



## DESIGN OF A PV/DIESEL STAND ALONE HYBRID SYSTEM FOR A REMOTE COMMUNITY IN PALESTINE

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### ABSTRACT

*Hybrid system based on photovoltaic is considered an effective option to electrify remote and isolated areas far from grid. This is true for areas that receive high averages of solar radiation annually. Using diesel generator as a standby source will make utilization of hybrid systems more attractive. An economic feasibility study and a complete design of a hybrid system consisting of photovoltaic (PV) panels, a diesel generator as a backup power source and a battery system supplying a small community in Palestine were presented in this paper. Other scenarios were also studied and analyzed in this paper to ascertain which of them the most appropriate considering cost and pollutant emissions are. A simulation program using iterative approach is developed to optimize the sizes of PV system and battery bank. Specifications of the hybrid system components are then determined according to the optimized values. Solar radiation data is firstly analyzed and the tilted angle of the PV panels is also optimized. Costs of different components, hourly solar radiation and ambient temperatures and other design considerations are inputs of the simulation program. It is found that electrifying rural small community using this hybrid system is very beneficial and competitive with other types of conventional sources as it decreases both operating costs and pollutant emissions.*

**Key Words:** Photovoltaic; Hybrid system; Economics; Rural region

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