

ABSTRACT NO.: 539**TITLE:** Using An Evacuated Tube Solar Water Heater as a Heat Source for Solar-assisted Air Conditioning Systems**AUTHORS:** Kavita Rajkumar
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This research project evaluates the efficiency and performance of an evacuated tube solar water heater as a heat source for solar-assisted air-conditioning system. The heat from the evacuated tube solar water heater can be used to power a thermally-driven chiller, such as an absorption chiller. Research also included doing a theoretical evaluation of the performance of flat plate collectors against evacuated tube collectors. One of the factors which distinguishes evacuated tubes from flat plate collectors is their operating temperatures. The flat plate collector is designed to operate at temperatures less than 93⁰C, while the evacuated tube collector is usually operated at temperatures above 93⁰C. Though the flat-plate collector is frequently used in the Caribbean as it performs efficiently to attain required temperatures, the evacuated tube can attain a higher temperature within a shorter time period. The evacuated tube collector therefore is particularly effective for high temperature applications such as solar-assisted air conditioning.

In calculating the efficiency of the evacuated tube solar water the amount of solar radiation that was incident on the evacuated tubes was first measured. Secondly measurements were taken of the ambient temperature and the inlet and outlet temperatures. The efficiency of the collector was then calculated based on these parameters. These calculations were performed to establish the efficiency of the evacuated tube solar water heater. An assessment was made regarding the viability of using the evacuated tube solar water heater to power an absorption chiller for air conditioning purposes.

