**Project Guideline: Idea Proposal Submission**

1. **Project Idea:**

Use ML algorithms to forecast energy demand and dynamically balance energy distribution in smart grids, optimizing efficiency and reducing wastage.

1. **Relevance to Sustainable Development Goals (SDGs):**

By accurately forecasting energy demand and dynamically balancing energy distribution, the project supports the efficient utilization of energy resources, contributing to the goal of ensuring access to affordable, reliable, sustainable, and modern energy for all. Balancing energy distribution based on real-time data allows for better integration of renewable energy sources, reducing reliance on non-renewable sources.

1. **Literature Examples:**

Literature Example 1: "Short-Term Load Forecasting with Artificial Neural Networks"

Reference:Authors: Saurabh Singh; Shoeb Hussain; Mohammad Abid Bazaz

Journal: 2017 Fourth International Conference on Image Information Processing (ICIIP)

Literature Example 2: An Overview Of The Latest Machine Learning Trends In Short-Term Load Forecasting

Reference:Authors: Pedro M.R. Bento; Jose A.N. Pombo; Silvio J.P.S. Mariano; Maria R.A. Calado

Journal: 2022 IEEE International Conference on Environment and Electrical Engineering and 2022 IEEE Industrial and Commercial Power Systems Europe (EEEIC / I&CPS Europe)

**4. Describe Your Data:**

The data for this project can be sourced from electricity grid operators, utility companies, or relevant government agencies responsible for managing and maintaining energy infrastructure. Many countries provide open datasets related to energy consumption, grid operations, and renewable energy production. Timestamp: Date and time of the energy consumption or generation data. Load Demand: Actual electricity consumption or demand during each time period. Renewable Energy Production: Information on the output from renewable energy sources (e.g., solar, wind) during each time period. Weather Data: Relevant weather conditions (temperature, humidity, etc.), if applicable, as they influence energy demand.

**5. Approach (Machine Learning or Deep Learning):**

Machine Learning Approach:

Interpretability is a critical factor, traditional machine learning models such as linear regression, decision trees, or ensemble methods might be preferable. These models provide transparent insights into the relationships between features and the target variable.