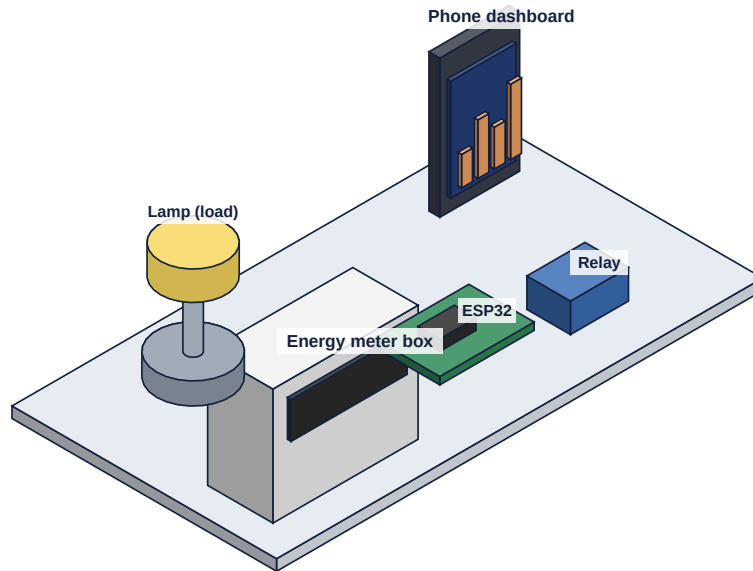


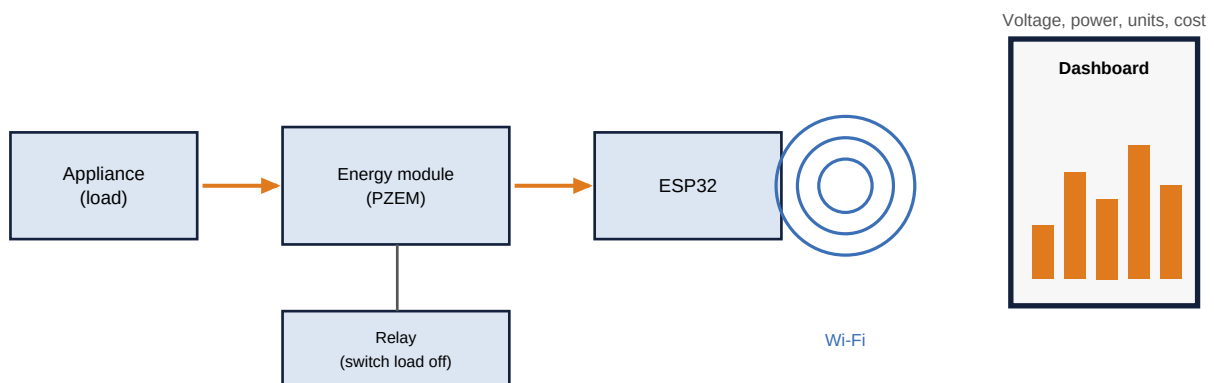
IoT Smart Energy Meter with Real-Time Dashboard

Short Project Guide

Domain	Level	Approx. component budget	Lab feasibility	Build + test time
Energy Monitoring / IoT	Easy-Medium	Rs. 4,000 - 8,000	High	4-6 weeks



3D concept view (illustration, not to scale).



Block diagram / sketch (not to scale). Your final build will look different depending on your design and materials.

OBJECTIVE

Measure and log the energy use of different household loads and show it live on a phone, with a cost estimate and a limit alert.

HOW IT WORKS (IN SIMPLE WORDS)

An energy module measures voltage, current, power and power factor of a household load, and an ESP32 sends the readings to a phone dashboard. The dashboard shows live power, units consumed and cost per day, and warns you when a limit is crossed. A relay can switch the load off.

MAIN PARTS YOU WILL NEED

- ESP32
- PZEM-004T or similar energy module
- Display and relay
- Dashboard (a free service or a simple web page)
- Enclosed box and fuse

CAN YOU BUILD IT IN YOUR COLLEGE LAB?

Electronics and programming only. It connects to mains, so use an enclosed box and a fuse, and have a qualified person do the wiring.

RESULTS YOU CAN EXPECT

- Power and energy per appliance
- Daily and monthly usage graphs and cost
- Comparison with a normal meter

QUESTIONS YOU SHOULD BE ABLE TO ANSWER IN VIVA

- What is the difference between power and energy?
- What is power factor?
- How does the energy module measure current?
- How would you improve billing accuracy?

Want to build this project? The full package gives you the complete guide: detailed design, step-by-step build plan, parts list with specifications, testing procedure, report material, PPT and viva preparation. Message us on WhatsApp: **WhatsApp: +91 8171053962**