

A Platform to Analyze Controllers for Solar Hot Water Systems

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Abstract : Governments around the world encourage the use of solar water heating in residential houses due to the low maintenance requirements and efficiency of the solar collector water heating systems. The aim of this work is to study a domestic solar water heating system in a residential building to develop a model of the entire solar water heating system including flat-plate solar collector and storage tank. The proposed model is adaptable to any households and location. The model can be used to test different types of controllers and can provide efficiency as well as economic analysis. The proposed model is based on the heat and mass transfer equations along with assumptions applied in the model which can be modified for a variety of different solar water heating systems and sizes. Simulation results of the model were compared with the actual system which shows similar trends.

Keywords : solar thermal systems, solar water heating, solar collector model, hot water tank model, solar controllers

Conference Title : ICESRET 2019 : International Conference on Energy System and Renewable Energy Technologies

Conference Location : Bangkok, Thailand

Conference Dates : August 19-20, 2019