

## Copper Coil Heat Exchanger Performance for Greenhouse Heating: An Experimental and Theoretical Study

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**Abstract :** The present work is a study of the performance of a solar copper coil heating system in a greenhouse microclimate. Our system is based on the circulation of a Heat transfer fluid, which is water in our case, in a closed loop under the greenhouse's roof in order to store heat all day, and then this heat will supply the greenhouse during the night. In order to evaluate our greenhouse, we made an experimental study in two identical greenhouses, where the first one is equipped with a heating system and the second (without heating) is used for control. The heating system allows the establishment of the thermal balance and determines the mass of water necessary for the process in order to ensure its functioning during the night. The results obtained showed that this solar heating system and the climatic parameters inside the experimental greenhouse were improved, and it presents a significant gain compared to a controlled greenhouse without a heating system. This research is one of the solutions that help to reduce the greenhouse effect of the planet Earth, a problem that worries the world.

**Keywords :** solar energy, energy storage, greenhouse, environment

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