readers respond

E-mail us at letters@solartoday.org. Letters may be edited for length and clarity and may be published in any medium. **To read more letters, visit solartoday.org/letters**

Low-Cost Wind Isn't Cost-Effective

SOLAR TODAY columnist Mick Sagrillo responds (in italics) to a reader's questions:

Hi Mick,

I wanted to comment on your interesting and helpful article ("Back to the Basics: Ground Drag," Jan./Feb. issue).

I particularly noted the graph from the Danish Wind Energy Association. The interpretation of the graph in the text is incorrect, due to the peculiar orientation of the Danish graph: "Note that ground drag starts 'breaking' in the graph at about 20 meters above the ground, or 66 feet. This is the point where wind speeds begin increasing more quickly as the effect of ground drag diminishes and the laminar flow of air over air increases."

Actually, the wind speed increases very quickly up to 10 or 60 meters above the ground, and then increases only very slowly thereafter. For cheapie-me, this means that if I could get up to 50 or 80 feet, I'd be getting the most for my money.

This is actually the worst place to put a turbine. Here's why: The change in wind speed with increasing height above ground is known as "shear." A large shear indicates a large change in wind speed over a short vertical distance. Now put your rotor in those winds. The bottom of your rotor might see 10 mph, but the top of the rotor might see 1[1] mph — this would not be unusual at these low heights.

Such situations literally tear up wind turbines in very short order — months to a few years. They simply cannot deal with the cyclic changing forces on the rotor. This results in an extremely high failure rate of turbines installed on short towers. Turbines that are not functioning are not generating electricity.

One has to consider how cost-effective additional height beyond some baseline height would be. The number of dollars for installation accelerates, possibly exponentially, as the size and height of the turbine increase.

Not correct, at least for height of a given turbine, and not increasing turbine sizes.

The reason is that when we are discussing taller towers, we are not talking about the cost of the taller tower, but the incremental increase in the cost of the entire installation. A typical 10-kilowatt (kW) wind system might cost $60,000. An 80-foot tower for that 10-kW system might cost $12,000, for example. But a 120-foot tower for that same turbine might cost $13,000. In addition, the additional wiring for the additional 40 feet might be $400. For a variety of engineering reasons the foundations for both towers will likely be the same. Most all of the rest of the equipment and installation will likely be very close.

So, you could easily see an increase of 50 percent or more in power available to the turbine, at a cost increase of maybe $58,000 to $60,000. Not much. Paralleling this is a considerable reduction in wear and tear on the turbine, increasing reliability and life expectancy. This is why I do these pieces, so that folks understand that there is more to a wind turbine than just writing a lower check.

Thank you very much, Mick, for your past help, the interesting article, and for listening.

Dan Fa
Fort Atkinson,Wis
danfary@compufort.co

Connect with *SOLAR TODAY* online:

Fan the American Solar Energy Society on Facebook

Follow ASES_Solar on twitter @ASES_Solar

Connect with the American Solar Energy Society on LinkedIn

Get daily solar updates on our blog, solartoday.org/blog