OPTIMIZATION IN SOLAR ENERGY HARVESTING

College   : *New Horizon College of Engineering*
Branch   : *Department of Information Science and Engineering*
Guide(s)   : *Dr. Gautham K S and Dr. Arvind S Kapse*
Student(S) : *Mr. Kalyan Kumar N*
                  Mr. Mounika B
                  Ms. Kamini Yeseswini
                  Mr. Bishal Singh

Keywords*:*

Optimization, Renewable, Solar Energy, Static Solar Panels, Rotating Panel, Angle of Rotation

Introduction

Today, the primary source used by all citizens to lead a daily life is electricity. There is rapid urban development and growing call for rising demand and energy costs, enabling us to find smarter ways to save energy with the help of renewable energy resources. Some other examples of renewable energy sources of energy mainly include Hydropower (Hydropower), Wind Energy, Solar Energy. Satisfying energy demand and reducing the cost at same time, calls for the need to monitor and control energy consumption.

Energy is one of the main fuels for everything that is happening in the universe. Humans and animals need energy for doing every-day chores which are fulfilled by the consumption of food and liquids. Humans have also discovered the kind of fuels required to run these appliances. When there is a threat of losing these forms of electricity, renewable sources of energy were identified to fulfill the energy (electricity) requirements of different sectors.

There are two main reasons for generation of electricity to be used:

(A) Elimination of natural resources, for example, fossil fuels, coal, and petroleum.

(B) Increased demand for electricity after industrial and industrial production and also in the period of globalization.

Our project focuses on a fundamental issue for a second reason. With the advancement of technology and science at an unprecedented rate, demand for electricity has grown exponentially.

Objective

(a) More specifically, this project works to achieve the following:

(b) Reduce/manage power consumption;
(c) Reduce electricity bills while increasing residents' comfort and productivity;
(d) To improve environmental management without compromising living standards;
(e) Minimize carbon emission, hence, eco-friendly;
(f) Abides by the Government restrictions on harm to the environment;
(g) Effectively combats power outages, accidents as well as blackouts;
(h) Gives a proper understanding of energy use;
(i) Identifies the malfunctions in time and prevents them;
(j) Integrates greener sources of energy.

Methodology

Working System
Working of the System is as follows:
(a) First, we will calculate the sun's position in the cloud.
(b) We will develop a web application that can control the electrical appliances and can also visualize the incoming and the outgoing energy.
(c) We will use a router for connecting the MCU to the cloud.
(d) Using MCU helps control the servo motor which will align in position with the data computed in the cloud and the MCU itself will calculate the incoming and outgoing energy.
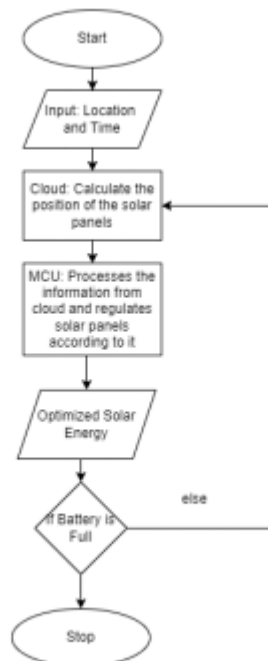(e) From the panels, we will obtain electrical energy which will charge the batteries.

Flowchart

Fig: Flowchart

Result and Conclusions

This solar energy application uses data sensors embedded in the structure and captures real-time data, it is portable and can be used for villages which are not expensive and hence it is cost-efficient and produces maximum efficiency as the sun rays fall perpendicular to these panels and for maximum conversion of solar to electrical energy the panels rotate as at one particular period sun will be in one position and earth will be rotating around the sun in oval shape we will use cloud and we can calculate the angles and upload it along with the time and in the cloud, we will calculate the degree it should rotate and the panels will be rotated automatically. Solar energy can be used for generating electricity, charging batteries and can also be used for vehicles. In this project, the proposed cloud system allows the users to know how much energy is consumed in total along with the estimation of their impact on the usage of energy and user comfort**.**

Scope for Future work

Power and energy management is a large and fast-growing market, leveraging trends in and technologies from the Internet of Things, Big Data, Machine Learning, and Asset Performance Management. With rising public and legal pressures, problematic grid, electricity prices, and bulk waste, organizations across the industry are likely to re-examine their energy practices and ask where they can save fuel. It is especially true in the manufacturing, marketing, hospitality, education, health, and real estate sectors. In our future scope, we must explore various energy-efficient techniques to reduce the usage of energy consumption.