CERTIFICATION

This research work has been submitted to the Department of Electrical and Electronics Engineering, Olabisi Onabanjo University Ago Iwoye Nigeria as a requirement for the award of Post-Graduate Diploma in Electrical Electronics Engineering.

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DEDICATION

This work is immensely dedicated to God Almighty, the source of everything, and also to my beloved family who has tirelessly been there for me

ACKNOWLEDGEMENT

With sincere gratitude, I give all glory to God who from the build-up of this project has been faithful and all sufficient to the end.

I equally owe great honour to my parents Mr and Mrs Charles and Esther Nwozuzu who have been a source of encouragement in this my academic endeavour.

My appreciation also goes to my supervisor Engr. A.A Okubanjo and O.K.Oyetola of blessed memory, the life-wire of this project for their trust in my ability even when the success of this project seems unattainable. Equally, to Engr. Mrs O. Ade-Ikuesan the Head of Electrical Department I tender my thanks to her for words of encouragement

ABSTRACT

The heat pump and solar energy systems are excellent source of providing energy for heating systems with very low or no carbon dioxide emission.

In this analysis (study) a combination of a photovoltaic thermal hybrid collector (PVT) and a multi-source heat pump for domestic hot water (DHW) production is being analysed.

The system input include: solar energy, heat from heat exchanger, electrical energy from heat pump, and cold water, while the system output is the domestic hot water temperature.

The hybrid solar thermal heat pump system have been analysed by means of a simulation model using SIMULINK/MATLAB. The solar heat pump combination has six main sub-models which include; solar thermal collector, heat pump system, heat exchanger, piping, boiler tank and storage water tank.

Conclusively we can say that the study reveals that the hybrid system can satisfy the energy demand provided that the solar thermal collector is sufficiently within the acceptable value needed for the domestic hot water. Should the solar radiation level at night drop below 40 degrees Celsius the heat pump is triggered on to compensate for the needed heat on demand for domestic hot water heating at a reduced electricity consumption

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