Social –Economic Impacts of Energy and Demand Growth, Call for Energy Mix in Uganda

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INTRODUCTION

Power demand in Uganda has been increasing rapidly against a background of recent economy growth, and it is predicted that the growth rate of power demand continues to be around 8%.

Addition to this, Uganda is a member of the East African Power Pool and is expected to play a role of "Power Supply Country" utilizing her wealthy natural resources thus calling for the need to diversify her energy resources in order to address all the energy demands.

PEAK ENERGY DEMAND IN THE LAST DECADE

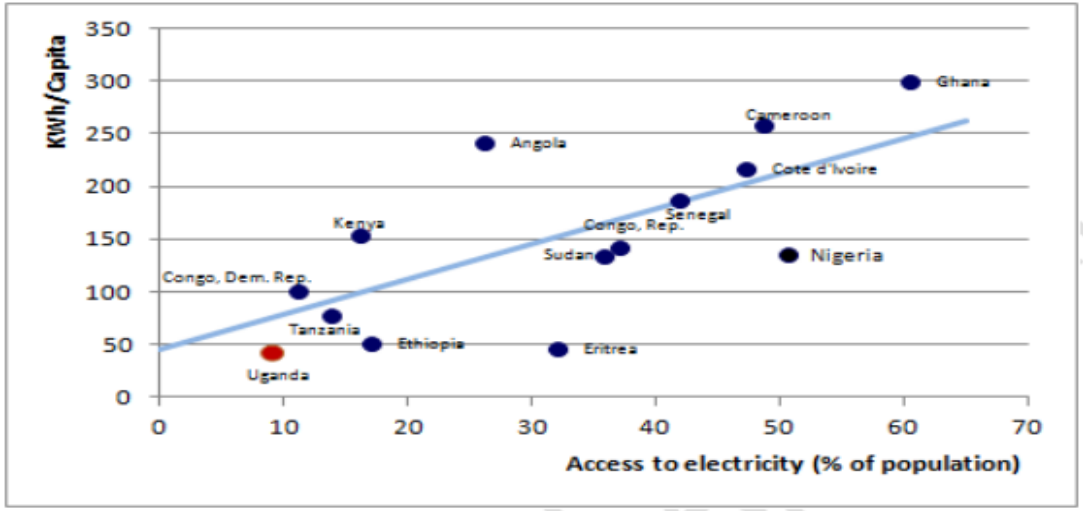
Item	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Reg. Peak (MW)	180	243	236	281	279	270	253	246	283	310
Derived Peak (MW)	257	261	261	281	294	334	357	370	368	387
Load Shedding (MW)	77	18	24	0	15	64	104	124	85	77

INSTALLED CAPACITY

December 2019, Installed capacity was at a total of 1,252.4MW of which 1,246.5MW supplied the main grid and 5.9MW off the main grid. Capacities by technology are; Hydropower 1004.2MW (80.1%), Solar PV 50.8MW (4.1%), Thermal 100MW (8.1%), Bagasse/Cogeneration 96.2MW (7.7%) and others 1.1MW (0.1%).

Access to electricity as per the reports of Power Africa fact sheet Uganda April 2020 stands at Rural Access 19%, Urban Access 23% and Households without power at 6.9million.

ACCESS TO ELECTRICITY IN THE REGION



Source: Consultants elaboration with data from the World Bank (Year 2009)

ENERGY DEMAND

In March 2019, 55% of Ugandans living in urban areas and about 10% of those in rural areas had access to grid electricity and as of April same year generation capacity was at 1,167MW with peak demand of 625MW and 25% national electrification rate.

Same year 2019, the reports by the Ministry of Energy and Mineral Development showed that about 1000 new customers were requesting grid power connection on daily basis., with over 1.3million existing Umeme connections.

2012 ENERGY BALANCE OF UGANDA

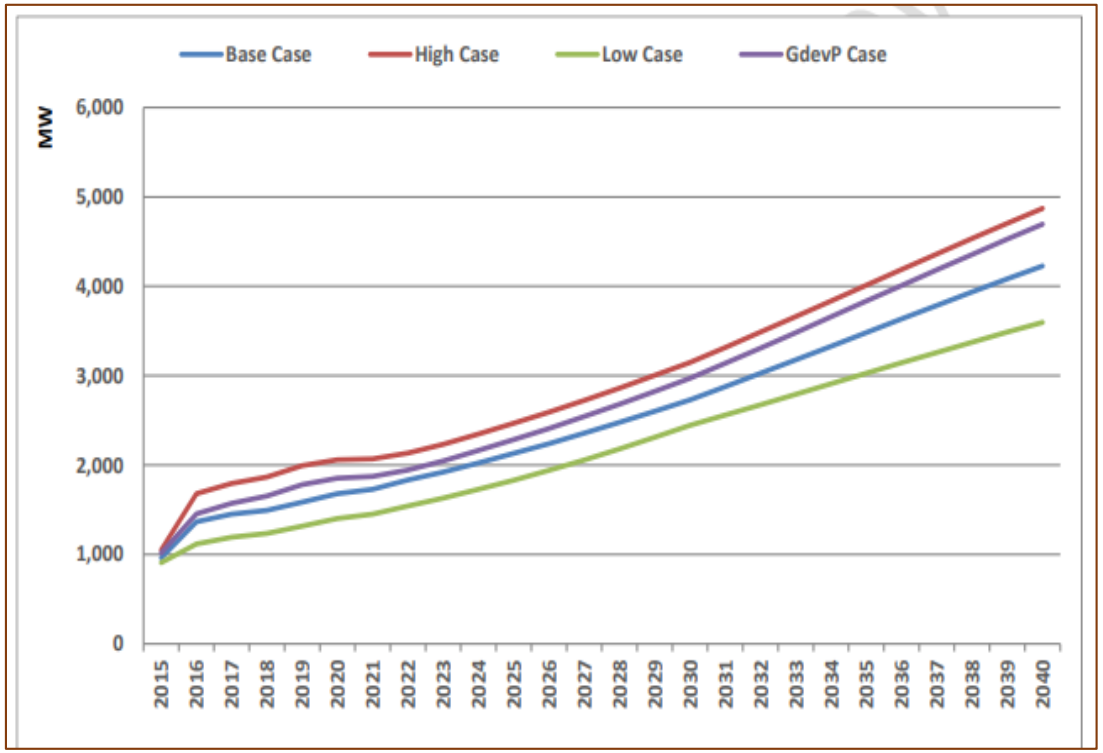
Number	Sector	Energy Demand	Electricity Demand
1	Residential	67.09%	24.24%
2	Commercial	13.35%	11.16%
3	Industrial	11.86%	64.60%
4	Transport	7.25%	0.00%
5	Agriculture	0.45%	0.00%
	Total	100%	100%

RELIABLE SOURCES FOR ELECTRICITY IN UGANDA

SOURCES OF ELECTRICITY IN UGANDA

Rank	Source	Quantity(MW)	Percentage
1	Hydropower	1,007	80.4
2	Fuel Oil	100	8.0
3	Solar Power	50	4.0
4	Cogeneration	95	7.6
5	Wind	0	0.0
6	Geothermal	0	0.0
7	Nuclear	0	0.0
8	Others	0	0.0
	Total	1,252	100.0%

PEAK DEMAND FORE CAST



DISCUSSIONS AND CONCLUSIONS

The 2005 and 2006 power case crippled Uganda into a power crisis with a sharp decline in hydropower generation output due to the prolonged droughts that affected water levels in Lake Victoria. This called for exploration of more sources of energy to address any close load shedding which could arise in the future, till now hydro potentials in the country have still not addressed the growing demands. In 2017 Uganda imported close to 40MW of power from Kenya, in 2015 over 60MW and 71.2MW in 2018

Research has shown that nuclear-based generation can become a key player in the Ugandan energy mix in the following decades. Nuclear generation is an economically advantageous solution to meet the Vision 2040 demand as well as the generation targets and the other less demanding scenarios. It can provide a low-carbon and reliable base-load energy option for Uganda.

The development for nuclear power will also allow a hedging against the potential problems of a generation system based on hydropower and fossil fuels in case of draught and or supply constraints of fossil fuels.