Abstract

Abdelaziz Farouk A. Mohamed

Hybrid Nanocrystal PV/Wind Turbine Power Generation System in Buildings.

With increasing concern of global warming and the depletion of fossil fuel reserves, world is looking at sustainable energy solutions to preserve the earth for the future generations. Renewable energy resources such as solar, wind and hydro power energy hold the most potential to meet our energy demands and protect environment. Many researches are presented to develop the solar panels and wind turbines through their power efficiency and reasonable price. Nanotechnology and Nanomaterials are used to improve the properties of the photovoltaic panels in order to produce more electricity power and increase their useful life. So, this research presents an optimal design of a hybrid Nanocrystal PV-Wind turbine energy system, where it can use both of renewable energy sources to generate the power with a main goal to minimize the plant establishment cost, utilize the land used and give earth a healthy environment. A proposed Nano hybrid system is applied to power eco-house in the western desert in Egypt as a case study. On a techno-economic basis, the proposed case study obtains the economical installation and operation costs of the hybrid system. Taking into account the life cycle costing method to evaluate the proposed system in order to encourage the householder's and other buildings' owners to apply this system in their buildings particularly in the desert zone where the public utility is not available.