

April 28, 2017

Secretary Molly Joseph Ward
Virginia Department of Natural Resources
1111 East Broad Street
Richmond, VA 23219

Re: EO-57 Development Of Carbon Reduction Strategies For Electric Power Generation Facilities

Dear Secretary Ward,

The American Council for an Energy-Efficient Economy (ACEEE) welcomes this opportunity to provide comments to the Virginia Department of Natural Resources on the above-referenced executive order on the development of carbon reduction strategies for electric power sector generation facilities. 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.

The work group convened under Governor McAuliffe's Executive Order 57 has solicited public comment on the reduction of carbon emissions from Virginia's electric power sector. In our comments below, ACEEE primarily seeks to address objective (7) on cost-effective pollution reduction strategies and objective (6) on the impact of carbon reduction strategies on low-income and vulnerable communities.

Introduction

Energy efficiency is an important strategy to reduce emissions in the electric power sector. As it lowers electricity use, it avoids emissions of greenhouse gases and other harmful pollutants. Energy efficiency can substantially reduce carbon pollution from the electricity sector in Virginia, often at lowest cost.¹ ACEEE estimates that if the Commonwealth placed a cap on carbon dioxide (CO₂) emissions or enacted another policy to reduce carbon pollution 30% by 2030, Virginia could realize 100% of pollution reductions through a suite of energy efficiency policies and programs.²

¹ Energy efficiency is typically much cheaper for utilities to implement than building new generating capacity. Utility energy efficiency programs cost about 2 to 5 cents per kilowatt-hour, which is one-half to one-quarter the cost of other options: aceee.org/sites/default/files/cost-of-ee.pdf

² ACEEE 2016. State and Utility Pollution Reduction Calculator Version 2 (SUPR 2). aceee.org/research-report/e1601.

Utilities can meet electricity demand by generating power, or they can encourage efficient technologies as a way to reduce their customers' energy waste while providing the same level of service. In this way, energy efficiency is a resource similar to power plants, wind turbines, or solar panels. Today in the electric power sector, ACEEE estimates that energy efficiency is the nation's third-largest electricity resource, greater than the contribution of nuclear power (Figure 1). If we considered energy efficiency as a segment of our nation's electricity resource "pie," based on ACEEE estimates, it would count as 18% of total generation in 2015 (Figure 2). Without energy efficiency investments we have made since 1990, we would need the equivalent of 313 additional large power plants today to meet the country's energy needs.³

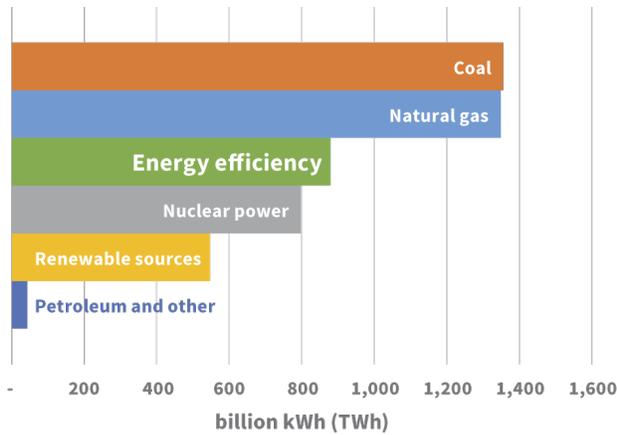


Figure 1

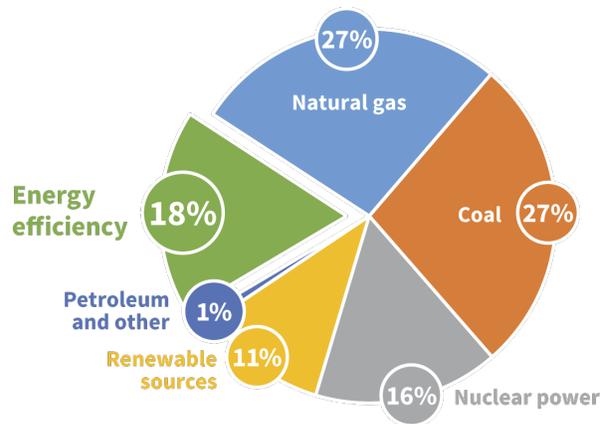


Figure 2

While our comments below focus on efficiency as a pollution reduction strategy, it is important to recognize the variety of other benefits of energy efficiency. By reducing the need to burn coal and other fossil fuels to generate electricity, efficiency offers health benefits to individuals and communities.⁴ It also saves money on household and business energy bills and improves equity and comfort. Energy efficiency increases community and grid resilience, creates jobs, and expands economic development opportunities.

Energy Efficiency as a tool for pollution reduction

Virginia can use energy efficiency as a low cost tool for reducing pollution from the electricity sector. Below we discuss several specific policy and program approaches that the Commonwealth could take to save energy and avoid CO₂ emissions. We have grouped our recommendations below into three sectors: utility, buildings, and transportation. However, we recognize that no policy pathway should be siloed and we encourage extensive coordination across agencies and branches. The Executive Order 57 work group should leverage the resources and expertise of the Governors Executive Committee (GEC) on Energy Efficiency,

³ Figures 1 and 2 come from ACEEE's report: *The Greatest Energy Story You Haven't Heard: How Investing in Energy Efficiency Changed the US Power Sector and Gave Us a Tool to Tackle Climate Change*: aceee.org/research-report/u1604

⁴ For more on the health benefits of energy efficiency, see aceee.org/sites/default/files/ee-health-1008.pdf.

which has explored the feasibility and implementation details of energy efficiency strategies in Virginia since 2015, with support from the Roadmap project team.⁵

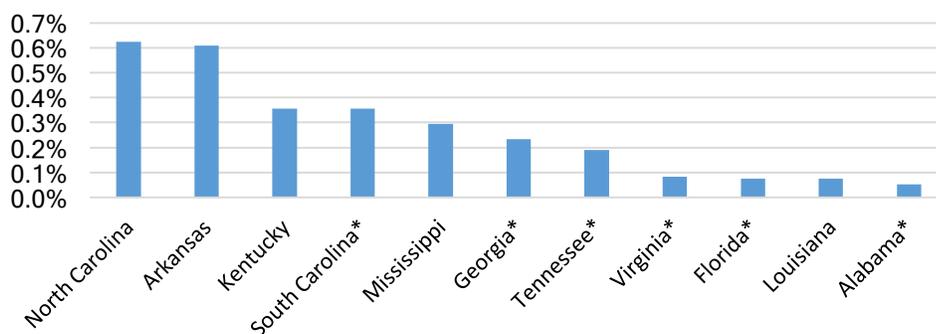
Below we identify several key energy efficiency policy and program areas that Virginia could pursue, outlining the current landscape and recommending next steps for each.

Utility Sector

The implementation of energy efficiency programs benefits all customers in a utility system, including program participants and nonparticipants alike. Energy efficiency reduces costs for everyone, primarily by reducing load in given areas. It allows utilities to defer or avoid the need to build new power plants or upgrade existing substations and transmission and distribution facilities. Lower utility costs translate into lower electricity bills for families and businesses.

Virginia utilities have much room to expand and strengthen efficiency programs and policies. Utilities across the state currently report very small budgets for electricity and natural gas efficiency programs. In 2015, utilities in Virginia reported spending less than 0.01% of statewide utility revenues on electricity efficiency programs, as compared to the nationwide median of 1.28%, and \$2.69 per residential customer on natural gas efficiency programs, as compared to the nationwide median of \$7.22 per residential customer. As a result, energy savings in Virginia are among the lowest in the Southeast and across the country. In 2015 utilities in Virginia only saved 0.08% of retail electric sales, as compared with the nationwide median of 0.61% (Figure 3).⁶

Figure 3: Southeastern electric savings as a percent of sales (2015)



* At least a portion of savings were reported as gross. We adjusted the gross portion by a net-to-gross factor of 0.817 to make it comparable with net savings figures reported by other states. Data from 2016 State Scorecard and 2015 EIA-861.

⁵ The Virginia Department of Mines, Minerals, and Energy (DMME) has an Energy Efficiency Studies and Resources page that contains documents and notes from GEC meetings (dmme.virginia.gov/de/EnergyEfficiencyResources.shtml) and a fact sheet about the Roadmap Project (dmme.virginia.gov/de/LinkDocuments/GEC/3VA_EE_Roadmap_FactSheet.pdf).

⁶ Efficiency spending data from the Consortium for Energy Efficiency's 2016 Annual Industry Report (www.cee1.org/annual-industry-reports) and ACEEE's 2016 State Energy Efficiency Scorecard (aceee.org/research-report/u1606). Efficiency savings data from 2017 EIA-861 (www.eia.gov/electricity/data/eia861/) and ACEEE's 2016 State Energy Efficiency Scorecard.

Utilities, the State Corporation Commission (SCC), and the state legislature play critical roles in reducing statewide emissions from the electric power sector in Virginia. Lawmakers and regulators can enact rules to require long-term energy savings and create opportunities for utilities to financially thrive while serving their customers reliably and at lowest cost. Below, we offer several recommendations for ways to significantly increase energy efficiency in the utility sector.

1. **Set a measurable and enforceable energy savings target.** An energy efficiency resource standard (EERS) is a long-term (3+ years), binding energy savings target for utilities or third-party program administrators. An EERS is one of the most effective ways for a state to guarantee long-term energy savings. While Virginia has a goal to reduce electricity consumption 10% by 2020, from 2006 levels, the state has not enacted regulatory requirements for energy efficiency requirements. As a result, this energy savings goal is considered voluntary and has done little to encourage utilities to invest in energy efficiency. Updating and improving implementation of this target has been the focus of recent GEC work.
 - a. *Recommendation:* Work with GEC members to prepare legislation for the 2018 General Assembly session that explicitly authorizes or requires the SCC to establish mandatory, long-term, and steadily increasing energy savings targets. Once the General Assembly grants the SCC this authority, the SCC could establish annual savings targets and associated rules.⁷ State government officials, GEC members, the Roadmap team, investor-owned utilities (IOUs), members of the energy efficiency industry, and other stakeholders can work collaboratively to develop energy efficiency programs that satisfy savings targets. For program ideas and best practices, these parties can review and discuss ratepayer programs from other states.⁸
2. **Develop strong evaluation, measurement, and verification (EM&V) protocols.** Uniform protocols for measuring, verifying, validating, and reporting the impacts of energy efficiency measures ensure consistency and transparency in the EM&V process. While Virginia relies on several classic cost-benefit tests to evaluate ratepayer-funded energy efficiency programs, it relies more heavily on the Ratepayer Impact Measure (RIM) test than any other state. SCC staff are currently drafting EM&V regulations that will be considered in a docketed proceeding and opened to the public for comment in 2017. It is important for this stakeholder forum to discuss key issues and program evolution specific to Virginia.
 - a. *Recommendation:* Work with the SCC to review existing, well-established EM&V practices and leverage stakeholder input to determine the appropriate EM&V practices to apply to different components of the Commonwealth's utility energy efficiency portfolio. We recommend against Virginia's use of the RIM test.⁹ State

⁷ Virginia could establish a target to reduce annual retail energy sales by 1.5%, a level of savings that ACEEE has found many states are already achieving. For examples of state energy savings targets, see: aceee.org/sites/default/files/state-eers-0117.pdf.

⁸ ACEEE. 2015. York, D. et al. *New Horizons for Energy Efficiency: Major Opportunities to Reach Higher Electricity Savings by 2030*. Washington, DC: ACEEE. aceee.org/research-report/u1507; ACEEE. 2013. Nowak, S. et al. *Leaders of the Pack: ACEEE's Third National Review of Exemplary Energy Efficiency Programs*. Washington, DC: ACEEE. aceee.org/research-report/u132.

⁹ ACEEE has found that the most widely used benefit-cost test is the Total Resource Cost (TRC) test, followed by the Utility Cost Test (UCT). We have also observed that the Ratepayer Impact Measure (RIM)

government officials, IOUs, members of the energy efficiency industry, and other stakeholders should read and discuss how EM&V protocols will impact ratepayer programs. Interested stakeholders should participate in the SCC's 2017 EM&V docket proceedings by submitting comments and/or testifying before the Commissioners. These parties and others should establish a stakeholder collaborative to address the ongoing evolution of ratepayer programs under new EM&V protocols.¹⁰

3. **Modify the utility business model to treat energy efficiency as a resource.** States can promote alternative business models like full revenue decoupling and performance incentives for utilities, which help to remove the disincentive for them to invest in efficiency. In Virginia, natural gas utilities may decouple profits from sales, but electric utilities may not. Although utilities may seek recovery of lost revenues, in practice the SCC has not approved such requests. Virginia also does not offer performance incentives to electric or gas utilities.
 - a. *Recommendation:* Support improvements to the utility business model that enable financially sustainable energy efficiency programs. Work with the SCC to understand existing authority to enable electric utilities to decouple profits from sales and offer performance incentives to utilities achieving higher levels of electricity and natural gas savings. Develop legislation that requires utilities to procure a percentage of their future electricity and natural gas needs using energy efficiency measures. To meet this target, utilities in Virginia should implement more comprehensive efficiency measures and design programs that better meet the needs of large customers.
4. **Encourage energy efficiency program delivery in low-income and vulnerable communities.** Low-income households and communities face a higher energy burden than more affluent households, meaning that a greater portion of their income goes towards home energy bills.¹¹ Greater investments in energy efficiency will reduce energy costs for Virginia's most vulnerable residents. While at least one utility-run electric efficiency program in Virginia is targeted to low-income customers, the state does not currently have minimum spending or savings requirements for utility low-income programs.
 - o *Recommendation:* Work with the SCC to set requirements and a goal for energy efficiency delivered to low-income customers. This goal could take several formats, including requirements that low-income programs be included in portfolios, minimum spending requirements, and portfolio savings carve-outs

test has become almost universally rejected by states as a primary test for decision-making, because it does not really measure the cost-effectiveness of an energy efficiency program. Rather, it is an indicator of the distribution of already sunk utility system costs. For that reason, we recommend that states not use the RIM test to make determinations about the cost-effectiveness of energy efficiency programs. For more details, see ACEEE's May 2016 EM&V recommendations to the SCC: aceee.org/regulatory-filing/va-scc-comments-0516

¹⁰ For examples of utility-focused work groups, see Michigan: www.michigan.gov/mpsc/0,1607,7-159-52495_53750_54587-217193--,00.html; and Arkansas: see Garland, Glen. "Collaborating for Success - How Arkansas Got it Right." 2008. aceee.org/files/proceedings/2008/data/papers/5_183.pdf. For an example of executive and regulatory collaboration, see South Carolina: energy.sc.gov/energyplan. For a national overview of best practices, see Energy Efficiency Collaboratives by SEE Action: www4.eere.energy.gov/seeaction/system/files/documents/EECollaboratives-0925final.pdf

¹¹ Recent ACEEE research examined energy burdens in cities across the country, including Virginia Beach and Richmond. For more information, visit: aceee.org/research-report/u1602

for low-income programs. Convene stakeholders representing low-income communities to identify opportunities for alleviating the higher energy burden and disproportionate health impacts faced by these communities. Offer energy efficiency programs or incentives that can save energy, improve the conditions of affordable housing, and protect public health.

Buildings Sector

Governor McAuliffe has shown leadership on energy efficiency through many efforts, including but not limited to his 2014 State Energy Plan and Executive order 31.¹² The Governor and the agencies involved in the EO 57 work group play an important role in promoting energy efficiency in buildings through 2017 and setting the stage for the incoming administration to carry forward these efforts.

5. Encourage energy benchmarking and transparency for commercial buildings.

Building energy benchmarking and transparency laws require property owners, builders, or sellers to compile and report information about their buildings' energy use or energy efficiency characteristics to a centralized database and/or to prospective buyers at the time of sale. This information can then be used to identify energy efficiency opportunities. Local governments are more likely to pursue these policies, but state governments can also use them to incentivize building stock upgrades. There is no benchmarking and transparency policy in place and Virginia statute does not allow localities to require such practices for residential and/or commercial buildings. As a result, residential and commercial building owners and tenants lack energy data and are less able to identify energy saving opportunities.

- a. *Recommendation:* Expand access to building energy data across the residential and commercial sectors. Continue DMME coordination with cities, utilities, the Virginia Energy Efficiency Council (VAEEC), and the SCC on data access and benchmarking at the local level. Support 2018 legislation enabling localities to develop mandatory building energy benchmarking and transparency programs. Develop a voluntary building energy benchmarking system for the residential and commercial sectors that can be leveraged by localities across the state.
- ### **6. Update building energy codes.** Mandatory building energy codes set a minimum level of energy efficiency for all new residential and commercial buildings in a state. Residential buildings in Virginia must comply with the 2012 International Residential Code (IRC), however, weakening amendments make the energy portion of the code equivalent to a 2009 standard. Commercial buildings in Virginia must comply with the 2012 International Energy Conservation Code (IECC), with reference to ASHRAE 90.1-2010. The Virginia Department of Housing and Community Development (DHCD) is currently reviewing the 2015 codes as part of the update process to the Uniform Statewide Building Code.
- a. *Recommendation:* Virginia DHCD should adopt the full 2015 IECC for residential and commercial buildings, including energy efficiency provisions. The EO 57 work group should provide guidance to Department of Environmental Quality

¹² www.dmme.virginia.gov/DE/LinkDocuments/2014_VirginiaEnergyPlan/VEP2014.pdf ; governor.virginia.gov/media/3257/eo-31-conserving-energy-and-reducing-consumption-in-the-commonwealth-of-virginiaada.pdf

(DEQ) and DMME staff on participation in the Virginia code update process.¹³ DHCD should also work to measure and enforce code compliance, for example, by developing a strategic compliance plan or working with utilities to increase compliance rates. In addition, Virginia agencies should calculate emissions reductions associated with updates to the state building energy code.

7. **Advance energy efficiency in public buildings.** State governments can advance energy-efficient technologies and practices in the marketplace by adopting policies and programs to save energy in public-sector buildings and fleets, a practice commonly referred to as *lead by example*. These strategies improve the operational efficiency and economic performance of states' assets. 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 does not currently track state facility energy consumption and VEMP participation could be improved.
 - a. *Recommendation:* Continue efforts to reduce energy consumption in public buildings and lead the state by example. Renew the energy savings target for public facilities and work to improve energy data collection efforts from the municipal, university, school, and hospital (MUSH) market. Maintain DMME and Department of General Services (DGS) funding for the procurement and management of energy data software, currently under development through the Energy Data Warehouse pilot. Invest in funding for training and education for state facilities managers on maintaining accurate facilities records and using the software. Use these data to identify facilities that would be good candidates for participation in VEMP. Work with public facilities and ESCOs to implement the new contract to improve data collection efforts.

Transportation Sector

Moving toward a low-carbon energy system is likely to involve increased electrification of sectors currently powered primarily by other fuels. This is true of both vehicles and heating systems, where electrification can reduce overall carbon emissions by moving to more efficient equipment and facilitating the use of renewable energy. These transitions could modestly *increase* electricity use and hence carbon emissions from electric power generation facilities, but they would nonetheless reduce total carbon emissions. The U.S. transportation sector recently overtook the power sector the highest-emitting sector, so reducing transportation carbon emissions will be a crucial part of an overall carbon reduction strategy. Emissions reductions achieved by moving to electric vehicles (EVs) follow from the intrinsic efficiency of electric motors relative to internal combustion engines. An EV results in lower emissions than a typical internal combustion engine vehicle, even in accounting for losses associated with generating, transmitting, and distributing the electricity and charging the vehicle.

In the longer term, EVs can also contribute to reducing carbon emission within the power sector by facilitating the use of renewable power. An EV battery can be used to store electricity from intermittent power sources such as solar or wind. The vehicle is charged at a time when renewable generation is plentiful and discharged via "vehicle-to-grid" transmission when

¹³ For more information on building energy code updates in Virginia, see VAEEC's building codes update: vaeec.org/virginia-building-codes-update-march-2017/.

renewables are not available. That allows renewables to cover a larger fraction of electricity demand. Vehicle-to-grid transmission is not a commercial practice today but could become so in the foreseeable future.

8. **Develop a comprehensive plan to reduce transportation sector emissions.** The transportation sector offers a wide range of carbon reduction opportunities for states through efficiency measures. Virginia, like other states, is eligible to be a beneficiary of the Volkswagen (VW) settlement funds. Virginia is eligible for \$93.6 million, to be spent over the ten years beginning in 2017.¹⁴ Of these funds, 15% can be spent on EV charging infrastructure.
 - a. *Recommendation:* Develop programs and policies that improve the efficiency of Virginia's transportation sector. This could include adopting the Clean Car Standard and the Zero Emissions Vehicle Program, or expanding mobility options via less energy-intensive modes of transport. Virginia should take full advantage of VW settlement funds to reduce carbon emissions.

Summary of Recommendations

Virginia should look to energy efficiency as a least cost tool for reducing CO₂ emissions from the electricity sector. To do so, the Commonwealth should take the following steps:

1. *Set a measurable and enforceable energy savings target*
2. *Develop strong evaluation, measurement, and verification (EM&V) protocols*
3. *Modify the utility business model to treat energy efficiency as a resource*
4. *Encourage energy efficiency program delivery in low-income and vulnerable communities*
5. *Encourage energy benchmarking and transparency for commercial buildings*
6. *Update building energy codes*
7. *Advance energy efficiency in public buildings*
8. *Develop a comprehensive plan to reduce transportation sector emissions*

These energy efficiency investments would benefit Virginia residents through lower electricity bills, more local jobs, and improved air quality. The recommendations of the EO 57 work group will not only inform Governor McAuliffe's remaining efforts to save energy and reduce carbon pollution, but they will provide a blueprint for the next administration in Virginia. ACEEE welcomes this opportunity to provide comments, and as needed can provide additional information on national trends and state examples of energy efficiency as a tool for reducing emissions.

Sincerely,



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¹⁴ www.deq.virginia.gov/Programs/Air/VWMitigation.aspx