

Abstract

In rural areas, the high cost of grid extension requires institutions to consider other alternatives, such as use of generators (GE) diesel is often considered as an economic and reliable solution, but generates environment pollution and it is convenient for the user. High Costs of operation; Energy dependence; fuel supply problem (removal of fuel suppliers); complicated and expensive maintenance; Low lifetime (about 5 years and sometimes less); Impossibility of 24 hours electricity production (or need for several GE; Sound Births and waste oil management issues). Furthermore, the continuous decline in the prices of generators based on renewable energy and the increasing reliability of these systems lead to a greater use of renewable energy sources for power generation in remote areas. A property which limits the use of renewable energy is related to the variability of resources. Fluctuations in load according to annual or daily periods are not necessarily correlated to the resources. In remote areas, the preferred option is the coupling between multiple sources, such as wind turbines and solar panels, this coupling is called hybrid power system. Algeria's geographic location presents several advantages for the development and use of renewable energy, namely, solar energy and wind energy. In addition, Algeria has huge deposits of natural gas, 98% electricity comes from gas. Therefore, currently, the production of electricity from renewable energies primarily depends on their competitiveness with economic gas. The objective of this work is to study the technological feasibility and economic viability of the hybrid system (PV/fuel) electrification project in a school located in Tarat (Algeria) and to reduce traditional power emissions by using renewable energy. The HOMER model is used in this study to size the proposed system and determine the optimum configuration.