

# Project Title: Predicting the Energy Output of Wind Turbine Based on Weather Conditions

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## CS AS



1. **Customer Constraints:**
   * Wind turbine revolves around harnessing wind energy to power a daily use product like lights.

**CC**

**5. Available solution:** Available solution takes lot of time in identifying the energy output of wind turbine. utilised aerostructural simulations data for a turbine and applied regression trees to forecast turbine power output, accounting for wind speed, turbulence and shear.

**Explore AS, differentiate**

1. **Customers Segment:**

**Define CS, fit into CL**

* + The onshore

segment dominated the

market and held a revenue share of

71.66% in 2021.

## PR

**Focus on PR, tap into BE, understand RC**

1. **Problems/ Pains:**

The biggest problem

with wind turbines is that they can be loud and unsightly, sometimes

harming the physical environment.

## 7. Behaviour: BE

Wind energy is tied to variabilities of weather patterns, especially wind speed, which are irregular in climates with erratic weather conditions.

**9. Problem Root Cause:**

The mechanisms of leading edge erosion, adhesive joint degradation, trailing edge failure, buckling and blade collapse phenomena are considered.

**RC**

**Focus on PR, tap into BE, understand RC**

## Triggers:

**TR**

The energy output of a wind farm is highly dependent

on the weather conditions present at its site. If the output can be predicted more

accurately, energy suppliers can coordinate the collaborative production.

**8. Channels of behaviour:** Behaviour include the functions of wind turbine weather it works properly with all the mechanisms included.

**SL**

**CH**

**10. Your Solutions:**

Our studies are carried out on publicly available weather and energy data for a wind farm. We report on the correlation of the different variables for the energy output.

**Extract online & offline CH of BE**

**Identify strong TR & EM**

## Emotions:

**EM**

* + Most significant is the hub height wind speed, followed by hub height turbulence intensity and then wind speed shear across the rotor disk.