**Project Design Phase**

**Problem – Solution Fit Template**

|  |  |
| --- | --- |
| Date | 20 February 2026 |
| Team ID | LTVIP2026TMIDS83675 |
| Project Name | Weather-Based Prediction of Wind Turbine Energy Output: A Next-Generation Approach to Renewable Energy Management |
| Maximum Marks | 2 Marks |

**Problem – Solution Fit Template:** **Wind Turbine Energy**

Energy companies, wind farm operators, and grid managers face significant challenges due to the unpredictable nature of wind energy production.

* **Energy Companies** struggle to forecast energy output accurately, making distribution and pricing inefficient.
* **Wind Farm Operators** cannot plan maintenance effectively, risking downtime during high wind activity.
* **Grid Operators** find it difficult to balance renewable energy with traditional sources, leading to instability in the grid.

**Solution**

**A machine learning–powered prediction system that uses historical turbine data and live weather inputs to forecast wind energy output.**

* **Accurate Forecasting: Predicts energy production based on weather conditions, enabling better planning.**
* **Maintenance Optimization: Identifies low-output periods for scheduling turbine maintenance.**
* **Grid Integration: Provides reliable predictions to help grid operators balance renewable and traditional energy sources.**

**Purpose:**

* **✅ Solve complex forecasting and operational problems in renewable energy management.**
* **✅ Increase adoption of wind energy by making it more predictable and dependable.**
* **✅ Sharpen communication with stakeholders by providing clear, data-driven insights.**
* **✅ Build trust with energy companies and operators by solving costly inefficiencies.**
* **✅ Improve the renewable energy ecosystem by aligning production with demand and infrastructure needs.**

**Template:**

Calendar

Description automatically generated

References:

1. <https://www.ideahackers.network/problem-solution-fit-canvas/>
2. <https://medium.com/@epicantus/problem-solution-fit-canvas-aa3dd59cb4fe>