World Academy of Science, Engineering and Technology
International Journal of Energy and Environmental Engineering
Vol:9, No:01, 2015

Analysis of the Performance of a Solar Water Heating System with Flat Collector

Authors : Georgi Vendramin, Aurea Lúcia, Yamamoto, Carlos Itsuo, Camargo Nogueira, Carlos Eduardo, Lenz, Anderson Miguel, Souza Melegari, Samuel N.

Abstract : The thermal performance of a solar water heating with 1.00 m2 flat plate collectors in Cascavel-PR, is which presented in this article, paper presents the solution to leverage the marketing of solar heating systems through detailed constituent materials of the solar collector studies, these abundant materials in construction, such as expanded polyethylene, PVC, aluminum and glass tubes, mixing them with new materials to minimize loss of efficiency while decreasing its cost. The system was tested during months and the collector obtained maximum recorded temperature of outlet fluid of 55 °C, while the maximum temperature of the water at the bottom of the hot water tank was 35 °C. The average daily energy collected was 19 6 MJ/d; the energy supplied by the solar plate was 16.2 MJ/d; the loss in the feed pipe was 3.2 MJ/d; the solar fraction was 32.2%, the efficiency of the collector was 45.6% and the efficiency of the system was 37.8%.

Keywords : recycling materials, energy efficiency, solar collector, solar water heating system
Conference Title : ICBSED 2015 : International Conference on Biodiversity and Sustainable Energy Development
Conference Location : Singapore, Singapore
Conference Dates : January 08-09, 2015