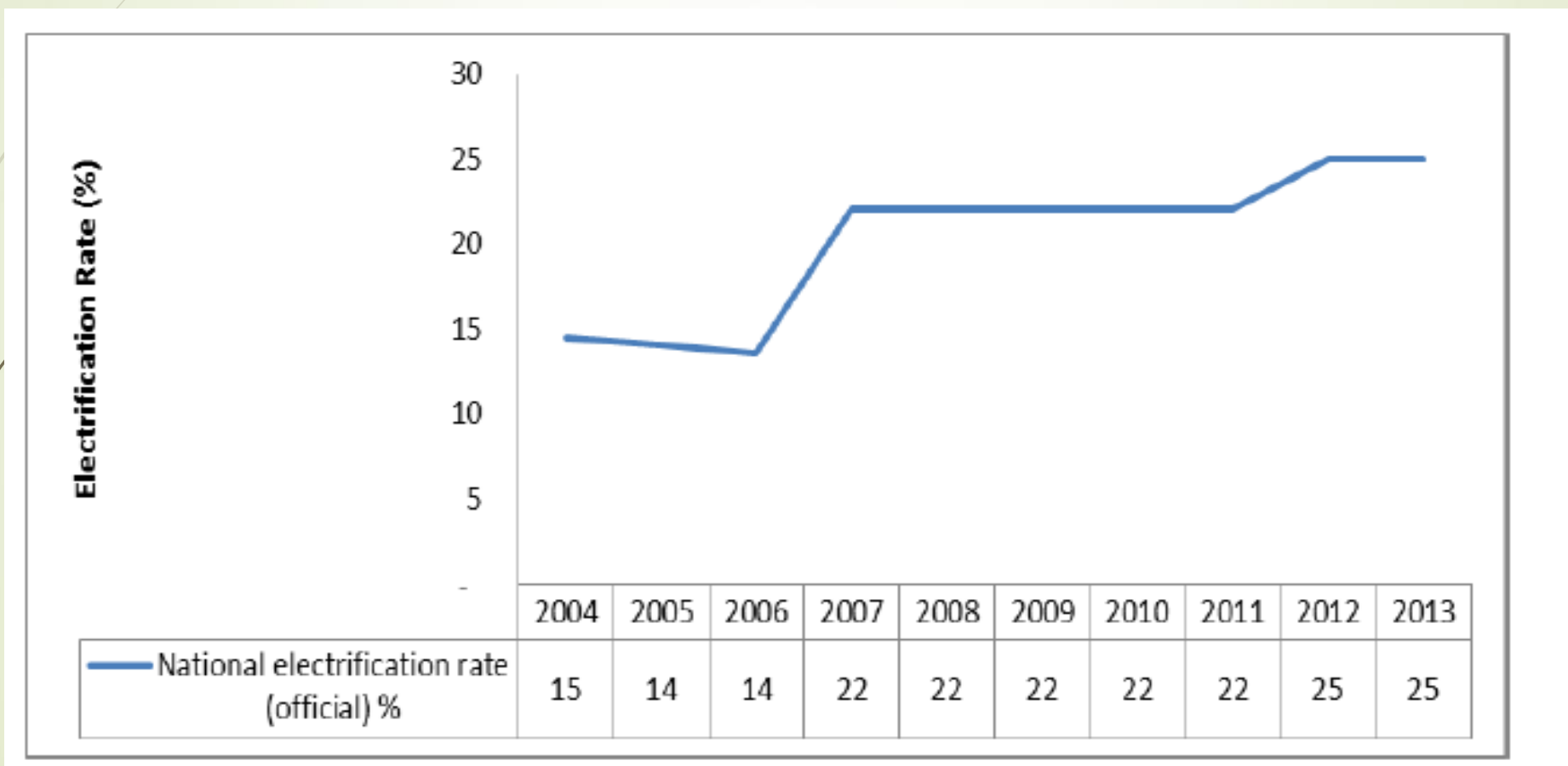


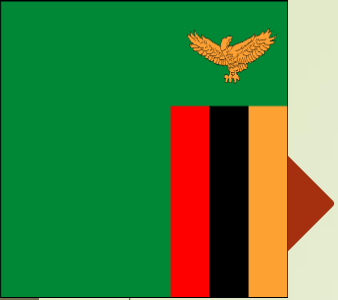
# Electricity consumption by sector



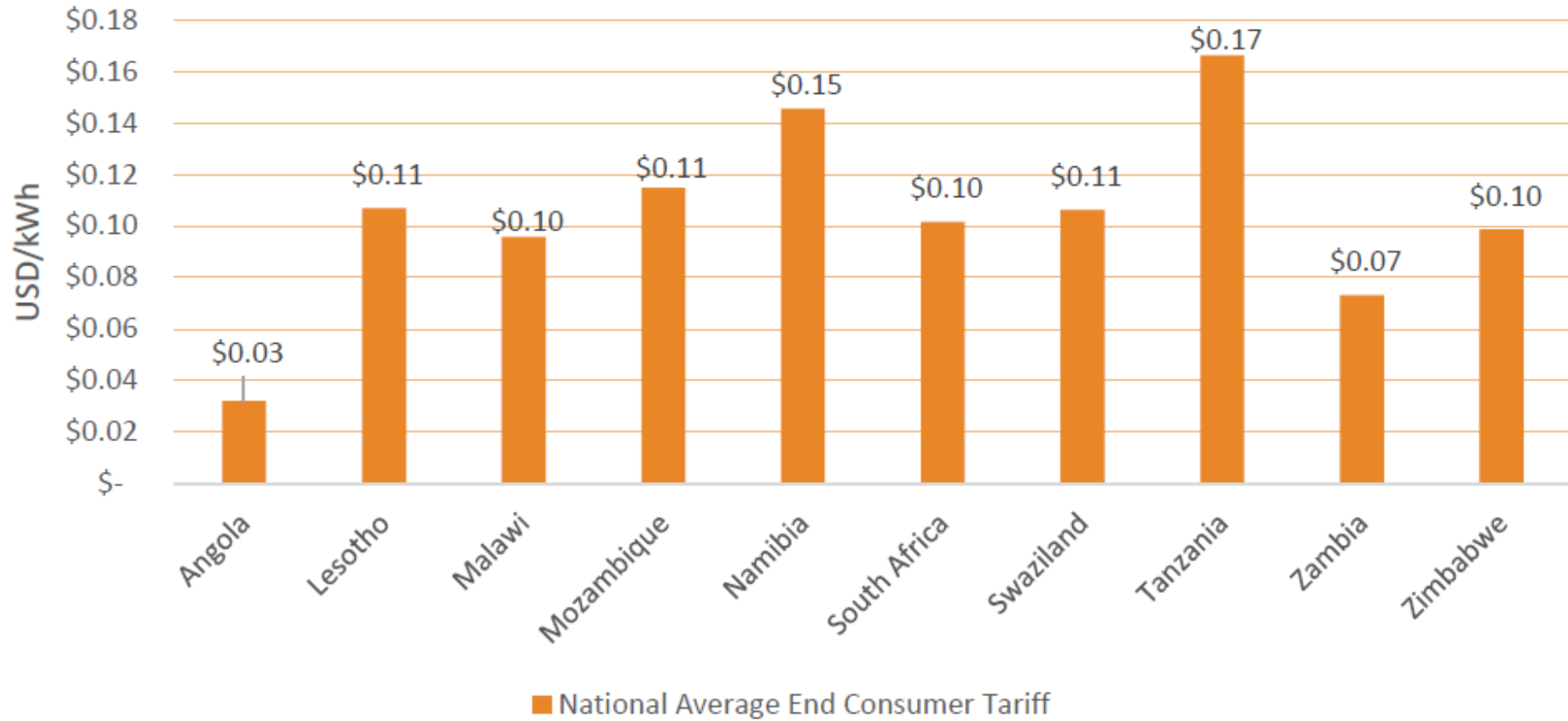


# Electrification rate





# Electricity tariffs compared in the region



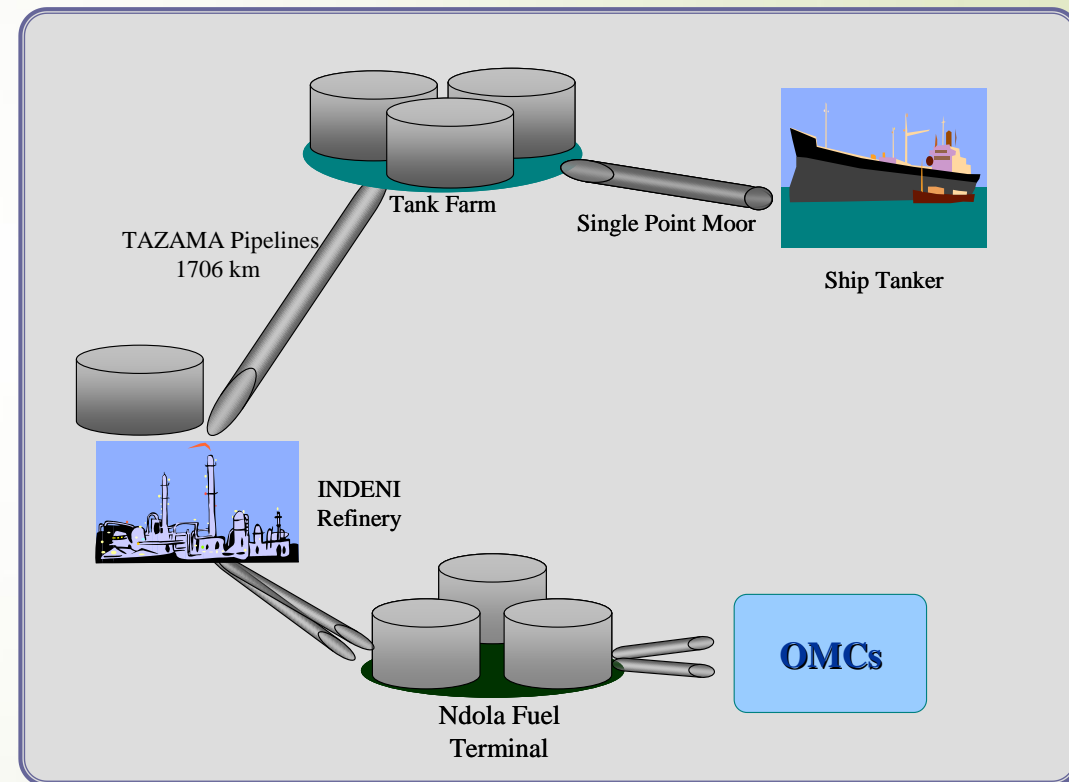
Source: RERA Database 2014



# Petroleum subsector



- ▶ Zambia imports all her petroleum requirements
  - ▶ 40% supplied by Indeni Refinery
  - ▶ 60% supplied as “white” products
- ▶ The Petroleum sub-sector accounts for 12% of final energy consumption
- ▶ In previous years, it accounted for 10% of the total national forex import requirements
- ▶ Key infrastructure components include:
  - ▶ TAZAMA Pipeline – 1710 km, commissioned 1968
  - ▶ Indeni Refinery – 1.1 million tonnes capacity pa, commissioned in 1973
  - ▶ Ndola Fuel Terminal – 130 million litres
  - ▶ Fuel tanks – Lusaka (25m ltrs, Mpika (6.5m ltrs)

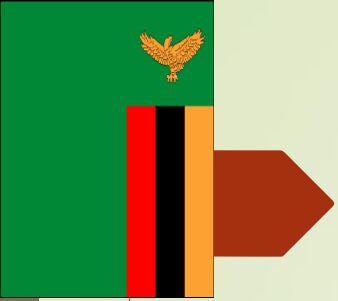




# Renewable energy subsector

- Biomass:
  - Accounts for over 70% of energy consumption in the form of firewood and charcoal
  - Biofuels – not commercially produced yet however, blending ratios and pricing framework done
  - Biogas – used on a smaller scale
  - Gelfuel – being used for cooking but not locally produced
- Solar
  - Less than 1% - 60KW off grid system
  - 100MW in the pipe line to be installed by end of yr with additional 120MW by end of next yr
- Wind - Studies still underway to determine wind potential being supported by World Bank.





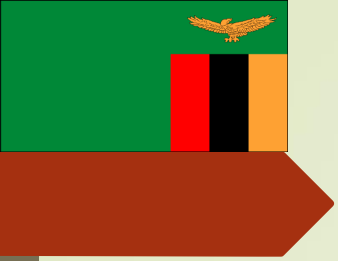
# CURRENT STATE OF POWER SECTOR

- Zambia is experiencing a power deficit of approximately
  - **1,000 MW in January**
  - **760 MW now**
- Reduced Generation capacity attributed to
  - low rainfall experienced during the 2014/2015 and current season
    - Leading to low water levels in the two main dams at Kariba and Itezhi-Tezhi dams.
- ZRA has allocated 20 billion cubic metres for electricity generation at Kariba in 2016 compared to the 45 billion allocated in 2015

# SHORT - MEDIUM MEASURES

- **EMERGENCY POWER SUPPLY**
- **THERMAL AND SOLAR POWER**
- **DEMAND SIDE MANAGEMENT**





# POLICY MEASURES



## Policy and project development

- **REFIT strategy** - GRZ with the help of SATH and USAID is developing a Renewable Energy Feed-in Tariff strategy (REFIT) to promote investments in Renewable Energy development.
- REFIT strategy aims at implementing at least 200 MW from renewable energy in the next 3 years
  - 100 MW from hydro – up to 20 MW
  - 100 MW from non hydro, mainly solar



## POLICY MEASURES (CONT...)

- Under REFIT strategy standardized projects development documents have been developed e.g PPA, Connection Agreement, Connection Guidelines and Implementation Agreement.
- REFIT strategy is expected to be adopted by end of May 2016

### Get FIT Programme

- Based on REFIT policy, GRZ with the assistance of KfW (Germany Development Bank) is working on the development of the Global Energy Transfer Feed-in Tariff (GET FiT) mechanism, to leverage tariffs for projects to be developed under the REFIT strategy



# POLICY MEASURES (CONT...)

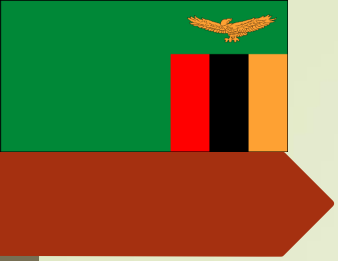


## SE4ALL Initiative

- GRZ working on the UN Sustainable Energy for All Initiative to support three interlinked objectives of;
  - providing universal access to modern energy services,
  - Doubling the global rate of improvement in energy efficiency,
  - Doubling the share of renewable energy in the global energy mix.

## Renewable Energy Resource Map

- GRZ with support from World Bank is developing a resource map indicating the country's solar and wind resource potential to guide investments on suitable locations



# POLICY MEASURES (CONT...)



## Revision of Electricity and Energy Regulation Acts

- ▶ Reviews of Electricity and Energy Regulation Acts are on-going to take account of emerging issues in the energy sector

## Scaling Up Renewable Energy Program for Low Income Countries (SREP)

- ▶ Programme aims to help low income countries use new economic opportunities to increase energy access through renewable energy use
- ▶ Total amount of up to \$40 million made available for Zambia to assist private sector power project financing, of which \$18 million is a grant and \$22 million is a concessional loan
- ▶ Currently the government is in the process of preparing an investment plan for the programme



# CONCLUSION



- Power rationing is inevitable to avoid depleting water in the reservoirs to shutting down Kafue Gorge and Kariba hydro power stations
- Government is considering all avenues to alleviate the problem both on short and long terms to ensure continued economic growth and sustenance of the current economic activities.
- Government is undertaking consented efforts to diversify the power sector and ensure that the country achieves a climate resilient power sector.



***THANK YOU FOR YOUR ATTENTION***