



Tompkins Co. energy options offer gas, wind, solar choices

Written by

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As we are all increasingly aware, our future energy supply involves difficult choices and significant consequences.

Last fall, a group of Cornell University engineering students considered the possibilities for Tompkins County. As the professor who led the class and a local resident who provided community input to the class, we summarize the findings of the students and our own subsequent thoughts.

Our local electricity comes from the AES Cayuga power plant, which currently generates 300 megawatts by burning coal, including coal from mountaintop removal. Coal has a considerable negative environmental impact. We estimate that 10 deaths each year can be statistically attributed directly to negative air-quality effects from burning coal at AES Cayuga.

As an alternative, a path to a cleaner and more sustainable electrical energy could consist of three basic components:

» Over the next 25 years, install 700 wind turbines, which would equal AES Cayuga's average output, on a 50-square-mile hilltop area between Seneca and Cayuga lakes.

» To balance the daily variations in wind and consumer demand, build a half-square-mile, 20-foot-deep water storage reservoir 700 feet above Cayuga Lake in Lansing that could store 4000 megawatt hours of energy, enough for 12 hours of AES Cayuga output.

» Convert AES Cayuga from coal to natural gas. This conversion would cover our present energy needs but the output would be gradually reduced to 10 percent of its initial capacity as wind turbines were deployed. A 25-square-mile area overlying the Marcellus Shale could supply the gas needed for 125 years.

Additional thoughts

Solar photovoltaics was studied but is not

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considered as a significant source for two reasons: Complete solar would require 8 square miles of land, almost 1.5 times the area of the City of Ithaca; also, the cost to an average electric user would be \$7,500 per year, five times the current \$1,500 per year.

Interestingly, the AES Cayuga site was originally considered for a nuclear plant until opposition led to the expansion of the current coal-fueled plant. New developments in nuclear energy could provide a clean energy alternative to both wind and natural gas.

Ithaca also has a small but significant untapped hydraulic resource. Cornell currently utilizes roughly half the Fall Creek water flow to produce 1 megawatt of electrical power. The City of Ithaca could produce an additional 1 megawatt by utilizing flow above Ithaca Falls. This would be more than 100 times the annual energy output of the solar panels on the Tompkins County Public Library, currently the largest solar PV installation in the state.

Visual depictions of the land areas required for the energy options discussed, student presentations and details of our calculations can be viewed at <http://sites.google.com/site/fingerlakesenergychoices>.

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