
# COMMONWEALTH of VIRGINIA

# GOVERNOR TERENCE R. MCAULIFFE'S EXECUTIVE ORDER 57 WORK GROUP

# REPORT AND FINAL RECOMMENDATIONS TO THE GOVERNOR

May 12, 2017

# Table of Contents

## I. Introduction

Climate change along with associated sea-level rise and increasingly volatile weather patterns pose potentially devastating risk to Virginia. According to data compiled by the Georgetown Climate Center and Old Dominion University's Mitigation and Adaptation Research Institute, the Commonwealth has already seen a 33 percent increase in heavy rainstorms and snowstorms in the last sixty years, as well as an 11 percent increase in precipitation from the largest storms.[1] The same report found that as many as 400,000 Virginia homes are at risk of damage from increased storm surges. The researchers projected that rebuilding Virginia's at-risk residential property could cost $92 billion. Home loss disproportionately affects low-income homeowners who often lack the insurance or capital to relocate or rebuild without jeopardizing their overall financial security.

Climate change also has the potential to endanger the Commonwealth's agricultural sector, particularly small, family-owned farms without the resources to implement expensive site-specific adaptation strategies. Half of Virginia's counties face increased risk of water shortages by 2050 as the result of climate-related shifts in precipitation and weather.[2] Currently, agriculture is Virginia's largest industry, supporting almost 311,000 jobs with an annual economic impact of $52 billion.[3] Other business sectors are similarly feeling the impacts of climate change as warmer temperatures affect worker productivity and the health of the workforce.[4]

In addition to the environmental and economic consequences of climate change, carbon emissions also pose a significant risk to human health. According to data from the United States Centers for Disease Control and Prevention, the burning of fossil fuels has resulted in negative impacts to air and water quality and been linked to increased incidence of asthma and cardiovascular disease.[5] Across the United States, warmer temperatures have been linked to increased ground-level ozone[6] and more frequent and sustained wildfires,[7] a major contributor to

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[1] Georgetown Climate Center and Old Dominion University Mitigation and Adaptation Research Institute, *Understanding Virginia's Vulnerability to Climate Change*, February 17, 2017, *available at* http://www.georgetownclimate.org/files/report/understanding-virginias-vulnerability-to-climate-change.pdf (last accessed May 9, 2017).
[2] *See id*.
[3] Virginia Department of Agriculture and Consumer Services, *Virginia Agriculture Facts & Figures*, *available at* http://www.vdacs.virginia.gov/markets-and-finance-agriculture-facts-and-figures.shtml (last accessed May 9, 2017).
[4] U.S. Global Change Research Program. *Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*, April 2016, *available at* https://health2016.globalchange.gov/ (last accessed May 9, 2017).
[5] Centers for Disease Control and Prevention, *A Human Health Perspective on Climate Change*, https://www.cdc.gov/climatechange/pubs/hhcc_final_508.pdf (last accessed May 9, 2017).
[6] Pfister, G. G., S. Walters, J.-F. Lamarque, J. Fast, M. C. Barth, J. Wong, J. Done, G. Holland, and C. L. Bruyère, Journal of Geophysical Research: Atmospheres, *Projections of future summertime ozone over the U.S.*, *available at* http://onlinelibrary.wiley.com/doi/10.1002/2013JD020932/abstract (last accessed May 9, 2017).

particulate matter pollution harmful to public health. Evidence from the Virginia Department of Health shows increased incidences of West Nile virus and Lyme disease,[8] an indication that recent environmental shifts may have improved survival rates for disease vectors like ticks and mosquitos.

The impacts of climate change are also causing ocean warming and ice-sheet loss, resulting in potential sea level rise of more than five feet in Virginia by the turn of the century.[9] Because of its low-lying elevation, natural geography, and high rate of land subsidence, Hampton Roads is consistently ranked as the second most vulnerable region in the country at risk from rising seas, a clear and accelerating result of climate change.[10] According to analysis by Risk Management Solutions, the Virginia Beach-Norfolk Metropolitan Statistical Area ranks 10th in the world for assets at risk of flooding as the result of relative sea level rise.[11] The Hampton Roads Planning District Commission estimates that a conservative three foot rise in sea level would cover nearly 900 miles of roads in the region, costing as much as $87 billion.[12] Naval Station Norfolk, the world's largest naval base, has replaced four World War II-era piers to compensate for higher seas and plans to build eight more, at a cost of more than $100 million per pier.[13]

Given the challenges associated with climate change and the need for solutions, Virginia is uniquely positioned to become a leader in the international efforts to reduce carbon dioxide emissions and stave off the most dramatic consequences of climate change. While carbon dioxide emissions from Virginia's electric generating units have fallen by 21 percent between 2005 and 2014, they still account for approximately 30 percent of the state's overall carbon dioxide emissions. Investments have accelerated since 2014, but the Commonwealth has tremendous potential to build on this growth and achieve even greater carbon emission reductions through additional investments in clean energy technologies.

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[7] A. L. Westerling, H. G. Hidalgo, D. R. Cayan, T. W. Swetnam, Science Magazine, *Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity*, *available at* http://science.sciencemag.org/content/313/5789/940.full (last accessed May 9, 2017).

[8] Virginia Department of Health, *Ten-Year Trend in Number of Reported Cases of Reportable Diseases in Virginia, 2006-2015*, *available at* http://www.vdh.virginia.gov/content/uploads/sites/13/2016/03/table2a_trend2015.pdf (last accessed May 9, 2017).

[9] Virginia Institute of Marine Science, *Sea Level Rise Scenarios*, *available at* http://www.vims.edu/newsandevents/topstories/slr_scenarios.php (last accessed May 9, 2017).

[10] Deconcini, C. and Tompkins, F., World Resources Institute, *Sea-level Rise and its Impact on Virginia*, *available at* https://www.wri.org/sites/default/files/wri_factsheet_virginia_final.pdf (last accessed May 9, 2017).

[11] Nicholls, R. J., Hanson, S., Herweijer, C., Patmore, N., Hallegatte, S., Corfee-Morlot, J., Château, J., & MuirWood, R., Organisation for Economic Co-operation and Development, *Ranking Port Cities with High Exposure and Vulnerability to Climate Extremes*, *available at* http://www.oecd-ilibrary.org/environment/ranking-port-cities-with-high-exposure-and-vulnerability-to-climate-extremes_011766488208 (last accessed May 9, 2017).

[12] Hampton Roads Planning District Commission, *Climate Change in Hampton Roads, Phase III: Sea Level Rise in Hampton Roads, Virginia*, *available at* http://www.hrpdcva.gov/library/view/230/climate-change-in-hampton-roads:phase-iii-sea-level-rise-in-hampton-roads-july-2012 (last accessed May 9, 2017).

[13] Evan Leghmann, E&E News, *Inside One Naval Base's Battle with Sea-Level Rise*, Oct. 27, 2016, *available at* https://www.eenews.net/stories/1060044863 (last accessed May 9, 2017).

Today, Virginia has more than 1,800 megawatts (MW) of solar currently in service or under development.[14] In the last year alone, the number of solar jobs in Virginia has increased by 65 percent, from 1,963 to 3,236.[15] Virginia's solar job market is the 9th-fastest-growing solar jobs market in the nation.[16] The Commonwealth is already home to over 75,000 energy efficiency workers.[17] Clean energy business revenue in Virginia has increased from $300 million in 2014 to $1.5 billion in 2016, a five-fold increase.[18] The continued growth of clean energy investment in the Commonwealth has the potential to bring about long-term sustainable economic development while also mitigating the impacts of climate change through reduced carbon dioxide emissions.

With these two principals in mind – the enormity of climate change impacts and the potential for clean energy industry growth – Governor McAuliffe signed Executive Order 57 ("EO 57") on June 28, 2016. When the Governor issued EO 57, he recognized that the Commonwealth must continue to facilitate and engage in a dialogue on carbon reduction methods while simultaneously creating a pathway for clean energy initiatives that will grow jobs and help diversify Virginia's economy. Through the Executive Order, Governor McAuliffe directed the Virginia Secretary of Natural Resources, Molly Ward, to convene an EO 57 Work Group ("Work Group") to study these issues and recommend methods to reduce carbon emissions from the electric sector in Virginia. The focus of the Work Group was to evaluate options under the Governor's existing authority while simultaneously creating more clean energy jobs.

In addition to Secretary Ward, the Work Group was comprised of Secretary of Commerce and Trade Todd Haymore, Virginia Department of Environmental Quality Director David Paylor, Virginia Department of Mines, Minerals and Energy Director John Warren, and Deputy Attorney General for Commerce, Environment, and Technology John Daniel. Through a robust stakeholder engagement process, the Work Group received presentations and feedback from a variety of perspectives including electric utilities, clean energy businesses, industrial manufacturing, academic institutions, environmental organizations, and other interested stakeholders. This report is the result of the efforts of the Work Group.

The full text of Executive Order 57 is provided in Appendix A and the complete agendas for all of the Work Group meetings are provided in Appendix B of this report.

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[14] Department of Mines Minerals and Energy, Solar Tracking Data, Updated May 5, 2017.
[15] The Solar Foundation, *National Solar Jobs Census 2016*, *available at* http://www.thesolarfoundation.org/national/ (last accessed May 9, 2017).
[16] *See id*.
[17] U.S. Department of Energy, *2017 US Energy and Employment Report*, *available at* https://energy.gov/downloads/2017-us-energy-and-employment-report (last accessed May 9, 2017).
[18] The Virginia Energy Efficiency Council, *Why Energy Efficiency is a Smart Investment in Virginia*, *available at* http://vaeec.org/resources/data/ (last accessed May 15, 2017).

## II. Process

EO 57 outlined a process for the Governor, through the Secretary of Natural Resources, to receive recommendations from the public to further reduce the Commonwealth's carbon emissions and grow the clean energy economy under existing state authority. This process ensured that the Work Group would have the necessary public input to develop recommendations and submit a report to the Governor by the May 31, 2017 deadline stipulated in the Executive Order.

The process consisted of six monthly meetings that began on August 31, 2016 and ended on February 28, 2017. Each public meeting lasted between two and three hours, and the meetings consisted of presentations from members of the public. The presentations were voluntary, and all members of the public were invited to send suggested topics and presenter information to the Secretary of Natural Resources' office. In total, the Work Group received more than forty presentations. Each presentation was made publicly available on the Secretary of Natural Resources' website.[19]

In addition to the public meetings, the Work Group also facilitated a three month written public comment period that opened on February 1, 2017 and closed on April 30, 2017. Members of the public were invited to submit comments either electronically or in hard copy to the Office of the Secretary of Natural Resources. In total, the Work Group received over 8,000 written comments.

## III. Recommendations

The recommendations set forth in this report are drawn from the information developed and understanding gained through the public meetings and the public comment process. The Work Group synthesized the many presentations and comment topics down to the five recommendations set forth below. This list does not attempt to include every recommendation that was provided to the Work Group, but it covers the broad categories of recommendations for the Governor's consideration.

### 1.) Promulgate regulations to limit carbon dioxide emissions

The Work Group received a number of presentations and written comments from stakeholders advocating for a regulation to limit carbon dioxide emissions from power plants. These comments included recommendations that the Commonwealth join or participate in the Regional Greenhouse Gas Initiative ("RGGI") or another regional trading program, that a price be put on carbon, and that Virginia strive to reduce its greenhouse gas emissions by 30 to 40 percent by the year 2030.

[19] *See* Office of the Secretary of Natural Resources Website, *available at* http://naturalresources.virginia.gov/initiatives/eo-57/.

The Work Group received information on both ratepayer impacts and potential job creation opportunities associated with a regulation to limit carbon emissions. Advanced Energy Economy modeled carbon reduction targets similar to those in the federal Clean Power Plan that would be achieved through implementation of power generation fleet changes already planned by utilities along with the addition of renewable energy and energy efficiency measures. They found that these actions would result in 54,231 cumulative additional job years by 2030 and, if Virginia reduced its imports while applying the same carbon reduction actions, we could see the number of cumulative additional job-years double to more than 120,000. The Natural Resources Defense Council, which advocated for a 30 percent reduction target by the year 2030 (i.e., 30x30), also performed utility-sector modeling. They found that if the target included 20 percent in-state renewable generation and 1.5 percent annual energy efficiency savings, Virginia customer electric bills would decrease by almost $100 per year.

The business community also weighed in on the establishment of carbon dioxide regulations. Mars, Nestle, and Unilever filed joint comments noting that "an annual emissions reduction cap or clean energy standard are models that have been effective in other states' efforts to foster clean energy development." These companies stated that while they do not support one particular policy over another, they "believe that such policies will create market certainty and drive private-sector investments."

The Business Council for Sustainable Energy stated that "[s]uccessful reduction of Virginia's carbon emissions will require embracing the full portfolio of clean energy and energy efficiency technologies, products, and services." Dominion Resources filed comments stating that they "have confidence the Commonwealth can devise a forward-looking plan ensuring the continued decline in carbon emissions that is compatible with promoting a growing economy and keeping Virginia the most attractive state for new businesses." In addition, Dominion stated, "a rate-based approach or a mass-based limit on existing sources is the most accurate way to stimulate economic growth and job creation while achieving measurable carbon emission reductions."

The University of Virginia's Environmental and Regulatory Law Clinic and the Southern Environmental Law Center provided information on the legal justification for regulatory action. Both presentations focused on the current authority of the State Air Pollution Control Board ("Board") and the Department of Environmental Quality under Virginia Code § 10.1-1300 *et seq*. Each concluded that the Board has authority to regulate carbon dioxide from electric power generation facilities. This has since been confirmed by Attorney General Mark Herring in an official opinion dated May 12, 2017.

In short, there was tremendous public interest in this particular recommendation. Although many stakeholders provided feedback focused on specific in-state targets (such as 30x30), the Work Group believes that it is important and necessary that Virginia work through a

regional model, like the established and successful RGGI, in order to both achieve lower compliance costs and address the interstate nature of the electric grid.

*The Work Group recommends that the Governor consider taking action via a regulatory process to establish a "trading-ready" carbon emissions reduction program for fossil fuel fired electric generating facilities that will enable participation in a broader, established multi-state carbon market.*

**2.) Update state building codes to reflect current technology and standards**

Buildings account for approximately 70 percent of America's electricity consumption and more than 40 percent of total national energy usage annually, producing 39 percent of the United States' overall carbon emissions.[20] Inefficiency in building design was a major source of stakeholder concern, and a number of presenters and written comments focused on the need to strengthen Virginia's building codes. Some commenters recommended that Virginia adopt the 2015 International Energy Conservation Code (IECC) with no alterations while others recommended updating to the 2012 IECC without amendments.

Currently, Virginia's building code embraces the standards from the 2012 IECC for commercial properties and the 2009 equivalent for residential structures. Arlington County recommended adoption of the 2015 IECC with no alterations, and noted that "Virginia homeowners would save $2.5 billion between 2010-2040 and avoid nearly 16 million metric tons of carbon emissions." The Southeast Energy Efficiency Alliance also recommended that Virginia update its building codes to the 2015 IECC, and noted that "Virginia could achieve annual carbon savings of 1.21 million metric tons CO2 by 2030, and cumulative savings of 15.66 million metric tons CO2 from 2010 to 2030." The Virginia Energy Efficiency Council and Local Energy Alliance Program similarly recommended updating the building codes to the 2015 IECC. The Virginia Poverty Law Center recommended that Virginia update the building codes to the 2012 IECC, but that Virginia develop a plan to adopt the 2018 updates when they are released.

The Work Group also received information evaluating compliance with Virginia's current building codes. Recent testing in both Charlottesville and McLean, presented by the Virginia Energy Efficiency Council and the Local Energy Alliance Program, shows that a significant portion of the Commonwealth's homes do not meet established standards for air-tightness or ductwork. The U.S. Department of Energy (DOE) is conducting a statewide research field study investigating energy code implementation in residential buildings in Virginia. This study will provide valuable Virginia-specific data on energy code compliance as well as insight into market-driven efficiency decisions of homebuilders.

[20]Presentation by Virginia Energy Efficiency Council and Local Energy Alliance Program, *The Role of Building Energy Codes in a Carbon Reduction Strategy for Virginia, available at* http://naturalresources.virginia.gov/media/8635/4-vaeec.pdf.

The Virginia Board of Housing and Community Development (BHCD) is currently in the process of updating the Commonwealth's Uniform State building codes (USBC). This spring, BHCD began accepting amendments to the draft code and stakeholder workgroups began meeting. By November of 2017, BHCD will vote on the final State Building Codes.

*The Work Group recommends that BHCD update the commercial building codes to reflect the 2015 IECC and that the residential building codes be consistent with current technology and be more reflective of the 2015 IECC. In addition, the Department of Mines, Minerals and Energy should participate in data collection efforts, including the previously-mentioned DOE energy code field study, to better inform the building code process and to provide data and best practices for implementation.*

**3.) Improve access to clean energy resources like solar, wind, and energy efficiency**

Stakeholders from a variety of constituencies across the Commonwealth presented or filed comments on the need to further increase deployment of clean energy resources. However, the policy recommendations that would achieve such a result varied. Some presenters recommended adoption of a mandatory Renewable Portfolio Standard (RPS) while others focused on market opportunities and customer choice.

A number of presenters focused on recommendations regarding the adoption of a mandatory RPS. Virginia's Renewable Energy Portfolio goal was created via legislation in 2007 as part of the re-regulation of the Commonwealth's electrical industry. The goal was set to incrementally increase until 2025, at which point it would level off to 15 percent of electricity sold by a utility. Two years after adoption of this preliminary goal, legislation was passed allowing research and development expenses to be counted towards up to 20 percent of the goal. Further legislative modifications were made in 2013 to remove the incentive structure supporting utility compliance. While there are merits to the RPS, a mandatory RPS would require legislation, and the Work Group has aimed its focus on recommendations that could be implemented through the Governor's executive authority.

The Governor has used his executive authority to show state leadership in powering state operations with renewable energy. In 2014, the Governor announced a goal of getting 8 percent of state government's electricity from renewable sources within three years. The Commonwealth is moving toward achieving this goal through partnerships with the U.S. Navy and the University of Virginia. However, some presenters noted that Virginia should expand on this lead-by-example model by meeting stated energy reduction targets and expanding the state renewable procurement target.

Another set of recommendations addressed the need to grow market opportunities and increase customer choice, both at the business and residential levels. Mars, Nestle, and Unilever recommended that the Governor develop an "explicit legal framework to allow companies to enter into contracts with non-utility energy providers through third-party financing or offering

utility-administered, cost-of-service-based renewable energy tariffs for large buyers." E2 recommended that the Governor convene a task force including DMME, the State Corporation Commission, the Department of Environmental Quality, the Virginia Economic Development Partnership, Dominion, and Appalachian Power to discuss corporate renewable procurement needs and how to meet them. Ceres noted that corporate procurement targets increasingly focus on achieving 100 percent renewable energy and companies will factor this into site selection when considering investments in new facilities or expansion of existing operations.

A number of activities have occurred in the General Assembly to drive increased solar development. Solar industry and utility representatives met over fifty times in 2016 to break the legislative impasse over needed changes to the existing legislative framework governing solar generation in Virginia. This group (the "Solar Group"), facilitated by the Virginia Center for Consensus Building at VCU, crafted three pieces of legislation that passed the General Assembly unanimously in 2017 and were signed into law by the Governor. Senate Bill 1393 created a pilot program for community solar projects administered by utilities. Senate Bill 1394 and House Bill 2303 enacted an additional option for agricultural customers with solar installations. Senate Bill 1395 opened the streamlined Permit by Rule process for regulatory approval to certain projects not previously eligible. The EO 57 Work Group received recommendations to tackle additional solar deployment access issues. Building on the trust and respect that was established in 2016, the Solar Group could tackle even more complex issues in 2017 with more outreach to additional stakeholders.

*The Work Group recommends that the Governor update Virginia's current renewable energy procurement target and work with the Solar Group to develop a comprehensive plan to increase corporate access to renewable energy as an economic development tool.*

**4.) Develop an energy efficiency accounting and registry tool**

The Work Group received many presentations focused on the fact that Virginia faces challenges in the effort to improve and increase energy efficiency. Many other states are already in the process of implementing energy efficiency programs that are much more expansive than those in Virginia. In addition to recommendations on specific energy efficiency deployment mechanisms, the Work Group also received a presentation from E4TheFuture on the National Energy Efficiency Registry ("NEER").

This presentation noted that many regulatory systems and their supporting computer infrastructure have been developed independently at the state level, making it difficult to accurately track and compare results across state lines. To remedy this problem, the Tennessee Department of Environment & Conservation has partnered with the U.S. Department of Energy, the National Association of State Energy Officials, the Climate Registry, and agencies from Michigan, Minnesota, Oregon, and Pennsylvania to create the NEER. The registry, currently

under development, is intended to serve as a software platform for credibly evaluating the benefits of energy efficiency projects.

By providing a consistent framework for measuring and assessing energy efficiency initiatives, the registry could help states apply efficiency savings to their self-selected energy goals as well as existing or future federal or state regulation. In addition, NEER will use best practices in data management, reporting, and registry design, to improve data collection and management efficiency and, where possible, automate processes. Increased transparency could allow both private and public sector entities to see validated cost savings that can be achieved through improved efficiency, thus encouraging increased investments in conservation.

*The Work Group recommends that the Department of Mines, Minerals and Energy investigate the NEER model and evaluate whether the registry could be a starting point for an energy efficiency accounting and trading mechanism conceptually similar to the currently used Renewable Energy Certificate.*

**5.) Establish a statewide Environmental Justice Advisory Council**

An important element of the Executive Order 57 process, which was spelled out in the text of the order itself, is to make a particular effort to ensure that all people and perspectives have a voice in environmental discussions. This concept, known as environmental justice, is defined as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental law, regulations, and policies."[21]

Some environmental issues can be compounded or concentrated as the result of sociological factors. Low-income communities at risk from sea level rise often lack the resources to adequately improve resiliency and can suffer more sustained consequences as the result of personal property loss and damage. Virginia's power plants are disproportionately located in areas with high concentrations of poverty and people of color. Many of the most severe health consequences arising from coal-fired electrical generation are localized in nature, so this distribution unfairly burdens already disadvantaged communities with increased health problems and accompanying costs.

The Virginia Environmental Justice Collaborative proposed the creation of a statewide Environmental Justice Advisory Council ("EJAC"). Pursuant to this recommendation, the EJAC would serve as a sustained conduit for conversations about environmental justice and underserved communities.

*The Work Group recommends that the Governor convene an EJAC consisting of appointed representatives to communicate directly with the Secretary of Natural Resources, the*

[21]U.S. Environmental Protection Agency, *Learn About Environmental Justice*, *available at* https://www.epa.gov/environmentaljustice/learn-about-environmental-justice.

*Secretary of Commerce and Trade, the Secretary of Health and Human Resources, the Secretary of Public Safety and Homeland Security, and the Commission on Local Government. The EJAC should provide a forum for sharing information and making recommendations to policy makers to help ensure fair treatment and meaningful involvement by all people with respect to policy decisions that impact the environment and health of local communities.*

## IV. Conclusion

Climate change is among the most pressing issues facing humanity, but it is not insurmountable. While no single solution exists, the recommendations in this report offer attainable strategies that could be performed under the Governor's existing executive authority. These recommendations are aimed at both reducing carbon dioxide emissions from the electrical generation sector and driving economic growth from the clean energy sector. While Virginia cannot solve the problem of climate change alone, we can take important and necessary steps at the state level to protect our citizens from the most extreme impacts and create meaningful opportunities to grow the clean energy sector.

# Appendix A:

Text of Executive Order 57

Commonwealth of Virginia
Office of the Governor

# Executive Order

## NUMBER FIFTY SEVEN (2016)

## DEVELOPMENT OF CARBON REDUCTION STRATEGIES FOR ELECTRIC POWER GENERATION FACILITIES

### Part I – Importance of the Initiative

Though our coastal communities may be the first to witness the effects of climate change, the risks presented by increasingly fierce storms, severe flooding, and other extreme weather events are not confined to a single geographic area. Neither are their causes. The economic implications are significant, and we must do all we can to protect our critical military infrastructure, our ports, our homes, and our businesses. It is only by acting together with common purpose that the Commonwealth can effectively adapt and stave off the most severe consequences of climate change.

One key step forward is to continue with a strategic goal of reducing carbon emissions. Virginia has already made meaningful strides – between 2005 and 2014, Virginia reduced its carbon emissions from power plants by 21 percent. However, the electric sector is still responsible for approximately 30 percent of the carbon dioxide pollution in the Commonwealth. Moreover, electric companies are including carbon regulation projections in their long-term plans. The electric sector is changing rapidly through increasing reliance on low and zero carbon resources. As such, it is vital that the Commonwealth continue to facilitate and engage in a dialogue on carbon reduction methods while simultaneously creating a pathway for clean energy initiatives that will grow jobs and help diversify Virginia's economy.

Accordingly, by virtue of the authority vested in the Governor under Article V of the Constitution of Virginia and under the laws of the Commonwealth, I hereby direct the Secretary of Natural Resources to convene a Work Group, chaired by the Secretary, to study and recommend methods to reduce carbon emissions from electric power generation facilities. The Secretary shall receive input from interested stakeholders.

Such methods shall align with the Virginia Air Pollution Control Board's power to promulgate regulations abating, controlling and prohibiting air pollution throughout or in any part of the Commonwealth.

**Part II – Scope and Guidance**

In preparing their recommendations, the Secretary and the Work Group shall consider the following:

(1) the establishment of regulations for the reduction of carbon pollution from existing electric power generation facilities pursuant to existing authority under Virginia Code § 10.1-1300 *et seq.;*

(2) the carbon reduction requirements for existing electric power generation facilities established under § 11l(d) of the federal Clean Air Act, which are currently stayed pending final disposition;

(3) the interaction between electric utilities and regional markets, including PJM Interconnection;

(4) the impact any reduction requirements place on the reliability of the electric system;

(5) the impact any reduction of carbon pollution may have on electric rates and electric bills;

(6) the impact of reducing carbon pollution on low income and vulnerable communities;

(7) the cost effectiveness of pollution reduction technologies that may be deployed;

(8) the economic development opportunities associated with deployment of new carbon reduction technologies;

(9) the implementation and administration of carbon reduction regulations; and

(10) flexibility in achieving the goals of any carbon reduction regulation.

The Secretary of Natural Resources shall complete her work, including the development of recommendations as to viable carbon reduction methods for the electric power generation facilities by April 30, 2017. The Secretary of Natural Resources shall provide a report on the recommendations to the Governor by May 31, 2017.

**Effective Date of the Executive Order**

This Executive Order shall be effective upon its signing and shall remain in full force and effect for one year after its signing unless amended or rescinded by further executive order.

Given under my hand and under the Seal of the Commonwealth of Virginia this 28th Day of June, 2016.

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Terence R. McAuliffe, Governor

Attest:

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Kelly Thomasson, Secretary of the Commonwealth

# Appendix B:

Executive Order 57
Work Group Agendas

# Executive Order 57 Work Group Meeting

August 31, 2016
1:00pm – 4:00pm
Patrick Henry Building, West Reading Room
1111 E. Broad St., Richmond, VA 23219

## Agenda

I. Welcome and Overview of Work Group Structure – Molly Ward, Secretary of Natural Resources

II. Presentation on Virginia's Carbon Reduction Efforts – Mike Dowd, Virginia Department of Environmental Quality

III. Presentation on the Legal Status of Carbon Reduction Rules – Matt Gooch, Virginia Office of the Attorney General

IV. Presentation on Supportive Research Regarding Climate Impacts – Emily Steinhilber and Molly Mitchell, Center for Recurrent Flooding Resiliency

V. Next Steps and Adjournment – Molly Ward, Secretary of Natural Resources

## Work Group Members

1. Molly Ward, Secretary of Natural Resources
2. Maurice Jones, Secretary of Commerce and Trade
3. David Paylor, Director of the Virginia Department of Environmental Quality
4. John Warren, Director of the Virginia Department of Mines, Minerals, and Energy
5. John Daniel, Deputy Attorney General for Commerce, Environment and Technology

# Executive Order 57 Work Group Meeting

October 6, 2016
1:00pm – 4:00pm
Patrick Henry Building, East Reading Room
1111 E. Broad St., Richmond, VA 23219

## Agenda

I. Welcome – Molly Ward, Secretary of Natural Resources

II. Presentations:

a. PJM Interconnection, LLC

b. Tenaska

c. Advanced Energy Economy

d. Business Council for Sustainable Energy

e. Virginia League of Conservation Voters

f. Faith Alliance for Climate Solutions

g. Warrenton Climate Change Group

III. Next Steps and Adjournment – Molly Ward, Secretary of Natural Resources

## Work Group Members

1. Molly Ward, Secretary of Natural Resources
2. Todd Haymore, Secretary of Commerce and Trade
3. David Paylor, Director of the Virginia Department of Environmental Quality
4. John Warren, Director of the Virginia Department of Mines, Minerals, and Energy
5. John Daniel, Deputy Attorney General for Commerce, Environment and Technology

# Executive Order 57 Work Group Meeting

October 31, 2016
1:00pm – 4:00pm
Patrick Henry Building, East Reading Room
1111 E. Broad St., Richmond, VA 23219

## Agenda

I. Welcome – Molly Ward, Secretary of Natural Resources

II. Presentations:

a. American Council for an Energy Efficient Economy

b. Oil Change International

c. Alliance for Industrial Efficiency

d. Sierra Club

e. Virginia Housing Alliance

f. National Green Fuels

III. Next Steps and Adjournment – Molly Ward, Secretary of Natural Resources

**For those unable to attend in person, we have arranged a webcast using the following link:** https://attendee.gotowebinar.com/register/6736447537171170050

## Work Group Members

1. Molly Ward, Secretary of Natural Resources
2. Todd Haymore, Secretary of Commerce and Trade
3. David Paylor, Director of the Virginia Department of Environmental Quality
4. John Warren, Director of the Virginia Department of Mines, Minerals, and Energy
5. John Daniel, Deputy Attorney General for Commerce, Environment and Technology

# Executive Order 57 Work Group Meeting

December 1, 2016
1:00pm – 4:00pm
Patrick Henry Building, West Reading Room
1111 E. Broad St., Richmond, VA 23219

## Agenda

I. Welcome – Molly Ward, Secretary of Natural Resources

II. Presentations:

a. EnerNOC

b. Covanta

c. WestRock

d. Third Party Delivered Energy Efficiency Coalition

e. UVA School of Law's Environmental and Regulatory Law Clinic

f. Birchwood Power

g. Virginia Poverty Law Center

III. Next Steps and Adjournment – Molly Ward, Secretary of Natural Resources

**For those unable to attend in person, we have arranged a webcast using the following link:** https://attendee.gotowebinar.com/register/5842017918223385090

## Work Group Members

1. Molly Ward, Secretary of Natural Resources
2. Todd Haymore, Secretary of Commerce and Trade
3. David Paylor, Director of the Virginia Department of Environmental Quality
4. John Warren, Director of the Virginia Department of Mines, Minerals, and Energy
5. John Daniel, Deputy Attorney General for Commerce, Environment and Technology

# Executive Order 57 Work Group Meeting

January 10, 2017
1:00pm – 4:00pm
Patrick Henry Building, West Reading Room
1111 E. Broad St., Richmond, VA 23219

## Agenda

I. Welcome – Molly Ward, Secretary of Natural Resources

II. Presentations:

   a. E2

   b. Appalachian Voices

   c. Southeastern Wind Coalition

   d. Virginia Energy Efficiency Council

   e. American Lung Association

   f. Southeast Energy Efficiency Alliance

   g. ACN Energy Solutions

III. Next Steps and Adjournment – Molly Ward, Secretary of Natural Resources

**For those unable to attend in person, we have arranged a webcast using the following link:** https://attendee.gotowebinar.com/register/5975119298986349057

## Work Group Members

1. Molly Ward, Secretary of Natural Resources
2. Todd Haymore, Secretary of Commerce and Trade
3. David Paylor, Director of the Virginia Department of Environmental Quality
4. John Warren, Director of the Virginia Department of Mines, Minerals, and Energy
5. John Daniel, Deputy Attorney General for Commerce, Environment and Technology

# Executive Order 57 Work Group Meeting

February 28, 2017
1:00pm – 4:00pm
Patrick Henry Building, West Reading Room
1111 E. Broad St., Richmond, VA 23219

## Agenda

I. Welcome – Molly Ward, Secretary of Natural Resources

II. Presentations:

a. Ceres

b. Gerdau Long Steel North America

c. Virginia Environmental Justice Collective

d. E4TheFuture

e. Dominion

f. Southern Environmental Law Center

g. American Petroleum Institute

h. Verde Sources

i. Virginia Nuclear Energy Consortium

j. Natural Resources Defense Council

III. Next Steps and Adjournment – Molly Ward, Secretary of Natural Resources

**For those unable to attend in person, we have arranged a webcast using the following link:** https://attendee.gotowebinar.com/register/6504634204203803393

## Work Group Members

1. Molly Ward, Secretary of Natural Resources
2. Todd Haymore, Secretary of Commerce and Trade
3. David Paylor, Director of the Virginia Department of Environmental Quality
4. John Warren, Director of the Virginia Department of Mines, Minerals, and Energy
5. John Daniel, Deputy Attorney General for Commerce, Environment and Technology