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# New Energy Struggles on Its Way to Markets

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WASHINGTON — To stave off climate change, sources of electricity that do not emit carbon will have to replace the ones that do. But at the moment, two of those largest sources, nuclear and wind power, are trying to kill each other off.

In the electricity market, both are squeezed by pressure from natural gas, which provides some carbon reductions compared with coal but will not bring the country anywhere near its goal for reducing greenhouse gas emissions. Natural gas has a carbon footprint that is at least three times as large as that goal.

Energy companies announced this year that five nuclear reactors would be closing or not reopening, and the owners blamed competition from natural gas and wind. In the Pacific Northwest, wind and hydroelectricity — neither of which produce carbon — are sparring to push each other off the regional power grid.

Output from the two has sometimes forced the Columbia Generating Station in Washington State, the region's only surviving nuclear reactor, to cut back its production. One recent study found that shutting down the reactor would save consumers \$1.7 billion, partly because it cannot run full time, and partly because its costs are higher than some other technologies.

If electricity prices were slightly higher, renewable sources of energy would flourish and even some reactors would be built, experts say, lowering carbon emissions. But electricity prices are being forced down by federal subsidies for wind energy production and by cheap natural gas.

“Gas is raining on everyone’s parade; gas is ruining it for everybody in most electricity markets,” said one expert, Michael Webber of the University of Texas at Austin. In 2012, production of electricity from natural gas rose 10 times as fast as production from wind.

Wind energy is being added to the grid mostly because of state requirements, called renewable portfolio standards, but production would grow faster than the standards required if electricity prices from other sources were slightly higher, experts say. At the Electric Power Research Institute, a nonprofit utility consortium, Anda Ray, the group's vice president for environment, said the electric system would incorporate more zero-carbon sources if natural gas rose to the level of few years ago.

Adding to the clean energy industry's cannibal behavior, wind farms are being built in places where there is lots of wind but not much demand for power, some experts argue.

Experts say a more intelligent use would involve dispersing the wind farms. Travis Kavulla, a member of the Montana Public Service Commission, said putting the wind machines in one place created an "all-on, all-off" problem. If the wind machines were spread more widely, he said, there was a far better chance that at any moment some would be running and some would not be, with less chance of a local useless surplus.

Montana has a cluster of wind machines near the town of Judith Gap, and Mr. Kavulla's commission has set up connection fees that charge extra for building in Judith Gap and reward developers for building elsewhere.

The nuclear industry makes the same complaint, but louder. David C. Brown, a Washington representative for Exelon, the Chicago company that operates the nation's largest network of nuclear reactors, said that the main subsidy for wind, the production tax credit, which pays operators about 2.3 cents per kilowatt-hour for the first 10 years of production, "has been very effective at getting generation built."

"It's getting built without regard to whether it's actually needed for power supply purposes, and it distorts the market," he said. Existing nuclear plants do not get a subsidy per kilowatt-hour produced.

Wholesale energy prices fluctuate throughout the day. Exelon, he said, is "seeing this tipping point developing" when several of its zero-carbon reactors may have to be retired because wind power is suppressing those prices around the clock, and at some hours producers must pay the grid operator if they put energy on the grid. Wind operators still make money, though, through the production tax credit.

It is not clear how this struggle will play out over the next few years. At the moment, according to Mr. Webber, natural gas is so cheap that it is stunting construction of even new plants that would burn natural gas.