VIRGINIA ENERGY REFORM COALITION

Virginia Energy Reform Coalition – Take Back Our Dominion

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Advanced technologies are creating an opportunity to modernize the electric power grid. This modernization also gives consumers more freedom to choose their electricity services provider. Providing this consumer choice would reduce electric bills, enhance reliability, and improve the environment. The regulatory framework for the electric power system in many parts of the country, however, has not kept up with technological advances, creating barriers to achieving these benefits.

The retail, and in some cases the wholesale, electric power system in many areas is largely run and regulated the same way it has been since the early 1900s. The regulation of the wholesale electric power system changed significantly beginning in the 1990s, but major barriers to advanced technologies and customer choice that can help reduce electric bills remain. Policy reforms are needed to create a modern, 21st century grid.[1]

The traditional electric power system consists primarily of large power plants generating electricity that flows across the transmission system, gets stepped down to distribution level voltages, and is delivered to consumers. Yet new distributed energy resources (DERs) are now enabling non-utility entities, including consumers, to play a much larger role in meeting the energy needs of those served by the electric power system. These entities can supply energy at the same location as the demand for energy and may even have surplus energy to supply back to the larger system. For instance, small-scale power generation such as solar panel systems and natural gas micro-turbines are turning consumers into energy producers. These resources create a new paradigm for transmission and distribution system operations that is less hierarchical than has been the case to date.

Rapid advances in information and communication technologies are also making it feasible and convenient for consumers to provide other energy services to grid operators such as quickly reducing demand when the grid is stressed. Consumers can receive compensation for doing so, and all consumers benefit when this offers the least-cost solution. Consumers can install "energy management systems" that they can set to automatically adjust electricity use of their appliances and other devices

[1] For a more detailed description of the vision and policy reforms recommended in this backgrounder, *see* Michael Giberson and Lynne Kiesling, "The Need for Electricity Retail Market Reforms," *Regulation* (Fall 2017).

in response to price or other signals from grid operators. Grid operators could then send signals to participating customers to reduce energy demand instead of ramping up a power plant.

These advanced technologies would enable the electric grid to become a platform that links consumers and retail electricity services companies to the wider wholesale power market and grid operations. Such a transition would create additional consumer choices, increase efficiency, and spur technological innovation.

A regulatory framework inherited from the last century, however, is blocking this transition. Much of the framework was developed for a system that relied almost exclusively on large monopoly utility-owned power plants (often long distances from consumers). New DERs are poised to fundamentally change this system, but they remain bogged down by a regulatory structure that often dates back to when Ford Model T cars were still in production. It is time for the regulations to catch up with the 21st century and deliver the choice and value consumers want.

Well-designed competitive retail and wholesale markets are essential to creating a 21st century grid and should be established nationwide. Competitive wholesale and retail markets have already emerged in several regions of the country. The region of Texas covered by the Electric Reliability Council of Texas (ERCOT) wholesale market is an excellent model for both retail and wholesale competitive electricity markets. Texas moved to competitive markets in the ERCOT region in the early 2000s. The markets have reduced energy bills, enhanced consumer choice, and spurred innovation.

In addition to ERCOT, wholesale markets have been organized in California, the Mid-Atlantic, parts of the Midwest, and the Northeast, covering approximately two-thirds of the US population. Virginia is part of the PJM regional wholesale market. Wholesale markets involve purchases and sales of electricity and related services on the electric transmission system. These markets enable greater coordination between utility systems in their regions, creating significant benefits. They represent a paradigm shift for the utility systems of the United States, which have historically been highly balkanized.[2] This lack of coordination impeded economic efficiency-improving transactions worth billions of dollars.[3]

At the retail level, thirteen states and the District of Columbia have implemented some form of electricity consumer choice. The competitive retail electricity markets created by this choice involve purchases and sales of electricity and related services on the electric distribution system.[4] Prices in most of the thirteen retail choice jurisdictions have trended downward while prices have risen in most of states with monopoly regulation, according to a 2017 Retail Electricity Supply Association report.[5]

These jurisdictions implemented retail choice during a nationwide push during the 1990s and early 2000s to create more competitive electricity markets. This push came to an abrupt end shortly after the California energy crisis in 2000-2001. California's newly restructured electricity market fell apart with

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[2] Severin Borenstein and James Bushnell, *The U.S. Electric Industry after 20 years of Restructuring*, Energy Institute at Haas (2014) at 6.

[3] *Ibid.*

[4] The interface between the electric transmission and distribution systems is an electric substation where transmission voltages are stepped down to distribution voltages. This interface is also the boundary between any competitive wholesale and retail electricity markets associated with these electric systems.

[5] Philip R. O'Connor, Ph.D, *Restructuring Recharged: The Superior Performance of Competitive Electricity Markets 2008-2016*, Retail Energy Supply Association (2017).

skyrocketing wholesale electricity prices and rolling blackouts. Several factors unique to the California process contributed to the meltdown, including a faulty market design that enabled merchant generators such as Enron to manipulate wholesale market prices.

A number of states, including Virginia, abandoned the move towards retail choice after the California energy crisis. The thirteen jurisdictions that stayed the course demonstrated that competitive retail markets can work over the long-term and that good market design is critical to success.

The key elements of well-designed wholesale and retail electricity markets, as well as the associated transmission and distribution system operations that facilitate these markets, include: (1) a quarantine of the monopoly utility to ownership and maintenance of the electric transmission and distribution grid, (2) independent entities to operate and plan the grid, (3) full integration of the markets and system operations, (4) phasing out of wholesale capacity markets (where they exist) in favor of fully marginal-cost-reflective wholesale energy prices[6], (5) streamlined and uniform interconnection standards, (6) performance-based regulation of the monopoly utility, (7) low-income customer bill assistance and weatherization programs, (8) a standard ensuring the deployment of cost-effective energy efficiency resources, and (9) consumer protections and education.

Quarantine the monopoly. Utilities should be limited to owning and maintaining the transmission and distribution grid, a segment of the system that can still possibly be considered a natural monopoly. The utilities must get out of the business of generating and selling electricity before a 21st century electric grid platform can emerge. Private sector generation and retail energy services companies can completely serve consumer needs through dynamic, competitive markets. Monopoly utilities remaining in the market use their regulation-enabled competitive advantages[7] to inhibit other competitors, resulting in higher costs and slow technology adoption.[8] In Virginia, monopoly utilities have also used their political influence to establish policies that inhibit distributed generation and customer self-generation.

The telecommunications industry required a similar limitation, which some experts refer to as a "quarantine," to unleash the innovation that helped take the U.S. from landlines to smart phones. The federal anti-trust suit that broke up AT&T in the early 1980s included a quarantine of monopoly telephone service in the U.S. that limited monopolies to just local service. The quarantine was achieved by AT&T spinning off its local telephone service business to separate regional Bell Operating Companies (called the "Baby Bells"), which continued to be regulated monopolies. AT&T was then free to compete for long distance service. The competition prompted in part by the AT&T break-up led to lower prices, more choices, and a technology revolution for consumers.

Establish independent grid operators. Independent grid operators are needed to transition to a 21st century grid platform. A utility that both owns and operates the grid has a conflict of interest that inhibits the deployment of cost-effective non-utility energy resources. A utility earns a rate of return on its infrastructure (e.g., wires and transformers), so it has a financial interest in meeting demands through additional infrastructure investments rather than resources owned or services provided by

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[6] Including the value of lost load as the system runs short of reserves in real-time operations.

[7] Their advantages include access to customers through regulated monopoly activities and the ability to use these activities to cross-subsidize their competitive businesses. These advantages enable the monopoly utilities to acquire market power in their competitive businesses.

[8] *See* Michael Giberson and Lynne Kiesling (2017); Lynne Kiesling, "Incumbent Vertical Market Power, Experimentation, and Institutional Design in the Deregulating Electricity Industry," *The Independent Review* (Fall 2014).

other entities (e.g., large-scale distributed energy storage systems; consumer-owned rooftop solar; energy efficiency or price-responsive demand) even though they are often cheaper.

The best way to address this conflict of interest is by splitting the ownership and operation of the grid by creating an independent grid operator – a neutral party without any financial stake in the competitive markets or in building infrastructure for profit – that plans and operates the grid while the utility continues to own and maintain the grid. This structure is already used in competitive wholesale markets where independent, nonprofit organizations called Independent System Operators (ISOs) or Regional Transmission Organizations (RTOs) plan and operate the transmission grid, as well as operate the competitive wholesale market. The old monopoly utilities only own and maintain the transmission infrastructure.

A similar structure is needed at the electric distribution grid level to avoid distribution utility conflicts of interest that undermine competitive retail markets, inhibit interconnection of cost-effective DERs, and encourage over-building of infrastructure that inefficiently increase costs to consumers. An entity called an "independent distribution system operator" (IDSO) should operate and plan the distribution grid. Unlike ISOs and RTOs, the IDSO would not be required to operate any kind of market. Rather, the IDSO would provide the ISO/RTO increased visibility into distribution system operations and ensure prices in the wholesale market are efficiently propagated through the distribution system.[9] Electric distribution utilities would continue to own and maintain the distribution system.

Full integration of grids, markets, and operations. A 21st century grid would fully integrate the electric transmission and distribution systems, as well as the wholesale and retail electricity markets.[10] Such integration would enhance system efficiency, increase reliability, and better enable integration of DERs. The principal elements of a fully integrated grid are seamless system operations and pricing.

The independent grid operators – the ISO/RTO at the wholesale level and IDSO at the distribution level – would share many of the same functions, structures, and characteristics, except the IDSO would not be in the business of operating markets. These similarities would enable the grid to be operated seamlessly in contrast to the separately operated transmission and distribution systems of today.[11] The integrated operations could also enable the grid to become more modular with the IDSO taking full responsibility for ensuring reliable operations in each of its local distribution areas, as well as aggregating supply and demand into wholesale market bids.[12] The IDSO would aggregate bids, offers, loads, and DERs for each place in its system where a local distribution area interfaces with the bulk power system and wholesale market. The IDSO could replicate this structure at lower levels of its system such as a microgrid or a commercial building. This modularity would simplify the ISO/RTO's task of balancing the system, especially as DERs proliferate. The structure would increase the system's ability to identify and utilize DERs while not requiring the ISO/RTO to see each individual load or resource, simplifying operations and enhancing reliability, as well as reducing costs.

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[9] *See* Susan Covino, Andrew Levitt, and Paul Sotkiewicz; "The Fully Integrated Grid: Wholesale and Retail, Transmission and Distribution," chapter 22 in *Future of Utilities: Utilities of the Future* (London: Elsevier, 2016).
[10] *See* Covino, et al. (2016).
[11] *Ibid*.
[12] *See* David Roberts, "Clean energy technologies threaten to overwhelm the grid," Vox (Dec. 27, 2018); Lorenzo Kristov, Paul De Martini, and Jeffrey D. Taft; *Two Visions of a Transactive Electric System* (Jan. 2106).

The seamless pricing of a fully integrated grid would also enhance the system's economic efficiency. The wholesale electricity prices could then be transmitted all the way down to the distribution transformer level, enabling individual customers who wish to do so to better respond to price signals.[13] This response includes use of DERs behind the customer's meter (e.g., demand response, energy storage, generation). Such a customer may be more strongly encouraged to be responsive to the needs of the shared system.

Phasing out of wholesale capacity markets. Capacity markets are intended to ensure that enough generating capacity (or demand-side management capability) is available to match supply with anticipated future demand to a standard level of reliability. The goal, however, is not simply adequacy, but adequacy at least cost. Capacity markets work by ensuring investors receive the full amount of money that should be available to them in the energy market, but is not for various reasons (e.g., price caps). The capacity markets provide this "missing money" through out-of-market capacity payments to the investors. While this might address investors' concerns, it diverts attention from fixing the underlying problem of inadequate energy market prices. It is energy market prices that provide information and opportunity for numerous distributed resources, including responsive loads, that can dramatically reduce the cost of achieving adequacy. The reality is that the amount of capacity needed to achieve adequate power supplies at least cost depends very much on customer ability to respond to prices when they rise in response to tight system conditions and the value of lost load to customers. The reserve margin target[14] is mandated in the absence of these variables and does not allow customers to choose their desired level of reliability. Capacity markets are not designed to reflect these often ignored customer preferences.

Capacity markets are no longer necessary in the 21st century given the availability of more flexible and distributed energy resource options, as well as the information technology that allows customers to respond to prices easily and nearly automatically. Capacity markets are also causing over-investment in generating resources, excess costs (which are passed on to consumers), and unequal treatment of energy resources in current capacity market constructs. These problems are created primarily by the imposition of mandatory and inflated reserve margins, as well as a persistent tendency to over-estimate future peak demand. By phasing out wholesale capacity markets, a vibrant, more diverse, and robust energy market can emerge that would result in lower costs for consumers.

While it remains critically important to ensure sufficient investment to comply with expected levels of reliability, the reality is that there is a better approach than mandatory capacity markets.[15] Wholesale energy prices that fully reflect the marginal cost of energy, including the opportunity cost when the demand for energy causes the level of reserves to fall below what's needed to comply with reliability standards, are at all times capable of driving a level of investment consistent with consumers' choices about reliability and operational needs of the system during periods of system stress.

This does not mean abandoning reliability entirely to "the market," but rather enabling the market to do what it was meant to do and reflect the level of reliability chosen by electricity customers through consumption decisions at different prices. This means relaxing arbitrarily low caps on wholesale energy prices and acting through energy pricing that reflects system conditions and the value of load to consumers rather than opaque capacity markets. Independent system operators do this by adjusting

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[13] *See* Covino, et al. (2016).

[14] A reserve margin is a percentage of excess generation capacity maintained by a system to ensure reliability.

[15] *See* Michael Hogan, *Hitting the Mark on Missing Money*, Regulatory Assistance Project (Sept. 2016).

energy prices, if necessary, to ensure that they reflect the cost to customers of producing more energy whenever using resources to do so creates a shortage of resources providing critical system reliability services such as operating reserves. This ensures that the effort of empowering customers at the distribution level is not wasted – the wholesale prices incurred by their suppliers more accurately reflect the cost of energy consumption in time and place, prompting innovation in contracting strategies and technology deployment that increase choice and reduce the cost of the power system for all customers. The ERCOT market has used this resource adequacy approach for many years with operational results similar to capacity markets, but with less capacity leading to lower costs.

Streamlined and uniform interconnection standards. Most electric customers in the United States have the ability to install and operate DERs that will meet all or a part of their electricity needs. Inappropriate restrictions on such installations, including facility and system-wide size limitations, should be removed and distribution utilities should not be allowed to impose punitive charges on those who choose to install such facilities. The IDSO should adopt uniform interconnection requirements for DERs to streamline their deployment.

Implement performance-based regulation for operation of the transmission and distribution systems. Many monopoly electric utilities are regulated based on their cost of service and earning returns based on how much they have invested. A regulator implementing cost-of-service regulation determines the utility's revenue requirement, which is the amount that needs to be collected in rates to cover a utility's costs and a reasonable return on its investment. This investment is the amount of capital the utility has invested in its system (i.e., rate base), and the return on investment is calculated by multiplying this amount by an approved rate-of-return (typically around 10 percent per year). A utility thus has an incentive to expand its rate base to earn higher profits even when it is inefficient to do so. This expansion can lead to the utility "gold-plating" its system, which increases customer costs.

Cost-of-service utilities also have an inappropriate incentive to increase electricity sales to increase profits.[16] The utilities recover most of their costs through volumetric rates (i.e., cents per kilowatt-hour) that are set and only change during rate cases and hearings. Thus, the greater the volume of electricity sales, the higher the profits. Utilities also have an incentive to discourage the use of behind-the-meter energy resources because they experience lower electricity sales when these resources are used, eating directly into utility profits.

The traditional regulatory framework can be reformed to correct these flaws through new regulatory approaches that link utilities' revenues to performance measures unrelated to the volume of sales and investment. Commonly known as "performance-based regulation" (PBR), these approaches identify key performance criteria (e.g., reliability, cost, peak load, customer satisfaction, etc.) and metrics (e.g., outage frequency and duration, restoration times, asset utilization, MWh, etc.) by which they can be measured.[17] Regulators began using PBR for electric utilities in the 1990s.

Establish a low-income utility assistance and energy optimization program. Virginia Energy Assistance Program (VEAP) establishes a payment plan based on income for households at or below

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[16] Utilities should not be in the business to sell as much electricity as is profitable, but rather to provide valuable energy services to their customers.

[17] *See* David Littell, *et al.*, *Next Generation Performance-Based Regulation*, National Renewable Energy Laboratory and Regulatory Assistance Project (Sept. 2017).

150% of federal poverty guidelines to ensure low-income families are held harmless through and following the energy transition. The program is specifically designed to provide financial assistance to families in poverty while helping them reduce their energy usage through energy efficiency measures and energy conservation. VEAP addresses higher than average energy burden[18] experienced by families in poverty by setting payments at 6% of income (10% if home is all electric) and normalizes energy usage for the home through mandatory participation in an energy efficiency program, and weatherization if needed to implement energy efficiency measures (weatherization is not a cost of this program; separate federal funding is used for weatherization). VEAP support would be limited to typical levels of household electricity use, adjusted for factors including seasonality and residential building type. Abnormally high levels of consumption driven by atypical uses such as in-home businesses would not be supported. Qualified customers also participate in a mandatory energy conservation education program that provides information on ways families can reduce their energy bills further through behavioral changes.

The Department of Housing and Community Development (DHCD) would administer VEAP, coordinating program eligibility and implementation with LIHEAP eligibility requirements as a cost savings measure. A Universal Service Fee (USF) Fund collected from all ratepayers (including program participants) funds the program. DHCD files an annual rate review of the USF with the State Corporation Commission (SCC). SCC reviews and sets the rates for the following program year through the annual review process.

Implement an energy efficiency standard. Competitive markets may not deploy energy efficiency resources even though they may be a cheaper way to meet system needs than other methods such as building new power plants or transmission and distribution infrastructure. An all-cost-effective energy efficiency resource standard would ensure the deployment of such resources. An IDSO would be charged with implementing the standard by: (1) assessing whether all of the cost-effective energy efficiency resources are being deployed across its system (using appropriate measures of cost-effectiveness such as total resource cost and utility cost); and (2) issuing a private sector bid solicitation to remedy any significant discrepancy. If a competitive market were already deploying most or all cost-effective energy efficiency resources, there would be no need for IDSO intervention.

Consumer protections and education. Because the role and scope of public utility regulators will be significantly different in a competitive market, such a market will require built-in consumer protections to, among other goals, ensure reliability and continuity of service, protect against predatory marketing and pricing, protect data privacy, and enhance consumer education and awareness. For continuity of service, an IDSO (with PUC oversight), should be required to track relationships between retail electricity service providers and customers, as well as facilitate the expeditious transfer of a customer account to a pre-determined "Provider of Last Resort" (POLR) in the event that the customer's chosen retail provider is no longer able to provide service. The POLR responsibility may be assigned to one or multiple retail service providers. Consumers would also be protected against unfair, misleading or deceptive practices by retail electricity service providers and have the right to an impartial and prompt resolution of disputes with their service provider and/or transmission and distribution utility. Consumers would own the data associated with their electricity service. Additionally, advanced metering technology would collect and retain no more data than is necessary to bill a consumer unless the consumer has consented to such data being collected.

[18] "Energy burden" means the percentage of household income that goes toward energy costs.

Finally, the utilities commission, or other appropriate regulatory body, would offer consumer education programs and set standards for how retail energy providers market and inform consumers about product and rate offerings.