## Evidence

## 1. The Rising Problem of High Electricity Bills

- **Energy Costs:** In India, residential electricity tariffs range from ₹3 to ₹10 per kWh, and many middle-class families struggle with increasing bills.
- **Inefficiency:** Many homes unknowingly consume excessive electricity due to inefficient usage, vampire loads (devices consuming power even when off), and old appliances.

## 2. Lack of Awareness & Monitoring

- Most people **don't track their power consumption** in real-time. They only see the final bill and have no idea which appliances consume the most.
- Manual monitoring is inconvenient. **A smart solution is needed** to analyze, alert, and provide suggestions to optimize power usage

KSEB LTD

Meter(MM) Status OK
Load : 13 KW
CC Demand : 12.9 KVA
Phase : 3
Prv Rd Dt : 06/05/2023
Prs Rd Dt : 06/07/2023
Mt Rd(OMF) : 1

## Readings & Cons. (MM)

| Unit | Curr | Prev | Cons | Avg |
|---|---|---|---|---|
| KWH/R/I | 11889 | 11074 | 815 | 570 |

Cons. recorded on Changes

| | |
|---|---|
| KWH/R/I | 648 |

## Bill Details

| | | |
|---|---|---|
| Fixed Charges | : | 450.00 |
| Meter Rent | : | 0.00 |
| GST | : | 0.00 |
| Energy Charges | : | 12435.50 |
| Duty | : | 1243.55 |
| Fual Sur. | : | 131.67 |
| Monthly Fuel Sur. | : | 131.67 |
| Round off | : | -0.39 |
| Bill Amount | : | 14392.00 |
| ACD/ADJ | : | 2139.00 |
| Surcharge | : | 50.00 |
| CF | : | 30.00 |

**Payable : 16611.00**

## Key Findings

- **High Electricity Bills:** ₹2500/month (~7% of total income).
- **No Real-Time Monitoring:** Unaware of which appliances consume the most power.
- **Energy Wastage:** ACs, TVs left on; phantom loads from plugged-in devices.
- **Potential Savings:** EcoWatt can reduce bills by **20-30% (₹500-750/month).**
- **Need for Smart Management:** Helps optimize usage, reduce costs, and promote energy conservation.

**Comparison Analysis: TP-Link Kasa Smart Plug vs. Wipro Smart Energy Management System (SEMS)**

| Feature | TP-Link Kasa Smart Plug | Wipro Smart Energy Management System (SEMS) |
|---|---|---|
| Target Audience | Individual Appliance Users | Large Enterprises & Industries |
| Real-Time Monitoring | ✅ Yes (but only for a single device) | ✅ Yes |
| Whole-Home Power Analysis | ❌ No | ✅ Yes (for large setups) |
| Automated Alerts | ❌ Limited | ❌ No |
| Remote Control of Devices | ✅ Yes (for a single device) | ❌ No |
| IoT & Cloud Integration | ✅ Yes (App-based) | ❌ No |
| Cost-Effectiveness | ❌ Expensive when used for multiple devices | ❌ High Cost |
| Easy Installation | ✅ Simple (per device) | ❌ Requires professional setup |
| Energy Consumption Optimization | ❌ No | ✅ Yes (data-driven insights) |

## Comparison Analysis: Kenza vs. Solar Energy Solutions

| Feature | Kenza (Energy Monitoring System) | Solar Energy Solutions (Solar Panels & Batteries) |
|---|---|---|
| **Primary Function** | Tracks electricity consumption | Generates electricity from sunlight |
| **Energy Savings** | Helps reduce wastage | Reduces dependency on the grid |
| **Initial Investment** | Low | High (Installation cost) |
| **Long-term Savings** | Moderate | High (Lower electricity bills over time) |
| **Real-time Monitoring** | ✅ Yes | ❌ No (Unless paired with a smart system) |
| **Remote Control of Devices** | ❌ No | ❌ No |
| **Dependence on Grid Power** | ✅ Yes (Relies on electricity provider) | ❌ No (Can work independently with storage) |
| **Sustainability** | ❌ No direct impact | ✅ 100% Renewable & eco-friendly |
| **Maintenance** | ✅ Minimal | 🔧 Requires periodic cleaning & maintenance |
| **Integration with Smart Tech** | ❌ No | ✅ Possible with smart inverters |

## Shortcomings of Kenza (Energy Monitoring System)

1. **Does Not Generate Power** – Only tracks and optimizes usage; does not provide an alternative energy source.
2. **Dependent on Grid Electricity** – Cannot function without an existing power supply.
3. **Limited Cost Savings** – Helps reduce waste but does not significantly lower electricity bills like renewable sources.
4. **No Direct Environmental Benefit** – Unlike solar or wind power, it does not reduce carbon emissions.
5. **No Backup Power** – Does not help during power outages.
6. **Lack of Smart Automation** – Cannot automatically turn off high-consuming devices unless paired with additional smart tech.
7. **Initial Setup & Learning Curve** – Users must actively monitor and adjust their habits to see savings.