

Abstract

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Utilization of Solar Energy in Inland Water-Way Units

The world faces a challenge on energy resources such as fossil fuels are getting scarcer and unstable. The continuous increase in the consumption of the fossil fuels pollute local and global environment. The earth receives an abundant amount of renewable solar energy from the Sun. The Middle East region is rich with solar energy, and Egypt is located in the Sunbelt Solar energy area. In addition, the solar resources on Upper Egypt are excellent the Upper Egypt cities "Luxor & Aswan" are located in the highest solar density area and most powerful in the world throughout the year. There are a large number of luxury cruise ships sailing between Cairo to Luxor and Aswan and vice versa (Nile Cruise) in addition to a number of heritage, majestic and historical boats are famous by a common name known as "Dahabiyya". This paper focuses on the exploitation of the of solar energy for the inland waterway Nile Cruise units through experimental study and numerical analysis using Computational Fluid Dynamics (FLUENT code) to simulate temperatures and other parameters for the hybrid photovoltaic thermal (PVT) system, which consists of photovoltaic (PV) modules for electric loads plus thermal units under the (PV) modules to absorb excess heat generated and protect (PV) module efficiency .