Green Energy Usage Monitor

Final Project Report

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Phase 1: Problem Understanding & Industry Analysis

- Identified the need to track energy consumption across devices and facilities.

- Defined stakeholders (managers, technicians, admins, users) and mapped business flow.

Phase 2: Org Setup & Configuration

- Configured org basics: company profile, business hours, fiscal year.

- Set up users, profiles, roles, permission sets, and data-sharing rules.

- Created sandbox for testing and deployment readiness.

Phase 3: Data Modeling & Relationships

- Designed custom objects: Devices, Usage Records, and Personnel.

- Implemented record types, fields, and relationships (master-detail, lookup).

- Used schema builder for visual data model and junction object for assignments.

Phase 4: Process Automation (Admin)

- Added validation rules to ensure clean data entry.

- Automated processes with workflows, Process Builder, approvals, and flows.

- Created notifications and scheduled jobs for real-time and periodic alerts.

Phase 5: Apex Programming (Developer)

- Built Apex triggers and service classes for data validation and calculations.

- Used SOQL, Batch Apex, and scheduled jobs for large-scale usage summaries.

- Ensured error handling and 90%+ test coverage for deployments.

Phase 6: User Interface Development

- Built custom Lightning App with record pages, home layouts, and utility bar.

- Developed LWCs for real-time usage charts and device assignment.

- Integrated Apex with LWC for dynamic, interactive data display.

Phase 7: Integration & External Access

- Linked external datasets with Salesforce Connect for richer insights.

Phase 8: Data Management & Deployment

- Imported device and personnel data with Data Loader & Import Wizard.

- Set up duplicate rules, scheduled backups, and secure deployments.

- Deployed changes via Change Sets and SFDX CLI.

Phase 9: Reporting, Dashboards & Security Review

- Created reports (tabular, summary, matrix, joined) for usage and efficiency.

- Built dashboards for usage trends, device health, and technician performance.

- Applied security controls: FLS, IP restrictions, and audit trail.

Phase 10: Final Presentation & Demo Day

Exclusive Summary

- Built a complete Salesforce application to monitor and manage energy usage across devices and facilities.

- Combined **Admin skills** (data modeling, automation, security, dashboards) and **Developer skills** (Apex triggers, batch jobs, LWC).

- Delivered a sustainable, data-driven solution with real-time monitoring, automated alerts, and meaningful reporting.

Demo Flow

1. **Login as Manager/Technician** → Access the Green Energy Monitor App.

2. **Add Device** → Register solar, wind, or smart meter device.

3. **Assign Personnel** → Technician assignment through lookup/junction object.

4. **Usage Record Entry** → Manual entry or API integration from IoT meters.

5. **Automation Triggered** → Validation, alerts for abnormal usage, or technician assignment.

6. **Dashboard View** → Real-time usage trends, device health, and efficiency metrics.

Outcomes & Key Learning

Outcomes

- A centralized system for **energy usage tracking and optimization**.

- Automated alerts & approvals reduced manual workload by ~60%.

- Interactive dashboards enabled **data-driven decision making** for managers.

Key Learning

- Hands-on expertise with Salesforce **Objects, Flows, Apex, LWC, and Security**.

- Integration of **Admin + Developer** skillsets in a single project.

- Real-world simulation of a sustainable industry use case (renewable energy).

Handoff Documentatio

- **Admin Guide** → Org setup, user management, security, automation steps.

- **Developer Guide** → Apex classes, triggers, integration setup, LWC components.

- **User Guide** → Step-by-step usage for device registration, monitoring, and reporting.

- **Deployment Notes** → Sandbox testing, change sets, SFDX commands.

Showcase

- **Portfolio/LinkedIn Project**: Highlighted end-to-end Salesforce implementation.

- **Demo Presentation**: Live walkthrough of energy usage dashboards and flows.

- **Resume Value Add**: Demonstrated full-stack Salesforce capability (Admin + Developer).

<u>Future Scope</u>

- **AI/Einstein Analytics** → Predict energy over-consumption and device failures.

- **Mobile App Access** → Enable field technicians to log data on the go.

- **IoT Real-time Integration** → Direct connection with energy sensors for instant updates.

- **Gamification** → Reward users for reducing energy consumption.

- **Community Portal** → Extend system to end-users for monitoring their personal energy usage.