

7<sup>th</sup> World Congress and Expo on **Green Energy**

&

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## **Evaluation of hybrid renewable power system in Egor Community in Edo State Nigeria**

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The electrification of rural area through renewable energy-based power system has become a solution for communities where electricity is considered not feasible or huge cost intensive. A system of hybrid uses one or more renewable energy technologies as its primary sources of energy, and a conventional biofuel-based or fuel-based generator as a backup source. Hence, the system of hybrid reduces the dependence on one source of energy, thereby resulting in an affordable and reliable electricity for rural communities. Since the system of hybrid uses a number of energy technologies, the appropriate selection of the right technologies and optimum designing of the selected hybrid components is key to cutting the overall cost of the system installation, and increasing the availability of service. The aim of this research work is to ascertain the optimum design of a hybrid system which can supply electricity to a rural community in Edo state, Nigeria. The rural community chosen for the purpose of this research work is Eweka community in Egor local government area of Edo state, Nigeria. Eweka is a community with about 102 houses having a daily electricity demand of 165.24 kWh and a peak of 23 kW at night time. A number of energy generating technologies including solar, wind and diesel generators will be considered for this research study, and simulations will be performed on a number of system configurations using a software known as Hybrid Optimization of Multiple Electric Renewables (HOMER). The net present cost (NPC) of the various system configurations will be evaluated for an approximately 20 years of the system's lifetime in order to examine the least energy cost option.