

FREE

# The Appalachian VOICE

Dec. 2017 / Jan. 2018



## Current Choices

A continued look at the promises and perils of today's energy options

- Pumped storage | Wind
- Gasification | Coal

## The Call of the Red Crossbill



**ALSO INSIDE:**  
Section Hiking the Art Loeb Trail  
Southern Appalachian Mtn Stewards

The consequences of America's energy choices have been controversial for decades, and that debate is heightened in the face of climate change. Though coal and natural gas and their related problems often take center stage, they are far from the only energy sources at play in Appalachia.

On the following pages, we take a look at some of the region's more unconventional power sources, including wind, chicken litter, sewage and a type of hydropower known as pumped storage. Depending on how and where they are deployed,

such energy sources can bring clean, green electricity to the grid — or cause their own environmental or public health concerns. That line is not always clear.

But the consequences of some energy choices are well established, even if policymakers prefer to ignore the causes of climate change and prop up coal (see page 16), or debate whether to permit two new fracked-gas pipelines (see page 20).

And if you missed our October/November 2017 issue, which featured solar energy in the region, catch up online at [apvoices.org/thevoice](http://apvoices.org/thevoice).

## Pumped Up: A new hydro-storage energy facility in Southwest Virginia could potentially reuse an old coal mine — or raze a hillside

By Kevin Ridder

At first glance, pumping millions of gallons of water uphill to later release for energy may seem like a senseless use of energy. But pumped storage can actually bring much-needed stability to the grid or balance out wind and solar's inconsistent energy generation.

A community's energy usage typically ramps up in the morning, peaks in the early evening and falls as people go to sleep. When more power is being produced than used, a pumped storage plant could use that extra energy to pump water uphill — and then reverse the process to generate energy during a time of peak energy usage, serving as a massive battery.

Appalachia is already home to the Dominion Energy's Bath County Pumped Storage Station in Virginia, the world's largest pumped storage plant at 3,003 megawatts. Now, Dominion is exploring the possibility of another, smaller plant in the coal-bearing region of Southwest Virginia.

This comes after two bills backed by Dominion and Appalachian Power promoting pumped storage projects became law on July 1. The legislation speeds up the approval process for a pumped storage project — as long as it is "in the coal-

field region" — and allows the utility to petition the Virginia State Corporation Commission for a consumer rate hike to pay for it. It also declares the construction of pumped storage facilities "to be in the public interest."

"It ends up creating an essentially zero-risk proposition for Dominion," says Matt Wasson, director of programs for Appalachian Voices, the publisher of this newspaper. "Their ratepayers are basically taking all the risk."

According to a September Dominion press release, the company is looking at two possible sites for the potential \$2 billion proposed project: a 4,100-acre Dominion-owned site in Tazewell County and the abandoned Bullitt Mine site in Wise County, which Dominion would need to purchase. Other sites have not been ruled out.

"Dominion Energy filed a preliminary permit with the Federal Energy Regulatory Commission (FERC) for the Tazewell location on [Sept. 6]," the release states. "The company has contracted with Virginia Tech to conduct the study of the former Bullitt Mine near Appalachia, Va."

In an October Coalfield Progress article, Stuart Burrill wrote "[Dominion] officials said they expect the Bullitt site,



The relatively small exterior of the Bath County, Va., pumped storage facility belies its status as the largest of its kind in the world. Photo courtesy of Dominion Energy

if used, would generate about 100-150 megawatts." The preliminary Tazewell permit proposes a 446-megawatt capacity.

According to Dan Genest with Dominion, the smaller energy potential at the Bullitt site stems from the need for smaller equipment and a shorter elevation drop.

A study performed by Chmura Economics and Analytics and commissioned by Dominion states that a \$2 billion project over 10 years would "support a total of 86 jobs annually in the state," with 76 of those in Southwest Virginia. The facility would be "expected to employ about 50 permanent workers."

"We hope to have a decision on the preferred site, and whether to move forward, by the end of the first quarter of 2018," David Botkins of Dominion Energy wrote in an email. "It would take 10 years before the facility could be in commercial operation."

### Responsible Land Usage

According to LeRoy Coleman with the National Hydropower Association, a nonprofit that promotes hydropower, several pumped storage projects are built on mines — but a project on the Bullitt site would be the first in the nation on a coal mine.

Gabby Gillespie, Southwest Virginia organizing representative for the Sierra

Club, is unsure about the possibility of a pumped storage project in her home of Wise County. She says she hopes "that this project would require some form of environmental impact study or assessment" in addition to the feasibility study being conducted by Virginia Tech.

"Anytime that we're using underground mines, especially when pumping water into them, I do think we need to consider the impacts on our water and the impacts of continuous disturbance of formerly mined lands," Gillespie says. "That's a practice I haven't seen a lot of research about."

Virginia U.S. Rep. Morgan Griffith introduced a bill in June that would loosen the regulatory process for closed-loop hydro projects, like the potential venture on Bullitt Mine, that don't connect with an existing, naturally flowing water source.

"H.R. 2880 removes environmental impact statements for closed-loop pumped storage hydropower projects that are determined not to affect animals and plants," Rep. Griffith said in an email statement.

The Tazewell County site would need to have environmental impacts taken into consideration, according to the preliminary permit application. It would connect with West Fork Cove Creek.

*continued on next page*

## Turning Trash into Fuel

By Kevin Ridder

Before construction was finished on the gasification plant in Lebanon, Tenn., in October 2016, over 16 million pounds of wood waste, tires and treated sewage went to the landfill annually. Now, the gasification plant turns that waste into power to meet a third of the energy needs for the city's wastewater treatment plant, the single largest consumer of electricity in Lebanon.

Gasification — the process of converting carbon-based fuels like wood, coal or chicken manure into gas without combustion — is typically achieved by heating the fuel, or feedstock, to a high temperature in an oxygen-starved environment. Additionally, it produces a charcoal-like byproduct, biochar, that can serve as a valuable agricultural soil additive.

While the vast majority of gasification plants use coal or other fossil fuels as part of their feedstock, the number of plants that use biomass or landfill waste is "expected to grow," according to the Gasification and Syngas Technologies Council.

According to Scott McRae, project manager of the Lebanon, Tenn., gasification initiative, the feedstocks "molecu-

larly fall apart" when they reach over 1,500 degrees.

"Literally, they're just falling apart," he says. "And what they're falling apart into is gas. So we siphon that gas off into a thermal oxidizer 20 feet away, basically a giant combustion vessel."

According to Aries Clean Energy, the company that built the \$3.5 million facility, the Lebanon plant is the world's largest downdraft gasifier. By directing airflow down instead of up, downdraft gasifiers greatly reduce tar as a byproduct compared to updraft gasifiers. According to Jeff Snyder, vice president of business development for Aries Clean Energy, the plant produces no tar or slag. The facility has won five industry awards.

"The actual gasification process produces zero emissions," McRae says, but burning the gas produced, commonly called syngas, creates "very low emissions" that are "very, very similar to natural gas."

According to the air pollution permit issued by the Tennessee Department of Environment and Conservation for the Lebanon gasification plant, the facility uses a cyclone filter to limit particulate matter emissions from both wood drying before gasification and from burning the syngas. Some pollutants



Located in front of the largest circular tank, a gasification plant and solar panels provide two-thirds of the Lebanon, Tenn., wastewater treatment plant's power. Photo courtesy of Aries Clean Energy

like particulate matter, sulfur dioxide, carbon monoxide and other gases, are still emitted, however.

Lou Zeller, executive director of environmental nonprofit Blue Ridge Environmental Defense League, expressed concern over toxins from the tires or treated sewage that might "hitch a ride" on potential particulate emissions.

"[Particulates are] very toxic as they have other compounds attached to them," Zeller says.

But Hugh McLaughlin, chief technology officer of NextChar, a manufacturer and supplier of biochar, says that the "high temperatures guarantee the destruction of virtually everything," and that gasification is a way "to get

away from the practice of landfilling, which we've relied on for a long time."

"It's a matter of getting a balance between the benefit of getting rid of this wastestream and some natural energy recovery to the rather modest increment of existing pollution in the atmosphere," McLaughlin says.

### Beneficial Byproduct

According to Snyder with Aries Clean Energy, the only other byproduct of the Lebanon plant's gasification process is biochar, a charcoal-like material that is primarily used as an agricultural fertilizer, but could be used as a coal substitute in power plants.

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## Pumped Up

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Peter Anderson, Virginia program manager at Appalachian Voices, has concerns about a potential project on undeveloped land when there are plenty of properties with past industrial infrastructure or mined lands that could be reclaimed.

"What you'd be doing is razing lands to build an upper reservoir and a lower reservoir, probably a lot of tree and vegetative removal," Anderson says. "You have to do this on a hillside, you need a change in elevation. You're probably cutting down a lot of trees, creating a lot of sediment runoff and erosion problems."

### Would It Be Renewable?

Jeff Leahy of the National Hydropower Association says he sees the need

for pumped storage projects increasing "because of the greater amount of penetration of solar and wind resources."

"I would say that by putting more pumped storage on the grid, ultimately what you're doing is enabling your grid system to be more robust in order to bring more renewables and to green up the grid," Leahy says.

One of the recent Virginia laws promoting pumped storage requires that these potential projects "utilize on-site or off-site renewable energy resources as all or a portion of their power source" and that those renewable resources be "located in the coalfield region of the Commonwealth."

Anderson says, "it's an exciting possibility if you were to power one of these things with 100 percent renewable energy," but that the law is not specific enough.

"What does 'a portion of' mean?"

he asks. "Does that mean one percent? Twenty percent? That could mean anything."

In the Virginia code, the burning of biomass counts as renewable energy — meaning it could be used to fulfill this requirement instead of solar or wind.

"Bottom line is: will they use this as an opportunity to build storage for

energy that is truly renewable and do it in a way that builds community wealth?" Anderson says. "Or, since they know the ratepayers are going to pay for it, will the utilities just use this new authority to build large infrastructure that doesn't advance conservation in any way and simply stores coal and biomass power?" ♦



Pumped storage can be thought of as a giant rechargeable battery — pumping water uphill when there's extra energy being produced, and letting it flow downhill to generate energy when needed. Image courtesy of Dominion Energy



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# Southern Appalachian Mountain Stewards

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but there's a lot of love there."

The region is also changing, as the coal industry declines and some foundations shift their funding priorities. Although SAMS was established to combat mountaintop removal, the organization is now addressing other issues.

"Social justice in general is something that we are looking at, with the

environment being the number one priority," says Terran Young, a SAMS board member who is also serving as a Highlander Transition Fellow with SAMS, the community and scholar organization Livihoods Knowledge Exchange Network, and Appalachian Voices.

"We're committed to what's right and to having people treated equally," Young continues. "That's something we're willing to take on whether or not everybody agrees on it."

In 2016, SAMS and partners re-

opened a 1979 study that explored Central Appalachian land ownership and taxation of companies that own mineral rights. With approximately 45 percent of the land in Wise County owned by corporate landholding entities, this study has local significance.

Speaking about how SAMS is keeping their momentum, Young says, "I think the land study will be a big part of it, especially as far as recognition for SAMS, because we are a very small, pure grassroots organization. It was

created by the people, and run by the people of this area." ♦

*Azariah Conerly, Ricki Draper and Christian Huerta contributed to this report. The authors are Appalachian State University students and members of the university's Scholar Activist Alliance, a group that links academic institutions and frontline community organizations. They began interviewing current and former SAMS members in 2016 to document the organization's history.*

# Trash to Fuel

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The University of Tennessee is currently studying the effects of Lebanon's biochar on soil and crop yields.

Biochar has been used as an agricultural amendment for at least 8,000 years, according to Albert Bates, a lawyer who has written several books on the benefits of biochar. According to Bates, adding biochar to compost makes both materials a stronger soil amendment.

"It's not a physical process, it's not a chemical process — it's a biological process," Bates says. "What you're really adding to the soil are microbes, nematodes, earthworms, fungi and bacteria. And the way you get all that is from the compost pile."

According to Bates, the high temperature used in the Lebanon plant to break down the toxins in the tires and treated sewage leads to the resulting biochar not being porous enough to provide much benefit to the soil, though it can be used as a replacement for sand in concrete and asphalt.

"It actually helps the concrete self-

heal when it cracks," Bates says. "It has a lot of good applications besides agriculture, all of which have the effect of storing carbon out of the atmosphere."

# Promising Poultry Poop

With roughly 800,000 chickens at his Wardensville, W.Va., poultry farm, Joshua Frye has a lot of poop to deal with — about 660 tons a year. So when Frye was looking to offset propane heating costs for his chicken houses at Frye Poultry, he decided to put the stuff to use. In 2007, he built a \$1.2 million gasification unit right next door, \$550,000 of which was funded by a U.S. Department of Agriculture Conservation Innovation Grant.

According to a USDA report, the project saves Frye between \$20,000 and \$60,000 a year in propane costs. Additionally, since the propane fuel Frye previously used emits 0.8 gallons of water for every gallon of fuel burned, water was mixing with the nitrogen in the manure and causing ammonia emissions when the chicken houses were aired out. Heating with the gasifier is much less humid, leading to healthier chickens and



Joshua Frye stands in front of one of his chicken houses at Frye Poultry. Photo courtesy of Joshua Frye

reduced ammonia emissions.

The report also stated that the only emissions of concern, nitrogen oxides and particulate matter, were easily controlled and "below the need to permit."

While poultry manure is already a nutrient-rich fertilizer, it can also provide soil benefits as biochar since minerals remain after gasification. And with the biochar, Frye says, "the nutrients are locked into the carbon, so they're water insoluble." The nutrients in chicken litter, however, easily wash away and cause water pollution.

Frye still sells chicken litter as fertilizer for \$10 per ton, but can earn between \$500 to \$1,000 per ton for the biochar even though it's 30 percent the mass of the manure.

Joe Kapp, entrepreneur in residence at Eastern West Virginia Community and Technical College, aims to help Frye expand the biochar industry in Appalachia. He says the main challenge is that "there hasn't been a lot of testing for the various functions that it can serve."

According to Frye and Kapp, tests performed by USDA research chemist Isabel Lima have shown promise. Lima's research shows the biochar "shines better" in poor or eroded soils. It also can help soils retain water and

nutrients for longer periods of time.

When Frye's biochar samples were first tested, they came back positive for arsenic. Arsenic was being added to chicken feed in the United States to fight disease — meaning there was possibly arsenic in the chicken meat, the biochar and the gasifier's emissions for a time.

According to Frye, his chicken feed supplier removed arsenic in 2009.

Lima says in the later samples she received, there was "no detection of arsenic whatsoever," and "heavy metals of potential concern were either not found or present in negligible amounts." On the contrary, she found that since the biochar was porous and negatively charged, it could attract heavy metals like a sponge — and thus could treat water polluted by mining runoff.

Blue Ridge Environmental Defense League's Zeller, however, remains skeptical of gasification — even with biochar as part of the equation. "That doesn't get around the fact that you've emitted all this air pollution and other toxic air pollutants into the atmosphere," he says.

Kapp and Frye see potential for gasification and biochar in the region. "People will begin to discover that there's significant resources and opportunities in ... not just chicken biochar but all waste products," Kapp says.

"It's an exciting area for Appalachia, especially as we see opportunities in some of the more historic industries declining," he says. "This represents a new growth opportunity that has the potential to be significant for all of Appalachia." ♦

# Appalachia's Political Landscape

## Coal Insider Nominated to Lead Mining Agency

By Molly Moore

In late October, the White House nominated J. Steven Gardner, an engineer and coal industry consultant, to serve as director of the Office of Surface Mining Reclamation and Enforcement.

A bureau within the U.S. Department of Interior, OSMRE is charged with protecting people and the environment from the adverse effects of surface coal mining. In particular, the federal agency oversees state mining agencies and administers cleanup of mines abandoned prior to 1977.

Gardner has worked in the coal industry for more than 40 years and currently serves as president and CEO of ECSI, LLC, an engineering firm based in Lexington, Ky.

Gardner has been an outspoken critic of what he called the Obama administration's "war on coal." He was particularly opposed to the OSMRE's Stream Protection Rule, which was finalized in 2016 and struck down by the Trump administration in early 2017. Gardner's firm was among the subcontractors that produced draft research for the agency on the possible economic impacts of the rule. His firm's findings were the subject of a public dispute with OSMRE staff, and



the agency did not renew his contract.

Gardner's nomination comes as the coal industry is struggling, particularly in Appalachia. Across the region, a range of stakeholders including local governments, entrepreneurs and advocacy organizations see reclamation of former mines as a way to strengthen the economy.

"For better or worse, the OSMRE will play a critical role in shaping Central Appalachia's economic future," read a statement from Erin Savage, Central Appalachian program manager for Appalachian Voices, the publisher of this newspaper. "Mine reclamation, reauthorization of the Abandoned Mine Land Fund, bonding reform and the strict enforcement of environmental laws are crucial tasks in the coming years."

In a Department of Interior press statement, Kentucky Senators Mitch McConnell and Rand Paul, National Mining

Association CEO Hal Quinn and Interior Secretary Ryan Zinke applauded Gardner's nomination.

"Steve is highly regarded in the mining industry for his extensive experience and insight," Zinke said in a press statement. "Steve will help [the Interior Dept.] take the proper steps forward to ensure American Energy dominance is achieved, while also being a responsible steward of American lands."

In August, the Department of Interior halted a National Academy of Sciences review of studies connecting mountaintop removal coal mining to negative impacts on human health.

Gardner's nomination was roundly criticized by environmental groups, including Appalachian Voices.

"How can someone with his focus on defending the industry at all costs be the right choice for the federal agency in charge of overseeing that industry?" asked Davie Ransdell, a member of the progressive grassroots organization Kentuckians For The Commonwealth and a former supervisor at the Kentucky Division of Mine Permits.

"He is not the director Appalachian communities need to protect and advance their future," Savage stated.

## Calls for Action on RECLAIM Act

By Molly Moore

In October, Jim Ward, the judge executive of Letcher County, Ky., spoke at a press conference in Washington, D.C., joining legislators from both sides of the aisle to call for passage of the RECLAIM Act.

The bill, which passed the House Natural Resources Committee in June, would accelerate the disbursement of \$1 billion currently in the Abandoned Mine Land fund over a five-year period.

Committee members also approved an amendment to require projects that receive funding under the bill to spur local economic development.

"We need to use this money strategically so that with the economic development part, not only do we reclaim the land but we also create jobs, and future jobs, something that's sustainable," Ward told the Washington, D.C., audience. "Because we're looking at having to diversify our economies and this money could really put our people back to work."

Ward had traveled to the capital along with RECLAIM Act supporters from across the country to urge legislators to cosponsor the bill and hold a vote before the end of 2017. Appalachian Voices, the publisher of this newspaper, helped organize the citizen lobby week,



Judge Executive Jim Ward of Letcher County, Ky., discusses the RECLAIM Act. Photo by National Wildlife Federation

which included nearly 60 congressional meetings.

Citizens also called on the Senate to adopt the House's version and hold its own vote. Currently, the Senate version does not require that the abandoned mine land projects eligible for RECLAIM Act funding also boost local economies.

Rep. Morgan Griffith (R-Va.), a co-sponsor of the RECLAIM Act, touted the bill's bipartisan support.

"It's Democrats and Republicans coming together to identify a way that we can be helpful, help the country, help make the environment better, help create jobs and [help] people who are skilled but want to stay living in the mountains be able to stay there and pursue something different as we move forward in this country," Griffith said at the press conference.

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115 <sup>TH</sup> CONGRESS:	Kentucky		Tennessee			North Carolina		Virginia		West Virginia						
Below are recent congressional bills and amendments on environmental issues and how central and southern Appalachian representatives voted. To see other recent votes, or for congressional representatives outside of the five-state area, visit congress.gov. ● = pro-environment vote ✗ = anti-environment vote ○ = no vote	T. Massie (R) KY-04	H. Rogers (R) KY-05	A. Barr (R) KY-06	P. Roe (R) TN-01	J. Duncan (R) TN-02	Fleischman (R) TN-03	S. Desjardais (R) TN-04	V. Foxx (R) NC-05	P. McHenry (R) NC-10	M. Meadows (R) NC-11	T. Garrett (R) VA-05	B. Goodlatte (R) VA-06	M. Griffith (R) VA-09	D. McKinley (R) WV-01	A. Mooney (R) WV-02	E. Jenkins (R) WV-03
<b>HOUSE</b>																
H.R. 2936, the Resilient Federal Forests Act, would expand the types of timber projects that are exempt from environmental reviews and public participation and would limit the ability of citizens who challenge forestry activities in court to recover attorney's fees if they win, among other measures. <b>AYES 232 NOES 218 NV 12 ... PASSED</b>	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
<b>SENATE</b>																
S.Amdt. 1429 to H.Con.Res. 71, the Fiscal Year 2018 budget resolution, would allow legislative committees to avoid funding protection efforts related to federally endangered species if the entire species population lives within one state. <b>49 YEA 51 NAY ... FAILED</b>	✗	✗	●	●	●	●	●	✗	✗	●	●	●	●	●	●	✗