

Analysis of Life Cycle Cost and Determination of Economic Viability of Solar Photovoitaic System, Diesel Generator Set and National Grid Supply in Nigeria

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Nigeria is faced with serious energy challenges. At present about twenty million households out of about one hundred and fifty million inhabitants lacks access to grid electricity and for those who have access to grid electricity, the supply is very poor and epileptic. Inhabitants in the rural areas suffer most. A large proportion of the population generate their own electricity by diesel generator set, batteries, inverters, solar photovoltaic (solar PV) system, small hydro schemes and wind energy.

This research work is a life cycle cost analysis of solar PV system, diesel generator set and National grid supply in Nigeria. The economic viability of solar PV system, diesel generator set and National grid was also determined. Life cycle cost analysis is an economic method of determining the cost of power equipment acquisition, operation and maintenance. The determination of economic viability is necessary to effectively compare the cost competitiveness of solar PV system, diesel generator set and National grid supply in Nigeria.

The methodology used in this work was to access the load demand of some selected houses in Benin City, Edo State, Nigeria. The cost of acquisition, operation and maintenance of solar PV, diesel generator set and National grid supply was also determined.

The result of the economic viability shows that National grid power is cheaper in Nigeria but it is very poor, epileptic and unreliable. Therefore solar PV is the best in terms of cost and reliability.

Keywords: load, solar, generator, grid, PV