Climate Change Updates

By Hugh Rogers

The end-of-year National Energy Conference at WVU Law School, "Climate Change Issues Update," offered too much to cover in one *Voice.* Last month, we reviewed issues, communication and education, that are especially important in the state with the largest percentage of climate change deniers. (See climatecommunication.yale.edu. Thanks to Than Hitt for the cite.) Here, we'll address updates.

Methane was considered from three angles: present danger, achievable limits, and the legal landscape.

Kenneth Davis, Professor of Atmospheric and Climate Science at Penn State, began with the basics: energy produced by burning natural gas produces about half as much carbon dioxide as the same energy produced by burning coal. At the same time, it produces methane, a powerful greenhouse gas. In the last 200 years, atmospheric methane concentration has more than doubled.

Why are Penn State researchers studying West Virginia methane? Because it floats their way, overwhelming the data from local sources. We looked at graphics of this baleful cloud.

There is a **striking difference in methane emissions** between "conventional" and "unconventional" gas wells: The older, low-production, vertical wells put out 20 times as much methane as the deep wells with horizontal drilling. (Davis doesn't use the term "fracked" because many older wells were and are being fracked. However, "unconventional" seems misleading now that the big new ones have become standard.)

Derek Johnson, of the Center for Alternative Fuels, Engines, and Emissions in the College of Engineering and Mineral Resources at WVU, described mechanical fixes for the problem. Equipment is important! Age of equipment is important! Design of equipment—and so on. A lot of methane leakage is due to simple irresponsibility.

Is there a legislative fix? WVU Law Professor Josh Fershee said we have always been better at making rules than enforcing them, or paying for them. The problem is particularly acute when dealing with "legacy" and abandoned wells.

Some statistics: In West Virginia, we have 144,000 permitted wells. New wells (Davis's "unconventional" wells) are only 5% of the total. The Department of Environmental Protection has identified more than 12,000 abandoned wells—probably less than a quarter of the actual total. These wells leak, and occasionally explode. Pennsylvania has estimated that they are responsible for 5-8% of greenhouse gas emissions. It costs roughly $50,000 to plug a well. Currently, our state's fund for this purpose is $385,000.

Both states depend on permit fees from the few new wells to plug the many old ones. Ohio directs up to 30% of severance taxes to plug abandoned wells. That raises more money, but nowhere near enough.

Besides the dirty active wells that might be fixed and the leaky orphan wells that must be plugged are a set of old wells that limp along, putting out methane and a trickle of gas, postponing the day when the drilling companies must pay (or forfeit their bond) to have them plugged. This is the so-called "free gas" problem. As long as the well supplies gas to the landowner, the lease is kept open. The driller waits to see if the price of gas will go up, or if the well can be sold to another company, or if it can avoid its responsibility via bankruptcy.

By the way, Professor Fershee mentioned this startling statistic: the highest-pressure wells in the world are in Doddridge County.

Andrew Williams, who directs regulatory and legislative affairs on climate and energy for the Environmental Defense Fund (EDF), gave us **the view from the capital**. Methane, he said, is causing 25% of global warming. A large proportion of the emissions are due to "abnormal operating conditions," which could be reduced by better reporting requirements and aggressive enforcement. As we know, the Trump EPA is more interested in rolling back, not increasing, its work. In 2016, before the election, EPA announced New Source Performance Standards that would have lowered methane emissions by 40-45% over five years. Those standards have been shelved. EPA's current proposal would reduce methane by 3% over the same period. It should be emphasized that the standards address *new* sources, doing nothing about existing wells.

EDF is encouraging "cooperative federalism," i.e., states will have to take up the slack. But the states have a long way to go, beginning with boosting their low bonding requirements.

Williams pointed out a trend of companies buying old wells either to use for injection of produced (byproduct) fluids, or to prevent communication with new wells, or to refrack them.

On legislation at the federal level, Williams acknowledged that **while a fee on carbon production has many supporters**, EDF is going in a different direction, working on a "hard" carbon limit.

The Citizens Climate Lobby continues to press for a fee. Their proposal, introduced as HR 7173, the Energy Investment and Carbon Dividend Act, sets a rate of $15 per ton of carbon dioxide. Jim Probst, the CCL's West Virginia state coordinator, explained that it's revenue-neutral: 100% of fees would be "refunded" to U.S. households. In theory, this would offset higher costs of consumer goods.

Probst remarked that "the poor are more carbon virtuous." The wealthiest 1% generate six times more carbon dioxide than the bottom 10%. Wouldn't fairness require some adjustment of the "carbon dividend"?

At last, we came to a feel-good topic, **solar power in coal country**. However, as presented by the ever-realistic Evan Hansen, president of Downstream Strategies, the transition felt less abrupt, seeing how far West Virginia trails our neighbors. Compare solar-generated megawatts: North Carolina, 4,431; Virginia, 631; Pennsylvania, 373; Ohio, 176; West Virginia, under 7.

95% of our electricity continues to be generated by coal. Our statutory and regulatory environment is hostile to any change in that situation. In fact, much like the current federal government, we're going backward. In 2014, the Republicans, who had gained control of the Legislature, repealed the Renewable Portfolio Standard.

West Virginia is a disproportionate contributor to climate change. For example, one coal car, carrying 100 tons, will generate 275 tons of carbon dioxide.

At the same time, West Virginia is demonstrably harmed by climate change—especially, in recent years, by catastrophic flooding.

There are plenty of opportunities for solar energy production on abandoned mine lands and other degraded lands where mining ended post-1977, the year the Surface Mining Control and Reclamation Act passed. Downstream Strategies found 158 square miles potentially viable—in terms of slope, proximity to the electric grid, etc.—for large-scale solar development. It makes sense to use these sites rather than logging and leveling more forest.

To get there, though, will require cooperation among many interests, especially mining companies, that should welcome this form of reclamation, and utilities, that could attract more forward-looking corporations bound by their own renewable-energy standards. More and more

corporations, including the five largest companies in the world, require 100% of their power sourced from renewables. These are the employers we want.

Finally, on **solar power at a household and community scale**, we heard from Autumn Long, program director for WV Solar United Neighbors. SUN now operates in nine states, with three more coming on soon. They assist individuals and community groups to go solar and they lobby for legislation to encourage renewable energy. Long said they hope to see West Virginia join more than half the other states in enabling third-party power purchase agreements (PPAs).

PPAs are contracts between a developer, who installs, owns, and operates a solar array on a customer's property, and the customer, who agrees to purchase electricity produced by the array. The arrangement enables solar installation with no upfront cost to the customer. The customer pays a fixed rate to the developer that is generally lower than the local utility would charge. PPAs also enable tax-exempt organizations to take advantage of the federal solar tax credit. The developer takes the credit and passes the savings along to the organization.

SUN has fostered a dozen solar co-ops in the state. We now have a half-dozen installers. Nationally, it's the fastest-growing occupation, up to 250,000 jobs last year (coal mining employed 53,000). In the past ten years, the cost of solar panels and related equipment has dropped 80%. But hurry! 2019 is the last year for the 30% federal tax credit.