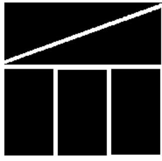


Virginia Department of Planning and Budget

Economic Impact Analysis

9 VAC 5-140 Regulation for Emissions Trading
Department of Environmental Quality
Town Hall Action/Stage: 6082 / 9879
December 21, 2022

The Department of Planning and Budget (DPB) has analyzed the economic impact of this proposed regulation in accordance with § 2.2-4007.04 of the Code of Virginia (Code) and Executive Order 19. The analysis presented below represents DPB's best estimate of these economic impacts.[1]

Summary of the Proposed Amendments to Regulation

The State Air Pollution Control Board (Board) proposes to repeal all of the existing language in Part VII of 9 VAC 5-140 *Regulation for Emissions Trading*,[2] which addresses the carbon dioxide (CO_2) Budget Trading Program, and add temporary transition language in a new section so that the repeal can be implemented without disruption to affected facilities or the electricity market.

Background

The Regional Greenhouse Gas Initiative Generally

The current regulation enables Virginia's participation in the Regional Greenhouse Gas Initiative (RGGI).[3] RGGI is a cooperative effort among the states of Connecticut, Delaware,

[1] Code § 2.2-4007.04 requires that such economic impact analyses determine the public benefits and costs of the proposed amendments. Further the analysis should include but not be limited to: (1) the projected number of businesses or other entities to whom the proposed regulatory action would apply, (2) the identity of any localities and types of businesses or other entities particularly affected, (3) the projected number of persons and employment positions to be affected, (4) the projected costs to affected businesses or entities to implement or comply with the regulation, and (5) the impact on the use and value of private property.
[2] See https://law.lis.virginia.gov/admincodefull/title9/agency5/chapter140/partVII/
[3] See https://www.rggi.org/

Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania,[4] Rhode Island, Vermont, and Virginia to cap and reduce power sector CO_2 emissions. Each state has allocated base budgets of CO_2 emission allowances for each year. A CO_2 allowance represents a limited authorization, issued by a participating state, for a regulated electric power plant to emit one short ton of CO_2. Regulated electric power plants (i.e., fossil-fuel-fired electric power generators with a capacity of 25 megawatts or greater) can use a CO_2 allowance issued by any participating state to demonstrate compliance in any state. They may acquire allowances by purchasing them at quarterly RGGI auctions, or through secondary markets.

The allocated base budgets of CO_2 emissions for each state are reduced every year. Hence the total amount of allowed CO_2 emissions across all of the RGGI states is reduced every year.

Virginia Revenues from RGGI

Virginia began participating in RGGI in 2021, and thus far has participated in eight quarterly auctions. Table 1 below shows the number of Virginia allowances sold in each auction, the market price for those allowances, and the proceeds from the sale of those allowances.

Table 1: Virginia Allowance Auction Results[5]

Auction Date	Allowances Sold	Allowance Price	Allowance Proceeds
March 3, 2021	5,735,509	$7.60	$43,589,868
June 2, 2021	5,698,446	$7.97	$45,416,615
September 8, 2021	5,698,445	$9.30	$52,995,539
December 1, 2021	6,587,274	$13.00	$85,634,562
March 9, 2022	5,497,712	$13.50	$74,219,112
June 1, 2022	5,497,711	$13.90	$76,418,183
September 7, 2022	5,497,711	$13.45	$73,944,213
December 7, 2022	5,497,711	$12.99	$71,415,266
Total	**45,710,519**		$523,633,357

[4] Pennsylvania's RGGI regulation, and hence participation, is currently under a court injunction. Source: https://www.rggi.org/program-overview-and-design/elements

[5] Data source: RGGI

Code of Virginia § 10.1-1330[6] states that the proceeds are to be used for the following purposes:

> 1. Forty-five percent of the revenue shall be credited to the account established pursuant to the [Virginia Community Flood Preparedness Fund][7] for the purpose of assisting localities and their residents affected by recurrent flooding, sea level rise, and flooding from severe weather events.
>
> 2. Fifty percent of the revenue shall be credited to an account administered by [Department of Housing and Community Development] DHCD to support low-income energy efficiency programs, including programs for eligible housing developments. …
>
> 3. Three percent of the revenue shall be used to (i) cover reasonable administrative expenses of the [Department of Environmental Quality (DEQ)] in the administration of the revenue allocation, carbon dioxide emissions cap and trade program, and auction and (ii) carry out statewide climate change planning and mitigation activities.
>
> 4. Two percent of the revenue shall be used by DHCD, in partnership with the [Department of Energy], to administer and implement low-income energy efficiency programs pursuant to subdivision 2.

RGGI billed the Commonwealth $592,920 and $638,238 for its 2021 and 2022 administrative costs, respectively.[8] After subtracting the quarterly payments to RGGI, the distribution of funding for programs and agencies from the auction proceeds are shown in Table 2 below.

Table 2: Distribution of Funding

Auction Date	Flooding	Energy	DEQ Admin.	DHCD Admin.
March 3, 2021	$19,548,737	$21,720,819	$1,303,249	$868,833
June 2, 2021	$20,379,773	$22,634,192	$1,358,052	$905,368
September 8, 2021	$23,781,289	$26,423,654	$1,585,419	$1,056,946
December 1, 2021	$38,468,849	$42,743,166	$2,564,590	$1,709,727
March 9, 2022	$33,326,799	$37,029,776	$2,221,787	$1,481,191
June 1, 2022	$34,316,381	$38,129,312	$2,287,759	$1,525,172
September 7, 2022	$33,203,094	$36,892,327	$2,213,540	$1,475,693
December 7, 2022	$32,065,068	$35,627,853	$2,137,671	$1,425,114
Total	**$235,080,990**	**$261,201,100**	**$15,672,066**	**$10,448,044**

[6] See https://law.lis.virginia.gov/vacode/title10.1/chapter13/section10.1-1330/#v1/
[7] The Virginia Community Flood Preparedness Fund is administered by the Department of Conservation and Recreation. See https://law.lis.virginia.gov/vacode/10.1-603.25/
[8] Source: DEQ

Costs

Table 3 below shows the tons of CO_2 emitted by regulated owners of electric power plants in Virginia during 2021.

Table 3: 2021 Tons of CO_2 Emitted[9]

Source Owners	CO_2 Tons in 2021	Percentage
Dominion Energy	18,265,441.65	68.4 %
Doswell LP	2,515,762.32	9.4 %
Potomac Energy Center, LLC	2,099,241.03	7.9 %
Tenaska Virginia Partners, LP	1,546,602.40	5.8 %
Old Dominion Electric Cooperative	1,260,517.00	4.7 %
Hopewell Power Generation	506,182.21	1.9 %
Buchanan Generation	225,450.08	0.8 %
Birchwood Power	104,810.07	0.4 %
Appalachian Power Company	100,316.86	0.4 %
Wolf Hills Energy	41,174.70	0.2 %
Commonwealth Chesapeake	31,389.46	0.1 %
Calpine Mid-Atlantic Generation, LLC	847.00	0.0 %
Total	**26,697,734.78**	**100 %**

The owners must purchase allowances equal to above the amount emitted. The allowances do not necessarily need to be purchased during the specific emission period; nevertheless, to estimate the total cost of paying for the allowances needed for the 2021 emissions we multiply the total emissions (26,697,734.78 tons) by the average allowance price per ton in 2021 ($9.47). This produces an estimated cost of $252,760,804 for regulated owners of electric power plants in Virginia to pay for their required allowances for 2021 CO_2 emissions.

Pursuant to Code of Virginia § 56-585.1 A 5 e,[10] Dominion Energy and Appalachian Power Company can fully recover from customers "the costs of allowances purchased through a market-based trading program for carbon dioxide emissions." Since these two utilities can fully pass on the cost of obtaining CO_2 allowances to their customers,[11] the incentive to reduce CO_2 emissions due to RGGI participation is reduced, as long as allowances are not in very short supply. As can be seen in Table 3, these two regulated utilities accounted for 68.8 percent of the CO_2 emissions in 2021, with Dominion accounting for the vast majority.

[9] Data source: RGGI. Data for all of 2022 is not yet complete.
[10] See https://law.lis.virginia.gov/vacode/title56/chapter23/section56-585.1/
[11] Monopolies may not always find it profit maximizing to pass on 100 percent of their cost increases.

Many if not most of the other owners likely sell their energy production directly to the PJM market,[12] and do not have ratepayers to whom they can pass on cost increases. Thus, these firms would have stronger incentive to cut CO_2 emissions (due to RGGI participation or other factors) because their cost of acquiring allowances may not be readily passed on to other entities.

Estimated Benefits and Costs

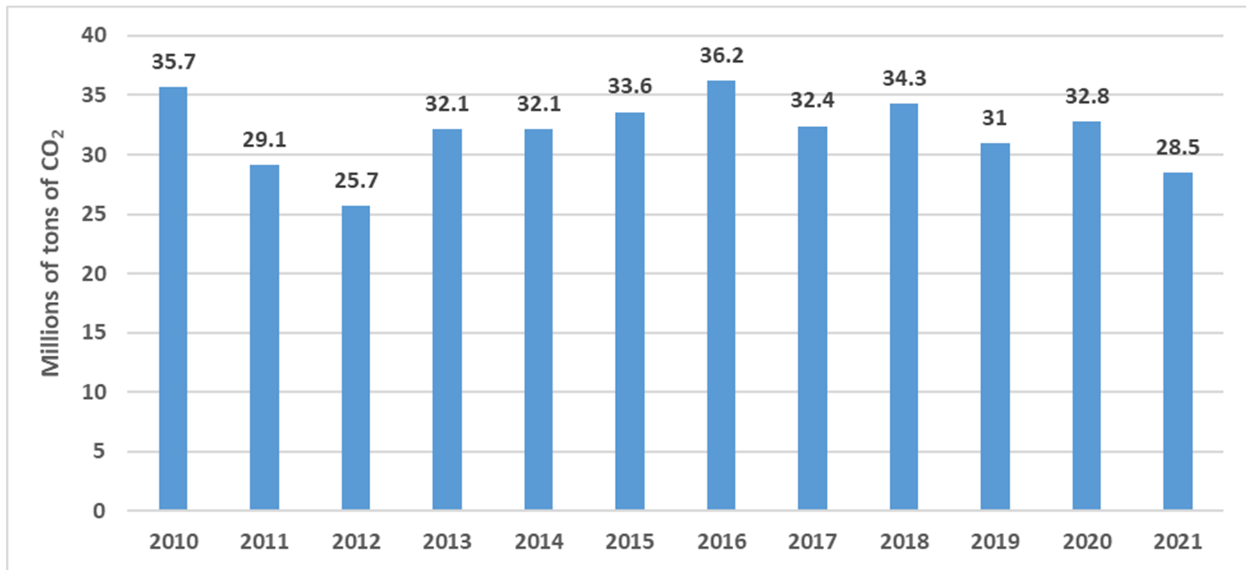
If this regulation were to be repealed and Virginia leaves RGGI, independent power plant owners would benefit in that their payments for CO_2 emission allowances would be eliminated. Customers of Dominion Energy would also benefit. Under the initial State Corporation Commission-approved RGGI rider created for Dominion Energy customers, typical residential customer bills were increased by $2.39 a month and the typical industrial customer bill by was raised by $1,554 per month.[13] In a filing before the State Corporation Commission, Dominion Energy stated that RGGI will cost ratepayers between $1 billion and $1.2 billion over the next four years.[14] Such costs going forward could be avoided if Virginia were to leave RGGI.

As shown in Table 2, in 2021 and 2022 close to $500 million dollars raised through participation in RGGI was designated for: 1) the purpose of assisting localities and their residents affected by recurrent flooding, sea level rise, and flooding from severe weather events and 2) supporting low-income energy efficiency programs, including programs for eligible housing developments. To the extent that this funding is not replaced from other funding sources, the benefits from the programs would be lost if this regulation were to be repealed and Virginia leaves RGGI. Likewise, to the extent that funding is not replaced firms that supply products and services for those programs would lose business.

As can be seen in Figure 1 below, in the first year of Virginia's participation in RGGI (2021), total Virginia power sector CO_2 emissions declined to 28.5 million tons versus 32.8 million tons the prior year. Figure 1 also indicates that emissions fluctuate from year-to-year, and it is unclear if longer-term trends are present.

[12] PJM Interconnection LLC (PJM) is a regional power transmission organization. It is part of the Eastern Interconnection grid operating an electric transmission system serving all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.
[13] Source: https://www.governor.virginia.gov/media/governorvirginiagov/governor-of-virginia/pdf/eo/EO-9-RGGI.pdf
[14] Ibid

Figure 1: Historical Virginia Power Sector CO_2 Emissions[15]



It is not clear whether all or part of the decline would have happened without RGGI participation, and DPB does not have any specific information with which to assess the factors that may have contributed to this reduction. However, as a general matter it appears that the cost to generate electricity from sources with lower emissions has been declining.[16] Moreover, separate from the regulation, the Virginia Clean Economy Act[17] mandates the gradual reduction and eventual elimination of CO_2 emissions for Virginia utilities. The presence of these two factors reduces the effect of leaving RGGI on CO_2 emissions.

To the extent that RGGI participation does in fact reduce CO_2 emissions that would not have otherwise been reduced, the benefits garnered from that reduction would be lost. Those benefits include reduction in the social cost of carbon (SC-CO_2). The SC-CO_2 is a comprehensive estimate of climate change damages and includes, among other things, changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services.[18]

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[15] The number for 2021 is somewhat higher here than shown for the total in Table 3 because Figure 1 includes non-regulated sources. Source: DEQ

[16] For example, see https://www.irena.org/publications/2022/Jul/Renewable-Power-Generation-Costs-in-2021

[17] See https://lis.virginia.gov/cgi-bin/legp604.exe?201+ful+CHAP1193

[18] See https://19january2017snapshot.epa.gov/sites/production/files/2016-12/documents/sc_co2_tsd_august_2016.pdf

Air pollutants such as sulfur dioxide (SO_2) and nitrogen oxides (NOx) are co-produced along with CO_2 emissions from fossil-fuel power plants. SO_2 and NOx can form particulate matter. Exposure to particulate matter can adversely affect the lungs and heart, leading to premature death in people with heart or lung disease, nonfatal heart attacks, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.[19] In meeting CO_2 reduction requirements, there would be incidental reductions in SO_2 and NOx emissions. To the extent that RGGI participation does in fact reduce CO_2 emissions that would not have otherwise been reduced, the associated benefits from reduction in SO_2 and NOx may also be lost by exiting RGGI. However, DPB does not have any specific information with which to assess the potential for this to occur.

Businesses and Other Entities Affected

The proposed repeal of the regulation would particularly affect[20] the firms that have fossil-fuel-fired electric power facilities with a capacity of 25 megawatts or greater in the Commonwealth. Currently there are 11 such firms.[21] All entities that use electricity, including industrial and commercial firms, farms, residences, government offices, schools and colleges, etc., would be affected as well. Additionally, if the funding for the flooding and energy efficiency programs is not replaced, firms that provide products and services for those programs and localities and citizens who benefit from those programs would be particularly affected. To the extent that RGGI participation does in fact reduce CO_2 emissions that would not have otherwise been reduced, all entities and people in Virginia would potentially experience associated environmental and health impacts.

The Code of Virginia requires DPB to assess whether an adverse impact may result from the proposed regulation.[22] An adverse impact is indicated if there is any increase in net cost or reduction in net revenue for any entity, of any amount, even if the benefits exceed the costs for

[19] See https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm
[20] § 2.2-4007.04 defines "particularly affected" as bearing a disproportionate material impact.
[21] As shown on Table 3, in 2021 there were 12 such firms. According to DEQ, Birchwood Power has shut down; so now there are 11.
[22] Pursuant to Code § 2.2-4007.04(D): In the event this economic impact analysis reveals that the proposed regulation would have an adverse economic impact on businesses or would impose a significant adverse economic impact on a locality, business, or entity particularly affected, the Department of Planning and Budget shall advise the Joint Commission on Administrative Rules, the House Committee on Appropriations, and the Senate Committee on Finance. Statute does not define "adverse impact," state whether only Virginia entities should be considered, nor indicate whether an adverse impact results from regulatory requirements mandated by legislation.

all entities combined. This regulatory action does not in of itself replace the funding for the flooding and energy efficiency programs that would be lost by repealing the regulation. This analysis examines the direct impacts of the proposed regulatory action and thus does not address any indirect effects that may or may not occur because of changes taken outside of this action. Thus, an adverse impact is indicated since the benefits from those programs, including the revenue for businesses supplying products and services for those programs, would be eliminated.

Small Businesses[23] Affected:[24]

Types and Estimated Number of Small Businesses Affected

The proposed repeal of the regulation would affect most small businesses in the Commonwealth.

Costs and Other Effects

Small independent power plant owners[25] would benefit in that their payments for CO_2 emission allowances would be eliminated. Small firms that obtain their electricity from Dominion Power, and to a lesser extent potentially from other providers, would have their electricity bills reduced.

If the revenue for the flooding and energy efficiency programs is not replaced, small firms that supply products and services for those programs would lose business.

Alternative Method that Minimizes Adverse Impact

There are no clear alternative methods that both reduce adverse impact and meet the intended policy goals.

[23] Pursuant to § 2.2-4007.04 of the Code of Virginia, small business is defined as "a business entity, including its affiliates, that (i) is independently owned and operated and (ii) employs fewer than 500 full-time employees or has gross annual sales of less than $6 million."

[24] If the proposed regulatory action may have an adverse effect on small businesses, Code § 2.2-4007.04 requires that such economic impact analyses include: (1) an identification and estimate of the number of small businesses subject to the proposed regulation, (2) the projected reporting, recordkeeping, and other administrative costs required for small businesses to comply with the proposed regulation, including the type of professional skills necessary for preparing required reports and other documents, (3) a statement of the probable effect of the proposed regulation on affected small businesses, and (4) a description of any less intrusive or less costly alternative methods of achieving the purpose of the proposed regulation. Additionally, pursuant to Code § 2.2-4007.1, if there is a finding that a proposed regulation may have an adverse impact on small business, the Joint Commission on Administrative Rules shall be notified.

[25] As of the date of the publication of this report, the number of CO_2 emitters that qualified as small businesses was not available.

Localities[26] Affected[27]

If the revenue from the state for the flooding program is not replaced, localities prone to flooding would be particularly affected. Their costs would increase either from replacing the funding themselves, or from responding to flood damage that would have been mitigated by the program.

Projected Impact on Employment

The proposal would effectively eliminate the need for the owners of the regulated electric power plants to purchase allowances. This would make the independent power plant owners more profitable, which in turn may enable them to expand and increase hiring. The electricity costs for firms that obtain their electricity from Dominion Power, and to a lesser extent potentially from other providers, would be reduced, potentially making these firms more profitable as well. The difference would not likely be enough to encourage expansion and more hiring for most, but it may for some.

Conversely, if the revenue for the flooding and energy efficiency programs is not replaced, firms that supply products and services for those programs would lose business and likely reduce employment. Data are not available to determine whether the positive impact on employment would outweigh the negative impact.

Effects on the Use and Value of Private Property

The elimination of RGGI participation would reduce costs for the CO_2 emitting firms in that they would no longer need to purchase allowances. For those that cannot pass on those costs to other entities, their values would likely commensurately increase. Electricity costs for firms served by Dominion would decrease, which may moderately increase their value. If the revenue for the flooding and energy efficiency programs is not replaced, firms that supply products and services for those programs would lose business. The value of these firms would commensurately decrease.

[26] "Locality" can refer to either local governments or the locations in the Commonwealth where the activities relevant to the regulatory change are most likely to occur.

[27] § 2.2-4007.04 defines "particularly affected" as bearing a disproportionate material impact.