

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 & unstable. The continuous increase in the consumption of the fossil fuels pollute local & global environment. The earth receives an abundant amount of renewable solar energy from the Sun. The Middle East region is rich with solar energy, & 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 & most powerful in the world throughout the year. There are a large number of luxury cruise ships sailing between Cairo to Luxor & Aswan & vice versa (Nile Cruise) in addition to a number of heritage, majestic & 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 & numerical analysis using Computational Fluid Dynamics (FLUENT code) to simulate temperatures & 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 & protect (PV) module efficiency .