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Solar street light with plane mirror

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Abstract
This paper proposes energy green of automated avenue lighting device based on plane reflect. The important objective is to design road light with the help of a plane reflect which reinforces the power production by the solar panel. While, the controlling and managing of the device is based totally at the range of traffic and day/night time. The device was programmed to robotically turn off throughout the hours of daylight and only operate in the course of the night time and heavy raining or bad weather. Many times we see that road lighting fixtures are remain switched ON even in the course of day time, that is lot of wastes of strength at the same time as India is facing lack of electricity. Another aspect is that these conventional avenue lam*ps e.G. Sodium vapor, Metal halide, Incandescent, Fluorescent lamps consumes more strength for a particular Lumen in keeping with Watt in comparison with new advanced Led Lights. Above troubles may be overcome the usage of computerized controlled, Self-powered, green Solar Street mild.

Keywords: proposes, lighting, automated, Above

Introduction
In complete international there are greater than 300 million of road lights, which emits one hundred million lots of carbon dioxide in step with yr. forty% of power is wasted which prices round 20 billion dollars. Therefore, for economical operation of avenue lighting fixtures and training of carbon footprints, High green LED luminaire with smart control of illumination level is the demand and want of time. About India, India consumes 18% of energy for street lights and residential lighting in which avenue lights takes
major part, while India is facing shortage of power. In December 2014, Government of India proposed and began to apply LED luminaire in streetlights. If all existing streetlight replaced with LED lighting fixtures then India can be benefited through 5,500 crore of rupees every year and reduction in CO2 emission. This is beneficial through many aspects like economic, environmental, lighting fixtures performance, discount in street accidents, thief and crime. According to statistical data, for residential lighting, every year in India 77 crore of incandescent, fluorescent bulb and forty crore of CFL bulb are purchased, which consumes around 60 to one hundred Watts and 30 to 40 Watts of power respectively, which lasts for one to maximum four years only. Therefore, use of green, durable 10 to 15-year LED lighting fixtures could be smart decision. LED is considered a promising answer to modern avenue lights system because of it is conduct and benefits as emphasized in apart from that, the advantages of LED are probable to replace the traditional avenue lamp such as the incandescent lamp, fluorescent lamp and High Pressure Sodium Lamp in destiny but LED technology is an extremely difficult procedure that calls for a combination of advanced production lines, top quality materials and high-precision manufacturing manner. Therefore, this paper highlights the energy efficient street lighting design using LEDs with the assist of mirror which helps us to obtain higher panel output.

Methodology
Four major parts were discussed under this topic. Design Architecture is the principle block feature for the proposed design. While, the hardware specs of every factor is given Below. Flow of the machine is likewise explained.

Design Architecture

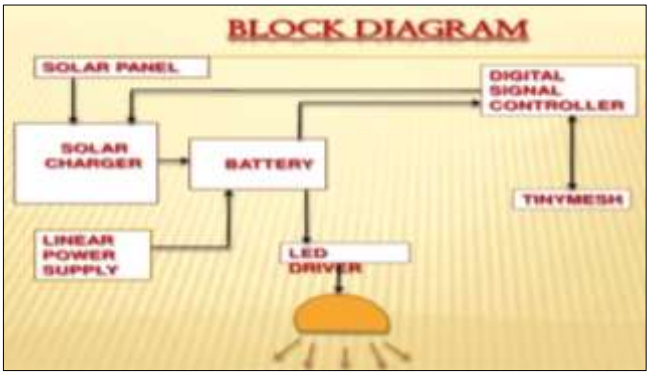

Fig 1: Hardware Specification

Solar Panel
As the call implies, these are cells which are grown from a unmarried crystal. Monocrystalline solar PV panel is extra green than polycrystalline panel. Efficiency is set 18%. High Efficient Monocrystalline sun panel generates strength throughout day time and it's far stored in battery

Battery
It is a sort of rechargeable battery, which uses lithium ion Phosphate as a cathode material. Li ion Ph batteries have somewhat high energy density, light weight offer longer lifetime. Inherently safer hence lithium ion Phosphate is popular amongst all garage batteries.

LDR (Light Dependent Resistor)
Light Dependent Resistor as the call indicates the resistance is dependent upon the mild incident on it. The LDR resistance changes with depth of mild, with growth in mild depth the resistance offered by way of the sensor decreases. LDR sensor gives analog input value to manipulate circuit. This value can be used to automatically turn on/off the LED streetlight

Led (Light Emitting Diode)
With the technological advancement in semiconductor Material, LED lamps produces mild within visible variety spectrum, therefore it has maximum performance than incandescent, sodium vapor and other lamps. Therefore, LED lamps world widely accepted for many lights' applications along with for Street lighting fixtures purpose. LED lamps having highest lifespan from 50,000Hrs to 1,00,000 Hrs. And efficiency of 100 to 120 lm/w.

Pole
Strong poles are important to all street lights, especially to solar road lighting as there are additives installed on the pinnacle of the pole: fixtures, panels and sometime batteries. And wind resistance must also be considered when deciding on the pole.

Mirror
A replicate is a flat piece of glass which reflects light, so that when you look at it you could see yourself meditated in it. If something mirrors something else, it has similar capabilities to it, and therefore looks like a replica or illustration of it.
It also reflects light with 90 efficiency that is the essential call for in our project.

Concept Used

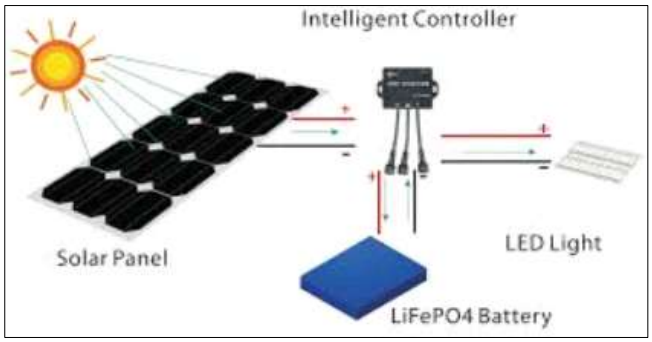

Fig 2

Most of the time a sun panel is operating properly beneath peak energy, on hazy days and when the solar is lower within the sky, early morning, overdue afternoon for example. The light tiers are just not excessive enough, so to enhance the mild degree I tried aligning a mirror to reflect extra light onto my solar panel. It worked virtually properly and after a chunk of experimentation I located that setting a reflect at least twice the size of the sun panel in the front of the panel could raise the output through as a whole lot as 75%.
Using a bigger replicate can reflect mild onto your panel over an extended period in the course of the day so that you don't need to tune the sun, simply face your panel and mirror due south

Working of Proposed System
1. During day time sun panel produces energy and it's far stored in the battery
2. Mirror facilitates in gaining more power so that panel offers greater strength
3. Mirror setup has been shown above which helps in acquiring the output
4. At the time of morning LDR turns of the mild while in nighttime it turns it on the light
5. Solar depth is increased with the aid of reflect so that greater output is obtained
6. In dusk to dawn time light sensor gives command.

Calculations
Solar panel electricity output
Daily watt-hours = Solar panel watts x average hours of sunlight*75%
Therefore, sun panels output before mirror is
For a 20-watt panel
Average hours of sunlight = 10. five-eleven hours
= 20*10.5 watt-hours
=210 watt-hours
Solar panels output with replicate is
For a 20-watt panel
Average hours of sunlight=10.5-eleven hours
Total output strength produced=energy produced by solar panel + 75% of power produced
= (20*10.5 + .75* 20*10. five) watt- hours
= (210 + 157.5) watt-hours
= (367.five) watt-hours
Hence electricity transferred by using the sun panel simply got increased with the aid of 75%

Conclusions
This might be one among the most inexpensive and simplest ways to reinforce the energy of a small sun panel, however this technique does have a few limitations
You can use more mirrors to reflect extra mild onto the sun panel and growth its strength further but on a sunny summers day the greater light can construct up numerous warmness that may harm the panel. In July I had my 1.5w panel going for walks at double its rated power for twenty minutes, it got so hot you couldn't contact it!
Placing mirrors either facet of the panel to reflect doesn't work well due to the fact as the solar moves west it will forged a shadow across the panel. The handiest location that the reflect may not forged a shadow at any time in the day is putting the replicate east in order that there is no problem of shadows ad mild intensity consequently position of reflect additionally matters.
On a dull day the replicate does not deliver a lot of a strength boost at all, I examined a panel on a stupid day in October; it produced 1% of its rated energy, adding a mirror made no difference
The streetlight with solar PV panel does no longer consumes any energy from utility supply, therefore operates free of value within furnished backup from battery.

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