Renewable Energy Development in Uganda

Opportunities and Challenges for Climate Resilient Infrastructure
Structure of Presentation

- Renewable energy resource potential
- Key priorities in Uganda’s Energy Sector
- Vulnerability of energy sector to Climate Change
- Impacts of Climate Change on energy infrastructure
- Enabling frameworks for Renewable Energy Development and addressing Climate Change
- Conclusion
Uganda is richly endowed with a variety of renewable energy resources including: plentiful biomass, hydropower, solar, mini/micro hydro and geothermal.

Apart from biomass and a fraction of hydropower, the remaining potential is largely unexploited and undeveloped.

There is big potential of over 3,000 mw along River Nile alone, and additional potential of over 2,700 along small rivers across the country.
Cont’d

• Of the total hydropower potential in the country, less than 1,000mw is developed and about 1,480mw is at different stages of development.
  • Sites being developed include: Isimba, Karuma and Ayago all along the Nile.
  • Feasibility studies for 10 mini/micro hydro sites totaling over 130mw have been concluded and invitation of proposals for development of these sites by the private sector will be out soon.
  • More than 41 sites with potential of 200mw are available for development.
Other Renewable Resources

- Uganda is also blessed with plentiful biomass (woody and non-woody) and solar energy resources.
- Mean solar radiation is 5.1kwh/m² per day, a very good regime for all solar applications.
- Significant quantities of bagasse for Cogeneration of power by sugar factories.
- Geothermal potential is estimated at over 450 mw in the Western Rift Valley.
Key Priorities in the Energy Sector

- To increase electricity generation capacity and develop the transmission network;
- To increase access to modern energy services through rural electrification and renewable energy development;
- To promote the efficient utilization of energy resources and reduction in power losses.
Vulnerability of Energy Sector to Climate Change

- Whereas the development and utilization of renewable energy is a mitigation for climate change, the effects of CC impact adversely on Renewable Energy infrastructure and developments.
- Uganda’s power sector is heavily dependent on hydropower and very sensitive to climate change with worsening droughts, more frequent floods and land slides.
- Energy infrastructure (dams, generation facilities, transmission and distribution facilities, energy crops) are highly vulnerable to climate variability and climate change impacts.
- Adverse impacts in form of: degraded catchment areas, reduced river flows, increased siltation, blown transmission and distribution systems have been/are being experienced in Uganda.
- Climate Change is increasingly responsible for increased costs of maintaining and repairing power and energy infrastructure as well as disruption in power supply.
Impacts of Climate Change on Energy Infrastructure

- The design of existing energy infrastructure did not take into account the impacts of climate change and therefore, not climate resilient.
- The current energy Infrastructure does not have the capacity to withstand and absorb external stresses and pressures imposed upon it by Climate Change.
- There is need to climate proof the existing infrastructure and design new infrastructure to be prepared to adapt to effects imposed by future climate change.
Challenges

- Lack of capacity to model/predict climate change impacts on different energy infrastructure
- Source of funds to upgrade existing infrastructure and integrate climate resilience measures?
- Additional investments translating into a rise in tariff (already experiencing unaffordable tariffs)
- Source of funds for public and private sector investments included in national or sectoral development plans addressing climate resilience?
Enabling Frameworks for Renewable Energy Development and Climate Change

- An adequate enabling environment for development of renewable energy in Uganda as well as for addressing climate change and associated mitigations is in place.
- Government has prioritized energy development as a high level issue for the country.
- Uganda is a signatory to Kyoto Protocol and other conventions on Climate Change.
Conclusion

- Energy development has been prioritized as a high level issue for Uganda.
- An adequate and comprehensive policy and legal framework is in place to promote the energy sector.
- Government’s strategy to increase generation capacity involves private sector participation.
- Uganda’s renewable energy sector provides excellent opportunities for investment.
Thank You for Your Attention!