

Problem Statement:

Power Trading Corporation (PTC) had installed 13 wind turbines in Madhya Pradesh. The picture portrayed to them before installing the turbines was that they would be able to produce 1300 MW of energy. However, after installing the capacity, they observed that the energy production was very less compared to the estimated capacity. The reason given to them was that the winds in the concerned year were very less as compared to previous years. Therefore, a project was given to Skymet by PTC to compare wind observations to the standard data sets, which ultimately lead to auditing the power plant.

Approach:

- Wind and wind power data collected from the plant of PTC at 2m, 10m and 50m heights.
- The wind and power data are available at 10 turbines at 10 minutes interval.
- It was analyzed with in situ and model wind observations.
- The observations were compared with the Modern Era Retrospective-analysis for Research and Applications (MERRA-2) data.
- The RMSE and R2 values are almost similar for all the turbines, indicating very less wake effect. The statistic calculated scatter index (SI) is less than 1 for all the turbines indicating a good relation between the two observations.

Benefits:

- The winds at different turbines as well as the temporal variations match with the Skymet's wind data.
- The strength of winds didn't degrade significantly during the audit year as compared to previous years.
- Using the results, Skymet concluded that the wind strength during the year of audit were similar to that of the previous years. Hence, the reason given for less power generation than expected is not the valid reason.

