## Documents

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**Experimental Investigation of Integrated Energy Storage on Thermal Performance Enhancement of Evacuated Glass-Thermal Absorber Tube Collector (EGATC) for Air Heating Application**

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**Abstract**
Thermal energy storage (TES) in solar thermal application assist to increase the performance and efficiency of the solar thermal collector system. Various technique has been developed to enhance TES performance such as using water and PCM as energy storage material. Type of material selection and design arrangement also contribute to the performance of solar thermal collector. The aim of this research is to enhance the thermal performance of energy storage on Evacuated Glass-Thermal Absorber Tube Collector (EGATC) for air heating application. The performance study has been conducted to measure the outlet temperature and energy storage rates as per indoor setup under the artificial solar radiation on the effect of parameters such as inner absorber surface area air contact (perforated fins), outer absorber selective coating surface, outer absorber wall thickness, double layer non vacuum glass tube, single layer transparent outer glass tube and single layer thin film inner glass tube. The results showed that the performance of temperature outlet, energy store and energy buffer increase at wind speed 0.9 m/s, zero (0) perforated fin, non-coating outer absorber and 2mm outer absorber wall thickness. It was also demonstrated that a double layer vacuum glass tube showed a better thermal performance enhancement compared with double layer non-vacuum glass tube, single layer transparent outer glass tube and single layer thin film inner glass tube. This concluded that EGATC performance can be increase with those respective parameters. 

**Author Keywords**
Coating thermal absorber; Egatc; Perforated fin; Thermal absorber materials; Thermal energy storage

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