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Re: Comments on the Proposed Action to Develop Regulations to Reduce and Cap Carbon Dioxide from Fossil Fuel Fired Electric Power Generating Facilities (Rev. C17), 9VAC5 Chapter 140

Dear Ms. Sabasteanski,

The American Council for an Energy-Efficient Economy (ACEEE) welcomes this opportunity to provide comments to the Virginia Department of Environmental Quality (DEQ) on the above-referenced proposed action on the development of regulations to reduce and cap carbon dioxide (CO<sub>2</sub>) from the electric power sector (“Proposed Action”). ACEEE is a nonprofit research organization based in Washington, D.C. that conducts research and analysis on energy efficiency. ACEEE is one of the leading groups working on energy efficiency issues in the United States at the national, state, and local levels. We have been active on energy efficiency issues for more than three decades. In Virginia, we developed an energy efficiency potential study in 2008 covering electricity savings opportunities, and since then have provided technical assistance on energy efficiency topics to various stakeholders.<sup>1</sup>

ACEEE’s comments herein seek to address the agency’s request for comments and specific ideas to be considered in the development of a multi-state, market-based carbon dioxide (CO<sub>2</sub>) trading program. Specifically, we recommend the following:

1. DEQ should consider mechanisms for increasing the energy savings impacts of the proposed rule, including using an updating output-based allocation methodology as opposed to a set-aside allowance pool.
2. Should the set-aside allowance pool remain DEQ’s preferred approach, the rule should ensure that the allowance pool is dedicated to cost-effective energy efficiency programs.
3. DEQ should consider doubling the pool of set-aside allowances in order to increase energy-savings impacts.
4. Finally, we offer some suggestions for energy efficiency programs for consideration by DEQ and the Department of Mines, Minerals, and Energy (DMME).

### **Allocation Methodology**

Energy efficiency is an important strategy to reduce emissions in the electric power sector. As it lowers electricity use, energy efficiency avoids emissions of CO<sub>2</sub> and other harmful pollutants,

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<sup>1</sup> ACEEE. 2008. Energizing Virginia: Efficiency First. [aceee.org/research-report/e085](http://aceee.org/research-report/e085).

often at lowest cost.<sup>2</sup> ACEEE estimates that by implementing a suite of energy efficiency programs and policies, the Commonwealth could exceed the emissions reductions required through the Proposed Action in 2030.<sup>3</sup> For example, regularly updating building energy codes and pursuing other efficiency program savings of at least 1% per year – either through ratepayer-funded programs, state-run programs, or some combination of the two – could result in cumulative reductions of over 80 million tons of CO<sub>2</sub>. In an allowance trading program, CO<sub>2</sub> reductions from energy efficiency will help electric generating units (EGUs) meet the Commonwealth’s CO<sub>2</sub> emissions limit by reducing electricity production. However, this does not mean that energy efficiency deployment will increase, even when it is more cost-effective than other CO<sub>2</sub> reduction options. Current market and regulatory barriers to investment in energy efficiency can hinder its use as a compliance strategy in a trading program.<sup>4</sup> DEQ should consider using methods for allowance distribution to help address these barriers to energy efficiency deployment.<sup>5</sup>

Set-asides allow for a portion of allowances to be budgeted for certain programs, such as energy efficiency. Typically, a set-aside is a small portion of a total cap of allowances, which means that energy efficiency is treated as a resource on the margin. This is not consistent with the Commonwealth’s energy efficiency potential, nor does it make economic sense. The financial incentive in a market-based regulation should drive emission reductions by the lowest-cost means within the regulated system. In this Proposed Action, the lowest-cost option states should turn to is energy efficiency. Instead of a set-aside, an allowance approach could preferentially award allowances to energy efficiency projects and programs. Such an approach could allocate allowances on an updating output basis according to kWh generated or saved. Ideally, such an approach would award allowances to zero-emission savings and generation (i.e., energy efficiency and renewable energy) first. The remaining allowances could be awarded to fossil-fueled electric generators in a second round of allocations.

An updating output-based allocation provides a transparent and predictable price signal, and rewards measures that deliver lasting CO<sub>2</sub> reductions.<sup>6</sup>

### **Energy Efficiency in the Set-Aside Allowance Pool**

As ACEEE has maintained in the past, energy efficiency provides emission reductions quickly and at a lower cost to ratepayers than any other CO<sub>2</sub> compliance option by reducing the need for central power generation. State energy efficiency policies and projects – including those that set energy savings targets, reduce business and industrial energy use, and deliver residential energy savings – can be the quickest and cheapest means to reduce generation from fossil fuel-

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<sup>2</sup> ACEEE 2016. How Much Does Energy Efficiency Cost? [aceee.org/sites/default/files/cost-of-ee.pdf](http://aceee.org/sites/default/files/cost-of-ee.pdf).

<sup>3</sup> ACEEE 2016. State and Utility Pollution Reduction Calculator Version 2 (SUPR 2). [aceee.org/research-report/e1601](http://aceee.org/research-report/e1601).

<sup>4</sup> ACEEE 2013. Overcoming Market Barriers and Using Market Forces to Advance Energy Efficiency. [aceee.org/research-report/e136](http://aceee.org/research-report/e136).

<sup>5</sup> See a description of allocation methodologies in ACEEE’s Comments to Virginia Department of Environmental Quality on Allowance Distribution Under a Market-based CO<sub>2</sub> Trading Program. [aceee.org/regulatory-filing/ed-noira-0717](http://aceee.org/regulatory-filing/ed-noira-0717).

<sup>6</sup> Several states participating in the NO<sub>x</sub> SIP Call use output-based allocation. In addition, see AJW’s Direct Allocation approach ([ajw-inc.com/mass-based-paper/](http://ajw-inc.com/mass-based-paper/)) and AEE’s Performance-based Allocation approach ([info.aee.net/allocation-for-clean-power-plan-compliance](http://info.aee.net/allocation-for-clean-power-plan-compliance)).

fired power plants. Energy efficiency is a lowest-cost option for states to reduce CO<sub>2</sub> emissions while supplying affordable, reliable electricity to their residents and businesses. Research by the Lawrence Berkeley National Laboratory and ACEEE shows that at a range of about 2 to 5 cents per kilowatt-hour (kWh) and an average of 2.8 cents per kWh, energy efficiency programs cost two to three times less than generating power from traditional sources.<sup>7</sup> States that invest in energy efficiency can reduce emissions at a lower cost than is possible through other options.

Moreover, energy efficiency brings significant ancillary benefits, such as improving air quality, improving inhabitant comfort, and saving consumers money. Additionally, energy efficiency boosts local economies by creating diverse, high-quality jobs across the construction, engineering, financial, environmental, manufacturing, and industrial supply chains.<sup>8</sup>

The experience of other Regional Greenhouse Gas Initiative (RGGI) states shows us that allowance revenues invested in energy efficiency reduce energy bills for households and businesses. In 2015, RGGI states invested 64% of allowance revenues on energy efficiency, amounting to 60% of cumulative investments. Programs funded by these investments are expected to return more than \$1.3 billion in lifetime energy bill savings to 5,700 businesses and 141,000 participating households.<sup>9</sup> Further, a recent report demonstrates how energy efficiency investments through RGGI contributed to substantially reducing the number of premature deaths, heart attacks, and respiratory illnesses in the Northeast since 2009.<sup>10</sup>

Under the current Proposed Action, DEQ proposes a set-aside totaling 5% of the conditional allowances for the Virginia Department of Mines, Minerals, and Energy (DMME) or its designee, to assist in the abatement and control of CO<sub>2</sub> emissions.

Given the multiple benefits and low-cost CO<sub>2</sub> reductions energy efficiency provides, we recommend that the entirety of the set-asides revenues be allocated to energy efficiency projects.

### **Expanding the Set-Aside for Energy Efficiency**

While ratepayer-funded programs will ramp-up to serve residential and commercial customers in Virginia over the next ten years, there is still a lot of untapped potential for non-utility energy efficiency programs.<sup>11</sup> The current set-aside amount of 5% does not reflect the level of potential investment in energy efficiency that the Commonwealth could achieve.

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<sup>7</sup> Megan A. Billingsley, Ian M. Hoffman, Elizabeth Stuart, Steven R. Schiller, Charles A. Goldman, and Kristina LaCommare, The Program Administrator Cost of Saved Energy for Utility Customer-Funded Energy Efficiency Programs, Lawrence Berkeley National Laboratory (2014), [emp.lbl.gov/sites/all/files/lbnl-6595e.pdf](http://emp.lbl.gov/sites/all/files/lbnl-6595e.pdf). See also Maggie Molina, The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs, Washington, DC: ACEEE, 2014, [aceee.org/research-report/u1402](http://aceee.org/research-report/u1402).

<sup>8</sup> [aceee.org/sites/default/files/ee-jobs-money-web.pdf](http://aceee.org/sites/default/files/ee-jobs-money-web.pdf)

<sup>9</sup> The Regional Greenhouse Gas Initiative (RGGI). Investment of RGGI Proceeds in 2015.

[www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI\\_Proceeds\\_Report\\_2015.pdf](http://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2015.pdf).

<sup>10</sup> Abt Associates. 2017. Analysis of the Public Health Impacts of the Regional Greenhouse Gas Initiative, 2009–2014. <http://abtassociates.com/RGGI>.

<sup>11</sup> ACEEE. 20008. Energizing Virginia: Efficiency First. [aceee.org/research-report/e085](http://aceee.org/research-report/e085).

We recommend a doubling of this set-aside to 10% in order to provide a more robust financing stream for energy efficiency projects.

Energy efficiency is the lowest-cost option to reduce CO<sub>2</sub> emissions, and the 5% set-aside cap limits the amount of cost-effective reductions that could be achieved.

While the market decides the price of allowances, the scenarios in Table 1 are meant to represent a range of prices using available allowances in the current Proposed Action and prior RGGI auction clearing prices as a basis. As shown, increasing the set-aside to 10% would lead to a doubling of the investment in energy efficiency, allowing for more cost-effective reductions in CO<sub>2</sub> emissions. Further, as Virginia Advanced Energy Economy demonstrates in comments on this Proposed Action, modeling indicates that increasing the set-aside would not impact rates. Implementing energy efficiency measures also reduces overall customer bills, helping to alleviate any potential rate increases.

Doubling the set-aside would allow for increased investment in energy efficiency programs as described in the following section.

Table 1. Annual Dollar Value of Set-aside Scenarios

	5% Set-aside	10% Set-aside
Scenario 1: \$3.8 per ton allowance price	\$6.3 million	\$12.5 million
Scenario 2: \$5 per ton allowance price	\$8.3 million	\$16.5 million
Scenario 3: \$15 per ton allowance price	\$24.8 million	\$49.5 million

### **Eligible Projects under Set-Aside Allowance Pool**

We recommend that DMME use the set-aside to invest in energy efficiency projects that save energy and reduce utility costs for public and private sectors alike.

The following are some examples of projects that could be eligible to receive revenues under the set-aside:

- **Technical Assistance for the Industrial Sector.** A significant amount of energy savings opportunities exists for industrial facilities. While ratepayer-funded programs for residential and commercial customers in Virginia will ramp-up over the next ten years, large industrial customers will not be served by these programs. Opportunity exists for state agencies like DMME to fill this gap. Manufacturers are typically aware of at least some energy savings projects in their facilities, and many have implemented efficiency programs. However, these projects face multiple challenges and barriers. Energy efficiency projects often cannot compete with other capital demands, and it may be difficult to navigate corporate decision-making to get management to endorse any efficiency project, no matter the payback period. Small- and medium-sized

manufacturers in particular may also be limited in terms of staff resources and knowledge.

Technical assistance programs targeted at industrial customers can help identify potential energy efficiency projects and guide the implementation process. These programs typically offer no- or low-cost expertise and advice to manufacturers on new technologies and practices, offer a platform to share analytical tools, disseminate success stories and case studies, and convene manufacturers for networking opportunities. Several states have non-ratepayer-funded technical assistance programs for manufacturers, often leveraging university research centers. For example, the Energy Systems Laboratory at Texas A&M focuses on continuous commissioning and provides technical support to industry.<sup>12</sup> The Kentucky Pollution Prevention Center at the University of Louisville is a state-supported nonprofit that offers businesses engineering and efficiency services at low or no cost.<sup>13</sup> Industries of the Future at West Virginia University partners with industry to improve competitiveness by reducing energy costs, and grew out of a partnership with the U.S. Department of Energy (DOE).<sup>14</sup> DOE's Advanced Manufacturing Office also engaged with Colorado to develop the Colorado Industrial Energy Challenge, which offers energy assessments, training programs, and recognition to manufacturers that commit to greenhouse gas reduction goals.<sup>15</sup>

We also encourage DEQ to clarify that combined heat and power (CHP) and waste heat-to-power (WHP) projects are eligible for set-aside funds. This will help ensure that potential project hosts are aware of this opportunity. Other RGGI states have used their auction revenue to support CHP deployment and can be used as an example for the Commonwealth.<sup>16</sup>

- **Revolving Loan Fund.** DMME can leverage its experience operating the Commonwealth Energy Fund, using revenues to make loans to high growth potential early stage Virginia companies focused on energy efficiency and pollution prevention or establishing a new revolving loan fund (RLF) to finance energy efficiency investments at low interest rates for other markets, including public entities, residents or commercial businesses. Financing products could be paired with utility rebates in order to further spur investment.

Revolving loan funds have several benefits. For example, they can leverage private financing, allowing the Commonwealth to maximize set-aside revenues and potentially reach goals that are unattainable with their own funding alone. An RLF can also be mission-driven, targeting underserved markets where private investment is lacking or nonexistent. If the RLF can demonstrate that lending to these markets is profitable, it

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<sup>12</sup> Texas A&M. "Energy Systems Laboratory." [esl.tamu.edu/](http://esl.tamu.edu/).

<sup>13</sup> University of Louisville. "Kentucky Pollution Prevention Center." [kppc.org/](http://kppc.org/).

<sup>14</sup> West Virginia University. "Industries of the Future at West Virginia University." [iofwv.nrcce.wvu.edu/](http://iofwv.nrcce.wvu.edu/).

<sup>15</sup> Department of Energy. "Colorado Industrial Energy Challenge." [energy.gov/eere/amo/colorado-industrial-energy-challenge](http://energy.gov/eere/amo/colorado-industrial-energy-challenge).

<sup>16</sup> The Regional Greenhouse Gas Initiative (RGGI). Investment of RGGI Proceeds in 2015. [www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI\\_Proceeds\\_Report\\_2015.pdf](http://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2015.pdf).

might encourage private lending and create a market that no longer requires subsidies. Many states currently operate revolving loan funds.<sup>17</sup> If well established, these programs are sustainable and can have considerable market impact. For example, Nebraska's Dollar and Energy Saving Loan program was established in 1990 and since that time has invested more than \$322 million in funds into the clean energy market, supporting more than 28,000 projects. Of that amount, more than \$151 million came from the energy office's revolving loan fund, with the rest funded by participating lenders and borrowers.

- **Advance energy efficiency in public buildings.** Virginia currently has a goal to reduce energy consumption in public buildings 15% by 2017. Through the Virginia Energy Management Program (VEMP), DMME helps state agencies, institutions of higher education, and public bodies reduce electric, gas, and water consumption by working with energy savings performance contractors (ESCOs). However, Virginia is still working to collect these data from participating public buildings and, consequently, has faced difficulty measuring progress. In parallel with VEMP, Virginia recently launched the \$6 million Clean Energy Development and Services (CEDS) program to provide grants and loans for energy efficiency, renewable energy, and alternative fuel projects in state and local agencies. In spite of these efforts, the state has only met about one-third of this energy savings target.<sup>18</sup> We recommend that DMME use the set-aside to expand energy efficiency offerings for public buildings, whether through VEMP and/or deeper incentives as part of CEDS.

## Conclusion

Energy efficiency is often the lowest-cost option to meet CO<sub>2</sub> reduction goals, and deployment should be encouraged through allowance distribution under a trading program. As DEQ develops a regulation to limit carbon emissions, ACEEE is available as a resource to discuss any of the issues raised herein or others DEQ may be considering regarding the treatment of energy efficiency. We have attempted to keep our comments succinct, but welcome the opportunity to provide further information.

Sincerely,



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<sup>17</sup> National Association of State Energy Officials. "State Energy Financing Programs."  
[www.naseo.org/state-energy-financing-programs](http://www.naseo.org/state-energy-financing-programs).

<sup>18</sup> Virginia Energy Efficiency Roadmap, report forthcoming. A description of the project purpose can be found here: [www.dmme.virginia.gov/de/LinkDocuments/GEC/3VA\\_EE\\_Roadmap\\_FactSheet.pdf](http://www.dmme.virginia.gov/de/LinkDocuments/GEC/3VA_EE_Roadmap_FactSheet.pdf).