CONSERVE CONVENTIONAL ENERGY RESOURCES BY SMART CITY LIGHTS

SIDDHI NITIN BHAVSAR[1], RUTUJA BABAN TAMBE[2], NIKEETA ARJUN TAMBEKAR[3], POOJA SANJAY WAGH[4],
[1'2'3'4'], *Diploma Scholar Electronics and Telecommunication Engineering,*
Dr. S. B. Dhoot[5],
[5'], *Professor, Dept. Electronics and Telecommunication Engineering,*
[1'2'3'4'5], *Government Polytechnic Chhatrapati Sambhajinagar, India,*
[1'2'3'4'5] , siddhibhavsar09@gmail.com, rutujat950@gmail.com, nikeetat2004@gmail.com, poojawagh500@gmail.com, drsachindra.dhoot@gmail.com

Abstract **-** Our conventional energy resources are being rigorously used day by day. If the same practice goes on there will be no time that it will get extinct and probably, it will be all history to our future generation. Proposed methodology "CONSERVE CONVENTIONAL ENERGY RESOURCES BY SMART CITY LIGHTS". This proposed system will consume very less electricity as the lighting of the area will be such a way that, it will work productively efficient throughout. In any city, street light is one of the major power consuming factors, most of times we see street light are on even after sunrise thus wasting lot of energy. To avoid this problem of energy wastage, this proposed methodology has automatic street light control base system with the super combination of IoT. This is less power consuming and security base system. The main perspective of this proposed system is to save the electricity.

Key Words **- Conventional Energy, MTBF, MTTR, Odd-Even, Display Reader, Regenerative Speed Breaker.**

I. INTRODUCTION

As mentioned above in the abstract, proposed methodology aims to save the conventional energy resources. That implies, this proposed system will consume less electricity in compare with the existing system, while providing more security and automation for area's as it has 5 prime aspects :-

1. Fully ON + Motion Detection Picture Capturing Camera.
2. Even Odd Concept.
3. Fully ON.
4. Intensity controller (30%-100%) based on Motion Detection.
5. Motion Detector ON-OFF.

This proposed system has four main features. They are as follows :-

1. A Day-Night indicator.
2. This proposed system has CONTROL ROOM in the security cabin which will continuously observe the situation of poles with the help of display reader.
3. It has FAULT DETECTION switch / indicator which will glow when fault is encountered.

This is all about conserve but what about reserve…

4. This proposed system has 4th feature THE REGENERATIVE SPEED BREAKER which will generate electricity from the kinetic energy whenever the vehicle passes through…

II. LITERATURE SURVEY

Gong Siliang describes a remote streetlight monitoring system based on wireless sensor network. The system can be set to run in automatic mode, which control streetlight according to Sunrise and Sunset Algorithm and light intensity.

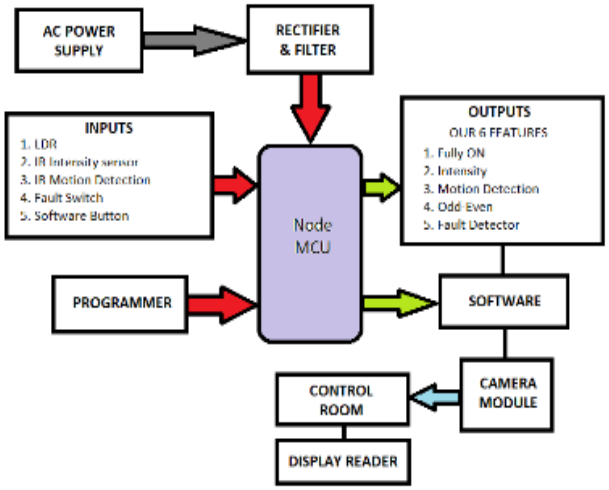
S.H. Jeong describes about the development of Zigbee based Street Light Control System which control and monitor status of street lights installed alongside road. Lights are, switched to ON/OFF by this system's control command.

System developed by Gustavo W. Denardin deals about a control network for a LED street lighting system. The use of LEDs is being considered promising solution to modern street lighting systems, due to their longer life time, higher luminous efficiency and higher CRI. This system has automatic street light intensity control based on the vehicular movement and switching ON and OFF of street lights depending on the light ambiance. This will help in reducing the power consumption during hours of measure road usage. The street light module is installed consequently for every certain distance.

A.C. Kalaiarasan deal about solar energy-based street light with auto-tracking system for maximizing power output from a solar

system is desirable to increase the efficiency. In order to maximize the power output from the solar panels, one needs to keep panels aligned with the sun. As such a means of tracking the sun is required. This is a far most cost-effective solution than purchasing additional solar panels.

III. SCHEMATIC DIAGRAM



Proposed Block Diagram

IV. REGARDING RESEARCH

Sr. No	Parameters	Existing System (250W) Approx.	Proposed System (120W) Approx.	Approx Saving
I.	Power Consumption Per Month	5200 units	1500 units	3700 units
II.	No. of bulbs used in a day	60 bulbs	35 at 100% 7 at 30% 8 at 0%	Approx. 22 to 23 bulbs
III.	Electricity Bill	81200 Per month	21600 Per month	59600 Per month
IV.	Percentage of consumption of electricity	100%	27%	73%
V.	Area Covered	Approx 10 acer	No change	-
VI.	Infrastructural cost	Not required	Not Added	-
VII.	Reliability 1.MTBF (Mean Time Between Failures) 2.MTTR (Mean Time To Repair)	Less Reliable as compared to the proposed system as MTBF & MTTR is more	More Reliable as MTBF & MTTR is comparatively less	-

4.1 Conclusion of Regarding Research

From this research and all the study of ours we came to a conclusion that if this proposed system is implemented the amount of energy, the electricity bills are reduced down till approx. 70% of the total consumption in the existing system. Which will definitely reduce down the consumption and make our conventional energy resource electricity conservable.

V. EXPECTED RESULT

By using this proposed methodology, the proposed system will have the following expected outcomes –

1. INTENSITY CONTROLLER FROM 30% TO 100% WHEN MOTION DETECTED

In this feature the military area is catered where the compulsory lightning of the light poles is restricted. So as after the evening there is not much need of the light so considering the fact, the proposed system will control the intensity of the light. As there is any movement in the pole region sensed by the IR sensor the lights which was in the 30% intensity will switch to 100% intensity for some delay after the motion is detected.

2. SWITCHING ON OF THE POLES ONLY WHEN MOTION DETECTED

In this proposed system, this feature caters the dark area or say suspect area but at the same time no so used area where there is no need of the light. This feature approaches the need of such areas, it includes the motion detection ON-OFF of the poles only when motion is detected else will be OFF.

The next two features provide automation in the system. These features can be controlled by the mobile app button only by the authorised user. These features are IoT based.

3. FULLY ON

This feature is an ordinary feature which includes fully lightning of the poles on 100% as it caters the high-profile area or say prime area which should be lighted thoroughly in a city.

4. ODD EVEN DAYS CONCEPT

In this feature the proposed system; the area which are catered does not need fully lighted conditions, some of the area on the street does not needs fully on lights throughout the night. So, this feature introduces partial or lightning the adjacent poles on a different day (broadly classified in even and odd days). Where the even no. of poles will light only at even no. of days whereas the odd no. of lights will be lighted on odd no. of days.

5. IMAGE CAPTURING WITH MOTION DETECTION

In the proposed system, this feature caters the high-profile area in accordance with the need of security in these areas is the highest. So according to the proposed methodology, the proposed system will have a motion detection camera with fully ON lights on 100% which will continuously monitor the area and is programmed in such a way that whenever the

motion is detected the picture / photograph of that instant will pop up to the authorised user's mobile app providing it a high security aspect.

6. REGENERATIVE SPEED BREAKER

This feature of the proposed system indicates all the speed breakers in the city. As soon as the vehicle passes through the speed breaker the cylindrical rod in the two ramps will spin and cause an energy conversion from the kinetic energy to electrical energy. This produced energy can be stored in the Lithium-ion batteries and can be reused whenever needed.

7. CONTROL ROOM OR DISPLAY READER

In this feature all the systems listed above, covering all the poles in a particular area; their connections will be displayed at one board that means this feature of the proposed system satisfies the security purpose, as ON and OFF of the poles will be indicated through LED's representing each pole in the particular area. This will help the security person to monitor the status of the lights and record the maintenance if required... And according to the 2nd feature of the proposed system that will also be indicated as the motion is detected.

VI. ADVANTAGES

- Conventional Energy Resource Management (sustained energy resources).
- LEDs are energy efficient because they emit very little heat, so they require far less power to emit the same amount of light as their conventional equivalents.
- Less consumption of electricity, hence Saves Electricity.
- Lifespan of the components increases.
- Reduce in maintenance.
- Reduce in cost (say electricity bills).
- Provides security system as it enhances public safety by adjusting the light output in the needed areas.

VII. CONCLUSION

Hence, from this proposed system it is concluded that by using this proposed methodology we can conserve our endangered conventional resource 'Electricity' by using it in a smarter and productively efficient way so that it would last for some more years, and with addition to effectual features we will lead our way towards making our city smarter and magnificent.

VIII. FUTURE SCOPE

- This proposed system can have enhancement due to the upcoming features in the future. For example, when a vehicle or a person meet with an accident street light remains on, a system can be introduced to inform the respective authorities. Similarly, a system can be introduced to inform the technicians about the default. All this will be possible with the proper use of technology.
- In future, we can also use speed sensor to control the on time of lights.
- The proposed system can be developed using solar street light system with automatic street light controller.
- The system can be powered from a battery, which can be charged during daytime by harvesting the solar energy through a solar cell. The solar energy harvested from sunlight can be stored, inverted from DC vtg to AC vtg.
- The emerging era will be going to have an enhancement for smart light system. In future, system can be operated remotely as well as by using GSM system. Also, smart light system can be operated by using AI system.

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