Team ID	PNT2022TMID18314
Project Name	Project - Predicting the energy output of wind turbine based on weather condition
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Proposed solution:

S.No	Parameter	Description
1.	Problem Statement	Wind power consists of converting the energy produced by the movement of wind turbine blades driven by the wind into electrical energy. Wind power generation differs due to the stochastic nature of wind. The prediction of wind power plays an indispensable role in maintaining the stability of the entire power grid. This solution aims to forecast the wind power values efficiently by correlating the parameters of weather conditions and wind turbines.
2.	Idea / Solution description	Wind energy is a significant and eligible source that has the potential for producing energy in a continuous and sustainable manner among renewable energy sources. However, wind energy has several challenges, such as initial investment costs, the stationary property of wind plants, and the difficulty in finding wind-efficient energy areas. Hence, long-term wind power forecasting is to be performed based on daily wind speed data using machine learning algorithms. With the process of applying machine learning models along with statistical models to historical wind speed data of a region, we can obtain long-term wind power values. This architecture integrated with a weather forecasting API, furthermore assists in the prediction in any location. The model is trained using IBM Watson's machine learning service and its scoring endpoint is fed to the application developed using the Flask framework to process the API's and energy prediction requests from the user to render the results on the UI.
3.	Novelty / Uniqueness	This solution is aimed to be architected in a way that makes it scalable and flexible in any kind of situations like unusual weather conditions, sudden influx of customers or users, analyzing in any type of location etc. This helps in dealing with the challenges of balancing supply and demand in any electricity system ,reducing the need for additional balancing energy and reserve power to integrate wind power by accurate wind power forecasting. Through statistical analysis combined with machine learning service over cloud as SAAS, the mentioned uniquenesses are desired to be achieved.
4.	Social Impact /Customer Satisfaction	By creating an effective machine learning model we will be able to increase the power produced hence the num and a clean technology, and this is one of the main impacts that makes it such an attractive and promising energy supply solution to predict the energy output of wind turbines based on weather conditions.Main social and environmental benefits includes reduction in CO_2 emissions and fossil fuels imports. In areas where wind energy is employed, job opportunities are provided to many families and

		hence increases the employment percentage providing regional development. The customer will be able to get an overall picture of the output hence will get a clear picture on whether to invest more in that particular region or to rectify by investigation in another region. The customer will also be able to analyze and make changes based on the output to maximize the output making him/her a happy customer
5.	Business Model (Revenue Model)	Opportunities to trade in the power produced are likely to expand significantly.Currently, it is possible for wind power producers to sell electricity to the grid, use it for captive consumption or sell it to third parties. With the emergence of independent power exchanges and with the likely liberalization and streamlining of power distribution across states, the opportunities to trade in power are likely to increase and become more lucrative.With the advent of the RPO/REC mechanism in India, there has been significant demand for non-solar (wind, small hydro, biomass etc.) over the past few months.
6.	Scalability of theSolution	Energy trading in liberalized markets is particularly interesting from the perspective of wind energy producers because of the non-dispatchable nature of wind. This means that wind energy producers need to forecast how much they will produce in the future in order to place their bids. Hence customers can use our SAAS model to accomplish the task