CHAPTER 1

INTRODUCTION

1.1Background

The ever evolving world needs a constant and sustainable power source to keep aspects of production from relying heavily on human labour.Since the search for renewable energy,we have found a way to convert water,wind and sun rays into the sorted out energy.Through astronomical research,it was discovered that the sun is an abundant energy source and is readily available so a keen interest has been taken into this energy source.Solar energy is environmentally friendly and suitable for locations with high solar irradiance but conventional solar panels have limited effectiveness since the sunlight changes throughout the day due to the movement of the earth and the sun.

The sun tracking solar panel is now designed to make up for this inefficiency by adjusting the solar panel to follow the rays of sunlight as it hits the earth. By maintaining optimal alignment with sunlight,the panels capture more solar energy. Progress in sensors,micro controller technology and embedded systems made it possible to design cost-efficient and functional solar panels suitable for domestic,educational,business and industrial applications.

1.2 Problem Statement

This project calls for the need of an automated system that will constantly track the sun movement and re adjust the position of the panel.the repositioning of the solar panel according to sunlight movement will result in energy gains,regardless of the change in sunlight from early morning and late afternoon. The system will then be cost effective and ready for use when normal electricity is not available.

1.3Objective of the study

The objective of this project is to design,stimulate,prototype and implement a working sun tracking solar panel containing sensors,actuators,analog circuits and micro controller programming.

1.Design and simulate the complete sun tracking solar panel system using TinkerCAD and Proteus.
2. Develop the analog circuits for signal conditioning and light sensor interfacing.
3. Write,test and optimise micro controller code for real time sun tracking control.
4. Design a standard printed circuit board (PCB) for the system.
5. Construct and test a physical prototype of the sun tracking solar panel.
6. Document the entire project process and have the work published on GitHub.

1.4Research Questions