

## **EXPERIMENTAL AND ANALYTICAL STUDY OF ROOF HEAT EFFECT ON THE PERFORMANCE OF SOLAR DESALINATION SYSTEM**

**K. RAJ THILAK<sup>1</sup>, R. KIRUTHIKA<sup>2</sup> & M. SAKTHIVEL<sup>3</sup>**

<sup>1,2</sup>Department of EEE, Sri Eshwar College of Engineering, Chettipalayam, Tamil Nadu, India

<sup>3</sup>Department of Mechanical Engineering, Info Institute of Engineering, Coimbatore, Tamil Nadu, India

### **ABSTRACT**

This paper presents a new approach to enhance the productivity of single basin solar stills especially during the nocturnal period; a heat recovery system (building roof heat) was coupled to the still. An exertion has been made to utilize the maximum amount of solar energy and to reduce the heat loss from the sides and the bottom of the still. The roof heat (copper tubes lay inside the roof) absorbs the excess heat energy from solar radiation during noon hours. An experimental as well as theoretical investigation is carried out. This device can be a suitable solution to solve drinking water problem. Mathematical models are developed to give the ability to estimate the expected performance of the system under given climatic conditions. The whole investigation is based mainly on experimental data under real usage conditions. To validate the proposed mathematical models, comparisons between experimental and theoretical results had been performed. Good agreement had been achieved. The study also showed that the daily production of still can be increased by reducing the depth of the water in the basin. These results indicate that the still productivity is increased by 17–20% and also the amount of heat penetrated inside the building through the roof can be reduced.

**KEYWORDS:** Single Basin Solar Still, Roof Heat, Glass Temperature