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Industrial wind is just hot air

By BEN LUCE

This letter is in response to Washington Electric Co-op's Manager Avram Patt, who recently argued that the majority of Vermonter's support large wind power development here, despite its impacts.

As someone with technical expertise in renewable energy and a strong record of advocating for wind energy on the Great Plains, I do believe strongly that wind power can contribute significantly to our clean energy future. But I also believe that industrial wind development on forested ridge lines is horrifically destructive and inappropriate, and is not in fact needed for clean energy production in the US or elsewhere.

First, mountain ridges possess surprisingly little wind resource. For example, Department of Energy estimates indicate that Vermont's entire wind resource is only 1 percent of Iowa's, or closer to home, only 4 percent of the Gulf of Maine's. It's also actually less than 1/2000 of just the on-land wind resource of the contiguous United States. Our resource is miniscule precisely because it's mainly located on narrow, widely separated, ridges, unlike in Midwest states or offshore.

This smallness has a terrible consequence: If we sincerely decide to "do our part" by developing wind here, we must definitely deface most of our ridges. For example, if we develop enough just to cover the equivalent of Vermont's relatively small electricity demand, not to even mention a surplus for export, then a conservative calculation shows that it will take approximately 35 percent of the high ridge lines to accomplish this, and more than 50 percent if electric transportation eventually succeeds.

This would have a catastrophic impact on Vermont's beautiful mountain scenery and its fragile ecology. Unfortunately, in my experience many Vermonters believe the turbines can be blended tightly into the forest, some even suggesting to me that helicopters will surely be used to avoid road construction. I suspect people assume this because they've mainly seen photos that hide the real impacts via the choice of camera angle, or they've visited projects that are not truly representative of wind development on high ridges. In truth, very wide, flat, industrial scale roads must be blasted and bulldozed down the ridges, often with additional feeder roads. The turbine sites themselves need to be cleared to several hundred feet wide, for assembly purposes. All of this must be maintained for regular maintenance, and put off limits to the public. Wind projects must also have flashing lights, which will severely impact the scenery even at night. And unlike the Midwest, the turbines here must be sited at hundreds or thousands of feet above where people live.

Fortunately, we have better alternatives to wind power. For example, a different calculation shows that Vermont could generate the same amount of electricity with a photovoltaic collection area equivalent to less than 1 percent of our current farmland. This footprint is so

small that much of this could be sited on rooftops, and whatever is not on rooftops would also have a very small footprint compared to wind, as it would be close to the ground and on already cleared land. And if done properly, most of the land around and under the arrays can remain in agricultural use. This will not "industrialize" Vermont, as some have claimed. Wind development definitely will.

PV used to be too costly. But PV power is now within a factor of two of retail electricity costs, and the price continues to drop as economies of scale are achieved. Projections suggest that PV will be directly competitive with retail power by about 2015, and incentives and net-metering already largely make up the difference. So we can begin deploying PV seriously now, and the ultimate transition cost should be quite reasonable. Recent scientific advances also suggest that PV will ultimately achieve much higher efficiencies, lower cost, less embodied energy, and less toxicity in manufacturing.

There are other solid reasons not to develop wind here: Committing our rural electric grid to large amounts of wind power now may significantly hamper a massive built-out of solar in the near future due to limits on integrating intermittent sources. It will also ensure long-term dependence on the power plants and fossil fuels needed to "firm" wind.

Industrial wind is not only the wrong choice for Vermont, but will surely be looked back on either as a terrible mistake or something we were lucky to avoid. As Vermonters once opposed plans for a green mountain highway down the ridges, we should now oppose big wind development vigorously. Once the mountaintops are defaced there will be no turning back.

Ben Luce is professor of physics and chairman of the sustainability studies program at Lyndon State College, and the former director of the New Mexico Coalition for Clean Affordable Energy.
