

Smart Energy monitoring and wastage detection system

The smart monitoring and wastage detection system aims to monitor real-time electricity usage of appliances, detect unnecessary energy consumption, and provide instant alerts for wastages. Using IoT technology, the system collects data from sensors, displays it on a custom dashboard, and in screen, and uses human presence detection to prevent false alarms. This project demonstrates energy conservation principles, raises awareness about electricity usage, and encourages sustainable practices in households and workplaces.

This project primary objectives:

1. Monitor Real-Time energy usage
2. Detect Energy wastage
3. Human-Aware Alerts
4. IOT Dashboard Display

Impact on mankind:

- Help to save wastage of electricity, leading to lower energy demand.
- Prevents overheating or misuse of electrical appliances, which reduces risks of electrical hazards.
- Helps to monitor households and institutions their electricity usages.

Conclusion:

This project main aims to helps households and institutions to save their electricity wastage, prevent risk of electrical hazards, and keep them track about their electricity use.

Materials, Budget, and Timeline

Materials needed

- ESP32
- ACS712 current sensor (5A)
- PIR motion sensor (HC-SR501)
- Buzzer
- 16x2 LCD with I2C
- small DC bulb/Fan
- Breadboard
- Jumper wires (male-male & male-female)
- USB cable / 5v Adapter

Estimated Budget

Item	Estimated cost (in NRs.)
ESP32	1000
ACS712 Current sensor	400
PIR motion sensor	300
Buzzer	125
Small DC bulb/fan	250
16x2 LCD with I2C	800
Breadboard	250
Jumper wires	250
USB cable	150
Miscellaneous cost	500
Total Estimated Budget	4025

Timeline

The project is planned over Three weeks:

1. Week1: Research and design the system layout, gather materials and construct the smart monitoring system.
2. Week2: Test and debug errors.
3. Week3: Document results and prepare for a community demonstration.

This timeline ensures that the project is feasible within a three week while allowing adequate time for construction and testing.

Citations:

[1]

https://www.researchgate.net/publication/380972742_Smart_Energy_Monitoring_System_SEMS

[2] <https://ijrpr.com/uploads/V6ISSUE12/IJRPR57337.pdf>

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