Project Initialization and Planning Phase

Date	14 December 2025
Team ID	SWUID20250254709 (Anshika Arya)
Project Title	Global Energy Trends: A Comprehensive Analysis Of Key Regions And Generation Modes.
Maximum Marks	3 Marks

Project Proposal (Proposed Solution)

This project proposal outlines a data analytics based solution to analyze global energy consumption and power generation trends. With a clearly defined objective, scope, and problem statement, the proposed solution leverages Power BI to transform complex energy datasets into meaningful visual insights that support sustainable energy planning and decision-making.

Project Overview	
Objective	To analyze and visualize global energy consumption and generation patterns across continents and countries, focusing on renewable vs non-renewable sources and historical trends (1990/1997-2017), using interactive Power BI dashboards to support sustainable energy decision making.
Scope	• Region wise and country wise analysis. • Source wise analysis (Solar, Hydro, Biofuel, Geothermal, Coal, Oil, Gas, Nuclear). • Historical trend analysis and interactive dashboards (3 pages). • Exclusions: forecasting / predictive modelling (out of scope).
Problem Statement	
Description	Raw, fragmented energy datasets make it hard for policymakers and analysts to compare energy sources, track renewable adoption and understand regional consumption patterns.
Impact	Better policy & infrastructure planning, clearer monitoring of renewable adoption and improved ability to target interventions in regions/countries with high consumption or low renewables penetration. Support for global sustainability and carbon reduction goals.

Proposed Solution	
Approach	• **Data collection:** from the provided CSV files (continent, country, renewables, non-renewables, top20). • **Data preparation using Power Query:** trim text, standardize column names, convert types, unpivot wide tables, remove total rows, validate values. • **Data modelling in Power BI:** create measures (Total Renewable, Total Non-Renewable, Renewable Share, YoY growth), create a minimal Dim_Country if needed. • **Visualization:** Build three dashboard pages, Global Overview, Renewable Deep Dive, Country & Regional Analysis, with KPIs, time-series, maps, stacked bars and drill through. • **Testing & Documentation**: Performance tests, screenshot based validation and write the report & demo script.

Key Features	• Cleaned, analysis ready datasets (Power BI model).
	• Measures/DAX list and Power Query steps.
	• Interactive Power BI dashboard with three pages:
	  ○ Page 1: Global Overview (KPI cards, donut, continent column, top 10 countries bar)
	  ○ Page 2: Renewable Deep Dive (multi-line trend, stacked area, source share, top20 composition)
	  ○ Page 3: Country & Regional Analysis (top countries, matrix, drill through)
	• Project report with methodology, visuals, insights and appendix (M & DAX code).
	• Recorded demo (video walkthrough).

Resource Requirements

Resource Type	**Description**	**Specification/Allocation**
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	Standard Laptop/Desktop
Memory	RAM specifications	8 GB RAM
Storage	Disk space for data, models, and logs	Minimum 50 GB free disk space

Software		
Frameworks	Python frameworks	Power BI Desktop
Libraries	Additional libraries	Built-in Power BI DAX & Power Query
Development Environment	IDE, version control	Windows OS
Data		
Data	Source, size, format	Global energy datasets (Excel format, multi-year TWh data)