Date	1 oct 2025
Team ID	LTVIP2025TMIDS40838
Project Name	Weather-Based Prediction of Wind Turbine Energy Output: A Next-Generation Approach to Renewable Energy
Maximum Marks	3 Marks

Proposed Solution Overview:

A machine learning-based system to predict wind energy output using weather data. The system will analyze wind speed, temperature, pressure, and humidity to estimate potential energy output.

System Architecture / Approach:

1. Data Collection from APIs and historical datasets

2. Data Preprocessing: cleaning, normalization, feature engineering

3. Model Development: Linear Regression, Random Forest, Gradient Boosting

4. Model Evaluation: RMSE, MAE, R^2 score

5. Optimization and Tuning: Hyperparameter tuning, feature selection

6. Deployment via Flask web application

Technologies Used:

- Python, Pandas, NumPy, Scikit-learn, Matplotlib/Seaborn

- Flask for deployment

- Jupyter Notebook for development

Expected Results:

- Reliable wind energy prediction

- Optimized turbine utilization

- Web interface for operators

Timeline / Milestones:

Milestone	Duration
Data Collection & Preprocessing	1 week
Model Development	2 weeks
Model Evaluation & Selection	1 week
Optimization & Tuning	1 week
Deployment via Flask	1 week
Documentation & Submission	1 week