

Absorption Solar Thermal Cooling System, An Evaluation Study for the Environmental Effects on the Inner vacuum New Medium- Rise Housing Project in Cairo

ABSTRACT

This research addresses measuring the efficiency of solar energy production using Absorption Solar Thermal Cooling Technology in the residential buildings and integrating them with the external case design, suitable for residential units and designed based on standards and recommendations of the Egyptian Energy Code of residential buildings and the consumed energy quantum and savings and rationalization quantum required monthly and annually.

The research aims to practically analyze the bio-simulation results using TRNSYS program, developing a methodology for comparison and analysis, then the research presents the most important results and explain the purposes of increasing renewable energy efficiency within residential units in the New Medium-Rise Housing Project In Cairo and concludes the Academic recommendations calls for further research studies on energy and sustainable environmental design.

The Absorption Solar Thermal Cooling System was designed to cover the thermal loads in the southwest residential unit on roof, as this unit is the most exposed residential unit for external and internal thermal loads. Consequently, this system is the most suitable for testing and checking performance efficiency of the Absorption Solar Thermal Cooling System. The simulation results were intended to be read on 19 June, as, according to the TRNSYS simulation program, the date on which the summer season simulation results were recorded the highest temperature in Cairo, place of the practical study.

The evaluation study proved that the Absorption Solar Thermal Cooling System is efficient at saving percent of 86% of the monthly electricity consumption percent.