Title: ECONOMIC ANALYSIS OF RENEWABLE ENERGY TECHNOLOGIES IN GHANA - ACHIEVING GRID PARITY

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WHY?

Ghana is endowed with enormous Renewable Energy (RE) resources. However, 30% of the population do not have access to electricity whilst the other 70% are faced with acute power shortages (see figure 1) and load shedding due to inadequate electricity supply.

WHAT?

This study is an economic evaluation of introducing large-scale grid connected Wind and Solar RETs in the energy mix of Ghana and the feasibility of providing access to electricity to four remote communities through a Mini-grid Solar PV. The study was geared towards answering the following questions:

- *What is the Levelized Cost of Electricity (LCOE) for Solar and Wind Energy compared to other power sources in Ghana?*
- *Is it profitable to invest in renewable power generation in Ghana, giving the current fiscal policies?*
- *What policies and incentives could the Government implement in order to increase the investment attractiveness for RE?*

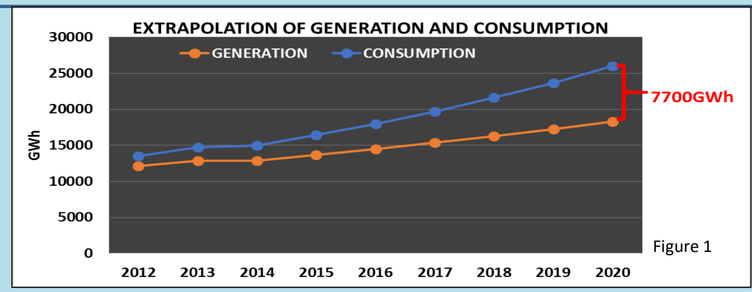
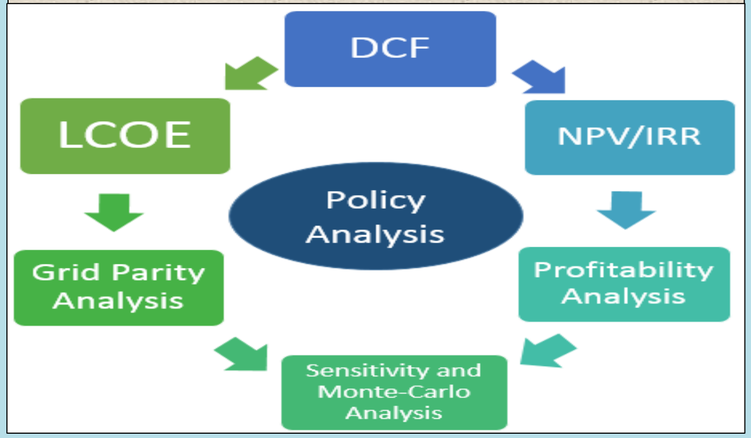


Figure 1

HOW?



RESULTS

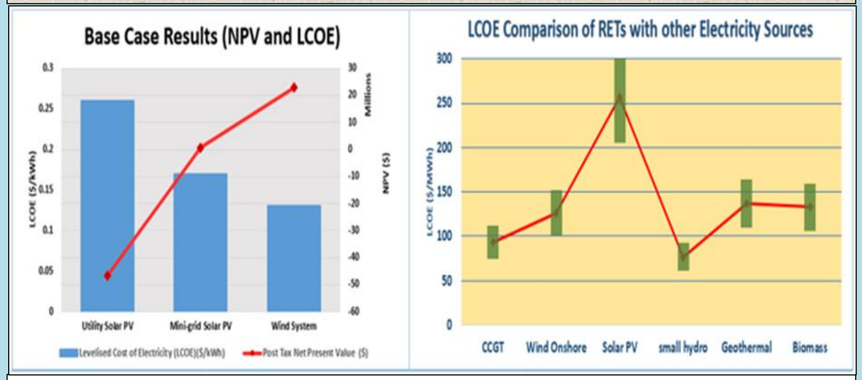


Figure 2: Base Case Results

For Solar PV systems, capital cost was the most sensitive variable to NPV whilst capacity factor was the most sensitive parameter to the LCOE. Mean wind speed proved the most sensitive variable for both NPV and LCOE of the wind system.

Monte-Carlo analysis(Fig. 3) of mean wind speed and Feed-in Tariff indicates 22% probability of negative NPV and 51% probability of LCOE higher than the base case results for the wind system.

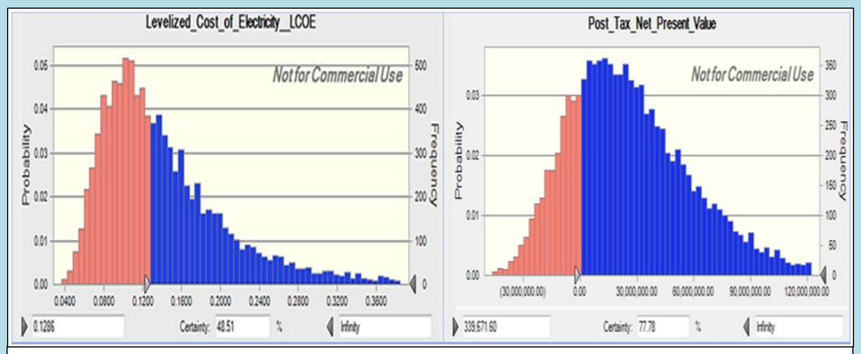


Figure 3: Monte-Carlo Simulation Results for Wind System

CONCLUSION AND RECOMMENDATIONS

In order to meet the RETs electricity generation and universal access to electricity targets by 2020, the government will need to: **1**. support investors by providing financial subsidies to RET companies **2**. assist in developing infrastructure investment in RE **3.** provide assistance for manpower training and skills development in RETs industry **4.** develop a cost and risk sharing system for the industry **5.** facilitate access to funds and lower cost of funds to companies in the RE industry.

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