Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	3 February 2026
Team ID	LTVIP2026TMIDS84120
Project Name	Weather-Based Prediction of Wind Turbine Energy Output: A Next-Generation Approach to Renewable Energy Management
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Login & Authentication	Login via Email & Password Login via Google Forgot Password / Reset Password
FR-4	User Dashboard	View predicted wind energy output View weather parameters View turbine performance status
FR-5	Energy Prediction Module	Upload weather data Run prediction model Display prediction results
FR-6	User Management (Admin)	View users Activate/Deactivate users Manage roles

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The system shall provide a clear, intuitive interface for users to view weather data, wind energy predictions, and analytics dashboards with minimal learning effort.
NFR-2	**Security**	The system shall ensure secure authentication, role-based access control, and encrypted storage/transmission of weather and turbine data to prevent unauthorized access.

NFR-3	**Reliability**	The system shall deliver consistent and accurate prediction results and maintain stable operation during continuous data ingestion and model processing.
NFR-4	**Performance**	The system shall process input weather data and generate wind energy predictions within a short response time (e.g., a few seconds) under normal load conditions.
NFR-5	**Availability**	The system shall be accessible 24/7 with minimal downtime to support continuous monitoring and decision-making for renewable energy management.
NFR-6	**Scalability**	The system shall support increasing volumes of weather and turbine data, additional users, and multiple wind farm deployments without significant performance degradation.