CLEAN ENERGY FINANCING IN UGANDA

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Overview

Uganda, like many developing countries, faces the dual challenge of meeting growing energy demand while transitioning to a sustainable, low-carbon energy system. The country's energy mix is dominated by renewable sources, with hydropower accounting for over 90% of electricity generation. Small-scale solar, wind, and biomass energy solutions are increasingly being deployed, particularly in rural areas where the national grid has limited reach. With a population of over 45 million people and an electrification rate of just over 50% (Uganda Bureau of Statistics, 2023), access to affordable, reliable, and clean energy remains a priority for the country's economic development and poverty alleviation efforts.

The government of Uganda has made significant strides in promoting clean energy solutions, and financing plays a pivotal role in accelerating the adoption and implementation of these technologies. However, the country's energy sector faces significant financing gaps in scaling up clean energy projects to meet the growing demand and achieve universal access by 2030, and address climate change goals under the Paris Agreement. This paper aims at analysing the relationship between clean energy financing and energy access for economic growth in Uganda.

Methods

Data collection methods:

The paper uses time series secondary data for 20 years from 2002 to 2022 to capture long term trends and relationships. Data is collected on the total annual investment in clean energy to measure clean energy financing, electrification rate (% of the population with access to electricity for grid-based versus off-grid electrification) to measure energy access and Gross Domestic Product (GDP) growth rates to measure economic growth. This data has been obtained from World Bank, Uganda Ministry of Energy and Mineral Development, Uganda Bureau of Statistics (UBOS) and World Development Indicators.

Data Analysis methods:

The study employs cointegration tests and Vector Error Correction Models (VECM) to analysed the relationship between clean energy financing, energy access, and economic growth over time, that is to examine the causal relationship between the volume of clean energy investments, electrification rates, and GDP growth. We also check for stationarity of the data using the Augmented Dickey-Fuller (ADF) test. The paper tests two hypotheses; 1) whether clean energy financing leads to greater electrification rates and adoption of renewable technologies and 2) whether clean energy financing positively impacts GDP growth.

Results

Results from analysis show that higher financing levels lead to higher electrification rates. The analysis confirms a strong positive relationship between clean energy financing and energy access. Increased investments in clean energy infrastructure significantly improve electrification rates. Clean energy financing, especially for off-grid solar systems are likely to have a more pronounced impact in rural areas, where the national grid is limited. We also find that clean energy financing has a positive relationship with GDP growth, particularly in the energy sector's contribution to GDP.

The results of the cointegration analysis indicate that clean energy financing and energy access share a

long-term equilibrium relationship. This means that, despite short-term fluctuations or delays, financing efforts eventually lead to measurable improvements in electrification. The VECM demonstrates that any short-term shocks from this equilibrium tend to adjust back over time.

Conclusions

The paper concludes that clean energy funding for projects should be enhanced through a combination of public and private sector investments and international support. Carbon credit programs can help to find additional resources to enhance clean energy adoption in Uganda. To address rural energy access gaps, the government should prioritize investments in off-grid systems such as solar energy. Ensuring consistency in clean energy policies such as subsidies and tax incentives to encourage private sector participation is key. Finally, we recognize that clean energy financing requires sustained, long-term efforts to achieve maximum impact on energy access and economic growth.

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