Problem Definition Document

Sustainable Development Goal (SDG) 7: Affordable and Clean Energy

1. Introduction

Sustainable Development Goal 7 aims to ensure access to affordable, reliable, sustainable, and modern energy for all. Despite progress in urban areas, rural communities often face significant challenges in accessing and utilizing clean energy sources. Addressing these challenges is crucial for improving the quality of life, economic development, and environmental sustainability in these areas.

2. Problem Statement

Problem: Many rural areas experience inadequate access to affordable and clean energy. This results in reliance on inefficient and polluting energy sources, which impacts health, economic opportunities, and environmental sustainability. Effective monitoring and management of energy consumption and access are essential for improving energy distribution and support to underserved regions.

Specific Problems:

- Limited Energy Access: High percentages of rural households lack access to modern energy services.

- Inefficient Energy Use: Reliance on traditional and inefficient energy sources such as firewood or diesel generators.

- Uneven Energy Distribution: Disparities in energy access between different regions, leading to unequal development opportunities.

- Inadequate Data: Insufficient data on energy consumption patterns and access levels hinders effective policy-making and resource allocation.

3. Objectives

1. Monitor Energy Consumption: Track and analyze energy consumption by source in various rural regions.

2. Assess Energy Access: Evaluate the percentage of households with access to modern energy services.

3. Identify Gaps: Identify regions with the lowest energy access and highest consumption of inefficient energy sources.

4. Optimize Energy Distribution: Provide insights to optimize energy distribution and support for regions in need.

4. Data Requirements

Data Collection:

- Energy Consumption Data: Monthly energy consumption for each energy source in different regions.

- Energy Access Data: Percentage of households with access to modern energy services in each region.

- Regional Data: Information about the population and geographic characteristics of each region.

Data Sources:

- Surveys and field data from energy providers and government agencies.

- Reports and records from energy distribution companies.

- Publicly available datasets on rural energy access and consumption.

5. Expected Outcomes

1. Comprehensive Data Insights: Detailed understanding of energy consumption patterns and access levels across different regions.

2. Improved Policy Making: Data-driven insights to guide policy decisions and resource allocation for energy projects.

3. Enhanced Energy Access: Targeted interventions to improve energy access in the most underserved regions.

4. Increased Efficiency: Optimization of energy distribution to ensure more effective use of resources.

6. Implementation Plan

1. Design and Build Database:

- Create a relational database schema with tables for regions, energy sources, consumption, and access.

- Populate the database with sample data.

2. Perform Data Analysis

3. Develop Dashboard

4. Prepare Reports:

- Document insights, recommendations, and the impact of proposed interventions.

- Prepare a pitch deck for presentation to stakeholders.

7. Challenges and Considerations

1. Data Accuracy: Ensure data is accurate and up-to-date for reliable analysis.

2. Data Integration: Integrate data from various sources seamlessly.

3. User Accessibility: Design the Excel dashboard to be user-friendly for non-technical stakeholders.

4. Scalability: Ensure the solution can be scaled to include more regions or additional data sources in the future.

8. Conclusion

Addressing the problem of inadequate energy access in rural areas requires a data-driven approach to understand and address gaps in energy distribution and consumption. By leveraging a well-designed database, detailed data analysis, and interactive visualization tools, we can provide valuable insights to improve energy access and optimize resources in underserved regions.