

OPTIMIZATION AND SENSITIVITY ANALYSIS OF HYBRID ENERGY SYSTEMS FOR RURAL ELECTRIFICATION: A CASE STUDY OF THE CENTERS OF TELECOMMUNICATION MOBILE (MOBILIS) IN ADRAR, ALGERIA

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A B S T R A C T

The demand for power generation of the world is increasing day by day so the use of hybrid systems become an important solution. The hybrid systems are used for supplying power in different areas to overcome the intermittence of solar and wind resources. The hybrid system incorporate two or more renewable energy sources so techno economics analysis of different combinations of hybrid systems is necessary for efficient utilization of renewable energy resources. In this study an extensive review of power generation from different hybrid systems are carried out and research gaps are identified. To conduct our studies different hybrid systems PV-Wind-Diesel-Battery, PV-Diesel-Battery, Wind-Diesel-Battery investigated for different cities, ouled said, Talmine and Timiaouine in Adrar ,Algeria . The telecommunication load demand is used in HOMER simulation. The results show that the PV-Wind-Diesel-Battery produce more power in comparison to PV-Diesel-Battery, Wind-Diesel-Battery system. The cost of energy (COE) is found to be 0.468 \$/kW h, 0.4689 \$/kW h, 0.4914\$/kW h, respective cities for load 1.3 kW peak, providing best combination PV-Wind-Diesel-Battery system are useful for generation of power.

Keywords: Telecommunication load , Cost of energy, Battery, Diesel, Power PV and Wind.