

## **SDG Problem Definition Document**

### **Project Title:**

Analyzing and Reducing the High Costs of Renewable Energy Technologies

### **Sustainable Development Goal (SDG):**

**SDG 7:** Affordable and Clean Energy

### **Problem Statement:**

The high upfront costs of renewable energy technologies, such as solar, wind, and hydro, pose a significant barrier to their widespread adoption, particularly in developing regions. This project aims to analyze and compare the costs of different renewable energy sources across various regions and track trends over time. Understanding these cost dynamics will provide insights into how to make renewable energy more affordable and accessible, thereby supporting the global transition to sustainable energy.

### **Objectives:**

1. **Analyze Cost Variability:**  
Compare the costs of different renewable energy technologies across various regions to identify disparities and opportunities for cost reduction.
2. **Track Cost Trends:**  
Analyze historical data to identify trends in the affordability of renewable energy technologies, highlighting regions or technologies where costs have significantly decreased or stagnated.
3. **Assess Impact of Projects:**  
Evaluate the impact of specific renewable energy projects on cost reductions, focusing on successful initiatives that have driven down costs.
4. **Inform Policy and Investment:**  
Provide data-driven insights to guide policy decisions and investment strategies aimed at reducing the costs of renewable energy technologies.

### **Scope of Work:**

- **Data Collection:**  
Gather data on the costs of renewable energy technologies (e.g., solar, wind, hydro) across different regions and over time. This data will include cost per megawatt (MW), project costs, and regional cost comparisons.
- **Database Design:**  
Design and implement a relational database to store and manage data on energy sources, regions, costs, and projects. The database will include entities such as EnergySources, Regions, CostData, and Projects.

- **Data Analysis:**  
Write SQL queries to retrieve and analyze data, focusing on cost comparisons, trend analysis, and regional disparities.
- **Visualization and Reporting:**  
Use Microsoft Excel to create visualizations, such as line graphs, bar charts, and pivot tables, to present the findings. The analysis will be summarized in a final report.

#### **Expected Outcomes:**

- **Cost Comparison Report:**  
A detailed report comparing the costs of renewable energy technologies across different regions, highlighting areas where costs are particularly high or low.
- **Trend Analysis:**  
A visual representation of cost trends over time, showing how the affordability of renewable energy technologies has evolved.
- **Policy Recommendations:**  
Data-driven recommendations for policymakers and investors on how to reduce the costs of renewable energy technologies and accelerate their adoption.

#### **Project Timeline:**

- **Week 1:** Data Collection and Database Design
- **Week 2:** Database Implementation and Data Entry
- **Week 3:** SQL Query Development and Data Analysis
- **Week 4:** Data Visualization and Report Writing
- **Week 5:** Final Review and Presentation

#### **Stakeholders:**

- **Primary:**  
Renewable energy companies, policymakers, and investors interested in reducing the costs of renewable energy technologies.
- **Secondary:**  
NGOs, academic researchers, and communities affected by the high costs of energy.

**Risks and Assumptions:**

- **Risks:**  
Limited availability of accurate and comprehensive cost data, particularly for developing regions. There may also be challenges in normalizing cost data across different currencies and time periods.
- **Assumptions:**  
It is assumed that cost data will be available and accessible for all the major renewable energy technologies and that this data can be accurately normalized for comparison.

**Conclusion:**

This project aims to provide a comprehensive analysis of the costs associated with renewable energy technologies. By identifying trends and disparities, the project will offer valuable insights to help make clean energy more affordable and accessible, contributing to the achievement of SDG 7.