Mini Project Report - Energy Monitoring Dashboard

Project Title

Energy Monitoring Dashboard using Power BI

Student

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Domain

Electrical Engineering x Data Analytics

Tools Used

Power BI, Excel, DAX

Project Objective

To develop a real-time (or simulated) energy monitoring dashboard that tracks and visualizes critical electrical parameters such as Voltage, Current, Power, and Frequency. The goal is to help identify patterns, abnormal behavior (like frequency drops), and daily energy consumption trends for effective decision-making in energy management.

Dataset Details

Source: Simulated using Excel with 10,000+ entries at 15-minute intervals

Parameters: Timestamp, Voltage (220-240V), Current (3-10 A), Power (kW), Frequency (49.5-50.5 Hz)

Derived Columns: DateOnly, DayOfWeek, Status (Normal / Freq Drop)

Dashboard Features

- KPI Cards: Total Energy, Avg Voltage, Max Power, Min Frequency
- Line Charts: Power, Voltage & Frequency trends over time
- Bar Charts: Avg Voltage & Power grouped by day and status
- Slicers: Filter by Date Range, Status, Day of Week

- Alerts: Conditional status highlighting using DAX

Key Insights

- Identified peak power demand times using timestamp-level analysis

- Tracked frequency drops using alert rules and conditional formatting

- Detected daily usage patterns useful for load optimization

Outcomes

- Created a clean, professional dashboard in Power BI

- Gained experience in DAX, time-series analytics, electrical data analysis

- Ready for use in solar plants, smart grids, and utilities

Power BI Model