WIND STUDY

Wind Study is intended for grades 5-8 and 8-11
Questions posted on: Monday Answers posted on: Friday
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2021Q10 (PERCENTAGES)

One of the ways One Energy is able to compare potential projects to each other, and determine the quality of a site's wind resource, is through a metric called *capacity factor*. This metric compares the predicted turbine production to the theoretical maximum production. The theoretical maximum production is the total kWh produced if the turbine operated at full rated power (maximum capacity) for a given time period. The capacity factor is expressed as a percentage of the theoretical maximum production. For example, a site with a 35% capacity factor is producing 35% of the theoretical maximum production.

Level 1: One Energy is considering installing two turbines, each rated for 1.5 MW, at a potential project site. The two turbines are estimated to produce 4,160,000 and 3,990,000 kWh per year. What is the annual capacity factor for each turbine and for the site as a whole?

Level 2: Say that One Energy is considering installing a 1.5 MW turbine at Site A and a 2 MW wind turbine at Site B. The two turbines are estimated to produce the same amount of power in one year. Which site would have the higher capacity factor?

Now assume that the projects at Site A and Site B are estimated to have the same capacity factor. Which site would have a higher kWh production estimate?

An operating Wind for Industry® project.