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

Renewable Energy Resource

- 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.

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- 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.
- The Renewable Energy Policy for Uganda, 2007.
- The Climate Change Policy for Uganda, 2012.
- The Biomass Energy Strategy for Uganda, 2014.
- 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 !