Ideation Phase
Brainstorm & Idea Prioritization

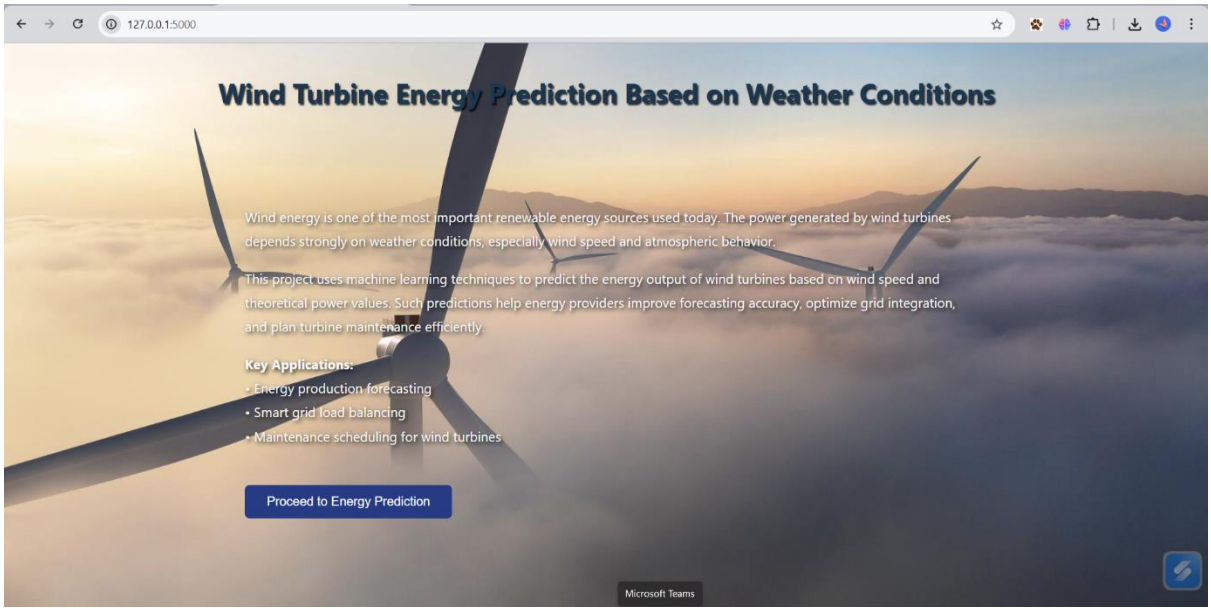
Date	3 February 2026
Team ID	LTVIP2026TMIDS90282
Project Name	Weather-Based Prediction of Wind Turbine Energy Output: A Next-Generation Approach to Renewable Energy Management
Maximum Marks	

Brainstorm & Idea Prioritization:

The increasing demand for renewable energy has made wind power an essential component of modern energy systems. However, wind energy production is highly dependent on weather conditions, particularly wind speed and atmospheric parameters. Variations in weather directly impact the power generated by wind turbines, making accurate prediction crucial for efficient energy management and grid stability.

The idea behind this project is to use machine learning techniques to predict the energy output of wind turbines based on weather-related inputs such as wind speed and theoretical power values. By analyzing historical data and training a regression model, the system can estimate the expected energy production under given conditions.

The expected output of the project is a web-based application that allows users to enter weather data and receive a predicted wind energy output in real time. The system should provide accurate, reliable, and fast predictions that can assist energy providers and grid operators in decision-making.



- **To build Machine learning models you must require the following packages**
    - **Sklearn:** Scikit-learn is a library in Python that provides many unsupervised and supervised learning algorithms.

- **NumPy:** NumPy is a Python package that stands for 'Numerical Python'. It is the core library for scientific computing, which contains a powerful n-dimensional array object
- **Pandas:** pandas is a fast, powerful, flexible, and easy to use open-source data analysis and manipulation tool, built on top of the Python programming language.
- **Matplotlib:** It provides an object-oriented API for embedding plots into applications using general-purpose GUI toolkits
- **Flask:** Web framework used for building Web applications.
- Watch the video below to learn how to install packages.