

Ideation Phase

Define the Problem Statements

Date	29 January 2026
Team ID	LTVIP2026TMIDS84120
Project Name	Weather-Based Prediction of Wind Turbine Energy Output: A Next-Generation Approach to Renewable Energy Management
Maximum Marks	2 Marks

Customer Problem Statement Template:

A customer problem statement helps capture the real challenges faced by stakeholders involved in wind energy generation and grid management. For weather-based wind turbine energy prediction, it focuses on understanding the needs, goals, barriers, and emotions of users such as wind farm operators and renewable energy planners. By clearly defining what they are trying to achieve and what prevents success, teams can design prediction models that directly address operational and planning difficulties.

A well-articulated problem statement also builds empathy by highlighting how uncertainty in wind energy forecasting impacts decision-making, efficiency, and grid reliability. This understanding enables researchers and developers to prioritize high-impact solutions that improve prediction accuracy, optimize turbine performance, and support stable integration of renewable energy into the power system.

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A wind farm operator managing daily power generation	Accurately predict wind turbine energy output to plan grid supply and operations	Weather conditions change unpredictably and current forecasts lack precision	Traditional models do not fully integrate real-time meteorological data and advanced analytics	Uncertain and pressured about meeting energy demand commitments
PS-2	A renewable energy planner responsible for grid stability	Optimize integration of wind energy into the power grid	Energy output fluctuates and causes imbalance in supply planning	There is no reliable short-term prediction system linking weather patterns with turbine performance	Frustrated and concerned about grid reliability and renewable efficiency

