WIND STUDY | Wind Study is intended for grades 5-8 and 8-11
Questions posted on: Monday   Answers posted on: Friday
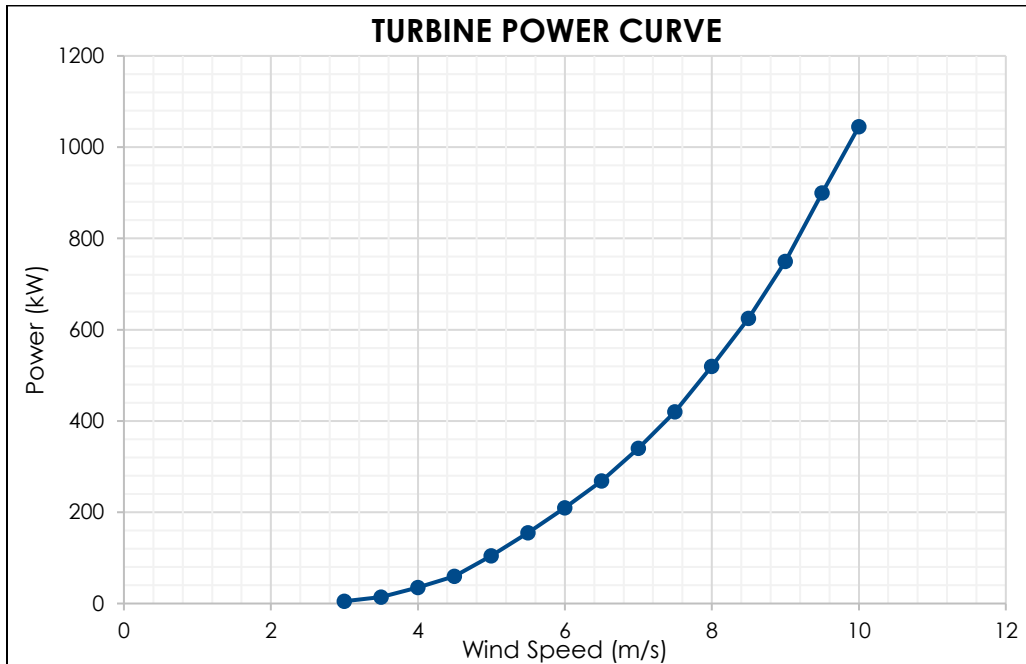Find downloadable one pagers at www.oneenergy.com/one-energy-feed

2021A5   (GRAPHING, FUNCTIONS)

Level 1: The wind speed should be plotted on the x-axis, and the power output on the y-axis. Make a point on the graph for each given wind speed/power pair. Then connect the points to create the power curve. Axis sizing and spacing may vary – see an example below.

Level 2: First, rearrange the given equation to solve for wind speed.

$$V = \sqrt[3]{\frac{P}{C_p * \rho * A}}$$

Then, plug in the given values and solve.

$$V = \sqrt[3]{\frac{850,000}{0.3 * 1.2 * \pi * (\frac{93}{2})^2}}$$

$$V = \sqrt[3]{\frac{850,000}{0.3 * 1.2 * \pi * 2,162.25}}$$

$$V = \sqrt[3]{\frac{850,000}{2,445.45}}$$

$$V = \sqrt[3]{347.58}$$

$$V = 7.03 \, m/s$$

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Because the wind speed is cubed in the power equation, this variable will have the largest impact on the power output.

A 1.5 MW wind turbine.