

July 26, 2017

COMMENTS OF
THE VIRGINIA CHAPTER OF THE SIERRA CLUB
CONCERNING DEQ's IMPLEMENTATION OF EXECUTIVE DIRECTIVE 11

The Virginia Chapter of the Sierra Club ("Sierra Club") welcomes Governor McAuliffe's directive in Executive Directive 11 ("ED11") for DEQ to develop and complete by the end of the year a proposed rule to implement a trading ready program to limit emissions of carbon dioxide (CO₂) from electric generation. This is an important step toward implementing CO₂ emission restrictions needed to protect Virginia, its citizens, natural resources and economy from climate change and its consequences.

OVERVIEW

These comments will focus on the appropriate elements for a rule, including alternatives in some areas. Since the Governor and DEQ do understand the urgency of the issues and the consequences of inaction, the Sierra Club incorporates, by reference, its previous comments and presentations in the proceedings surrounding the Governor's EO 57, rather than restating the factual support for such a rule. We would like to underscore, however, that (a) a rule requiring deep CO₂ reductions is badly needed to protect Virginia's people and economy and (b) deeply reducing Virginia's CO₂ from electric generation is technically and economically viable.

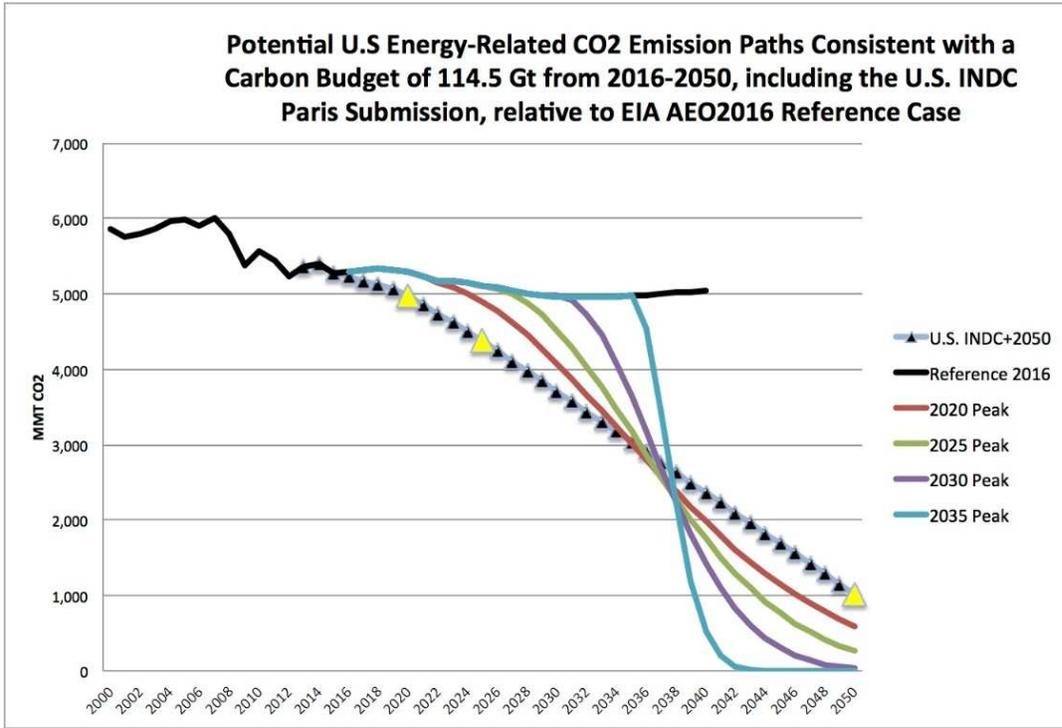
Briefly, we submit that the proposed rule should include the following key elements, each of which we submit can be implemented under current law, without need for additional legislation:

1. The rule should apply to both new and existing sources and implement a declining mass-based cap that reduces CO2 emissions from covered electric generation.
2. The cap should decline steadily from the beginning of the program, and early CO2 reductions should be incentivized. The aggregate cap should reduce aggregate emissions by the greater of (a) 33-40% from 2015 levels by 2030 or (b) the level required to join a trading regime. To assist long-term planning, the rule should require continued steady reductions through 2050 (to 80-95% of 2015 levels) subject to the possibility that the rate of reduction may be adjusted based upon experience new scientific evidence. An annual reduction of the cap for new and existing generation by approximately 1MMtons (roughly 3%) from a starting point based on 2015 emissions from covered sources illustrates a reasonable reduction path for interim (2030) and long-term (2050) purposes. Long-term investments (40-60 years for much generation) need long-term guidance.
3. The basic elements of the proposed rule should be compatible with the operations and standards of the Regional Greenhouse Gas Initiative (“RGGI”), which is the only trading regime currently operating in the Eastern United States. This would include the definitions of allowances (one short ton of CO2), retirements matching emissions, adoption of key elements of RGGI’s tracking and accounting system (COATS), etc. This would enable Virginia generators to trade (a) within the Commonwealth from the start (whether or not we join or link to RGGI) and (b) within RGGI if a linkage or membership agreement is reached. (If an agreement were to be reached with some other trading market, appropriate adjustments can be made.) Creating an incompatible program from the outset would be costly and not “trading ready.”
4. Allowances can be allocated in several possible ways. In the comments below, we recommend that allowances be auctioned to all generators, with revenues (all or part) being allocated among utilities or others in a manner that helps to achieve the rule’s objectives. Some allowances should be held in reserve for possible distribution in order to stabilize markets or address other emergencies.
5. Program progress must be closely monitored and reported. This includes, for example, for results (prices, transfers, banks, and emissions), procedures and unintended consequences (e.g., pollution hot spots, market manipulation, temporary emergencies, etc.). There should be periodic evaluations and, if needed, amendments should be made to the program to reflect market experience and to improve outcomes.
6. Efforts should be made to join or link to a credible, mass-based trading market, such as RGGI, as soon as reasonably practical. A larger market will lower the costs and provide greater flexibility for market participants. While there may be valid alternatives to RGGI (e.g., California-Quebec), there is no merit to the suggestion that RGGI is problematic

because its members retail rates are higher than Virginia's. If anything, their higher energy prices will put downward pressure on CO2 prices that markets will tolerate and that would benefit a lower cost state, such as Virginia. Nor would there be a "loss of control" inasmuch as RGGI is a voluntary, collaborative organization.

7. The final rule should be completed in 2018 and implemented in 2019.
8. Issues pertaining to leakage – growth in GHG emissions incentivized but not covered by the rule – should be addressed in separate proceedings. This important proceeding should not be delayed.

Virginia should embrace the Governor's direction to implement reductions in CO2 emissions from electric generation. Virginia should commence those reductions as soon as possible. The sooner Virginia does so, the sooner its economy will move toward a profitable, clean energy future and healthier communities. Even if other states are slower to catch on, Virginia will benefit. Scientists and governments around the world have recognized that human emissions of CO2 and other GHGs are causing the world's climate to change dangerously and that we must rapidly reduce those emissions if we are to avoid catastrophic outcomes from people, natural systems, agriculture and the economy. Since the needed reductions are based on a total quantity of tolerable emissions minus accumulated CO2 emissions, the longer we keep emitting at current (or rising) levels, the steeper and more costly the required reductions will be when we finally get started. This is illustrated by the graph below. The U.S. emission paths in this graph, other than the Reference 2016 case, are consistent with keeping U.S. cumulative carbon emissions to within 141.5 GT, or 17% of the estimated global carbon budget needed to keep global temperature increase to less than 2° C.



Despite the recent actions by the Trump Administration, we know the world is moving to cut carbon pollution and some other states and communities are committed to doing so as well. The U.S. will return to the fold or suffer for failing to do so. It is in Virginia’s interest to be at the leading edge of the carbon-reduction, clean energy movement, rather than continuing to invest in and operate technologies that are destined to harm our citizens and decline in value. Clean energy and energy efficiency generate jobs and economic growth, attract businesses and produce energy bill savings.

RECOMMENDATIONS

As recognized by the Governor and the final report of the EO57 Work Group, Virginia law empowers the State Air Pollution Control Board to promulgate regulations to protect the public

from pollution, including greenhouse gas pollution.¹ These comments are intended to propose ways to do so consistent with existing law.

A. Implement A Mass-Based, Declining Cap For New And Existing Sources

1. **Mass Based.** In order to meaningfully combat climate change, we must reduce total CO₂ emissions in absolute terms not relative terms. Consequently, there must be a mass-based cap which applies to both new and existing generation and steadily reduces the aggregate CO₂ emissions from those plants. All electric generators that emit CO₂ (above a de minimus size) must be required to obtain and retire allowances for their emissions. Growing electricity markets can be served with growing zero-carbon energy investments and with allowances freed up with energy efficiency. But, the climate will only be protected if the total CO₂ emissions are reduced. Reducing “carbon intensity” while maintaining or increasing CO₂ emissions will doom our citizens and our planet. Climate systems respond to levels of CO₂ and other GHGs, not to levels of economic activity. As demonstrated by Dominion’s 2016 and 2017 IRPs, failure to establish a declining mass-based cap applicable to new and existing generating sources will result in rising CO₂ levels over the next 25 years. Without regulations compelling actual reductions in CO₂, Dominion 2017 IRP projects that the company would increase its *direct and indirect* CO₂ emissions (from generation and purchases) by up to 35% by 2042. Its 2016 IRP showed that without aggregate limits applicable to new and existing generation, Dominion’s own emissions would rise by more than 80% over 25 years. In contrast, the U.S. needs to reduce its economy-

¹ CO₂ fits Section 10.1300’s definition of air pollution and Section 10.1-1307A gives very broad authority to implement “a comprehensive program for the study, abatement and control of all sources of air pollution in the Commonwealth.”

wide emissions by 80%-90% by 2050, and it must do so steadily, not make a last minute leap off a pollution cliff.

2. **Broad Coverage.** Both utility and non-utility (“NUG”) fossil fuel generating units in Virginia must be covered by caps and allowances, subject to a possible exception for small units.² However, an exception for small units should not exempt utility-owned peakers or other utility-owned generators, which operate as part of the utility’s overall system and should be counted in its footprint. We also submit that emissions from generation using biomass, especially wood-based biomass, should also be covered inasmuch as it emits CO₂—sometimes at higher levels per MWH due to moisture content of biomass—and the CO₂ recapture rates associated with wood growth are very slow and uncertain, at best.

3. **Allowances to Emit CO₂ Required.** All operators of covered generation must be required to acquire “allowances” (permits) to emit units (“short tons”) of CO₂ and to retire those allowances as CO₂ is emitted. The allowances would be tradable, *i.e.* eligible to be purchased and sold within Virginia or in such larger market as Virginia enters.

4. **Declining Cap With Interim and Long-Term Requirements.** The total quantity of CO₂ emission allowances must be capped and reduced steadily over time. If they are not capped and steadily reduced, then current and future generations alike will face catastrophic consequences, including greater economic dislocations, heat waves, coastal losses, more extreme weather events, flooding, droughts, crop failure, forest and grass fires, mass species extinction, submersion of communities, and mass human migration. Establishing steadily declining limits

² There may be a practical limitation on the appropriate size of covered generating units. Very small generators may appropriately be excluded at least initially. With experience, the size may reasonably be reduced and the scope may be extended to non-generation emitters.

over a long period (e.g., to 2050) will help power producers to plan and to avoid making investments that are later stranded and dumped on captive ratepayers. Although they know that dramatic GHG reductions are critical to save ourselves and our planet, generators will take advantage of free pollution opportunities (plunder the commons) unless they receive clear regulatory guidance and price signals. (This is clearly demonstrated by Dominion's 2016 and 2017 IRPs which reveal its plans to keep raising CO2 emissions unless rules prevent that result.) We also know that early and steady reductions will do more to protect our economy and climate than trying to conduct business as usual while delaying and increasing the annual magnitude of the needed reductions. For CO2, it is the cumulative total emissions that matter the most to climate impacts.

Clear interim and long-term reduction requirements will help the SCC, as well as utilities and other generators. It is harder to plan and assess the public interest in the costs, risks and benefits of new generation, transmission and efficiency proposals, if the SCC is left to speculate about future CO2 reduction policies. In the absence of such guidance, it will be pressed by utilities to build expensive facilities as if CO2 emissions will have no additional future costs or limits. Since new generation and transmission will be built to last 40-60 (or more) years, utilities and the SCC need to know that CO2 limits will continue to tighten beyond 2030. Otherwise, they may make short-sighted investments in fossil fuel generators that meet a near-term target but are wholly incompatible with the longer term needs. Captive ratepayers should not face stranded costs while utilities claim that no one told them that deeper cuts would be required.

Interim goal. The rule should establish a near-term (interim) goal for 2030 of reducing total CO2 emitted by covered generators by the greater of (a) 30-40% from a recent year prior to

ED11, such as 2015, or (b) by more if called for by a larger trading regime joined by Virginia. The allowance cap should be reduced in steady increments each year through this interim period. This would cut CO₂ and put companies on a path to the needed long-term goal and insure that cumulative carbon emissions are not increased.

Long-term goal. Adopting a long-term goal would put all participants on notice that they must plan for deeper reductions. There has long been a recognition—including in the Report of the Virginia Governor’s Commission on Climate Change—that the U.S. needs to reduce its overall emissions by 80% or more by 2050. That level has been in several documents signed by the United States for economy-wide reductions. And, as recognized by scientists and virtually all nations in the Paris Agreement, the world will need to achieve zero-net carbon emissions sometime after that.³ Indeed some reports indicate we will need zero net emissions before then. Continued regulatory inaction is not an acceptable option.

Unfortunately, because atmospheric CO₂ has accumulated significantly since scientists warned and many leaders warned of the need for emission reductions, the CO₂ reductions that we now need are closer to 90% by 2050. Fortunately, however, falling prices and rising availability of solar, wind, efficiency, storage and other zero-carbon energy sources, plus improvements in grid-integration technologies, have made it both technically and economically feasible to achieve the needed reductions. Those clean technologies are major job creators, and they are producing an array of health benefits on top of the climate benefits. When the harms from climate change and air pollution are factored in, there is a net benefit even in purely

³ See Paris Agreement, Art. 4, Section 1, which calls for a balance of emissions and sinks (net-zero carbon emissions) after 2050.

economic terms, to which one adds moral, cultural and ethical duties to our descendants and fellow species.

In sum, to enhance long-term planning and investments, the final rule should establish a steady CO₂ reduction rate that begins from the level of a recent, pre-ED11 base year (e.g., 2015) and lowers the cap annually from 2019 through 2030 and to 2050. An annual reduction rate for the cap of 1 MM tons or 3% of 2015 emissions extending from the start of the rule in 2019 to 2050 would achieve reasonable interim and long-term goals and give clear planning guidance to generators, utilities and other agencies, such as the SCC. The annual reduction rate could be adjusted before or after 2030 if the experience and evolving scientific data calls for a change. Delaying the start of the reductions or allowing greater emissions in early years would require steeper reductions each year thereafter.

Deeper Reductions if Required by Interstate Trading Agreements. There is nothing wrong with a state having a stronger interim or long-term reduction requirement than its trading partners. We understand that some RGGI members have long-term goals stricter than other RGGI states. However, Virginia should never have weaker reduction requirements since that could distort the trading markets. Since RGGI updates its reduction targets periodically based on experience—typically that reductions are achieved faster and cheaper than originally expected—Virginia should build in a provision for updating reduction requirements if needed to comply with a multi-state trading regime.

Generator-specific limits. DEQ and the Air Board should consider generator-specific caps designed to protect residents near or downwind of individual generating stations. That is, generators—particularly coal-fired generators—should not increase their pollution over the base-

year level through allowance purchases. Such a limit would limit the risks that auctions and trading might aggravate the number or intensity of pollution hot-spots involving the larger panoply of pollutants, SO₂, NO_X, smog, mercury, coal ash, etc. Such a limitation would be most important for coal-fired generating stations, but might also be relevant to biomass.

5. **Flexibility.** A trading regime offers considerable flexibility to generators to allow them to buy and sell allowances as needed. A reasonable trading structure provides one important form of flexibility for individual generators and for the system as a whole. That flexibility would be enhanced by joining a larger trading market, such as RGGI. Joining a larger, functioning mass-based trading market would give generators access to more sellers and buyers thereby lowering the costs of CO₂ allowances and program compliance. Joining a larger market would also lower the risk that a large entity would be able to exert market power.

The issue of banking allowances from one year to the next will be raised. We are skeptical of the benefits and the risks of misuse. If banking is permitted, the quantity and duration of banking should be limited in order to avoid hoarding and market manipulation or a future jump in emissions.

In addition, the system administrator should withhold some allowances to permit distribution in the event of an emergency or market disorder or market manipulation.

6. **Monitoring for Unforeseen Problems.** DEQ and the Air Board should monitor implementation for unforeseen problems, such as attempts at market manipulation, hoarding, harmful leakage and the growth of pollution hot-spots downwind or in the vicinity of dirty

generating stations. If such problems emerge, regulators should initiate proceedings leading to orders or rules correcting the problems.

B. Prescribe Implementation Standards and Protocols Compatible with RGGI.

Standards and protocols are needed to implement an allowance-based, trading-capable regime for carbon reductions. The regime adopted by Virginia should be compatible with the most likely trading regime, which is RGGI. RGGI has a well-established set of standards and protocols, which have been refined over years and tested in the market place. Even if Virginia does not reach an agreement to join or link to RGGI, it would benefit from following the lead of RGGI's work. The trading rules could be used among Virginia companies with or without joining RGGI. If a different candidate emerges as a trading regime, it would likely have rules generally similar to RGGI, and it would be easier to amend Virginia's rules to make the adjustments than to start from scratch.

Necessary elements include, but are not limited to:

- Definitions
- Units of allowances transactions
- Standards and requirements for tracking and accounting for participants' allowance usage, trades, trade prices, retirements, banks, etc.
- Means of tracking aggregate patterns of allowances uses, pricing, retirements, banks, etc.
- Methods of measuring or calculating emissions and aligning them with allowance holdings and retirements.
- Reporting by participants and by the market administrator.

- Use of auction methodology (sealed bid, uniform price) that would fit with RGGI's.
- Clear statement that the regulations, particularly allocation methods and procedures, do not create property rights precluding amendments and orders affecting the rules or their implementation.

C. Allocations or Auctions of Allowances in a Basic Program.

Emission allowances can be distributed among market participants in a variety of ways with different implications for market success and fairness. We think that this should be the subject of a public hearing or supplemental procedure in which issues surrounding specific proposals can be addressed. This important issue should not be left to a subgroup dominated by utilities and other generators. Against this background, we will lay out several important components of an efficient and effective system of allocating allowances.

1. **Auctioning allowances is preferable to a simple allocation.** Auctioning allowances has the advantages of allocating allowances based on price so that buyers acquire them only if they need them relative to the cost of other available options, such as generation or purchases of zero-carbon energy or energy efficiency. A reserve price should be established to assure that some minimum price is bid by all buyers.

2. **An auction could potentially be structured in different ways.** The following are two examples for auctioning all allowances that are not held back to address particular problems. In any auction, DEQ or the Air Board should set a reserve price for bidding.

- a. Allowances would be put in a pool and auctioned under procedures implemented by Air Board, DEQ, or an independent entity. All buyers would begin from the same

starting point and have to bid into the auction to acquire allowances (or buy in the resale market). There would be a single clearing price based on the lowest successful sealed bid. (Treatment of revenues is separately discussed below.) This has an advantage of simplicity.

b. Under a consignment structure, allowances could be allocated by a formula subject to a requirement that all those allowances be sold to winning buyers in a common auction run by DEQ or an independent entity. All interested entities would buy their needed allowances in the common auction. Revenues would go to sellers of allowances into the auction at the clearing price, subject to conditions on the use of the revenues to promote the purposes of the rule (reducing emissions) and cost mitigation for consumers. (See below.)

3. Allowances could be allocated among generators in different ways.

a. In a consignment auction, revenues would presumably go (at least primarily) to the entities selling allocated allowances into the auction, so pre-auction allocations among potential sellers would be critical. (Importantly, since all allocations would have to be sold in the auction, all generators would have an equal opportunity to bid and acquire allowances.) Here, initial allocations (and thus revenues) could go entirely or primarily to utilities, but some could also be assigned to non-utility generators and possibly others that will providing “incremental zero-carbon” energy solutions as an incentive for new generation. As used here, “incremental zero-carbon” energy solutions could include, for example, solar and wind generation, storage to support solar and wind, and possibly efficiency retrofits constructed after the rule was proposed or finalized. Awarding a share

of allocations or revenues to “incremental zero-carbon” energy solutions for a few years after they start operations would serve the purposes of the rule by providing a temporary financial incentive to attract energy sources or reductions that add no CO₂ to the atmosphere. (Zero-carbon generation would not include biomass, particularly slow-regenerating biomass such as woody biomass.)

b. If there were an allocation of allowances without an auction, then allocations would presumably need to be made among all generators since allowance holders would not be obligated to sell their allowances and could unfairly drive competitors out of business. One would have to address the issue of updating those initial allocations without distorting incentives or markets.

c. Regardless of whether an allocation of allowances occurs prior to a consignment auction or otherwise, several factors should be considered. (i) The allocation method should be designed not to reward pre-rule jockeying (e.g., pushing up emissions to claim a larger share of allowances). This is one reason that starting reductions from a pre-rule base year, such as 2015, would be reasonable. (ii) The allocations should not be “generation-based” in a way that rewards any increases in CO₂ emissions or new CO₂-generating facilities after the rule is implemented. Nor should a “generation-based” allocation give a share of the limited CO₂ pool to utilities for their nuclear generation since such large allocations would potentially give the recipients market power over other utilities or generators that need allowances. (iii) In designing allocations of allowances or revenues, consideration should be given to helping residential customers and particularly low-income residential customers, with efficiency, renewable energy and cost reduction,

without reducing the price signals they receive for future purchases of electricity from carbon-emitting generation. (iv) The rule should provide for a holding back of allowances to address emergencies (possibly through loans) or other exigent circumstances. (v) Some allowances might appropriately be distributed to those providing incremental (new) zero-carbon energy generation or other solutions for a few years after start-up as an incentive (possibly including assistance to local governments to assist them in reducing their carbon footprints and costs which benefits everyone they serve).

4. Treatment of Revenues. It is important that the distribution of revenues support the purposes of the rule (*i.e.*, promoting zero-carbon energy and energy efficiency), while fairly protecting consumers, particularly residential consumers.

a. In addition to having the power to “develop a comprehensive program for the study, abatement, and control of all sources of air pollution in the Commonwealth,” the Air Board is authorized by law to “receive money from any...source whether public or private.” Specifically, Section 10.1-1307 states in part:

“The Board shall have the power to... cooperate with and receive money from the federal government or any county or municipal government, and receive money from any other source, whether public or private; develop a comprehensive program for the study, abatement, and control of all sources of air pollution in the Commonwealth....”

Thus, it appears that the Board has the power to administer an auction as part of a program comprehensive program for the abatement and control of sources of air pollution in the Commonwealth. It also appears to have the power to receive money and presumably use it as part of “a comprehensive program” to abate and control sources of

CO2 pollution in the Commonwealth. Even if it runs an allowance auction and distributes “auction revenue shares” without actually receiving the money, it should be able to condition the distribution of “auction revenue shares” to assist in achieving the air pollution “abatement” and “control” goals rapidly and at low costs to residents.

b. In a consignment auction, it would be reasonable to condition allocations of allowances upon the recipient’s using the revenues from the auction to mitigate its emissions through energy efficiency, zero-carbon renewable energy or storage investments—including supporting utility and NUG investments in zero-carbon solutions (solar, wind, efficiency, storage), customers’ investments in efficiency and self-generated renewables, and assistance to low-income and other customers while not disrupting price signals to conserve. The revenues from allowances should not be taken as corporate profits, nor should it be invested in dirty energy sources or to promote more energy consumption or to support other measures that would undermine the purposes of the rule.

5. Illustrating A Possible Approach to Auctioning and Distributing Revenues.

As a matter of economics and equity, it makes sense to auction emission allowances to all covered generators while returning auction revenues to consumers and/or incentivizing expansion of zero-carbon energy solutions by utilities or others. Such auction might work as follows:

- a. *All permitted allowances (except a limited number withheld for market stabilization or other needs) would be auctioned to all new and existing generators who need them. (RGGI conducts quarterly auctions, which would be reasonable.)* The auction could be conducted by DEQ, the Air Board, or an

independent entity retained by the utilities (possibly using a small percentage of the auction revenues to fund the independent entity.)

- b. *The auction would follow a sealed-bid, uniform price format (consistent with RGGI's successful format). DEQ or the Air Board should set a reserve price that it deems reasonable (perhaps the same as adopted by RGGI or other interstate platform in the same period).*
- c. *Each load-serving utility that complies with the disposition conditions (see below) would receive a share of the revenues from the auction—either from a simple auction or a consignment auction. The shares and disposition conditions could be based upon load, numbers of customers, measures to reduce carbon emissions, or a combination of factors. Keeping the revenues as profit or to support carbon-emitting generation would be inconsistent with the disposition conditions. A utility that does not agree to the disposition conditions would not receive a share of the auction revenues. To the extent otherwise required by law, a utility may need to get SCC approval to receive and dispose of revenues.*
- d. *The following example illustrates how allocations to utilities and the disposition conditions could address different issues.*
 - i. *50-75% of amounts available to utilities might be allocated to utilities that forward pro rata shares to residential customers, within 30 days, separate from utility bills for services. Allocating among the participating utilities based on the number of their residential customers would produce roughly equal payments to residential customers around the state. That makes sense since the air and our climate are our shared public goods, and this will help customers address climate and cost impacts without lowering rates in different amounts or in ways that encourage consumption and pollution. (Single meter, multi-family complexes may require the owner's cooperation in distributing sums or in identifying residents, but this should be able to be worked out.) A larger allocation or additional assistance (e.g., assistance reducing their energy usage) might go to low-income customers, but even equal "dividends" would benefit them because their units tend to be smaller and their energy bills are a larger share of their income.*
 - ii. *The remainder of utility allocations could go to support utilities' actions to promote energy efficiency, build zero-carbon renewable energy (solar, wind, etc.), install zero-carbon storage measures, and possibly other*

technologies (e.g., accelerated deployment of distributed zero-carbon generation) needed to reduce GHGs. (Greater detail on appropriate options would be in the final rule.) The amounts could not be used simply to pay for allowances in an auction or a trade, nor to increase profits, reduce debts, or other purposes unrelated to the purposes of the rule. Utilities subject to SCC review would not be relieved of the need to obtain any approvals needed from that agency for investments in GHG-reducing measures, including proving that the investments meet the requirements of these rules.

- iii. *A portion of the overall allowance revenues might be made available to support third-parties’ “incremental zero-carbon” energy solutions. Sellers, local governments and possibly others could be eligible. As noted above, eligible “incremental zero-carbon” energy solutions could include zero-carbon energy generation (e.g., wind, solar, wave, etc.), storage (batteries, flywheels, etc.) and long-term energy efficiency enhancements. We do not include biomass, particularly slow-regeneration biomass, which are not carbon neutral in the needed time frame, if ever. These incentives should be only for (a) installations that are announced and installed after the rule is proposed and (b) only for the first few years of operation. Capping the duration and size of these incentives for any individual projects will spread the incentives and prevent anyone from dominating the opportunities and undermining competition.*
- iv. *Reporting by recipients of these funds would be required to show that appropriate payments were made to customers; information would have to be submitted, in advance, to show how money to be retained for GHG-reduction purposes would serve those purposes; and A follow-up report should be required to prove that the money was spent for such purposes and to show the results.*
- v. *DEQ would regularly report to the public about the prices, proceeds and distribution of proceeds from the auction. It should also report on the allocations and dispositions of funds by the auction operator and by each recipient of auction revenues.*

E. Leakage Issues and Possible Solutions

Confining allowance requirements to combustion from in-state generation is a critical minimum, and is clearly lawful. That should be the highest priority of this proceeding. However, leakage—increases in GHG (CO₂, methane, N₂O) in fuel and other generation markets—could

undercut some of the benefits to be achieved by a rule that focuses on CO2 emissions from in-state generation. Climate pollution is not a local problem. Upstream emissions from fuels and electricity purchased by Virginia utilities will also harm Virginians. These problems are real but, except as noted, we suggest that they be addressed in separate proceedings after DEQ and the Air Board have adopted rules addressing CO2 from generation in Virginia problems that DEQ and the Air Board should consider and address to the extent legally permissible.

a. Methane. Methane is a byproduct of natural gas development and transportation, as well as a byproduct of coal and petroleum production. It has profound climate consequences. Methane has a global warming potential that is 87 times more powerful than that of CO2 over 20 years and 36 times natural gas over 100 years. Expanding natural gas fired generation yields more CO2e than just from its combustion. Leakage and venting in production areas has been estimated as being up to 12% of production in some areas, and leakage and venting also occurs in transportation, gathering and processing. It is a real problem associated with expanding fossil fuel generation.

Methane emitted in Virginia by energy producers (and possibly others) could be directly addressed now in a separate rulemaking. Reducing methane leaks and venting would be beneficial independent of the CO2 reduction program for electric generation. The Virginia Chapter of the Sierra Club has asked the Administration and DMME to reduce emissions from natural gas production in the state, but a broader rule addressing emissions from all energy production and possibly other sources could be undertaken by DEQ and the Air Board. We request that they undertake such a rulemaking as soon as possible.

In addition, in the context of follow-up rulemaking on emissions from electric generation, DEQ and the Air Board should also consider the nexus between electric generation and upstream methane emissions. It might consider, for example, whether the allocation of CO₂ allowances should be weighted to reflect GHGs from the fuel life-cycle of fuels used to power in-state generation. For example, a natural gas generator might be required to purchase more allowances to reflect the CO₂e of methane emitted in the production, processing, gathering and transportation of natural gas burned by gas-fired generators. Without this recognition, there may be a tendency of Virginia utilities and NUGs to continue building natural gas generators that do more climate harm than is apparent from their direct CO₂ emissions.

This is an important issue, but also complex. It should be addressed in separate proceeding rather than slow down this one.

b. Electricity Imports. Carbon emissions associated with energy purchases is an issue that deserves future consideration. It is complex since it involves a multi-state setting and PJM's operations. We would suggest that this be addressed in a separate proceeding, rather than slow this one.

In the short-term, however, Mt. Storm offers a discrete situation. Dominion owns and operates its Mt. Storm coal-fired generating station, which is located just over the border in West Virginia. Although located in West Virginia, it is operated as an integral part of Dominion's generating system and is included in its regulated rate base. DEQ should explore whether Dominion would voluntarily subject its Mt. Storm facilities to Virginia's CO₂ allowance program in exchange for raising the cap and allocating additional allowances based on Mt. Storm's base-year emissions profile. Those additional allowances could be used by Dominion

for Mt. Storm or for other activities in Virginia. To the extent Dominion may seek to treat its North Carolina renewable generation as a way to mitigate its emissions, Mt. Storm should be part of that picture. Since covering Mt. Storm might be mutually beneficial, this is at least worth considering although we reserve judgment on whether an emergent arrangement is, in fact, beneficial to Virginia.

F. CONCLUSION

Action is needed as soon as possible. A final rule should be implemented no later than the beginning of 2019. Virginia should work hard to identify a compatible multi-state trading system that Virginia can join or link to, but implementation of a final rule should not await joining RGGI or other organization. In-state trading can begin as soon as the rule is implemented. Any adjustments needed to link to a larger market can come later.

DEQ and the Air Board should carefully monitor operation of the rules to be sure that they are achieving the goals of reducing CO₂ emissions from Virginia's electric power system. It should look for ways to stem problems, such as hot-spots and market manipulation, to the extent they are not adequately addressed by the initial rule. If harmful unintended consequences do arise, efforts should be made to cure them promptly without undercutting the essential goals of reducing CO₂ emissions as rapidly as possible. Long-term and near term goals should be clear. And, Virginia should tighten the reduction requirements as the science calls for greater reductions.

Respectfully submitted,



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