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By electronic delivery: Karen.sabasteanski@deq.virginia.gov
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Ms. Karen Sabasteanski
Policy Analyst
Office of Air Regulatory Affairs
Department of Environmental Quality
P.O. Box 1105
Richmond, Virginia 23218

RE: Notice of Intended Regulatory Action (NOIRA): Regulation for Emissions Trading

Dear Ms. Sabasteanski:

Dominion Energy is submitting the following comments on the Department of Environmental Quality's (DEQ) Notice of Intended Regulatory Action (NOIRA), published in the June 26, 2017 Virginia Register, to establish a new regulation to reduce and cap carbon dioxide (CO_2) from fossil fuel fired electric power generating facilities by means of an interstate trading program (Revision C17)[1]. The purpose of DEQ's proposed action is to develop a regulation, in accordance with Governor McAuliffe's Executive Directive 11 (ED 11), that (i) ensures that Virginia is "trading-ready" to allow for the use of market-based mechanisms and the trading of CO_2 allowances through a multi-state trading program, and (ii) establishes abatement mechanisms that provide for a corresponding level of stringency to CO_2 limits imposed in other states with such limits.

Dominion Energy is one of the nation's largest producers and transporters of energy, with a portfolio of approximately 26,200 megawatts of generation, 15,000 miles of natural gas transmission, gathering and storage pipeline and 6,600 of electric transmission lines. The majority of Dominion's electric generation is located in Virginia, including four carbon-free nuclear units, one of the nation's largest portfolios of renewable biomass generation, three of the most modern combined cycle natural gas facilities in the United States (with a fourth state of the art facility under construction), and a rapidly growing portfolio of large-scale solar generation.

The Company is already a leader in reducing greenhouse gas emissions and began its transition to a less carbon-intensive generation fleet well in advance of the Clean Power Plan (CPP). Between 2000 and 2015, Dominion Energy's carbon intensity for units serving Virginia decreased by 23 percent, while the amount of power we produced increased by 10 percent. This is due, in large part, to the closure, sale or conversion to natural gas and biomass of 12 coal-fired units, the company's four nuclear units that operate in Virginia, its growing fleet of highly efficient natural gas-fueled power stations and its growing portfolio of renewable energy.

The Company will continue to move toward cleaner, more efficient, and lower emitting ways of generating, delivering, storing, and transporting energy. New electric power generators, like our highly efficient Brunswick and Greensville power stations, continue our long-term trend toward cleaner, less carbon-intensive electric generation. The company's investment in solar energy in

[1] See http://register.dls.virginia.gov/issue.aspx?voliss=33:17&type=4

Virginia during just the past two years is approaching $1 billion in projects in service, under construction or proposed, enough to power 100,000 homes. In addition, Dominion Energy operates several hydropower facilities and is one of the nation's largest generators of electricity using renewable biomass. The company has also announced an offshore wind demonstration project and is evaluating pumped storage utilizing renewable energy as all or part of its power source in the coal field region of the state supported by Virginia legislation[2].

At a time of significant uncertainty in federal policy, we remain committed to transitioning to cleaner, less carbon-intensive electric generation. Dominion actively participated in providing input to the Governor's Executive Order 57 (EO 57) Climate Work Group established in June 2016 and is committed to working with the Department of Environmental Quality (DEQ) in the development of state carbon regulations pursuant to the process and directive set by ED 11. We offer the following comments on the NOIRA:

General Comments

To the extent the Commonwealth pursues the development of state-specific regulations to address CO_2 emissions from power plants by establishing a statewide emissions cap, we generally support the concept of designing a program that would allow for emissions averaging and trading and would position the program to be "trading-ready" with linkages to either existing or future multi-state trading programs as put forth by ED 11. However, we do not believe the directive compels the state to join a particular multi-state program, such as the Regional Greenhouse Gas Initiative (RGGI), and urge the Commonwealth to proceed cautiously but thoroughly in evaluating whether direct participation in existing trading programs would meet state environmental and energy goals and ensure the continued diversity, reliability and affordability of electricity.

We also find that the following key features are essential to designing a reasonable and workable program to address carbon emissions:

- Set state emission reduction limits based on the deployment of existing, commercially available technologies to achieve supply-side reductions and reasonably achievable and quantifiable end-user energy efficiency program results;
- Allow for a representative baseline that effectively accounts for the emissions serving Virginia customer energy needs (electric consumption) from which to determine and measure emissions reduction goals. This should include emissions from instate generation sources as well as emissions from purchased power.
- Any Virginia reduction plan should evaluate and set emission goals and realistic implementation timelines that will provide needed time for the ramp-up of new renewables, energy efficiency programs, and infrastructure improvements in order to maintain the state's fuel diversity and goal to become more energy independent;
- Create a flexible program with multi-year emission averaging and other measures so that reductions can be achieved in the most cost-effective manner;
- Recognize the critical role of extending the operation of Virginia's existing fleet of carbon-free nuclear generation;
- Recognize the critical role of natural gas as the lowest cost, cleanest and most reliable form of dispatchable generation to complement the integration of renewables to the electric grid;
- Recognize the benefit of reducing purchased power and its impact on the environment, the Virginia economy and jobs;

[2] See http://lis.virginia.gov/cgi-bin/legp604.exe?171+ful+CHAP0820.

- Recognize and account for the role and opportunity electrification of other sectors of the economy, such as transportation and cities, can play to reduce carbon emissions economy wide in the Commonwealth; and
- Provide for a safety valve or "off-ramp" to address both unexpected scenarios and to address electric system reliability or adverse rate impacts.

Baseline and Emission Targets

The baseline and targets must accommodate for the dynamics of power generated outside of and imported into Virginia. The baseline must reflect and account for the fact that Virginia is a net importer of energy from more carbon-intensive out-of-state resources. The emission targets must allow for reasonable expansion of lower-emitting cleaner generation in the state to address energy needs and reduce imports of electricity in accordance with state energy policy.

Setting a stringent cap on already cleaner generation in Virginia absent a similar level of reductions from neighboring states would increase the cost burden to Virginia generators and would likely encourage lower cost electricity imports from out-of-state sources that are more carbon-intensive and not subject to a carbon cost adder. This could result in the unintended consequence of curtailing or limiting the dispatch of highly efficient and lower emitting NGCC facilities in Virginia and encouraging the dispatch of higher emitting resources in neighboring states (see matrix/table attached to these comments). With federal regulations currently stayed and under administrative review, few states outside of the northeast Regional Greenhouse Gas Initiative (RGGI) program and along the west coast have or are proceeding with definitive carbon regulations. This includes all of the remaining states that are part of the PJM Interconnection, LLC (except Maryland and Delaware which are part of RGGI), which is the regional transmission organization that operates the wholesale electric grid in the mid-Atlantic region including Virginia, North Carolina and West Virginia. At a minimum, any consideration of reduction targets for Virginia should include an evaluation of what surrounding states are doing in the absence of federal requirements and impacts that may have on power markets, trading opportunities, leakage and economic growth.

The baseline must also account for emissions from new generation projects, such as Dominion Energy's Brunswick and Greensville natural gas-fired combined cycle (NGCC) facilities that have already received air permits and either already commenced commercial operation or are under construction. These two facilities, each with capacity in excess of 1,300 MW, will operate some of the most efficient NGCC units with the most stringent greenhouse gas (GHG) limits in the country and will serve as base load facilities. Brunswick began commercial operation in April 2016; Greensville is expected to come on line in 2018 – likely before the carbon regulations are implemented. These units are critical in transitioning to a cleaner and less-carbon intensive generating fleet in Virginia.

Emission targets should be based on the deployment of existing, commercially available technologies. Dominion continues to analyze emissions reduction opportunities and finds that the following measures hold the potential for ongoing emission improvements:

- Heat rate efficiencies at existing coal-fired units;
- Capacity improvements at existing NGCC units;
- Maximize the dispatch from carbon-free nuclear and renewable sources first and then from lower-carbon NGCC units and other dispatchable resources;
- Co-firing coal units with natural gas where economical at appropriate units with proximity to natural gas pipelines;

- Efficiency improvements within the electric transmission and distribution system;
- Deployment of smart grid technologies such as voltage optimization software platforms.

We are also evaluating pumped hydroelectric storage, to be powered at least in part by renewable energy, as an additional energy supply for the Commonwealth.

Although the intent of the Governor's directive is to set Virginia on a path to regulating carbon in the absence of federal action and the apparent demise of the EPA's Clean Power Plan (CPP), it does not, nor should it compel the state to establish emission targets equivalent to levels that would have been imposed under the CPP. As we have previously indicated in past comments on the CPP, we believe that the mass-based carbon emissions target EPA established under the CPP underestimated potential future growth to meet energy demand and was the most costly compliance alternative identified in the Company's Integrated Resource Plan (IRP). This type of program, particularly if implemented without flexible program designs including interstate trading, would be constraining for a state like Virginia which forecasts economic growth and an electric capacity deficit position. Although established at the state-level, the limits required under the CPP presumed and envisioned a robust nationwide emissions trading program. Virginia should not impose more stringent emission reduction requirements to address a global environmental issue while other surrounding states we compete with economically have no established emission reduction goals or requirements. To the extent the CPP-based emission caps are considered, the caps should not be more stringent than the levels that would have been imposed under the CPP.

The program should allow for realistic timeframes to achieve emission reduction goals. This will provide needed time for the ramp-up of new renewables, energy efficiency programs, and infrastructure improvements in order to maintain the state's fuel diversity and its goal to become more energy independent. Reduction goals and implementation timelines must avoid premature retirement of remaining existing coal not otherwise shut down for compliance with other regulatory requirements.

Role of Nuclear Energy

The program must also recognize the critical role of extending the operation of Virginia's existing fleet of carbon-free nuclear generation. U.S. Nuclear Regulatory Commission (NRC) licenses for Dominion Energy's existing nuclear stations begin to expire in 2032. The loss of approximately 3,500 MWs of existing zero-emitting nuclear would significantly complicate compliance with any carbon reduction program in the post-2030 timeframe. To achieve electric output compatible with Dominion Energy's North Anna and Surry nuclear power stations would require over 98,000 acres of solar panels (over 2 times the size of Richmond, VA). In addition, generation from nuclear units provide a critical and stable source of electricity in all weather conditions and are increasingly needed to maintain the reliability of the electric grid. Dominion, with the support of Virginia policy makers, is leading the industry in working with the NRC on evaluating and applying the current regulations as the basis for nuclear units to apply for a subsequent license extension to operate beyond 60 years. These existing regulations will be supported with enhancements to existing license renewal tools and guidance documents, adding additional aging-related system reviews and associated upgrades. The continued operation of these zero-emitting resources will require significant financial investments that are comparable to building new combined cycle gas units, the only other large base load source of generation, yet with the associated carbon emissions. House Bill 2291, passed this year by the General Assembly and

signed into law by Governor McAuliffe, helps to support the process of the life extension of these units so that they can operate safety and efficiently for another twenty-year period.

Role of Energy Efficiency

The state's reduction targets should not be based on a presumption that energy efficiency potential from policies in neighboring states can be repeated and achieved in Virginia.

Energy efficiency programs historically have been financed by utilities. Dominion Energy continually works to achieve operating efficiencies in our existing generating units to get more output with fewer emissions. We also offer a number of end-use energy savings programs to our customers. Some of these existing programs are due to expire. Dominion Energy has filed approximately 35 replacement and new programs at the State Corporation Commission (SCC) for their review and approval. To date, about two-thirds of the proposed programs have been approved.

We continue to build upon our best in class energy efficiency and energy assistance program facilitated by the Governor's 2015 amendments to Senate Bill 1349 requiring the establishment of an energy assistance and weatherization program to serve low-income, elderly, and disabled customers as well as veterans. This program combines one-time energy assistance with the ongoing benefits of weatherization under the umbrella of our long-standing EnergyShare Program. This program has been widely recognized as the best in class in our industry.

There remains significant potential for energy savings from consumer-side energy efficiency program and we remain committed to expanding participation in the current programs and offering consumers more choices to achieve energy savings. However, the expansion and consumer use of these programs depends on state laws and regulations that allocate resources and approve of demand-side programs. In Virginia, energy efficiency and demand side management programs must be approved by the SCC based on cost/benefit studies and strict measurement and validation processes. It should also be noted that the ultimate successes of energy efficiency programs are generally within the control of the customer, not the utility. While utilities offer a range of consumer-friendly energy efficiency programs, they must nevertheless be prepared to still serve their native load should such programs not be as successful as hoped.

Accordingly, the state target should be based on well thought out and reasonable expectations of achievable energy savings and the compliance timelines must provide adequate time for the development, approval and implementation of the energy efficiency programs required to achieve such objectives.

Role of Renewable Energy and Natural Gas

Renewable energy needs to be part of the solution and additional renewable generation sources of solar, on-shore and off-shore wind and pumped hydroelectric renewable energy with back-up generation support from our highly efficient natural gas units have a strong place in our future investment strategy. At the beginning of the McAuliffe Administration in 2013, Dominion Energy had no generation from solar or on-shore wind sources. The company now has 423 megawatts of large-scale solar in Virginia either in operation, under construction, or under development, including power purchase contracts. All together, these facilities will produce enough electricity at peak output to power 105,000 homes. Our analysis shows that this rapid

expansion of renewable energy, particularly highly cost effective solar energy, will continue to increase rapidly.

Renewable energy, however, does have some challenges. It requires a reliable source of backup for when it is not available. While we continue to see advancements with respect to battery storage technology, further innovation is needed to achieve both the scale and cost-effectiveness necessary for storing the vast amount of electricity that would be required for renewables to reliably power our economy.

Natural gas is the lowest cost, cleanest and most reliable form of dispatchable generation to complement the integration of renewables to the electric grid. We will need our gas plants more and more to ramp up and down as Virginia grows its solar fleet. As noted previously, the Commonwealth is home to some of the most efficient NGCC units with the most stringent GHG limits in the country. This technology will also serve to provide "round-the-clock" baseload generation to replace retiring coal plants.

Another issue with renewables is the vast amount of land/real estate needed to produce sufficient power to meet energy needs. For example, 1 MW solar requires about 8 acres of real estate. In addition, significant grid improvements will be needed to accommodate growth in renewable energy. All of these challenges should be factored into assumptions regarding the expansion capability of renewable energy onto the electric grid in setting emission reduction targets.

Role of Electric Grid and Energy Infrastructure

Related to Dominion's ongoing rapid expansion of its renewable generation resources, the company is also examining the needed grid improvements to accommodate growth in renewable energy. Grid modernization is a national trend, and Dominion has taken an important first step with its strategic undergrounding program, an industry leading initiative to improve reliability which has received legislative support and approval from Governor McAuliffe in both 2014 and 2017 legislation. Building on these grid modernization efforts offers the opportunity to both better accommodate renewable energy and to improve customer reliability.

Role of Electrification to Reduce Carbon from Other Sectors of the Economy

In addition, in setting emission targets for the EGU sector, the state must recognize and account for the role and opportunity electrification of other sectors of the economy, such as transportation and cities, can play to reduce carbon emissions economy wide in the Commonwealth. For example, the Commonwealth intends to devote a significant amount of the environmental trust funds provided under the recent Volkswagen Consent Decree with EPA for promoting clean transportation technologies including the deployment of zero emission vehicle (ZEV) supply equipment, such as electric vehicle charging stations, as well as repowering large and medium-sized freight trucks, school and transit buses, port drayage trucks, locomotives, ferries and airport ground support and cargo handling equipment[3]. Sole focus on the electric generation sector and establishing too stringent an emission cap on in-state generation could impact the ability of the Commonwealth to holistically reduce carbon from other sectors of the economy.

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[3] Commonwealth of Virginia: Mitigation Plan for the Volkswagen 2.0 Liter Vehicle Partial Consent Decree, Appendix D at http://www.deq.virginia.gov/Portals/0/DEQ/Air/VWMitigation/plan.pdf?ver=2016-11-15-100015-493.

Applicability Considerations

In terms of affected EGU's subject to compliance obligations, the regulations should limit compliance applicability only to fossil fuel-fired EGUs that are greater than or equal to 25 MW. Small combustion turbines and boilers below this threshold should not be subject to compliance obligations under the program. This is consistent with many existing federal and state-level EGU-based emission reduction programs including EPA's Acid Rain program, the Cross-State Air Pollution Rule (CSAPR), the Mercury and Air Toxics Standard (MATS) rule and the northeast RGGI program.

In addition, the program should not impose any compliance obligations upon units that burn biomass as their primary fuel. No emissions attributed to biomass firing should require allowances. This would be consistent with EPA's approach in developing the Clean Power Plan (CPP) which did not include biomass generation in establishing the baseline and state emission reduction targets and did not require biomass units to hold emission allowances or surrender emission rate credits (ERCs) under the proposed mass-based and rate-based model trading rules. This compliance exemption should also apply to the emissions apportioned to the burning of biomass for fossil fuel-fired units that co-fired with biomass.

In 2013, Dominion made significant investments to converted three 51 MW units that used coal to 100 percent biomass, encouraged by EPA's prior determination that biomass was carbon neutral for Prevention of Significant Deterioration (PSD) permitting. Close proximity to an ample supply of waste wood biomass as well as EPA's "carbon-neutral" policy for permitting under the Prevention of Significant Deterioration (PSD) effective at that time were key economic drivers for these projects. Given Dominion's significant investment in renewable wood waste and forest residuals biomass, it is important for our customers that biomass emissions be considered carbon neutral.

Compliance Flexibility

The state program should provide for maximum compliance flexibility including the following:

- Use of emission trading with unlimited banking of allowances. The state should explore trading opportunities with other states and, where feasible, allow for linkages with other state programs to maximize market-based trading options.
- Allow for multiple-year averaging to demonstrate compliance with any interim and final target. This concept was allowed in the final CPP and the RGGI programs allow for a tiered surrender of allowances over a three-year period.
- Allow flexible resource options for use in demonstrating compliance with emission reduction requirements. These options should include:
    - Co-firing coal with natural gas or biomass;
    - Uprates at existing nuclear units;
    - Demand side and supply-side energy efficiency improvement programs, including voltage optimization and other electricity transmission and distribution efficiency improvements;
    - Generation from pumped storage.

RGGI

Although we have experience with RGGI though current and former assets in New England, we have serious concerns about potentially implementing the RGGI program in Virginia. We offer the following input to stakeholders considering RGGI in the Commonwealth.

- Although RGGI states have reduced carbon, the level of reductions achieved that can be solely attributed to RGGI itself is questionable. Emission reductions nationwide, including here in Virginia, have been comparable to the reductions achieved in the RGGI states and have been primarily driven by fuel economics (low gas prices) and the corresponding shift from coal to natural gas as well as lower load growth due to the 2008 recession.
- Although allowance prices in RGGI are currently around \$3.50/ton CO_2, the program is under an ongoing review and the RGGI states are exploring mechanisms that would set a trigger price, below which a certain amount of allowances would be held back from the auction in an effort to reduce amount of the allowance bank, increase the price and force more emission reductions.
- In addition, RGGI is considering increasing the stringency of the regional emissions cap going forward (post-2020), reducing the cap by as much as 3.5 to 5% per year. Currently, the cap is reduced by 2.5% per year.
- We have concerns about leakage if Virginia were to join RGGI and that our generating resources may not get dispatched if they are priced higher than other assets. As noted previously, we sell and buy our power into the PJM market which, with the exception of Maryland, consists of states that, to date, are not considering and have not developed or implemented carbon regulations. Accordingly, most other generators in the PJM market would not be subject to a carbon cost adder that generating units in Virginia would incur. This could result in the unintended consequence of curtailing or limiting the dispatch of highly efficient and lower emitting NGCC facilities in Virginia and encouraging the dispatch of higher emitting resources in neighboring states.

Conclusion

In conclusion, we've had a long-term trend towards cleaner generation at Dominion Energy and as reflected in our recent IRP and long-term planning, we expect to see that continue, notwithstanding the significant policy uncertainty at the federal level. We remain committed to working with our regulators and all stakeholders toward a workable carbon reduction program and policies here in Virginia that provide reasonable reduction timelines, flexible compliance options and keep fuel diversity, reliability and costs to customers top of mind.

Sincerely,

Pamela F. Faggert

Pamela F. Faggert

Ecc: Mr. David K. Paylor (DEQ)
Mr. Michael S. Dowd (DEQ)

Attachment

PJM Region - State CO_2 Emissions from Electric Generation (2015)

State	CO_2 (metric tons)	Net Generation (MWh)	CO_2 Intensity (lb/MWh)	Intensity Rank
West Virginia	66,270,000	72,295,269	2,017	2
Kentucky	76,427,000	83,543,671	2,013	3
Indiana	89,045,000	104,019,275	1,883	4
Ohio	83,722,000	121,893,401	1,511	11
Michigan	67,119,000	113,008,050	1,307	18
Delaware	4,091,000	7,810,006	1,152	23
Tennessee	37,977,000	75,214,636	1,111	26
Maryland	18,314,000	36,365,544	1,108	27
Illinois	84,275,000	193,952,040	956	31
Pennsylvania	90,973,000	214,572,291	933	32
North Carolina	53,824,000	128,388,445	922	34
Virginia	**34,898,000**	**84,411,592**	**910**	**37**
New Jersey	19,427,000	74,608,860	573	42

Note: State intensity rankings from highest to lowest emitters.
Source: State Electricity Profiles - Energy Information Administration