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Subject: : Conservation

Topic: : WIND

Re: WIND

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URL:

Of the immediate issues of a windmill, they are much the same as gas. Wind is land intensive, moreso than any other source of power other than solar. So land use issues are going to be magnified beyond that at which gas has been. You have to have a "pad", which means clearing of land, the same sort of muddy mess as you see with gas wells. You have to have access, where huge trucks can bring in huge equipment to remote locations. The trucks of course also take a toll on the roadways. While the truck traffic for a given windmill is less than for a Marcellus gas well, and the pad is likely smaller, you have to keep in mind that it will take an awful lot of windmills to get equivalent energy of one gas well. Comparisons like that only work on a per GWhr basis, and wind is much, much more land intensive. But, also like gas wells, once the thing is up and running, much of the "pad" can be left to regrow, leaving only a small base and some sort of access road. Also, in that stage, heavy equipment traffic will decrease, though not totally disappear.

Of course, while wind is more land intensive, the factors behind choosing the locations are very different. PA will continue to get some windmills, but they don't necessarily have to be in our wilderness areas. And PA isn't exactly ground zero for the wind industry, Oklahoma and the panhandle of Texas get that honor, and the whole of the great plains ranks above us. The most efficient winds are not in our backyards, they're in someone else's!

As far as pollution, windmills can and have spilled hydraulic fluid and oils, and contaminated waterways, and so has the equipment used to get it there. Like a gas well, it takes a screw up or a failure of some sort for this to occur. But windmills use a far lower volume of toxic chemicals, so I think its safe to say they would be far safer in this respect. Spills and failures are far less catastrophic, its hard to say if they're far less common (less common per windmill than per gaswell, but you'd need a lot more windmills than gas wells to produce the same energy).

So as far as immediate impact. Land use = much worse. Chemical pollution concerns = much better.

If CO2 is your thing, windmills are very good, although not as good as believed. They essentially take a whole lot more manufactured material per GWhr than fossil fuels, so there's a much higher penalty on the supply end. Any estimates are still very rough, as wind hasn't been around long enough to get a feel for the final reality. But the estimates I've seen, in CO2 per GWhr, say it produces roughly twice as much CO2 as nuclear, half as much as gas, and a third of that of coal.

One other issue with them is the need for rare earth magnets. Several tons are needed per windmill, and a lot of windmills are needed to make a dent in the power gen. As the name implies, rare earth elements are rare. They are, of course, mined, usually open pit mines. There is a worldwide shortage of it, and this somewhat limits the rate windmills can be built (which is one reason why it struggles to keep up with demand increases). Right now, China supplies about 95% of the rare earth minerals needed, but they are threatening to cut back their supply, which could prove disastrous for the wind industry (not necessarily for reasons of economics, more

supply availability). If the U.S. is to get serious about wind energy, and get it close to the ambitious goals set, we need to locate rare earth deposits in the ground here, and vastly expand our mining operations. That, of course, brings with it a whole host of environmental issues.

In a cruel twist of fate, it so happens that electric motors and batteries for electric and hybrid cars use the very same rare-earth materials. That's a main reason why hybrid batteries cost so much. Expanding wind power puts wind energy and hybrid and electric car industries in direct economic and material availability competition.

More likely, we won't, we'll just continue buying from China at the rate they can supply it at. This will mean that while wind will still expand rapidly, it won't be able to keep up with increased energy demand of the U.S., we won't meet our goals. And we'll still have to continue to add more coal, gas, and nuclear plants. I suppose my opinion is to be real careful about the new mining. In as much as we can get rare earth's, do it. Even if it can't wean us off gas and coal, every windmill means we have to add less coal and gas, and that's ultimately a good thing.