Analysis of Power Output Received from a

Wind Turbine

Preliminary Investigation

What is the Power output for 1 rev/s?

What is the Power output for 2 rev/s?

What is the Power output for 3 rev/s?

Do you see a correlation between the collected data? What would the hypothetical Power output for 10 rev/s be if this correlation holds true?

Output Analysis

Allow the electric fan to begin turning the turbine. What is the Power output on the fan’s lowest setting? What would the hypothetical angular velocity be in rad/s? What is the tangential velocity of the very tip of the turbine’s rotor in m/s?

Repeat this process with the electric fan on medium, and then high setting. Create a table that details the information requested and compare the results.

Once again, using the medium setting on the electric fan, adjust the placement of the wind turbine. Change the relative distance to the wind source, and also change the direction the air stream is blowing on the turbine. How do the results change? Add this information to your data table.

Conclusion

If we were to scale this experiment up, would there be a direct relationship between the available wind and the Power output of the turbine (if the same amount of wind was available, would the Power output increase as the size of the turbine increases)? What would cause a difference in results? What other factors should we consider?