WHERE TO PUT WIND TURBINES?

Geoffrey McD. Lewis

Wind power offers a clean, infinitely renewable source of energy that could play a valuable part in meeting the world's energy needs. But where should we put turbines for maximum value?

Traditionally, developers have looked at topography, wind patterns, land values, and the attitudes of local residents. Now, WISE researcher Geoffrey Lewis is proposing an additional factor: locational marginal price.

Locational marginal price (LMP) is the constantly updated wholesale price of electricity at a specific location. The harder it is for a system to meet local electricity demand, the higher the LMP. So adding turbines in areas where LMP is high takes stress off the system and lowers electricity costs.

Lewis mapped LMP data in Michigan over a two-year period, looking at how it varied across the state and over time. While he found that LMP was low at most sites, several locations had strikingly high values.

By combining this information with wind speed data, Lewis pinpointed the sites where installing wind turbines could generate the most electricity and create the greatest benefits for the electricity system.

As more and more electricity system operators incorporate renewable energy into their mix, this research can help them get the biggest bang for their buck.

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