

# Virginia's Clean Energy Transition: A special series by the Virginia Mercury

By Sarah Vogelsong - November 30, 2020



The sun rises over the Virginia Capitol. (Ned Oliver/Virginia Mercury)



*This week the Virginia Mercury is launching a five-part series on the commonwealth's transition to a carbon-free electric grid. First: Full speed ahead for offshore wind.*

The 2020 General Assembly session will be remembered as a sea change in Virginia's approach to not only energy, but climate change. From a fossil-fuel friendly state with only a small renewables presence, Virginia went to one with a mandatory schedule for phasing out fossil fuels by 2050, participation in a regional carbon market and some of the highest renewables targets in the nation.

Much of this transition will occur under the aegis of the Virginia Clean Economy Act, a law described by Sigora Solar policy chief and Solar Energy Industries Association board member Karla Loeb as "the single largest shift in energy policy as it relates to the electricity sector that's ever been achieved in any state." But that law wasn't the only major clean energy legislation to get the General Assembly's stamp of approval. Other measures sought to give local governments more power in negotiating permits with large-scale solar developers, to give apartment-dwellers access to solar and to pump money into low-income energy efficiency efforts.

Given the scale and complexity of the clean energy transition mapped out by these laws, the Virginia Mercury set out this fall to try to disentangle what's been done, what's underway and what people can expect in coming years. What will the 16.7

gigawatts of solar mandated by the VCEA actually look like? What steps does Virginia need to take to become an offshore wind hub? What are we talking about when we talk about energy storage?

To figure out the answers to these questions, we spent almost three months interviewing dozens of players in Virginia's energy sphere, from agency officials and representatives of advocacy organizations to academics and business groups. We dove into State Corporation Commission dockets, laws and a host of industry reports.

The public deserves a detailed snapshot of the early days of Virginia's clean energy transition. Although the new laws will take decades to fully implement, these are the months when frameworks for action are being crafted and policy decisions hammered out. Concern about climate change is rising among Virginians — as it is among Americans at large — and the 2020 session's clean energy laws were designed to address a significant amount of the carbon emissions that scientists know cause climate change.

Over the next five days, the Mercury is publishing stories about the five major fronts on which Virginia is attempting to reduce emissions from its electric grid: wind, utility-scale solar, distributed solar, energy storage and energy efficiency. Each represents a different approach to the problem, with different concerns, costs and challenges. Together, policymakers hope they will be able to replace the fossil fuels on which Virginia has relied for more than a century.

The costs of the Clean Economy Act and other legislation continues to be heavily criticized, with a wide variety of estimates of just how big they will get. State regulators have projected Dominion customer bills could rise by as much as \$800 annually by 2030. But many energy experts say that figure is based on an unrealistic and overdeveloped implementation plan proposed by Dominion. Litigation of these issues is ongoing before the State Corporation Commission.

The cost question is a critical one — but costs are shaped by policy decisions made in countless arenas, from local permit hearings held in school auditoriums to the somber halls of the SCC. This series aims to demystify some of those decisions and put them in wider context.

#### **Sarah Vogelsong**

Sarah covers environment and energy for the Mercury. Originally from McLean, she has spent over a decade in journalism and academic publishing. Most recently she covered environmental issues in Central Virginia for Chesapeake Bay Journal, and she has also written for the Progress-Index, the Caroline Progress, and multiple regional publications.

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# With offshore wind, Virginia hopes a 21st-century manufacturing boom will offset a hefty price tag

By Sarah Vogelsong - November 30, 2020



Construction of offshore wind turbines. (Ørsted)



First in a series on Virginia's transition to a carbon-free electric grid.

Tomorrow: What role will utility-scale solar projects play?

Maybe, if you squint really hard and the skies are clear, you might be able to convince yourself that you see them, out on the horizon: two turbines spinning far offshore of Virginia Beach.

You can't, of course — the distance to the Dominion Energy-owned offshore wind outpost is too great. Bill Murray, a senior executive with Dominion, describes it this way: Imagine, he says, that the *USS Wisconsin*, a World War II-era battleship now docked at Norfolk, were to be beached at Sandbridge and from there fire its 16-inch guns, capable of traveling 21 miles. “Those guns could not hit these turbines,” said Murray.

Until recently, Virginia's offshore wind dreams seemed to many an equally long shot. Dominion's two test turbines, known as the Coastal Virginia Offshore Wind Pilot, were a decade in the making. During that time offshore wind boomed in Europe and China, but the U.S., preoccupied with the glut of natural gas unlocked by the shale revolution, made few inroads into the technology. Rhode Island's [Block Island wind farm](#) was the nation's first offshore wind venture in state waters; Dominion's CVOW pilot 27 miles off the coast is the first in federal waters.

Today, however, [U.S. enthusiasm for natural gas is wavering](#), and offshore wind has seen a dramatic upswing in interest. Roughly a dozen major offshore wind projects have been announced along the East Coast with the potential to provide 30 gigawatts of energy to residents of the Atlantic seaboard. Much of the activity has occurred in the maritime states of New England and the upper mid-Atlantic, especially Massachusetts, New York and New Jersey. The farther south you go, the less the idea seems to have caught on.

Virginia is a major exception. Here, offshore wind has become the most ambitious and expensive part of the state's plan to meet Democratic Gov. Ralph Northam's goal of achieving a carbon-free electric grid by 2050. Last December, Dominion announced plans to build the nation's largest offshore wind farm in its federal lease area off Virginia Beach at an estimated cost of \$8 billion. Wind developer Avangrid, which is behind the [Kitty Hawk project](#) in North Carolina, is also eyeing the state as a possible destination for its power, although no contracts have been signed.

"Electrically, the easiest place for us to connect is in Virginia Beach," said Eric Thumma, Avangrid's senior director of new business for offshore wind.

When Democrats took the majority in both houses of the General Assembly in 2020, they came in with the desire to remake Virginia's electric grid. Offshore wind quickly became the most controversial part of their proposals due to its cost and the profits the politically powerful Dominion stood to make from its development. The Virginia Clean Economy Act's declaration that 5.2 gigawatts of the resource — more than all of the state's nuclear units and its largest gas-fired plant combined — is in the public interest provoked [a bitter fight](#) that continues to divide Democrats.

Tensions only increased after [a ProPublica-Richmond Times-Dispatch investigation earlier this fall uncovered a last-minute change](#) to the law that authorizes Dominion to spend an extra \$2.5 billion on its offshore enterprise. Depending on who you ask, the VCEA is either another utility giveaway or a vital part of a clean energy portfolio that will act as an engine for economic growth.

Much of the uneasiness over offshore wind comes down to its cost. Because Dominion is in the generation as well as transmission and distribution business, it reaps profits from building things — and the bigger the project, the greater the profits. At an estimated \$8 billion, CVOW will be the largest it's ever undertaken. A second wind farm of equal size would add billions more to the bottom line.

Offshore wind is necessary, Dominion executives say. "We simply can't rely on solar alone or energy efficiency alone to get us to a carbon-free grid," said Katharine Bond, the company's vice president of public policy and state affairs. Industry experts agree wind is an ideal complement to solar because it tends to peak at night and in the winter, when solar is at its lowest. And for Dominion, whose



Virginia territory is less well suited to onshore wind than the mountaintop ridges enjoyed by Appalachian Power, that leaves offshore wind as the primary solution.

“A carbon-free grid has to be a more diverse grid because of the intermittency of renewables,” said Murray. “There’s a tendency a little bit in energy policy to say, ‘OK, solar right now is the cheapest renewable, let’s just do all solar.’ And more incremental energy between noon and five is at some point not helpful.”

But while few supporters of weaning Virginia’s grid off carbon think offshore wind shouldn’t be part of the portfolio, many caution that Dominion shouldn’t be given carte blanche on spending.

Regulators’ ability to review offshore wind costs remains unclear. The VCEA includes language indicating the commission should sign off on CVOW costs unless certain specific conditions aren’t met, but even State Corporation Commissioners seemed unsure during hearings this October about how restrictive the law is. “What’s the play in the joints that is left after need and cost have been essentially predetermined?” Judge Mark Christie asked at one point.

Still, many clean energy advocates say regulators retain ultimate oversight. The Clean Economy Act’s language favoring renewables is “an expression of the General Assembly that they support this type of generation technology, but it’s not a mandate for the commission to approve any particular project,” energy attorney Will Reisinger told regulators during the same hearings. In an extended legal argument touching on the law’s history and wording, Southern Environmental Law Center attorney Will Cleveland said “the commission retains ultimate authority over whether a specific proposed offshore wind project’s costs are reasonable and prudent.”

Whether regulators will agree is a question several months from being answered.

*Dominion Energy, Virginia’s largest electric utility and a major U.S. energy company, is headquartered in Richmond. (Ned Oliver/Virginia Mercury)*

## **Dominion is at the helm – but not alone**

Energy issues, of course, have always been intricately intertwined with economic ones. Dominion has “been in the economic development business for decades,” said Murray. “Electric utilities are for economic development. In a way it’s altruistic, in a way it’s self-serving because any type of economic development plugs into the grid.”

But offshore wind takes the connection to a new level. Virtually all of the discussion and work surrounding Virginia’s wind goals center not on energy, but on the economy.



Part of that focus is due to the high threshold for entry into offshore wind development. Because the investments required for the technology are so high and only a limited number of government leases for sites are available, the industry's pool of players is small.

In Virginia right now, Dominion is at the helm. The utility is the [only company that owns a lease in federal waters](#) off the state's coast. And unlike other utilities to the north, which have relied on non-utilities to develop projects that they then acquire power from, Dominion is actively involved in not only developing but building offshore wind, and it has indicated in its long-range planning that it's interested in developing more than the CVOW project, and potentially all 5.2 gigawatts of the offshore target.

Still, other companies like Avangrid and Danish firm Ørsted, which partnered with Dominion on the CVOW pilot, have signaled strong interest in Virginia. Ørsted has leased 40 acres at the Portsmouth Marine Terminal, and Thumma said Avangrid, [which opened an office in Virginia Beach this fall](#), is "open to lots of different opportunities." Siemens Gamesa has also publicly said Hampton Roads is among the locations [it's considering for a turbine manufacturing facility](#).

"One of the key elements of getting a project done is making sure you have an offtaker," said Bruce Burcat, executive director of the Mid-Atlantic Renewable Energy Coalition. "And what the VCEA does, just like similar types of statutes in states like Maryland or New Jersey or Delaware or Pennsylvania, is there is now a market for the offtake of the energy."

Still, all eyes are on Dominion. How the utility navigates the state and federal permitting processes it has to undergo to get the full CVOW project underway will provide a template for other companies interested in Virginia who may be wary to put down money in these early months.

"There's going to be a reticence to invest until we actually see projects and steel in the waters," said Thumma.

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### *Onshore wind*

The VCEA doesn't limit wind development to offshore. Onshore wind is folded into the 16,100 megawatt and 600 megawatt targets set for Dominion and Appalachian Power to meet by 2035, and both welcomed proposals for onshore projects this summer.

Still, unlike the flat and windy Midwest, Virginia is less suited to onshore wind, with the most promising areas located along its western ridges in Appalachian Power territory. "One of the biggest challenges with Virginia and onshore wind is the wind resources are located in the most difficult terrain," said Director of Mines, Minerals and Energy John Warren. "There's a limited amount of project sites that really fit for large utility-scale onshore wind." To date, only one, the Rocky Forge project developed by Apex Clean Energy, has made it through the permitting process in the commonwealth. Utility executives are expecting more to come. In October, Dominion Director of Integrated Resource Planning Glen Kelly told the SCC that the utility is "very open to onshore wind" and that it expects the resource to have a more robust presence in the utility's future planning.

Dominion, for its part, is confident. Pointing to its successful navigation of the federal permitting process for the CVOW pilot — a process no other company has completed — Dominion executive Bond said the utility has “a set of experiences that others in the United States don’t necessarily have.” With that experience, Dominion is moving swiftly to develop the full CVOW project. After months surveying its lease area and taking core samples to determine how the massive turbines should be engineered, it intends to file its required construction and operations plan with the Bureau of Ocean Energy Management this December.

The company is also hoping to skirt some of the environmental problems other high-profile projects like Vineyard Wind off Massachusetts have encountered. CVOW’s location 27 miles off the coast “reduces concerns for birds,” said Bond. It limits fisheries impacts as well, although the state’s 19 black sea bass and conch fishermen remain concerned about how closures due to construction and the presence of 188 turbines, three substations and extensive cabling will affect their livelihood.

“The real challenge that we’re running into is there’s not a great roadmap,” said Todd Janeski, a fisheries coordinator with the Virginia Coastal Zone Management Program. “Ultimately, how this project does move forward here will inform” other efforts down the road.

## Creating an industry from scratch

Ironically, then, with Dominion preparing to file its plans with federal regulators, most of the offshore wind action in Virginia is happening on dry land.

These preparations are all about the economy. Because offshore wind turbines require manufacturing on a monumental scale and the U.S. has no supply chain in place to build them, states from Massachusetts to Virginia are scrambling to position themselves as offshore wind hubs that can not only operate new wind farms but manufacture and maintain the parts that run them.

“We’re trying to create an industry from scratch,” said Doug Smith, president and CEO of the Hampton Roads Alliance, an economic development group closely involved in bringing offshore wind to Virginia.

Local and state officials, as well as regional business groups, think Hampton Roads is one of the best candidates for the role. The region possesses a deepwater port that, thanks to the U.S. naval base at Norfolk, isn’t obstructed by bridges that could block vessels ferrying turbine components out to sea. The Navy’s presence has also fostered a robust manufacturing sector that’s oriented toward shipbuilding but could easily expand into offshore wind. And Dominion [has plans underway to](#)

develop a Hampton Roads-based vessel capable of installing wind turbine components – a major hole in the U.S. portfolio.

“There’s no harbor or port that has the existing infrastructure and workforce that Virginia has,” said Chris Gullickson, director of economic development for the Port of Virginia.

Virginia has already committed significant resources to convincing the fledgling industry that Hampton Roads is the ideal site for a hub, though it has also reached an agreement with North Carolina and Maryland to collaborate in promoting the Southeast and Mid-Atlantic as a regional center for the new energy source. The state’s 2020 budget included \$40 million for upgrades at the Portsmouth Marine Terminal, primarily dealing with soil stabilization and reinforcement that will ensure the port can handle parts of turbines that will stand taller than the Washington Monument and have blades longer than seven football fields placed end to end.

“This is the last small piece that we need that will make a huge difference to the industry,” said Jennifer Palestrant, chief deputy of the Department of Mines, Minerals and Energy.

Meanwhile, the 2020 General Assembly established a new Division of Offshore Wind within the department that Palestrant said aims to be “the convener for how we develop offshore wind” and allotted \$375,000 to stand the new office up. Among the new partners for the division? The Hampton Roads Alliance, which this September was awarded more than half a million dollars in state GO Virginia grant funds to help develop the offshore wind supply chain. The funding followed the group’s establishment this summer of an office in Frankfurt, Germany, that will allow the Alliance to explore partnerships in Europe, where Smith said “the major players of the industry are.” One consultancy, PM&P, has been working with the Alliance to develop a strategic plan for how Hampton Roads can attract offshore wind manufacturers.

Along the East Coast, “there’s going to be a limited number of hubs around the supply chain,” said Smith. “We want to really understand what that looks like.”



*The Port of Virginia's Virginia International Gateway facility in Portsmouth. (Port of Virginia)*

## A potential boom for workers

One thing is clear: if Hampton Roads becomes one of the East Coast's top offshore wind hubs, Virginia's looking at a lot of new jobs. [One study by Mangum Economics](#) estimates that for every gigawatt of offshore wind developed, Virginia could see 5,200 new jobs annually.

Most of those are likely to be local to Hampton Roads. The VCEA sets no firm quotas for the hiring of Virginia workers for wind farms, although it does require Dominion to draft a plan for how it will use both local workers and veterans in building out its project — a provision Southeastern Wind Coalition President Katharine Kollins said is “nebulous” but important.

Still, she pointed out, offshore wind energy production is labor intensive.

“A solar farm takes care of itself,” she said. “An offshore wind project needs daily operations and maintenance on at least one of the turbines. ... You've got folks out there every single day who are ensuring these things are running.”

The more manufacturing operations Virginia attracts, the more that workforce is likely to grow as other states build out their projects.



“It’s not just our project. If you look at the queue, the pipeline of projects up and down the East Coast continues to grow,” said Dominion spokesperson Rayhan Daudani. “You develop that workforce not just to construct the 2.6 gigawatts and then have the ongoing (operations and maintenance), but all up and down the East Coast there will be the opportunity to train them here, hire them here.”

One potential game changer would be the development of Dominion’s offshore wind vessel. Currently the only ships capable of installing offshore wind infrastructure are European, but the federal Jones Act bars foreign ships from carrying shipments between U.S. ports. If the utility can get its vessel in operation by 2023 as planned, it would prove a major inducement for manufacturers to locate near its home base of Hampton Roads.

Training, of course, will be necessary. “There’s only a handful of people in Virginia that are qualified to even step foot on a turbine,” said Paul Olsen, executive director of programs and partnerships at Old Dominion University, which has partnered with DMME to help advance offshore wind in the state. “We need to create hundreds of skilled positions.”

Officials are looking to Virginia’s community and technical colleges, as well as manufacturers, to help fill the gap. In October, Gov. Northam announced the creation of a new training alliance to offer certifications for offshore wind work. Partners include Martinsville’s New College Institute, Centura College and Norfolk’s Mid-Atlantic Maritime Academy. And officials like Palestrant said they expect skills from Hampton Roads’ existing maritime industry to be easily transferable.

“The technical colleges are already very very interested in providing programs for students to then go straight into these jobs,” said Kollins. “Once we see the development really start to take place ... you’re really going to see more and more students entering these courses knowing there’s a job for them at the end of the day.”

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# As solar farms multiply across Virginia, officials reckon with land use challenges

By Sarah Vogelsong - December 1, 2020



Dominion Energy's Whitehouse solar farm in Louisa County generates 20 megawatts on a 250 acre site. (Dominion Energy)



Second in a *five-part series* on the commonwealth's transition to a carbon-free electric grid. Tomorrow: The push to ramp up distributed solar.

Once upon a time, Virginia saw Halifax County as a golden place.

Just above the North Carolina border, in the heart of Southside Virginia, Halifax's sunshine and abundant lands yielded some of the country's largest crops of brightleaf tobacco. Mild and fragrant, the yellow-leaved variety sometimes known as "golden tobacco" sparked awe among visitors to the county's auction warehouses and brought wealth pouring into the county. It was, the local historical society would later recall, the golden age of Halifax.

Today, the landscape is far different. The population has shrunk and is aging. South Boston, once an independent city that until the Great Depression was the second-biggest brightleaf market in the country, reverted to a town in 1995 after ongoing fiscal struggles. Tobacco is a shadow of its former glory.

Halifax, though, still has the two resources that once put it on the map: sunshine and abundant land. Together, they have made the county one of the most attractive in Virginia for solar developers looking to convert vast swathes of agricultural and forest lands into fields of solar panels capable of providing the thousands of megawatts of power needed for the 100 percent renewable grid lawmakers have pledged to create by 2050.

In Halifax, that looks like a sort of 21st-century gold rush. Over the past five years, the county has seen proposals for roughly a dozen large-scale solar farms. Eight projects covering some 5,500 acres have been approved, and County Administrator Scott Simpson said there's room for more.

“The infrastructure that's in place in Halifax as far as the power infrastructure that's owned by the power companies is robust enough to accept more energy into that grid,” he said. And “Halifax has a lot of land that's available around that infrastructure.”

Throughout Virginia, “we now see an increase of activity from larger players in the development game, including national or multinational companies,” said Matthew Gooch, an attorney with Richmond-based energy law firm Reisinger Gooch. “Those with the sophistication and know-how are entering the Virginia market given the certainty of demand for these projects.”

For large-scale solar, though, demand means land. And as the pace of development accelerates, Virginians will have to grapple with major changes to the Old Dominion's landscape. Compared to coal and natural gas plants that emit pollution that is dangerous to human health, contributes to climate change and disproportionately affects low-income and minority communities, solar installations are low impact. But even advocates concede they have a larger geographic footprint, and tensions exist between rural areas that see themselves as bearing the burdens of the solar buildout and the urban areas that drive demand for renewables.

“The reality is there's going to be a lot of solar going in — like, a lot,” said Jonah Fogel, a program manager with the University of Virginia's Environmental Resilience Institute who has studied the overlap between the state's renewables goals and local land use concerns. “For the average person driving down the roads, they're going to be seeing energy in their life in a way that hasn't happened before.”

## **A transition already underway**

Virginia's landmark Clean Economy Act of 2020 committed the state to an ambitious future of renewables rather than the fossil fuels it has long extracted from its southwestern mines and piped in from the shale fields. But for solar, the biggest changes came from a lesser-known package of laws that attempt to resolve growing tensions between rural areas and the solar developers increasingly flocking to them.

“We generally viewed solar with a jaundiced eye,” King and Queen County Administrator Tom Swartzwelder told more than 200 attendees at Virginia's second Clean Energy Summit this October. “Like, ‘Well, that's great, we're going to



get this 2,000 acre solar farm, and it's going to support a new Amazon facility somewhere in Northern Virginia, and they're going to have \$1 billion of (capital expenditures) for this facility and 10,000 jobs, and we're going to have a solar facility.”

Unlike most other renewables, utility-scale solar was already on the upswing in Virginia prior to the VCEA's passage. By the end of 2019, according to one developer's calculation, plans had been announced for more than 17 gigawatts of solar energy in the commonwealth, most of it by non-utility developers. The Department of Environmental Quality's permit by rule program, which reviews solar projects of between 5 and 150 megawatts, had seen applications grow from one in 2015 to more than 70 notices of intent in 2020.

Consequently, the VCEA's mandate that by 2035 electric utilities Dominion Energy and Appalachian Power Company put forward plans for 16.7 gigawatts of new solar and onshore wind – the equivalent of nearly seven [Coastal Virginia Offshore Wind farms](#) – proved one of the least debated portions of the bill.

“The utility-scale sector was already robust. The VCEA just matched that,” said David Murray, executive director of the Maryland, Delaware, District of Columbia and Virginia chapter of the Solar Energy Industries Association, one of the biggest players in Virginia's renewables sphere.

Still, as solar companies sought land across Virginia for their projects, counties began to balk. The rule of thumb given current technology is that for every megawatt of power, roughly 10 acres is required. DEQ's permit by rule coordinator, Mary “Beth” Major, has calculated that the 50 projects already permitted by the department represent 27,000 acres of solar development. If all 70 projects in the program's queue go forward, that figure will rise to almost 100,000 acres.

While some of those projects are likely to fail, others are certain to take their place. As it has for wind and energy storage, the VCEA has locked in demand for large-scale solar. Carveouts in the law requiring 35 percent of all new solar to come from non-utility developers also guarantees that while Dominion and Appalachian Power will be the primary offtakers of the resource, they won't be the only ones in the game. Intended to reduce utility costs that could drive up customers' bills, these provisions are in line with regulators' preference for power purchase agreements over utility construction, which the State Corporation Commission says “[provides significant safeguards for customers.](#)”

In their earliest plans for how they will comply with the VCEA, Dominion and Appalachian have signaled their embrace of third-party development. Of the nearly 500 megawatts of solar Dominion proposed this October, more than 80 percent will come from non-utility companies. Appalachian Power's plan would source half its first tranche of projects from third parties.

Whether the full 16.7 gigawatts will ultimately need to be built out remains a matter of debate. As was the case with offshore wind, the question of whether the Clean Economy Act's declaration that 16.7 gigawatts of solar is in the public interest is a mandate for the commission to approve all solar projects up to that threshold remains unresolved. As Assistant Attorney General Mitch Burton noted during hearings on Dominion's long-range plan this October, "Any commission determination over whether a public interest declaration equals a build mandate has significant implications for future customer bills."

*Opponents of the proposed sPower solar project in Spotsylvania County decorated outside a meeting of the county Board of Supervisors in 2019 at Spotsylvania High School. (Sarah Vogelsong/ For the Virginia Mercury)*

## **'I've never seen anything move that quickly'**

Even before the VCEA threw Virginia's weight behind solar, the amount of land the projects required made Southside counties in particular nervous. The former tobacco- and textile-producing region has proven highly attractive to developers for its cheap, abundant land and large transmission lines that provide easy access to the electric grid. But its leaders feared losing too much land that they relied on for revenue and jobs.

"That's land that will be out of production for agriculture or timber production for at least a generation," said Simpson.

Solar developers and advocates argued tax revenues from solar farms far outstripped those from agriculture or timber. But many rural counties such as Halifax and King and Queen felt the arrangement was far from equitable. State solar incentives granted developers an 80 percent reduction in local property taxes



and required that any projects larger than 25 megawatts be taxed according to the local real estate tax rate instead of the generally much higher machinery and tools tax rate.

“Over a cycle of 35 to 45 years, it really did not offset the impacts of solar,” said Simpson. “We’re giving up our natural resources, our land, and we’re not being compensated properly for it. And we felt like there should be a lot more equity there.”

As the 2020 General Assembly session drew near, the counties found themselves with unexpected bargaining power. The new Democratic majorities pushing for clean energy action needed solar development to not only continue but accelerate, and many projects were finding that the main bottleneck they faced was local approvals. Developers too were eager for a solution to smooth the path forward.

Three key laws ultimately emerged. One, known as the revenue share bill, allows localities to replace their machinery and tools tax for solar with an energy tax of up to \$1,400 per megawatt for a project. A second reduces the machinery and tools tax exemption over time. The third allows virtually all localities to negotiate siting agreements with solar developers that can include incentives related to broadband or other projects already in local budget or capital improvement plans.

“We wanted to empower counties to develop the right set of tools to make these projects work if they want them,” said Drew Price, managing director of Hexagon Power, which is currently developing 10 solar projects in Virginia. The new laws, he said, have “enabled projects that were previously struggling to find the right set of agreements to make it a compelling local economic development opportunity.”

Local governments have been quick to flex their new power. Surry County has used the revenue sharing law [to strike a deal with Spring Grove Solar](#). Others like Sussex have followed suit. A tool being developed by the Virginia Department of Mines, Minerals and Energy and the UVA’s Weldon Cooper Center will also soon let localities weigh the financial impacts of the revenue sharing route versus the reduced machinery and tools tax exemptions.

“We have seen in the last five months tens of millions of dollars through the siting agreements being pledged,” Swartzwelder, the King and Queen County administrator, told Clean Economy Summit attendees in October. “In my tenure, I’ve never seen anything move that quickly to pump revenue into rural Virginia.”



*Dominion's Scott Solar site in Powhatan, shown before panels were installed, sits on 165 acres of land. (Dominion Energy)*

## **Balancing conservation with carbon cuts**

Even as many local governments' concerns about revenues have eased — although not disappeared; Simpson for one said he still doesn't think counties are getting "the full value" of solar developments — land conservation concerns remain.

"When I'm looking at siting, and this has to do with any project ... these lands are oftentimes the same lands that are providing us our natural resource benefits, our ecological system benefits," said Dan Holmes, director of state policy for the Piedmont Environmental Council.

Under Gov. Ralph Northam, Virginia has placed an increased emphasis on conservation. The governor has set a goal of protecting the top 10 percent of the state's "high conservation value lands" and in October 2019 established a special cabinet to address the issue by executive order. The state's ConserveVirginia mapping tool is also regularly touted by the administration as a new frontier in state-level conservation efforts.

So what happens when the state's two goals — solar development and land conservation — collide?

That's increasingly likely to happen, said Fogel of the Environmental Resilience Institute: "As time goes on, we're going to see upwards of 1 percent of Virginia's land area taken up by solar."

Conservationists fear that those commitments will chip away at the commonwealth's valuable resources, ranging from concentrations of high-quality agricultural lands to forests that help prevent erosion and absorb the very carbon in the atmosphere that the renewables transition is trying to combat. Holmes pointed to the planned [Cricket solar project in Culpeper](#), which was withdrawn in 2019, as an example: 75 percent of the land it was planned to cover is identified as top-priority land for conservation, he said.

Who is in the driver's seat when it comes to solar land use decisions also remains murky. With their zoning and permitting powers, local governments are often the primary assessors of a tract of land's best use, but their considerations tend to stop at the county line. State-level reviews do occur through [DEQ's permit-by-rule process](#), or other approvals overseen by the State Corporation Commission or DMME, but all are project-specific rather than offering a broad framework for new development.

Even a complete picture of what solar is being developed and where is lacking. Because projects can follow multiple permitting routes, information about what's in the pipeline is scattered between agencies. A [recently launched dashboard by the public-private SHINE partnership](#) between Southside Virginia Community College and MDV-SEIA has aimed to fill the gap but operates outside the auspices of government.

Funding is one impediment. Despite the explosive growth in solar projects, DEQ's permit by rule process continues to be overseen by a single full-time employee and is underfunded, with fees unchanged since 2012. Amendments to the regulations that govern the program still need Northam's signature to go into effect.

The conservation question, then, may point to a broader question likely to dog legislators in coming years: Who is at the helm of the clean energy transition?

"It's going to require a lot of cooperation," said Bill Shobe, director of the Center for Economic and Policy Studies at the Weldon Cooper Center at UVA. "One thing the General Assembly is probably going to have to tackle this year is what sort of administrative locus on state government should have the responsibility."

*This story has been corrected to reflect that Shobe is the director for the Center for Economic and Policy Studies at the Weldon Cooper Center, not the director of the Weldon Cooper Center.*

#### Sarah Vogelsong

Sarah covers environment and energy for the Mercury. Originally from McLean, she has spent over a decade in journalism and academic publishing. Most recently she covered environmental issues in Central Virginia for Chesapeake Bay Journal, and she has also written for the Progress-Index, the Caroline Progress, and multiple regional publications. In 2017, she was honored as one of Gatehouse's Feature Writers of the Year, and she has been the recipient of

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As solar farms multiply across Virginia, officials reckon with land use challenges - Virginia Mercury

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# Long-sought changes to rooftop solar laws offer a new vision of Virginia's electric grid

By Sarah Vogelsong - December 2, 2020



Rooftop solar panels. (VCU Capital News Service)



Third in a five-part series on the commonwealth's transition to a carbon-free electric grid. Tomorrow: Energy storage.

A chicken in every pot, a car in every garage — and a solar panel for every roof?

For many years, that notion would have been unthinkable in Virginia, where fairly competitive electric rates, a lack of incentives and what one solar developer described as “extreme utility control of the legislature” made most companies think twice before putting down stakes.

“We fondly referred to Virginia as the dark state,” said the same developer, Tony Smith of Staunton-based solar company Secure Futures Solar. “We always thought if we could succeed in Virginia, we could succeed anywhere.”

Now, however, that's all changed. A flood of legislation easing barriers for residents to put solar on their own roofs and in their own backyard has led to what installers, developers and trade organizations describe as a sudden rush of interest in the commonwealth.

“Virginia is kind of like the Wild West,” said Nolie Diakoulas of Virginia Beach-based installation company Convert Solar, which has been in business since 2012. Now national companies, he added, are “coming in and knocking on the doors and spreading the good word of solar.”

However, David Murray, executive director of the Maryland-DC-Delaware-Virginia Solar Energy Industries Association, a leading industry group, said that despite the



uptick in interest, new laws encouraging solar development “didn’t exactly turn Virginia into a California or New England market,” he said.

“Other markets have historically had much more robust incentives for solar,” he said. “I think part of the advantage Virginia has is it’s been untapped for a little bit. It’s had such a tough market, especially for distributed generation.”

While the massive [utility-scale farms](#) cropping up in the state’s more rural areas might be the most visible aspect of Virginia’s shift to solar, new state laws have carved out a special role in Virginia’s clean energy transition for a different application of the technology.

“Distributed generation” is the term used by industry players to refer to any kind of electric power that’s produced outside of large traditional plants. But while the definition applies as much to the propane-fueled backup generators used by businesses as it does to renewables, in Virginia energy policy right now, it means one thing: rooftop solar.

Solar panels designed to be mounted on a single-family residence’s roof have been around for decades. As technology has improved and prices have dropped, however, rooftop solar has increasingly come to be seen as a disruptive influence. When it comes to the electric grid, wind and utility-scale solar fill a similar space as gas and coal plants: large hubs where energy is produced at a central location and then sent down transmission lines to substations and eventually people’s homes.

Rooftop solar, though, offers a fundamentally new framework for power generation, one in which thousands of locations are producing energy at any given moment. In this more decentralized vision of the electric grid, large-scale power plants don’t disappear, but their importance is tempered.

For utilities like Dominion Energy and Appalachian Power Company, which long balked at the idea of widespread distributed solar, the rise of this form of energy will require close examination of the distribution and transmission systems that carry power around the state.

“If the distribution system’s not working, the rest of the stuff isn’t working either,” said Dominion Senior Vice President of Corporate Affairs and Communications Bill Murray. But it will also raise important questions for policymakers grappling with what a 21st century electric grid should look like.

Gov. Ralph Northam’s September 2019 executive order committing Virginia to a carbon-free electric grid by 2050 laid down a firm target, but “what does that mean?” asked Aaron Sutch, the Virginia program director for solar advocacy nonprofit Solar United Neighbors. “Does that mean that big utilities and big-scale



utility solar and wind do that transition? Or does it put the power, as it were, in people's hands?"

More simply, he asked, "If it's all large-scale centralized, are those benefits really going to trickle down to the community?"

*The Virginia State Capitol. (Ned Oliver/Virginia Mercury)*

## Peeling back policy barriers

Exactly how much distributed generation should be allowed onto Virginia's grid was a hotly debated issue during the 2020 General Assembly session. Of the 16.7 gigawatts of solar the legislature signed off on, 10 percent will be required to be distributed.

Getting to that goal, though, required major changes. One of the biggest battles that unfolded was over a provision in the Virginia Clean Economy Act that set a cap on how much energy could be net metered — that is, produced by individuals to be fed back into the grid and credited against their electric consumption.

Previously, the cap, which Sutch called "the engine that spurs distributed solar," was set at 1 percent of each utility's generating capacity. Rooftop solar developers said that was too low for any meaningful growth, and that it showed a lack of commitment to the technology's development, causing uncertainty within the market about whether companies and residents should invest in rooftop systems.

There were other barriers as well. Residential solar systems were limited to 20 kilowatts, and commercial ones to one megawatt. Consumers had to pay a demand



charge if their system exceeded 10 kilowatts, an unexpected fee that soured some residents new to rooftop solar on the technology.

Another restriction limited solar arrays to only producing enough energy to provide 100 percent of a customer's average annual usage, causing heartburn among residents interested in electric cars who couldn't install systems large enough to accommodate that future purchase. Still another put a low ceiling on the power purchase agreements nonprofits and public entities like schools and local governments could enter into with non-utility companies to install solar panels on their buildings.

Taken as a whole, "we didn't do much work in Virginia up until about two years ago," said Geoff Mirkin of Solar Energy World, an installer headquartered in Elkridge, Md., that works in five East Coast states and the District of Columbia.

The VCEA changed all that by "peeling back some of the policy barriers that have been in place for years," according to Rachel Smucker of MDV-SEIA. Aided by a push from progressive Democrats in the House of Delegates, the net metering cap was raised to 6 percent, with 1 percent of that allocation required to come from systems serving low-income customers. Both residential and commercial size limits were increased. The demand charge was eliminated in Appalachian Power's territory and raised to 15 kilowatts in Dominion's; in the latter, the 100 percent energy threshold was also upped to 150 percent. In both, the caps on power purchase agreements also saw large bumps.

At the same time, long-sought "solar freedom" laws allowing customers in Dominion territory who live in condos or apartment buildings to access solar also cleared the General Assembly. These community solar provisions opened the door to an arrangement that advocates say is important for areas with higher population density and more low-income residents who could benefit from lower power bills.

A prior community solar pilot created by Dominion in 2018 that would have charged the average participant an extra \$20 per month was ultimately never rolled out, although this November the utility announced it would embark on [a new effort in partnership with Harrisonburg Electric Commission](#).

Eric Hurlocker, an attorney with Virginia energy law firm GreeneHurlocker, said that in his practice, "community solar has kind of sparked the most interest."

"There's been a lot of out-of-state entities that have done community solar elsewhere that are taking a hard and long look at Virginia now," he said.



*Workers install solar panels at Huguenot High School in Richmond. (Sun Tribe Solar)*

## **Despite the pandemic, a spike in solar jobs**

Despite the COVID-19 pandemic, numerous solar installers across the commonwealth reported the same experience: a big uptick in business.

“I think there has definitely been inquiries and demand that is due directly to the new laws that went into effect this year,” said Patrick Feucht, operations manager with Baseline Solar, a Blacksburg-based company that has been active in Virginia since 2008. The lifting of the power purchase agreement cap in particular, he said, has driven a fresh wave of interest.

“We’re getting calls from developers more frequently than in the past and looking at projects more frequently than we have in the past because PPAs are now allowed,” he said.

Charlottesville-based Sun Tribe Solar, which primarily develops solar for public sector entities like school districts and local governments, described a similar experience: “Since the passing of the VCEA, we’ve been receiving inbound calls from local governments and school systems just about every week,” said vice president of development Rich Allevi. Straitened economic circumstances may play a role: “Budgets,” said Allevi, “are the number one reason why public sector institutions embrace renewable energy.”

Many of the calls reported by solar developers are translating into new work. Compared to 16 solar deals Convert Solar made in all of April 2019, Diakoulas told the Mercury on Oct. 13, “Today, just today, we’ve sold 10 projects.”

Along with the growing market for rooftop solar is a growing market for jobs. A [report](#) from Virginia Commonwealth University's Center for Urban and Regional Analysis found that in 2019, distributed generation accounted for 64 percent of all solar jobs in Virginia. Both Diakoulas and Feucht said their companies had recently increased their staff, with Diakoulas saying Convert Solar “would triple our workforce right away if someone told us the floodgates were fully opened.”

Compared to utility-scale solar, distributed generation “generally has greater job impact in the communities where these projects are located, in terms of employing local engineers, electricians, installers, crane operators, all the skillsets required to install a solar array,” said Smith of Secure Futures Solar.

“It’s a smaller piece of the pie in terms of what’s been carved out in the Clean Economy Act, but it has much more bang for the buck in terms of contributing to the state’s economy on a per kilowatt basis,” he said. “These decisions are made by many, many, many people on what we call Main Street. Whereas utility-scale solar, those decisions are made at Wall Street.”

*The State Corporation Commission regulates Virginia electric utilities. (Ned Oliver/ Virginia Mercury)*

## Legislative fights become regulatory ones

Against this backdrop of growth, however, disagreements have broken out over how Virginia will finally roll out its community solar programs.

With legislative fights on pause, the debate has moved to the State Corporation Commission, which has been charged with drafting regulations for how community solar will work in practice. But when commission staff released proposed regulations for shared solar and multifamily shared solar this October that virtually duplicated Dominion recommendations, clean energy groups and businesses reacted with dismay.

“These programs really are about equity and access,” said Smucker of MDV-SEIA. The rules as currently written, she argued, would hamper savings from being passed on to customers and make projects “highly unfinanceable.”

The biggest problems for solar advocates were administrative charges the utilities would be allowed to levy on customers, customer definitions that would exclude residents of duplexes from participating in shared solar programs, limits on how many months bill credits could carry over, and wording that would allow utility affiliates to participate in utility-managed programs.

Several state bodies also weighed in, including the Department of Mines, Minerals and Energy, which said it had “identified a number of issues that may not align with the goals of the legislature.” A sternly worded letter from six Democratic



lawmakers, including the VCEA sponsors, described the multifamily program drafted by regulators as “unnecessarily onerous.” The broader shared solar regulations, they wrote, would “delay the construction of projects and institute ambiguous, unsubstantiated costs that would significantly impact the ability to participate in the program until 2025.”

Dominion defended the rules, saying they would make distributed generation available to customers “in a way that minimizes cost-shifting and subsidization by non-participants.”

In response to the pushback, commission staff in late November issued an amended version of the rules that resolved some of the non-utility groups’ complaints, including the duplex issue and the restrictions on bill credits. But staff defended other recommendations, such as the strict licensing requirements for multifamily programs, noting concerns that there would be “a flurry of small projects with no experience to provide electricity service to vulnerable customers.”

The final decision lies in the three-person commission’s hands, and the clock is ticking: regulators have until Jan. 1 to finalize the new programs’ rules.

“They have a lot they have to accomplish before Jan. 1, 2021,” said Smucker, “but there’s a lot at stake for these programs.”

#### **Sarah Vogelsong**

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# Energy storage is the 'Swiss army knife' of the renewables transition, but it's still evolving

By **Sarah Vogelsong** - December 3, 2020



A battery storage system. (Getty Images)



Fourth in a five-part series on the commonwealth's transition to a carbon-free electric grid. Tomorrow: energy efficiency.

Hang around any debate about clean energy and you're bound to hear one question: What do you do when the sun isn't shining and the wind isn't blowing?

The answer, at least in theory, is straightforward: energy storage.

Storage can be thought of as the third leg of the stool Virginia will use to reach its clean energy goals.

It's what Virginia Advanced Energy Economy Executive Director Harry Godfrey calls "the Swiss army knife of the energy space," a way to fill gaps by more intermittent renewable sources while also balancing out the push and pull of energy supply and demand that bedevils every electric grid.

Every plan crafted by utilities for transitioning from fossil fuels to renewables relies on energy storage. But this keystone is also today the weakest link of most clean energy portfolios. Utilities and states see storage as a powerful way to balance out the intermittency of renewables like wind and solar; California, for example, is hoping storage coupled with wind and solar [will help replace natural gas and coal plants](#) now facing retirement.

Batteries, though, remain hampered by limitations in how much energy they can store and how long it can be pumped onto the grid. [Standard batteries today have a duration of four hours](#); extending that time span on a broad scale will take further research and investment. Nor is the technology very widespread yet:

Recent estimates from the U.S. Energy Information Administration [put battery capacity at under 1,000 megawatts](#).

“If you look at all of the operational grid-scale batteries throughout the country, they store collectively less energy than our nuclear facilities in Virginia produce in just a couple of hours,” said Dominion Vice President of Public Policy and State Affairs Katharine Bond.

Still, the technology may be approaching a turning point: global information and analytics firm IHS Markit in a white paper earlier this year forecast that “battery storage will continue to grow rapidly, with all trends pointing to a maturing battery industry that is well beyond the demonstration phase.”

Energy storage “is the single most important technology and policy issue facing energy right now,” said Bill Murray, vice president of corporate affairs and communications at Dominion Energy. “Storage has gotten better, no question about it. We need it to get geometrically better.”

Dominion already has several efforts underway. In February 2020, as the Virginia Clean Economy Act was still being hammered out at the General Assembly, regulators approved four Dominion pilots that aim to examine issues such as how batteries can be coupled with solar and how they can be used to avoid costly upgrades the utility would otherwise have to make to substations and distribution wires. The company has also been [experimenting with electric school bus batteries as a potential storage solution](#).

Appalachian Power’s interest in the technology has ramped up as well. In October, the utility announced a partnership with Dominion and economic development group InvestSWVA to advance energy storage development in the region.

“Much of Appalachian Power’s service territory in Virginia is rural and storage could aid service reliability for customers,” wrote spokesperson Teresa Hall in an email. “The area is also well suited for overall storage development. Land is available and costs are reasonable, but developing Southwestern Virginia into a hub for storage has to be done responsibly.”

How extensive the southwestern partnership will be remains to be seen. The VCEA set an energy storage target for Virginia of 3,100 megawatts, putting it among the most aggressive states in the U.S. when it comes to deploying the technology. As with most other VCEA targets, the bulk of that development will fall to Dominion, which is responsible for proposing 2,700 megawatts of storage compared to Appalachian’s 400 megawatts.

For both utilities, there’s more than one persuasive argument for investing in storage. Like solar and wind, storage can act as a power generator that can add



electricity to the grid when demand rises. But batteries in particular “can sort of play in all spaces,” said Southern Environmental Law Center attorney Will Cleveland. Unlike other renewables, storage can also play [critical roles in a utility’s distribution and transmission systems](#) – the complex and costly network of wires, substations and technology that ensure the grid functions smoothly and efficiently.

“Storage can be used to improve distribution system reliability and also serve as a non-wires alternative for capacity upgrades,” said Hall.

Other states have already reported savings with storage. The [New York Public Service Commission reported](#) earlier this year that electric utility Con Edison had successfully used a two megawatt battery as part of an effort to avoid paying \$1.2 billion to upgrade a substation.

Exactly how far storage solutions might stretch isn’t yet clear. “You want to use a battery every hour that it’s available when it’s not charging,” said Cleveland. “You want to use it in whatever the highest economic value is at any hour.”

Determining that value will be a tricky proposition, though – one that’s likely to take years. Much of the responsibility will fall to a new Energy Storage Task Force that a 2020 law ordered the State Corporation Commission to create “to evaluate and analyze the regulatory, market and local barriers to the deployment” of storage solutions. That body hasn’t yet been formed, and its final report isn’t due until October 2021.

“I don’t know that any state has fully gotten up to speed on those things,” said Cleveland, “but certainly Virginia has not.”

## Does pumped storage count as storage?

First on the list of unresolved storage issues is what exactly falls under that umbrella. Everyone agrees that batteries do, and it's advancements in that technology that are largely driving growth in storage around the world. More controversial is pumped hydropower, which today is the most common type of storage used worldwide, accounting for [more than nine-tenths of all storage in the U.S.](#)

A form of power generation that would have been familiar to our forebears, pumped storage systems create electricity when demand is high by channeling water from one reservoir into another, turning turbines as it flows. As demand drops, the water is then pumped back into the original reservoir. Virginia's utilities have been using it for decades. Dominion touts its 3,000 megawatt Bath County Pumped Storage Station as the largest battery in the world, and Appalachian Power has operated its 636 megawatt Smith Mountain Lake facility since the 1960s.

While tried and true, these systems aren't accepted by all clean energy advocates as part of the path forward. Pumped storage is expensive to build and has a large footprint; furthermore, it requires external electricity to operate, so whether or not it's "renewable" depends on what resources are supporting it.

The Virginia Clean Economy Act's wording also doesn't make it clear whether or not pumped storage is part of the renewable energy future lawmakers are envisioning. The law explicitly states that "renewable energy" doesn't include "electricity generated from pumped storage," and it excludes energy from pumped storage from being counted toward utilities' yearly targets for how much of their energy must come from renewables, a benchmark called the renewable portfolio standard.

Crucially, though, the VCEA doesn't explicitly exempt pumped storage from being counted toward the 2,700 and 400 megawatt storage development targets Dominion and Appalachian Power must meet by the end of 2035. Further complicating the picture is a 2017 law passed by the General Assembly nearly unanimously that declared one or more pumped hydro facilities in Virginia's coalfield region that at least partially rely on renewables to be in the public interest.

Dominion has already signaled it sees pumped hydro as part of its energy storage approach. Among the new capital projects the company listed in its 2020 Integrated Resource Plan, the first long-range plan to be filed in the wake of the VCEA, is a 300 megawatt pumped storage project in Tazewell — outside the utility's territory — that would cost \$2.9 billion. In 2017, three years before the VCEA's passage, [plans filed by the company with federal regulators](#) indicated interest in a much larger facility capable of generating 870 megawatts.

“In the energy storage space, we’ve got to take an all-of-the-above approach,” Bond told the Mercury this fall. “If it’s proven technology and it’s cost effective, we should deploy it as part of this clean energy transition and a carbon-free grid.”

Not everyone agrees. Among renewable energy advocates, “there’s very much a divide” as to whether pumped storage should be seen as a clean energy solution or simply an economic development driver, said Cliona Robb, an energy attorney with Thompson McMullan who also chairs Virginia’s Solar Energy Development and Energy Storage Authority.

One such opponent is Arlington-based utility-scale storage developer Delorean Power, which has strongly argued against the inclusion of pumped hydro on the grounds that it would “largely undermine” the VCEA’s “intent of creating storage targets in the first place.”

Pumped hydro “is a proven, legacy technology and offers very little benefits for grid modernization, economic development and energy storage innovation in Virginia,” the company wrote in a State Corporation Commission filing this summer.

Absent direction from the General Assembly, the decision seems likely to fall to the SCC – as will any approvals of Dominion’s Tazewell pumped storage facility that the utility submits to regulators.

The VCEA “is an important public policy, but it’s also going to require significant investments and significant costs,” energy attorney Will Reisinger told regulators this October as part of a case against Dominion’s Tazewell plans. “That heightens the importance of the planning process, and it makes it more critical to ensure that Dominion only invests in reasonable projects that are required to comply with the Clean Economy Act or are required for the company to provide quality and reliable service.”

## How soon and how fast

What qualifies as energy storage isn’t the only question facing regulators this fall. Also at issue is how quickly that storage ought to be rolled out.

While the VCEA mandated the development of 3.1 gigawatts of storage by the beginning of 2035, it left the nuts and bolts of how that would occur to the State Corporation Commission, which was charged with crafting regulations for energy storage deployment and setting interim targets leading up to the Jan. 1, 2035 deadline.

“These were the kind of things that we didn’t really have the bandwidth – I don’t think anyone had the bandwidth – to nail down,” said David Murray, executive



director of the Maryland-Delaware-D.C.- Virginia chapter of the Solar Energy Industries Association.

As they did with the shared solar rules, regulators have largely deferred to Dominion and Appalachian Power. Draft regulations hewed closely to the utilities' proposal, including a set of interim targets that would delay the rollout of most energy storage until 2030. Dominion and Appalachian have justified the "back-loading" of targets on the grounds that waiting to fully deploy storage until closer to the 2035 deadline will let Virginia take advantage of technological advancements made elsewhere at a cheaper price.

"We are expecting more renewables (solar and wind) to be connected to our grid towards the end of the 15-year period, creating the need for more storage to balance generation output," wrote Dominion spokesperson Rayhan Daudani in an email. "We are also expecting energy storage cost reductions and technology improvements to materialize in the latter half of the 2020s and 2030s, which will drive value and additional benefits for ratepayers and the power grid."

Clean energy advocates and the storage industry are pushing for more aggressive targets, however. A group including MDV-SEIA and the Energy Storage Association complained that delays could cause Virginia to miss out on early cost savings and could "lock in other investments that may reduce the utility of storage in the future."

Delorean meanwhile argued for a more aggressive timeline on economic grounds, citing the ongoing financial constrictions due to the pandemic: "The Virginia legislature wanted to do something big for energy storage, and this was clearly articulated in the VCEA," the company wrote in a commission filing. "The regulations adopted by the SCC need to send that same business-friendly message so that companies across the supply chain migrate to Virginia and the clean-energy industry can continue growing in earnest."



*Transmission lines in Louisa County. (Ned Oliver/ Virginia Mercury)*

## How big a role will non-utilities play?

In Virginia, which has prized its identity as the U.S.' top state for business, friendliness toward a growing industry might seem a given. The electric grid is a different story, however. Since the state re-regulated its electricity markets and handed monopolies back to Dominion and Appalachian Power in 2007, the utilities have carefully guarded their territory. Lawmakers too have frequently been cautious in allowing third-party companies to enter state markets and affect the monopolies' customer bases.

That could be changing. The last two big pieces of energy legislation to pass the General Assembly – the Grid Transformation and Security Act of 2018 and the VCEA of 2020 – have included mandatory carveouts for non-utility companies to take on certain capital projects. The State Corporation Commission has also increasingly shown favor toward utility proposals to buy power or other assets from non-utility developers in order to offload some of the financial risk that would otherwise be borne by Virginia residents and businesses. Among the VCEA carveouts was one requiring that 35 percent of the storage target be developed by third parties. (Another also carved out 35 percent of the solar and onshore wind goal.)

“When we drafted the bills that authorized these new programs, we envisioned policies and program rules that will unleash a competitive clean energy market that creates (a) maximum number of local jobs and attract(s) millions of dollars in investment to the commonwealth,” six Democratic lawmakers, including VCEA

sponsors Sen. Jennifer McClellan and Del. Richard “Rip” Sullivan, wrote to the State Corporation Commission in an [early November letter](#).

The letter, a four-page list of the legislators’ concerns with commission proposals for both energy storage and shared solar regulations, also issued a veiled rebuke of SCC’s approach: The bills, lawmakers asserted, “were intended to open competition for new entrants, and not simply make incremental changes that largely maintain the status quo.”

Of particular concern to many industry players are the permitting requirements regulators have proposed for non-utility companies to build storage. An early recommendation by SCC staff that would have required any project larger than 100 kilowatts to undergo a rigorous permitting process led by the commission provoked a strong backlash. The Virginia Department of Mines, Minerals and Energy said the low threshold imposed “onerous” requirements on a wide swath of projects, while the Southern Environmental Law Center labeled it “a transparent attempt to ensure non-utility storage is never built in Virginia.”

Dominion, for its part, said the 100 kilowatt threshold was reasonable and consistent with a threshold set by regional electric transmission organization PJM for projects to sell power into wholesale markets.

*The State Corporation Commission regulates Virginia electric utilities. (Ned Oliver/ Virginia Mercury)*

This November, commission staff conceded the 100 kilowatt threshold might be too low and bumped their recommendation up to one megawatt – still far lower than what many advocates sought. But they held tight to many of the permitting requirements, stating that while “certain aspects may be perceived as burdensome, they are intended to ensure that developers seeking to operate within the commonwealth will operate safely, will not negatively impact the reliability of the electric power system and will be ethically responsible in their interactions with Virginia consumers.”

That sense of caution is also evident elsewhere. The Rural Solar Development Coalition that convened last year in response to a flurry of solar applications in Southside and Tidewater Virginia is also beginning to eye storage as the “next wave” of the renewables transition, said Halifax County Administrator Scott Simpson.

“We want to be sure that our localities are prepared and understand what storage means, and if any of us were to be proposed a storage facility, what questions are there,” he said.

Sarah Vogelsong

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# A clean energy transition won't be free. Officials hope energy efficiency can offset costs.

By Sarah Vogelsong - December 4, 2020



New residential construction in Southside Richmond. (Sarah Vogelsong/Virginia Mercury)

Much of Virginia's planned shift to a carbon-free electric grid involves grand plans: turbines sprouting hundreds of feet tall from the ocean waves and solar panels spread across thousands of acres. But another major part of the clean energy transition Virginia and other states are looking to make is often overlooked: energy efficiency.



Last in a five-part series on the commonwealth's transition to a carbon-free electric grid.

Unlike wind, solar and storage, in which progress is seen in new construction, new megawatts and new technology, energy efficiency successes are chalked up in terms of absence: projects that no longer have to be built, costs that no longer have to be paid.

These “negawatts,” as they’re sometimes called, can be a harder sell to policymakers looking for concrete proof of their work, but to advocates they are a key counterbalance to the spending required to transform the electric grid.

“This is our bread and butter as far as addressing climate change in an equitable way,” said Walton Shepherd, Virginia policy director at the National Resources Defense Council.



An umbrella term for a host of practical and policy solutions, “energy efficiency” encompasses anything that reduces the amount of energy that would otherwise be consumed. Among the most familiar approaches are consumer products like LED bulbs, smart thermostats and “highly efficient” dishwashers or washing machines. Others are less obvious. Older or poorly constructed buildings guzzle energy because of drafts, leaky windows, inadequate insulation and other flaws.

Over time, these losses add up, increasing the energy demand that utilities like Dominion Energy and Appalachian Power are legally obligated to meet. Rising energy loads can eventually necessitate the building of new power plants and are often used by utilities to justify the ongoing operation of fossil fuel plants that offer more quickly dispatchable power than intermittent sources like wind and solar.

Energy efficiency can offset some of those load increases, although Dominion said the tool is just one of many needed to transition to a clean energy grid.

“To the extent that means on the very coldest days or the very hottest days of the year, can energy efficiency get us all of the way there?” asked Katharine Bond, Dominion’s vice president of public policy and state affairs. “No, it can’t.”

Just how far energy efficiency can push Virginia along that path is debated. Dominion is notoriously risk-averse on issues related to grid stability and reliability (“I make no apologies for that,” said Vice President of Corporate Affairs and Communications Bill Murray), and many of the parties involved in negotiating the terms of the Virginia Clean Economy Act were disappointed by the final version of the law that only established mandatory energy savings targets through 2025, leaving the task of setting future targets to the State Corporation Commission. An earlier version of the legislation had set targets through 2030.

“There currently is a question mark after 2025. ... We don’t know what standard the SCC is going to set,” said Shepherd. And, he added, “historically, the SCC has been skeptical of energy efficiency.”

That may change. Gov. Ralph Northam’s announcement Dec. 1 that he would appoint former Deputy Secretary of Commerce and Trade Angela Navarro to fill a State Corporation Commission seat set to be vacated by Judge Mark Christie this January may signal a new bent on the powerful regulatory panel. Navarro, who will be the second SCC judge to be appointed by the Democratic Northam, has been publicly supportive of energy efficiency efforts: In a July webinar on the VCEA, she described such programs as “one of the least expensive ways to reduce greenhouse gas emissions.”

“Of course that helps drive down the costs for individual customers,” she said. “But it also drives down the cost to the whole system.”

During the same webinar, other energy efficiency advocates indicated that the savings targets set for utilities in the VCEA may not be written in stone. “If the goals aren’t strong enough, this is something that can also be revisited,” said Virginia Energy Efficiency Council Executive Director Chelsea Harnish. “The next five years are set in place, and if we need to make it more rigorous to meet carbon goals, we have time to do so.”

*A solar installation on the Henrico Mental Health East Clinic. (Sun Tribe Solar)*

## **A counterbalance to renewables spending**

The savings targets created by the Virginia Clean Economy Act are known as an “energy efficiency resource standard.” They’re the flipside of the generation targets the legislature set for wind, solar and storage: Just as the utilities are required to propose an ambitious slate of projects that will increase renewables on the grid, so must they prove to regulators that they are saving energy through efficiency programs.

“The VCEA represents a turning point in many respects,” said Bond. “It absolutely will require a greater emphasis on energy efficiency, by design. ... It’s one of the key policy provisions that’s included in the legislation.”

Energy savings targets aren’t a new concept. [More than half of U.S. states have energy efficiency resource standards](#), according to the American Council for an Energy Efficient Economy, which considers the tool “one of the most effective ways for a state to guarantee long-term energy savings.”

In Virginia, [voluntary savings targets have existed since 2007](#), when the state set a goal of reducing electricity use by 10 percent by 2022. Reaching that goal, the [2007 Virginia Energy Plan](#) declared, “would defer or postpone the need for approximately 3,900 megawatts of new electric generation capacity by 2022, equivalent to four or five large generation stations.” Consumer savings were estimated to be in the hundreds of millions.

For the next decade, though, Virginia’s progress on energy efficiency was uneven. In its [2020 Utility Scorecard](#), the American Council for an Energy Efficient Economy ranked Dominion 50th out of 52 electric utilities, although Bond said the group’s rankings “don’t include all the company’s investments.” Virginia fared better in [ACEEE’s state rankings](#), snagging the 29th position in 2019. “Since 2018 Virginia has made strong legislative progress on clean energy and energy efficiency and appears poised to significantly strengthen programs following years of relatively low savings,” the organization wrote.

A major commitment to energy efficiency came in the 2018 Grid Transformation and Security Act, which ordered Dominion and Appalachian Power to invest more than \$1 billion in such efforts over the next decade, with Dominion, Virginia’s largest utility, responsible for \$870 million of the spending. But that mandate still fell short for many clean energy advocates.

“The problem with that is that’s a spending target, not a savings target. The utility had no incentive to propose programs that would actually result in savings,” said Chase Counts, who as senior director of operations for Community Housing Partners Energy Solutions oversees weatherization and energy efficiency programs throughout Virginia. The energy efficiency resource standard, “on the other hand, actually stipulates kilowatt-hour savings goals year after year that utilities are required to meet.”

“Now they’re going to be incentivized to design programs that result in energy savings or load reductions year over year,” he concluded.

By 2025, the VCEA requires Dominion to have achieved savings equal to 5 percent of its average retail sales; Appalachian Power’s target is set at 2 percent. If the utilities meet their annual goals, the law allows them to recover a profit margin. Failure, though, comes with a price: The State Corporation Commission is forbidden from approving any new utility plants that emit carbon if the utility hasn’t met its savings goals.



*State energy savings targets. (American Council for an Energy Efficient Economy)*

Still, because the version of the Clean Economy Act that made it through the General Assembly left it to the State Corporation Commission to set post-2025 targets, questions remain about how robust utility efforts will be in the longer term. In its first VCEA compliance filing, Appalachian Power told regulators it had assumed savings targets would remain constant after 2025 “due to the uncertain nature of any future proceeding regarding the efficacy or cost-effectiveness of additional (energy efficiency).”

Another challenge the utilities will face is in designing programs for large customers. Prior to the VCEA, no customer that used more than 500 kilowatts of electricity had to pay for utility energy efficiency programs. Under the new law, that threshold was raised to a megawatt. Furthermore, large customers can now only be exempted from participation if the State Corporation Commission determines they have “implemented energy efficiency programs that have produced or will produce measured and verified results consistent with industry standards and other regulatory criteria.” Regulators have already begun reviewing how those exemptions will work.

“That’s a really diverse set of customers. It could be a hospital. It could be a data center. It could be a large industrial site,” said Harnish. “Each and every one of those have very diverse needs. A data center doesn’t need the same thing as a hospital. Both utilities will need to be up to the challenge to provide programs to keep them.”

Bond said it’s an issue Dominion is already keenly attuned to. “One size doesn’t necessarily fit all,” she said. “Having ... solutions in mind that contemplate the differences between a 100-year old residential building versus a brand-new warehouse building is an important part of developing diverse programs that can meet the needs of our diverse customers.”

(Getty Images)

## A major new revenue stream

Energy efficiency might seem like a no-brainer to the average consumer worried about their bottom line. But to companies like vertically integrated utilities that make money not only by selling electricity to customers but generating it, energy efficiency can be an unappealing option. Not only do programs take money to design and implement, but by reducing energy use, utilities reduce their profits.

States, then, have long taken steps to incentivize energy efficiency measures. In Virginia, efficiency is the only area of the clean energy sector for which the legislature has earmarked a consistent funding stream.

Arguably the second most consequential energy law passed by the General Assembly during the 2020 regular session was the Virginia Clean Energy and Community Flood Preparedness Act, a bill that authorized the state's participation in the 10-state Regional Greenhouse Gas Initiative. Under RGGI – colloquially pronounced “Reggie” – Virginia agrees to an annual declining carbon cap that will require any fossil fuel plant with a capacity of 25 or more megawatts to purchase allowances for carbon emissions at an auction. The proceeds of those auctions are then returned to the states for their use.

Each state has discretion over how it spends those proceeds, which aren't insignificant. According to [the most recent numbers from RGGI](#), participating states received a total of \$248 million in auction proceeds in 2018, with almost 40 percent of those funds ultimately going toward energy efficiency programs.

While Virginia won't participate in its first auction until March 2021, [state fiscal analysts have projected annual revenues](#) will amount to more than \$100 million, with much of the cost passed along to utility ratepayers. Half of that, under the Clean Energy and Community Flood Preparedness Act, will go to low-income energy efficiency programs that will be managed by the state's Department of Housing and Community Development with assistance from the Department of Mines, Minerals and Energy.

Exactly how that roughly \$50 million will be spent, though, remains a question mark. Stakeholder meetings to map out a course of action were initially anticipated to begin in fall 2020 but were delayed by the COVID-19 pandemic and the General Assembly's special session over the summer, said Department of Mines, Minerals and Energy Director John Warren. A Department of Housing and Community Development spokesperson said meetings would start "before the end of December."

"We'll know a lot more once those meetings get started and underway and there's some framework established for that," Warren said.

Gov. Ralph Northam's administration has indicated that "deep energy retrofits" of affordable housing and improvements to public housing that couple energy efficiency and sustainability goals are at the top of its priority list for the new funding stream.

"One of the primary intentions from the administration is for those housing choice voucher holders or other low-income tenants, they'll have the ability to rent more highly efficient properties as a result of this, because we'll be able to make more investments in energy efficiency as we both develop and renovate affordable housing units," said Navarro during a DMME webinar this July.

Counts is eager to see at least some of the funds extend to weatherization efforts such as roof upgrades needed for low-income customers to install solar panels on their homes. Community Housing Partners has to turn away roughly a third of all households that seek weatherization services because of restrictions in the use of federal funds for such repairs.

"RGGI resources would go a long way to unlock the energy efficiency potential for low-income households we already have in the funnel but cannot serve," he wrote in an email.

DMME Director Warren also pointed to the priority his department is putting on solar: "We need to find a way to incorporate solar into low-income communities so it actually impacts their electric bill."

## **An equalizing force**

For many of its proponents, the attraction of energy efficiency is the promise it holds for incorporating equity concerns into the design of a 21st-century grid. Unlike most other aspects of the clean energy transition, where the benefits of renewables are understood to be broadly shared, energy efficiency improvements have their most immediate impact on the individual level.

“Energy efficiency as a solution is very personal, because in order to make improvements to somebody’s home, you have to be in their home,” said Bond.

The rapid changes ushered in by the Virginia Clean Economy Act and other laws geared toward achieving Virginia’s clean energy transition will come with a price tag, although how large it will be is still disputed. SCC staff during hearings on Dominion’s long-range plan this October estimated that the average residential customer’s monthly bill is expected to be \$67 higher in 2030 than it was in May 2020. Lawmakers at the General Assembly during the regular session fretted about the costs of moving from fossil fuels to renewables, a concern only heightened by the economic dislocations of the COVID-19 pandemic.

Energy efficiency, say advocates, is a counterbalance to those costs, one that can help ensure that the most disadvantaged Virginians, many of whom have long borne disproportionate pollution burdens from fossil fuel plants, don’t also bear disproportionate costs as the state turns to renewables.

It’s a charge the Department of Mines, Minerals and Energy, which has begun partnering with Virginia’s Council on Environmental Justice, said it’s taking seriously: “We try and really be advocates for those that we’re representing such as low-income residents and homeowners,” said Warren.

A newly convened organization called the Virginia Multifamily Energy Efficiency Coalition, which includes groups such as the Natural Resources Defense Council and the Virginia Poverty Law Center, has urged the Department of Housing and Community Development to prioritize communities of color in its allocation of RGGI funds by requiring measures such as annual program reviews and mandatory reporting of data.

“RGGI funding provides a remarkable opportunity to prioritize Black and brown households as a mechanism to address these disparities,” the group wrote in a letter to the department. “Program implementation must be structured accordingly.”

To Harnish, part of the promise of energy efficiency isn’t just the savings it can provide for households facing high energy bills, but jobs. Like distributed solar, energy efficiency is a labor-intensive industry, and one that is likely to grow all around the state.



“We could be talking about a Google who’s putting on the Nest thermostat ... all the way down to contractors and people who spend their day in people’s crawl space,” she said. “During the General Assembly, when you heard folks talking about the expanded potential for jobs in Virginia, energy efficiency jobs were the bulk of them.”

**Sarah Vogelsong**

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