Ideation Phase

Brainstorm & Idea Prioritization Template

Date	13 February 2026
Team ID	LTVIP2026TMIDS83348
Project Name	Weather Based Prediction Of Wind Turbine Energy Output - A Next Generation Approach To Renewable Energy Management
Maximum Marks	4 Marks

Brainstorm & Idea Prioritization Template:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Out-of-the-box ideas are encouraged, and all participants collaborate to shape creative and practical solutions for the problem statement.

Step-1: Team Gathering, Collaboration and Problem Statement Selection

Problem Statement:
The growing demand for renewable energy requires efficient management and accurate forecasting of power generation. Wind turbines generate electricity based on weather conditions such as wind speed, air density, temperature, and atmospheric pressure. However, the variability and unpredictability of weather patterns lead to fluctuations in energy output, causing grid instability and inefficient energy planning.

Step-2: Brainstorm, Idea Listing and Grouping

1. Collect and analyze historical weather data (wind speed, temperature, humidity, pressure).

2. Collect historical wind turbine power output datasets.

3. Build Machine Learning models to predict wind turbine power generation.

4.Compare multiple algorithms (Linear Regression, Random Forest, XGBoost, etc.) for best performance.

5. Develop a Flask-based web application for real-time energy output prediction.

6. Design a renewable energy management recommendation system (future scope).

Step-3: Idea Prioritization

High Priority:
- Exploratory Data Analysis (EDA)

- Machine Learning-based Wind Energy Prediction Model
- Model Performance Evaluation (MAE, RMSE, R^2 Score)

Medium Priority:
- Visualization dashboards for energy trends
- Feature engineering and hyperparameter tuning

Low Priority (Future Scope):
- Real-time weather API integration
- Renewable energy demand-supply balancing module
- Smart grid optimization suggestions