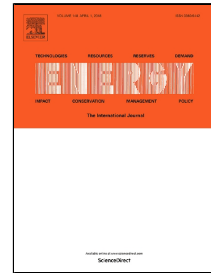


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HYBRID RENEWABLE ENERGY SYSTEMS FOR RENEWABLE INTEGRATION IN MICROGRIDS: INFLUENCE OF SIZING ON PERFORMANCE

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Abstract

Hybrid Power System (HPS) are effective means for the increase of the exploitation of local renewable energy sources in the Distributed Generation (DG) paradigm concept. This work aims at analyzing thoroughly the effects mentioned for two different energy demand profiles: an industrial facility and a residential complex of 75 apartments. A parametric analysis with different components sizing is proposed to evaluate the optimal solution in terms of deployment of renewable energies, resilience of the system and environmental impact, considering the economic convenience as a sustainability constraint. Results show that the two main drivers for the convenience of such systems are the load profile and the PV power plant power sizing. The former shows greater effectiveness of the microgrid management for the residential load rather than the industrial one. The latter shows that the correct sizing of the PV powerplant allows for a smarter use of the battery and gives lesser dependence on the energy exchanged with the grid.

Keywords: Renewables, Distributed generation, Fuel Cells, Microgrids, Hybrid Renewable Energy Systems.

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