World Academy of Science, Engineering and Technology
International Journal of Energy and Power Engineering
Vol:17, No:02, 2023

Performance of a Solar Heating System on the Microclimate of an Agricultural Greenhouse

Authors : Nora Arbaoui, Rachid Tadili, Ilham Ihoume

Abstract : Climate change and its effects on low external temperatures in winter require great consumption of energy to improve the greenhouse microclimate and increase agricultural production. To reduce the amount of energy consumed, a solar system has been developed to heat an agricultural greenhouse. This system is based on a transfer fluid that will circulate inside the greenhouse through a solar copper coil positioned on the roof of the greenhouse. This thermal energy accumulated during the day will be stored to be released during the night to improve the greenhouse's microclimate. The use of this solar heating system has resulted in an average increase in the greenhouse's indoor temperature of 8.3°C compared to the outdoor environment. This improved temperature has created a more favorable climate for crops and has subsequently had a positive effect on their development, quality, and production.

Keywords : solar system, agricultural greenhouse, heating, cooling, storage, drying
Conference Title : ICSTESH 2023 : International Conference on Solar Thermal Energy and Solar Heating
Conference Location : Rome, Italy
Conference Dates : February 20-21, 2023

Open Science Index, Energy and Power Engineering Vol:17, No:02, 2023 publications.waset.org/abstracts/161297.pdf