

SOLAR POTENTIAL IN KENYA

**PRESENTED BY:
ENG. HENRY GICHUNGI**

Summary

- Introduction
- Micro grids in Kenya
- Fuel cost adjustment
- Solar lighting for schools
- Conclusion

Introduction

- Africa enjoys 51% of Earth's most concentrated sunlight, leaving the rest of the world to share the remaining 49%.
- In one day, the sun sends 10,000 to 15,000 times more energy to the earth than we all collectively use (Msafiri 66, 2009).
- Africa is endowed with one of the highest wind velocities and fiercest exposure to sun (KT, 02/02/10).
- Studies sponsored by Ministry of Energy have shown that Kenya holds tremendous potential in solar energy but only a small portion has been tapped.

Introduction Cont.

- Kenya being astride the equator and extending four degrees on either side, receives a considerable amount of solar radiation.
- Early assessment by Ministry of Energy indicated that the country received on average 4.5 kWh per square meter per day.

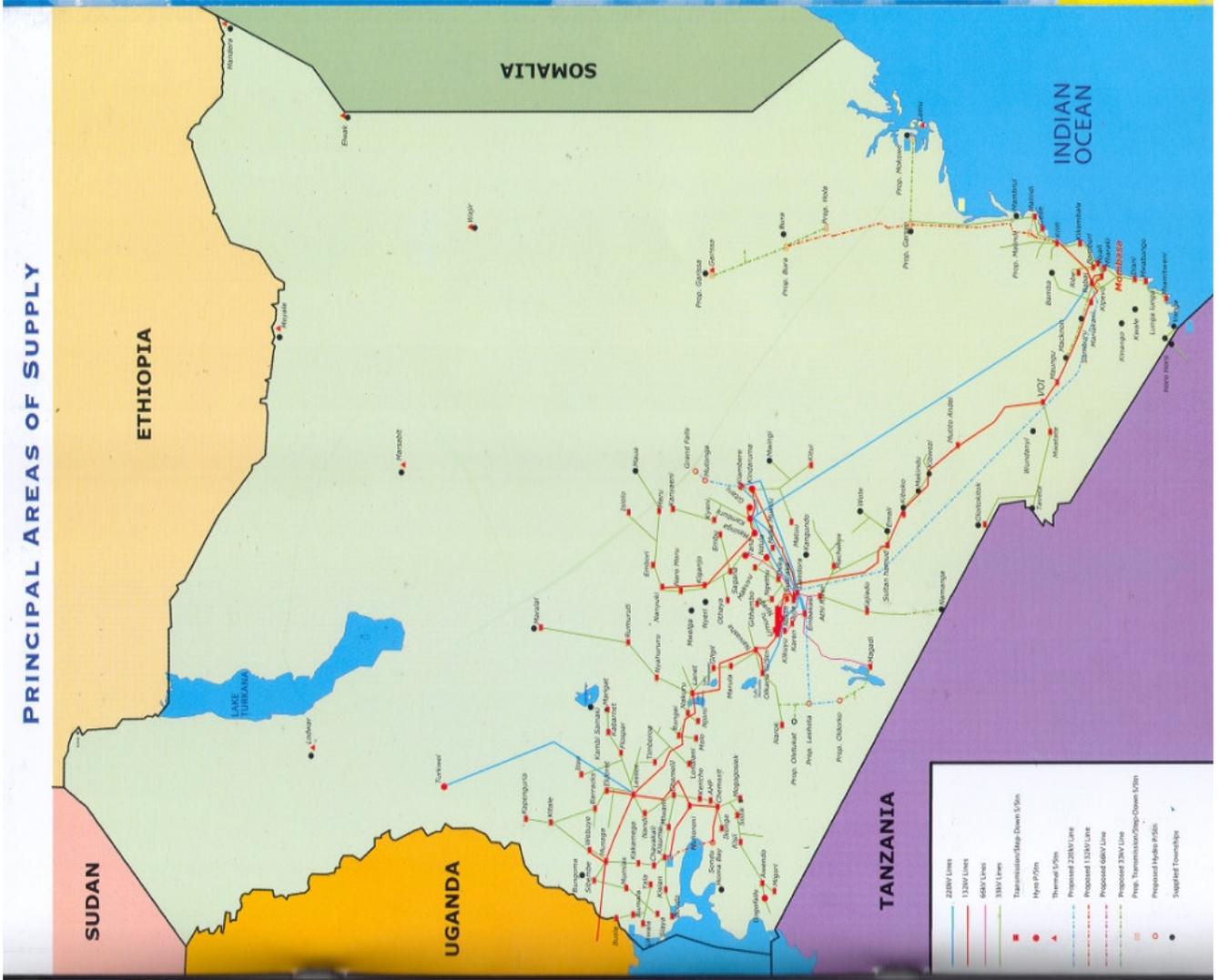
Micro Grids in Kenya

- Currently there are 13 operational micro grids that are operated by Kenya Power & Lighting Company (KPLC).
- Generating equipment in two of these micro grids are owned by Kenya Electricity Generating Company (KenGen) while the other 11 are owned by Rural Electrification Authority (REA).
- Distribution and sale of electricity in the whole country (inclusive of these micro grids) is done by KPLC.
- These three (KPLC, KenGen and REA) are all government organizations.

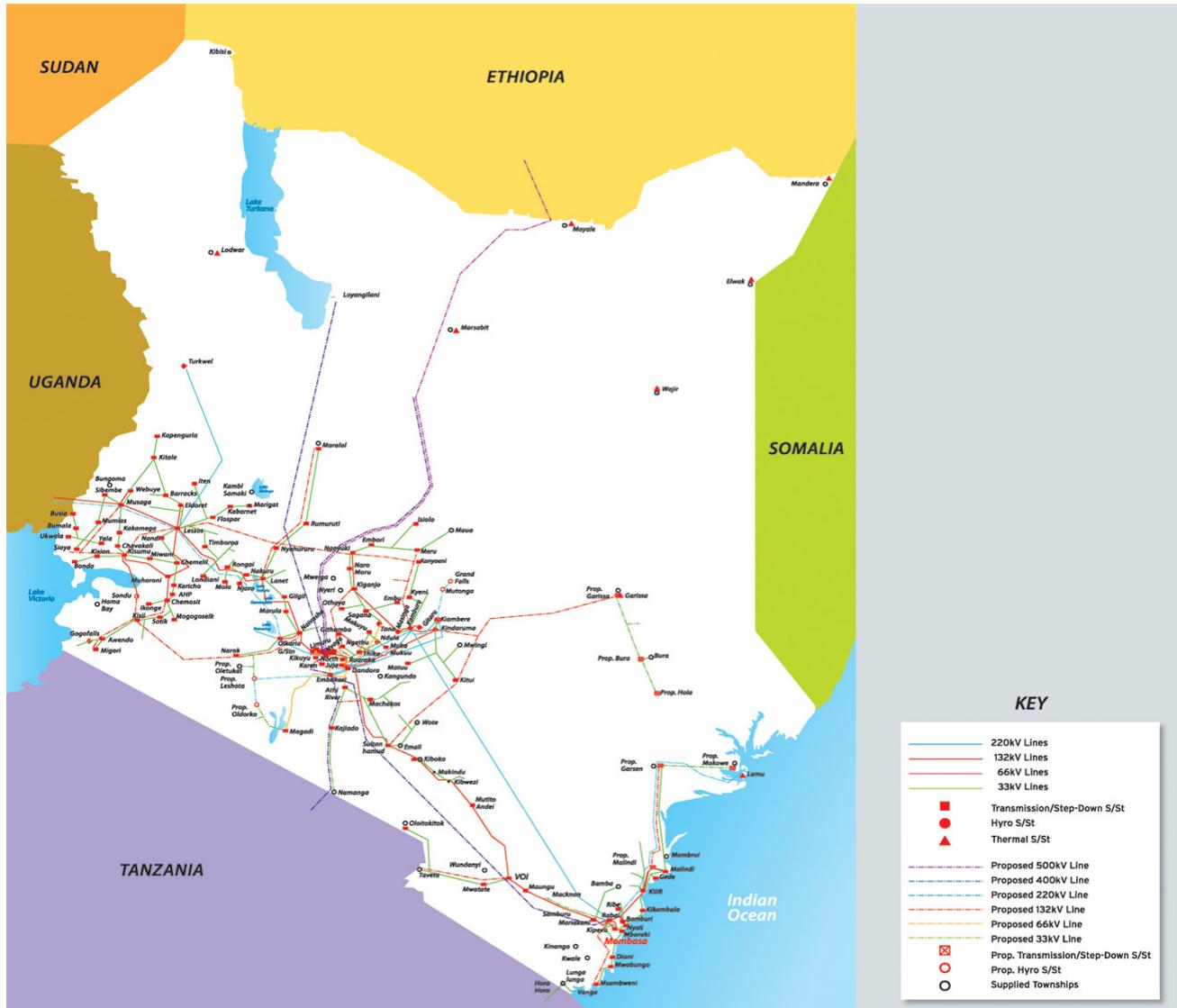
Micro Grids (Cont.)

- 9 additional micro grids are currently under construction financed by REA.
- All these public micro grids use diesel fuel to generate electricity. Only one in Marsabit had wind generation that broke down in 2006 and we are in the process of replacing the wind turbine.
- There are several privately owned micro grids around the country but these are normally very small in size. Small hydro micro grids are located around Mt. Kenya. The others use diesel for generation.

PRINCIPAL AREAS OF SUPPLY



Kenya Power Map With Planned High Voltage Lines



Fuel Consumption For REA's Micro Grids

No.	Description	Value
1	Total units generated in January 2010 (kWh)	1,665,866
2	Total fuel used (litres)	546,452
3	Total Cost (Kshs)	40,506,253
4	Total Cost (Euros)	368,239
5	Average generation cost (Euros/kWh)	0.221
6	Average generation cost (USD/kWh)	0.324

Fuel Cost Adjustment

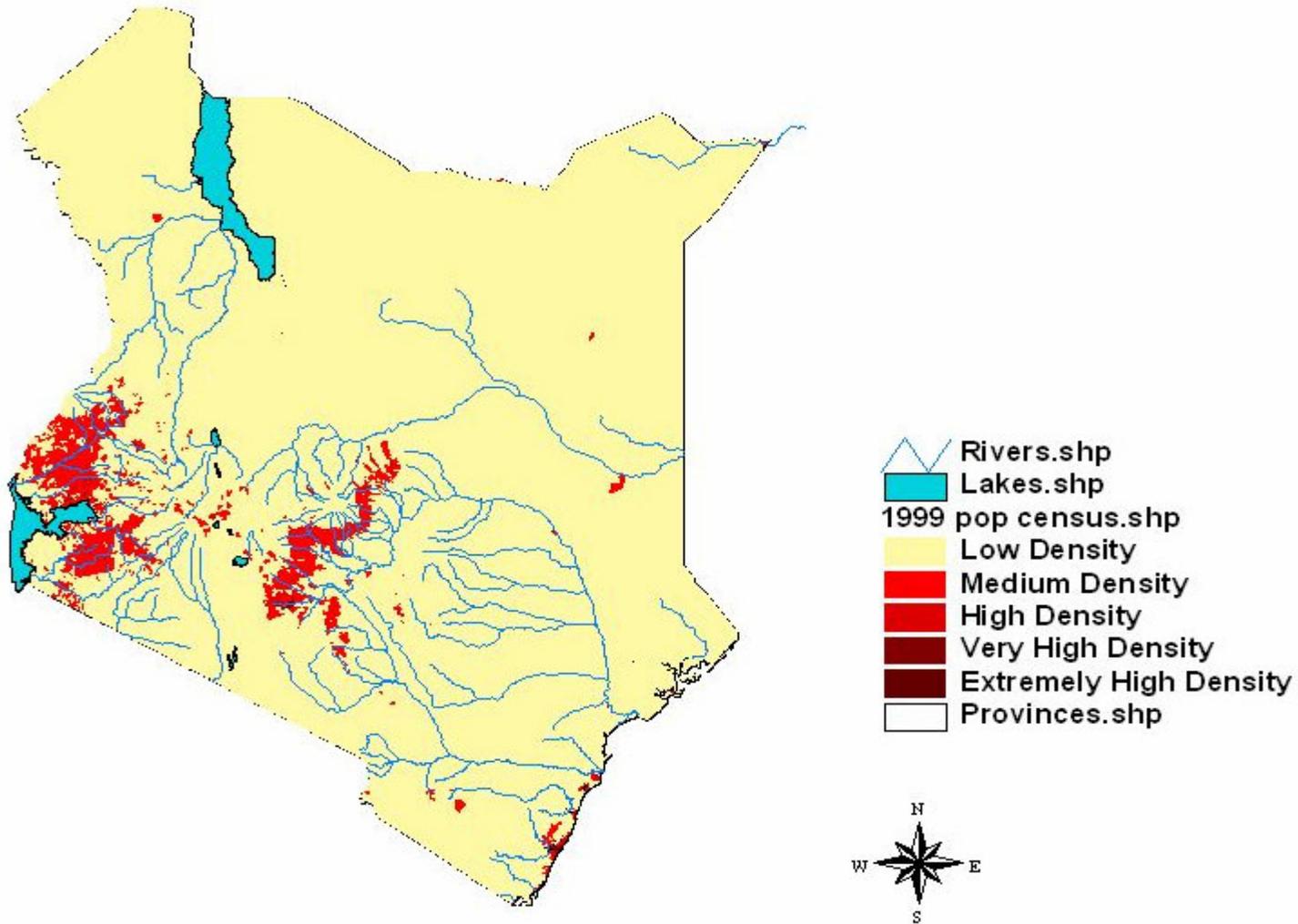
- All fuel costs in the whole country used for generation in KPLC system are passed to all the customers.
- The billing system is uniform for all customers in the whole country whether connected to the national grid or micro grids.
- The fuel cost adjustment portion for domestic customers in the month of November 2009 amounted to 40% of the total bill as compared to 38% for the energy charge.
- There is a huge potential of replacing diesel generation with solar generation in the micro grids.

Solar Lighting For Schools

- Currently 220 schools have been electrified using stand alone solar systems with a total capacity of 574.22 kW at a cost of Euros 6.16 million.
- Tender for another 117 institutions has been floated at an estimated cost of Euros 2.5 million.
- Another Euros 10 million has been provided by Spain to electrify 380 selected institutions with solar.
- Solar street lighting is also planned at a cost of Euros 0.27 million .
- Ministry of Energy Policy is to supply education facilities and health centres in arid and semi-arid lands 15 km away from the grid (National and Micro).
- Total planned investment in solar by MoE is Euros 18.93 million.

Solar Energy Potential Cont.

Kenya Population Distribution



Conclusion

- *Plenty of sunshine*
- *Space for installation of solar panels*
- *Government support as there is a lot of interest on renewable energy*

Q&A

THANK YOU