Abstract

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Economic Evaluation of Renewable Energy Systems, Case Study an Eco-House Powered by Nano-Crystal PV in New Aswan, Egypt

Based on the tendency of depending on the renewable energy resources in Egypt of the last decades, it is necessary to confirm that the use of solar energy in all applications is an effective energy source. This is driven by advanced technologies such as the use of better and cheaper material, more efficient production processes, increasing efficiencies as well as other conventional systems. Many researches are presented to develop the photovoltaic panels through their power efficiency and reasonable price to fulfil the buildings’ energy requirements. Nanotechnology is used to enhance the properties of the PVs in order to produce more power and increase their useful life. This research presents a design of a Nano-crystal PV system for providing the electrical loads in an eco-house according to its energy requirement. It is found that providing electricity to the eco-house in New Aswan city in the Egyptian south valley using Nano-crystal photovoltaic system is very beneficial and competitive with the other types of conventional energy sources. In addition to the decreasing prices of these systems and their increasing efficiencies, it is maintaining a clean environment for people. The proposed Nano-Crystal PV panels are applied in the eco-house which is designed to be eco-friendly with its context and the life cycle cost of the alternatives energy proposals are compared. The main results prove that the NCPV is economical than others.