Progress in Thermal Solar Energy Capture

Hubert KAZADI
Polytechnic Faculty, University of Kinshasa, Democratic Republic of Congo
Christian NTAMBWA
Polytechnic Faculty, University of Kinshasa, Democratic Republic of Congo

Abstract

With respect to ISO 9448 (1999), using certain thermal vessel operators like thermal cavities and greenhouses, a conception of a new device enhancing, heat rate exchanges and solar irradiating energy capture has been designed and built.

Solar energy capture in Kinshasa real conditions with this device has been experimented giving milestones data for its modelisation.

Solving the governing equations by numerical methods gives good agreement with experimental data. Projecting this model on the horizon long enough to reach the pledged 200◦C of the calorific oil purpoted to fuel the thermal cycle (Rankine, Hirn, Brayton or Stirling), shows that this device achieves the conversion of solar irradiating energy in calorific energy with an efficiency near to 95% remarkably greather than the maximum of 60% attainable by the current solar irradiation energy to calorific energy converters, provide that this new device is covered with the suitable insulation of glass fibers.

Index Terms

New Solar Irradiating Energy to Calorific Energy Converter Bringing Maximum Attainable Efficiency from 60% To 95%