OUR COMMON AGENDA

2026 ENVIRONMENTAL BRIEFING BOOK

a publication of Virginia Conservation Network

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A publication of the
Virginia Conservation Network

Our Common Agenda is written by, vetted through, and voted on by the 170+ Network Partners of the Virginia Conservation Network. This briefing book is intended to be used as an educational guide for policymakers, educational institutions, civic leaders, environmental advocates, and the public to understand the state policy background and potential opportunities to address the environmental problems facing Virginia.

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ABOUT VCN

Founded as the Conservation Council of Virginia in 1969, Virginia Conservation Network (VCN) began as a roundtable of major conservation groups and has grown to include over 170 Network Partners across the Commonwealth. VCN is committed to building a powerful, diverse, and highly-coordinated conservation movement focused on protecting our Commonwealth's natural resources.

VCN is a facilitator of strategic action, a resource for Network Partners statewide, and a constant conservation presence in Virginia's Capitol. Playing a unique role in Virginia's conservation community, VCN helps the community speak with one coordinated voice. The organization and its staff focus on strengthening the conservation community as a whole and winning environmental victories that benefit all Virginians.

VCN's Network Partners work on a wide range of issues from stream restoration, to transportation reform, to renewable energy advancement, to promoting sustainable community growth, to environmental justice and more. Given the diverse work of our partner organizations, VCN organizes its programs into four main categories: **WATER, LAND & WILDLIFE CONSERVATION, CLIMATE & ENERGY**, and **LAND USE & TRANSPORTATION.**

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HOW THE BRIEFING BOOK GETS DRAFTED

Our Common Agenda is written by, vetted through, and voted on by VCN's 170+ Network Partners. Here's our process for crafting this Briefing Book, a comprehensive policy resource:

ISSUE WORKGROUPS HOST ANNUAL MEETINGS

VCN's issue workgroups (Clean Water, Land & Wildlife Conservation, Climate & Energy, and Land Use & Transportation) decide which issues should be covered in the Briefing Book. During this process, the authors of each paper are also selected.

AUTHORS PUT PEN TO PAPER

The collaborative process is truly on display while co-authors craft their briefing book papers. Two–four authors work on each briefing book paper while consulting with VCN staff.

ISSUE WORKGROUPS CONDUCT EXTENSIVE REVIEWS

Once the briefing book papers have been drafted by authors, VCN's issue workgroups extensively review all of the papers, under different lens, including a review to make sure no issue opportunities may have an unnintended impact on marginalized communities. Authors incorporate the workgroup's feedback to make stronger arguments and/or opportunities. By the time briefing book papers have been fully reviewed and finalized, they are read by at least 5-10 experts in the topic's field.

BOARD OF DIRECTORS VOTE TO ACCEPT EACH BRIEFING BOOK PAPER

Finally, each briefing book paper is presented to the Board and a vote on its inclusion follows. This final step of the process ensures that topics and opportunities are in line with VCN's mission and goals.

VIRGINIA CONSERVATION PHOTOGRAPHY CONTEST WINNER

Every year, we ask Virginia's amateur photographers to share their best conservation photography of Virginia to showcase within Our Common Agenda. The public votes to decide on the featured cover photo of the Briefing Book, as well several award categories. This year's photo contest winner is TJ Byrd's photo of a budding Dogwood in front of the Carillon in Richmond, VA. See more of TJ's journey on Instagram at @thedailybyrd.

Shenandoah National Park
Photo by Saravanan Rajamanickam

OUR COMMON AGENDA

A MESSAGE FROM THE EXECUTIVE DIRECTOR

Thank you for opening up a copy of Virginia Conservation Network's (VCN) *Our 2026 Common Agenda*.

Our Common Agenda is the most comprehensive overview of Virginia's environmental policy landscape. A collection of papers written by, vetted through, and voted on by VCN's 170+ Network Partners, this briefing book explains the Commonwealth's environmental policy background and potential opportunities for clean water & flood resilience, land & wildlife conservation, land use & transportation, climate & energy, and good governance.

This publication is meant to be used as both an educational resource as well as a Rolodex – the authors of Our Common Agenda are leading conservation advocates in Virginia. They ground their research and findings in science and present practical environmental priorities that strive to be equitable for all Virginians. The glossary is a resource to make sure readers understand the frequently used terms, state agencies, and programs that govern Virginia's environment. Each paper gives the background for the existing policies that are in place and why the issue matters with references to a myriad of background material in the endnotes.

Our Common Agenda is published annually and widely circulated to policymakers, educational institutions, civic leaders, environmental advocates, and the public. No matter which of those categories you fit in, I'm looking forward to working with you on the topic or topics in this book that interest you the most. Feel free to reach out to me, my team, or any of the authors in this book for more information.

Mary Rafferty
Executive Director

Dog playing fetch at Gloucester Point: Winner of Photo Contest "Ripple Effect" Category
Photo by Tori Nutt

CLEAN WATER & FLOOD RESILIENCE

CLEAN RIVERS, CREEKS & BAYS

RELEVANT PROGRAMS & AGENCIES

See full glossary starting on page 155

AGRICULTURAL NEEDS ASSESSMENT

A systematic review process that identifies specific needs of farmers and/or rural communities to improve agricultural practices and livelihoods. Virginia started meeting the VACS program needs assessment in 2022.

CHESAPEAKE BAY WATERSHED IMPLEMENTATION PLAN

Provides scientific and technical guidance on the Chesapeake Bay Program on measures to restore and protect the Chesapeake Bay. Works to enhance scientific communication and outreach through reports, discussion groups, reviews, and workshops.

CLEAN WATER ACT

The primary federal law governing water pollution established regulations on pollutant discharges into bodies of water and regulated water quality standards. The CWA recognizes both federal and state roles in its implementation and enforcement.

ENHANCED NUTRIENT REMOVAL PROGRAM

This program incorporates technologies that allow sewage treatment plants to provide a highly advanced level of nutrient pollution removal by building on previously set biological nutrient removal (BNR) systems.

NATURAL RESOURCES CONSERVATION SERVICE (NRCS)

An agency within the USDA that conducts research and provides technical and financial assistance to landowners to protect and conserve privately owned natural resources. NRCS programs focus on supporting soil health, water quality, and thriving agricultural communities.

SOIL & WATER CONSERVATION DISTRICTS (SWCDS)

Political subdivisions of the state of Virginia. The 47 Soil and Water Conservation Districts manage the Virginia Agricultural Cost-Share program, employ technical staff, and deliver conservation technical assistance to landowners and farmers free of charge.

STORMWATER LOCAL ASSISTANCE FUND (SLAF)

A 50-50 state and local matching grant program that protects and improves the health of our waterways by funding local stormwater resiliency projects.

VIRGINIA AGRICULTURAL COST-SHARE PROGRAM (VACS)

A state-funded program that offers financial incentives and technical assistance to farmers to adopt agricultural best management practices that reduce pollution reaching waterways while enhancing farm productivity.

VIRGINIA CONSERVATION ASSISTANCE PROGRAM (VCAP)

Cost-share program providing assistance as well as financial incentives to urban landowners installing Best Management Practices (BMPs) on their property. Eligible practices include the removal of impervious surfaces, rainwater harvesting, and other efforts to mitigate the effects of erosion and stormwater runoff.

VIRGINIA DEPARTMENT OF CONSERVATION & RECREATION (DCR)

A state agency within the Natural Resources secretariat tasked with protecting, managing, and overseeing natural habitat, state parks, open space, and access to the outdoors. Oversees private dam safety and administers the Virginia Agricultural Cost-Share and Community Flood Preparedness Fund.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)

State agency responsible for administering laws and regulations related to air quality, water quality, water supply, renewable energy, and land protection. DEQ issues permits, conducts monitoring, performs inspections, and enforces environmental law.

VIRGINIA DEPARTMENT OF HEALTH

State agency that oversees public health throughout the state, including the regulation of public drinking water.

VIRGINIA POLLUTANT DISCHARGE ELIMINATION SYSTEM (VPDES)

Program administered by the Department of Environmental Quality (DEQ) designed to prevent pollutants from getting into state waters. DEQ issues permits for all point source discharges; stormwater discharges from Municipal Separate Stormwater Sewer Systems (MS4s); and stormwater discharges from industrial sites.

VIRGINIA WATER PROTECTION (VWP) PERMITS

A permit program and an associated compliance program that regulates impacts to surface waters, surface water withdrawals, and non-agricultural impoundments. Virginia law requires a VWP permit must be obtained before disturbing a wetland or stream.

WATER QUALITY IMPROVEMENT FUND (WQIF)

Fund that directs Virginia Department of Environmental Quality to assist local government and individuals in reducing point source nutrient loads to the Chesapeake Bay.

Little Island Pier - Sandbridge, VA
Photo by Michael Schimmel

SAFEGUARDING WATER SUPPLIES

CLEAN RIVERS, CREEKS, & BAYS

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WHY IT MATTERS

Virginia's waterways and groundwater aquifers have always been thought to be relatively abundant. For centuries, they have supported a diverse array of ecosystems and provided critical habitat for fish and wildlife. In addition to its ecological importance, Virginia's water supplies are critical to supporting the Commonwealth's economic and recreational sectors. Virginia's waters also play a vital role in supporting Virginia's #1 private industry: agriculture. Our waterways serve as the basis for robust tourism and recreational opportunities such as fishing, paddling, boating, and waterfowl hunting. Perhaps most importantly, our water supplies provide us with drinking water.

However, this relative abundance of water is being called into question. Water-intensive industries such as data centers are becoming more established, extreme weather patterns are intensifying drought conditions, and groundwater levels are declining, especially east of Interstate 95. Ongoing work at the **Virginia Department of Environmental Quality (DEQ)** has made it clear that there are major water planning data gaps and a need to clarify regulations regarding legacy unpermitted water intake users. We lack a comprehensive cumulative water supply planning process to help us ensure enough water is available for all beneficial users.

Compounding the issue, localities east of Interstate 95 are being forced to transition from groundwater wells to alternative water sources (most often surface water) due to significant declines in the **Potomac Aquifer**. This shift to surface water places additional pressure on Virginia's rivers and streams, which already face challenges from existing surface water withdrawals.

Virginia must proactively plan to ensure water supplies are accessible to all beneficial users in the future. To guarantee that Virginians have access to clean and sustainable water, a comprehensive approach is necessary.

CURRENT LANDSCAPE

As the Potomac Aquifer declines, DEQ is actively encouraging localities within the Eastern Virginia Groundwater Management Area (EVGMA) to transition from dependence on groundwater wells to alternative water sources. Often, the alternative source they pursue is surface water from Virginia's rivers and streams. As it stands now, DEQ modeling shows that some rivers are over-allocated during low-flow conditions, meaning there isn't enough water to meet the expected withdrawal demands.

New surface water withdrawals in Virginia require a **Virginia Water Protection (VWP) permit**, but not all existing intakes are permitted. Any surface water intake in existence before the creation of VWP regulations in 1989 is considered exempt and is not required to have a VWP permit unless certain conditions change. In 2023, outside of power-generating facilities, 76% of surface water withdrawals reported to DEQ were unpermitted.[1] DEQ and legacy water users, those with intakes that predate the 1989 regulations, disagree on how much water they're allowed to withdraw (pre-1989 usage vs intake capacity). DEQ has also not received complete information it requested from these users about intake capacity and past withdrawals. In the responses it did get, DEQ found "reported capacity and intake values that differ from DEQ records," and many responses either left fields blank or didn't report values in the correct format (million gallons per day, MGD).[2] Further, resource management and water supply planning become significantly more challenging when legacy water withdrawal exemptions persist indefinitely and can be transferred to new entities, creating uncertainty around actual water availability and system capacity.

In 2020, the General Assembly required DEQ to amend the water supply planning process.[3] As of October 9, 2024, new regulations direct the State Water Control Board to designate Regional Planning Areas based mainly on river basins and assign each locality to an Area; Virginia has 25 Areas. Each must submit a single, jointly developed regional water supply plan by 2029, identifying supply risks and proposing regional strategies. The General Assembly allocated $462,000 ($18,480 per Area) in grants over two years to support plan development, which is expected to cost $90,000–$300,000 per plan.

Additionally, the VWP permitting process assesses only the impact of the individual intake, not the cumulative impact of new and existing withdrawals on a river basin. In 2025, the General Assembly funded a three-year VIMS study of the cumulative impacts of surface water intakes on aquatic life and water quality of Virginia's Chesapeake Bay and tributaries. The findings can inform VWP permitting decisions affecting native aquatic species and salinity.

OPPORTUNITIES

There is an opportunity to clarify the withdrawal standard that unpermitted legacy water intake users all abide by (intake capacity/limiting capacity vs pre-1989 max) and enforce the requirement that all legacy intake users fully disclose reported capacity and intake values, and do so in the format required (MGD) to DEQ. As we approach nearly 40 years after this action to deliberately not require modern environmental protections or standards for these intakes, setting timelines or deadlines for meeting environmental protections, like aquatic organism structural protections, is warranted. Further, it would be similarly appropriate to stop the transfer of these legacy withdrawal exemptions from operations that have long ceased withdrawing water to new industries, which may seek to circumvent the VWP process.

There is an opportunity to provide DEQ and Regional Planning Areas with the resources they need to create the required regional water supply plans. These regional water supply plans can then be used to develop comprehensive water supply plans for each river basin that take into account the cumulative needs of all beneficial users. This type of planning allows us to know how much water is available in a river at any one time to ensure our rivers are not over-allocated.

TOP TAKEAWAYS

Many localities will transition from groundwater wells to rivers due to significant declines in the Potomac Aquifer. This shift adds pressure on Virginia's rivers and streams, which already face challenges from existing water withdrawals, and has resulted in applications for new water intake permits.

DEQ is working with legacy water intake users to define how much water they are permitted to withdraw (pre-1989 volume vs intake capacity/limiting capacity) and obtain current data from legacy withdrawers relating to intake capacity and pre-1989 max withdrawals.

Adequate funding is needed to create regional water supply plans that provide the basis for basin-wide cumulative water management to ensure all beneficial users have reliable access to water.

Dark Hollow Falls, Shenandoah National Park
Photo by Melissa Zukowski

PREVENTING EROSION RUNOFF & MANAGING STORMWATER

CLEAN RIVERS, CREEKS, & BAYS

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WHY IT MATTERS

Virginia is facing more frequent high-intensity rainfall events due to climate change.[1] At the same time, the Commonwealth is experiencing vast construction projects and an increasing percentage of impervious surfaces, which can negatively impact land and water without proper controls.

Developed areas are the fastest-growing source of pollution to our waterways.[2] Significant development pressures result in the expansion of impervious surfaces – parking lots, rooftops, and roads – in suburban and urban areas. Impervious surfaces transport water and pollution rapidly to storm sewers and streams; this rapidly moving runoff erodes streams, harms aquatic ecosystems, and contributes to the decline of streams and the Chesapeake Bay.

Stormwater runoff from sites under construction also contributes large amounts of pollution to Virginia's waters. Construction sites with required **erosion and sediment control (ESC)** measures contribute the highest annual sediment pollution loads per acre of any land use in the Chesapeake Bay watershed[3] and Virginia currently permits more than 6,000 construction site discharges across the state under its **Virginia Pollutant Discharge Elimination System (VPDES)**,[4] with over 13,000 acres approved for construction.[5] Experts have concluded that many sites, even with required ESC measures, will be moderately or extremely "functionally deficient" in sediment removal efficiency.[6] What is more, **Virginia Department of Environmental Quality (DEQ)** only has 21 inspectors to cover this large volume of projects and acreage.

Conversion of land from agricultural to urban, highly-developed and low-density residential land uses is increasing rapidly, with new development from 2017-2022 exceeding totals from the previous 15 years,[7] thus exacerbating runoff problems. Additionally, Virginia lost 19 percent of its tree canopy between 2001 and 2024.[8]

Managing construction stormwater and post-development runoff with **low-impact development (LID)** methods and wider use of green infrastructure, as opposed to engineered installations, will reduce pollution to our waterways, ameliorate flooding impacts, and be more cost-efficient in the long term. Virginia can implement these solutions through municipal permits (**Municipal Separate Stormwater Systems, MS4**), construction stormwater (CSW) permits, and flexible planning and zoning rules.

CURRENT LANDSCAPE

Stormwater permits for Virginia's largest localities, called Phase I Municipal Separate Storm Sewer System (MS4) permits, were reissued in 2024, after a significant delay, and the related stormwater permits for medium-sized localities, called Phase II Small MS4s, were covered by a General Permit that was reissued in November 2023. These permits will require an additional 60 percent reduction in nitrogen and phosphorus pollution discharges over the next five years. However, additional funding did not make it into the final budget this year to help localities meet these significant obligations. To meet the requirements, the Commonwealth must ensure sufficient and consistent funding of the **Stormwater Local Assistance Fund (SLAF)**, a state and local matching grant program that protects and improves the health of our waterways by funding the locality's stormwater projects.

The **Virginia Conservation Assistance Program (VCAP)** helps fund residential-scale stormwater management installations. VCAP reimburses homeowners, community associations (e.g. HOAs), businesses, schools, and places of worship to reduce stormwater volume and pollutant loads entering our rivers. Eligible practices include rainwater harvesting, rain gardens, conservation landscaping, permeable pavers, living shorelines, green roofs, and more. Since 2016, the VCAP, as administered by the Soil and Water Conservation Districts, has protected local waterways by funding thousands of practices across Virginia. Sadly, many HOAs restrict opportunities for residents to manage their runoff using native plantings ("conservation landscaping"), which can limit these Virginians from accessing state-funded programs like VCAP. Nearly 25% of Virginians live in HOAs.[9]

Yellow Crowned Night Heron on the shoreline–Hampton, VA
Photo by Sue Mangan

OPPORTUNITIES

Meeting the stated SLAF needs assessment is critical as Virginia continues to face more frequent and intense storms. The FY26 needs assessment is approximately $46M with cumulative needs through FY29 of $189M.[10] These funds will allow communities to address increased needs as they face more frequent and intense storms.

VCAP was funded at $4M in the FY25-26 state budget. Funding for VCAP would need to increase to $7M to meet the growing demands of stormwater management.

Given that almost 25% of Virginians live in a community association, it is also important to ensure that these homeowners have the option to install conservation landscaping on private property to help mitigate runoff. Limitations to the installation of conservation landscaping also limit constituents' ability to access state-sponsored programs such as VCAP.

Improving controls for erosion, sediment, and stormwater under the Construction Stormwater (CSW) general permit (or individual CSW permits) is necessary to limit pollutant discharges. For larger construction projects, ensuring stabilization and limiting the areas that can be disturbed may be necessary.

Funding opportunities are needed for smaller localities (those with fewer than 10,000 residents) that are not subject to MS4 permitting requirements to implement stormwater best management practices. Localities across the Commonwealth rely on state funding to reduce pollution discharges and effectively manage stormwater.

TOP TAKEAWAYS

- Developed areas are the fastest-growing source of pollution to our waterways, and the largest construction sites need to have sufficient staging and controls to reduce erosion runoff.
- Managing stormwater runoff with low-impact development (LID) methods and green infrastructure is more cost-effective than engineered installations in the long term, and more Virginians should be allowed to implement them, even if you live in an HOA.
- Consistent and sustained funding at the levels identified by the state needs assessment supports the implementation of practices by localities and their residents to reduce stormwater runoff.

SUPPORTING AGRICULTURE FOR A HEALTHY ENVIRONMENT

CLEAN RIVERS, CREEKS, & BAYS

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WHY IT MATTERS

Agriculture is Virginia's largest industry with over 7 million acres producing about 8.7% of the state's economic output.[1] Virginia farms produce food and fiber, maintain open space, help mitigate floods, create jobs, unite communities, and support wildlife. They also provide the state's greatest opportunity to sequester carbon and to reduce nutrient and sediment pollution reaching Virginia's local streams, rivers, and the Chesapeake Bay.[2] Farms have the potential to be the solution to many of our most pressing environmental problems.

Fortunately, it is possible to address pollution and protect the Commonwealth's natural resources while also enhancing the positive economic and societal impacts of agriculture. **Agricultural best management practices (BMPs)** improve water quality and **watershed** function, increase soil carbon, and help increase farm profitability by improving animal, soil, crop, and forest health and aiding in efficient nutrient management on farms.

CURRENT LANDSCAPE

Typical farm BMPs include fencing livestock out of streams and providing alternative water systems, nutrient management plans that help farmers efficiently apply fertilizers, grass and forested buffers along streams to filter nutrients and sediment from runoff, and conservation tillage and cover crops that conserve productive soils and keep nutrients in place. These and other practices protect Virginia's streams, lakes, rivers, and bays, build productive agricultural soils, and ultimately benefit farm businesses, though they can be cost-prohibitive to adopt in the short term. State cost-share and federal incentive programs have long been used to help farmers adopt BMPs.

The **Virginia Department of Conservation and Recreation (DCR)** administers the state-funded **Virginia Agricultural Cost-Share (VACS)** program through 47 **Soil and Water Conservation Districts (SWCDs)**, while the Department of Agriculture administers Federal programs through the **Natural Resources Conservation Service (NRCS)**. The District's trained staff provide technical assistance to farmers and landowners to plan and implement BMPs, and the VACS program helps offset the cost of the BMPs. VACS helps farmers adopt and implement changes to farm management that also result in improved water quality and more productive soils. NRCS programs have historically been used in conjunction with VACS to support conservation on farms.

Farm on the Blue Ridge Parkway
Photo by Patti Black

The 2014 **Chesapeake Bay Watershed Implementation Plan (WIP)** called on states to have practices in place by 2025 to reduce sediment and nutrient pollution to the Bay. The most recent data show that Virginia will fall far short of that goal, with over 95% of the remaining pollution reductions expected to come from the agricultural sector.[2] For most of VACS's history, it has not had the resources required to assist all farmers in achieving pollution reductions. 2022 was the first year that Virginia funded VACS sufficiently to meet the state's annual WIP goals. A fully-funded Agricultural BMP program is essential to provide the financial and technical support for the agricultural sector to reduce nutrient and sediment pollution to local waters and the Chesapeake Bay. Indeed, since receiving full funding from 2022-2024, there has been notable progress in modeled pollution reductions from the Agricultural sector. At a time when NRCS has lost nearly a quarter of its Virginia employees,[3] and federal programs are seeing budget cuts, it is more critical than ever that Virginia provides robust and consistent funding for the VACS program and SWCDs; adequate funding can ensure that Virginia complies with the Clean Water Act and helps create healthy and resilient farms.

OPPORTUNITIES

Fully funding the VACS program in the state budget has been a major achievement for Virginia. Continued funding at the level identified in the **Agricultural Needs Assessment** will accelerate water quality and environmental improvements for the entire Commonwealth. The State should embrace the chance to ensure support for farmers at a time when Federal support for similar programs is in question. Environmental improvements could be further advanced if Virginia conducts an analysis of the VACS program that identifies ways to make VACS more efficient and effective at improving water quality and increasing farmer participation. Some ideas to consider include:

- Prioritize hot-spots to achieve more effective reductions in pollution to local waterways. Combining local monitoring and modeling data to identify areas where there is a nutrient imbalance will allow more strategic placement of BMPs to reduce pollution.[4] Funding for BMPs and technical assistance should also be targeted to these locations.
- Focus on ways to accelerate the implementation of practices that have fallen well short of WIP goals. For example, a dedicated, sufficiently funded Riparian Forested Buffer program initiative would provide consistent and long-term support for this critical BMP.
- Recognize that building healthy soils is an important component of water quality improvements. Prioritize the implementation of soil health BMPs on upland farms, especially in regions of the Commonwealth with high connectivity between surface and groundwater.

TOP TAKEAWAYS

With reduced support for federal programs and staff, maintaining full funding for the Virginia Agricultural Cost-Share program (based on the annual needs assessment) and focusing on long-term conservation practices will reduce pollution loads while also enhancing the positive economic, environmental, and societal impacts of agriculture.

For a fully-funded VACS program to be successful, Virginia will need additional funding for staff and training at DCR and the SWCDs.

Strategic placement of BMPs and other ways to maximize the efficiency of the VACS program can significantly accelerate the reduction of pollution to achieve the clean water goals of the Commonwealth.

ENFORCING WATER QUALITY STANDARDS

CLEAN RIVERS, CREEKS, & BAYS

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WHY IT MATTERS

Virginia's streams, lakes, estuaries, and coastal bays are the lifeblood of the Commonwealth. These water bodies are enormously important to the health, happiness, and economic prosperity of our communities now and for the future, but pollution problems are widely hampering human uses and damaging ecosystem values across the state. Examples of those impairments include:

- *Sediment pollution*: In its 2024 statewide water quality assessment, the **Virginia Department of Environmental Quality (DEQ)** estimates that 31% of all stream miles in the state are negatively affected by "streambed sedimentation," calling sediment pollution the "most common stressor across Virginia," which substantially raises the risk of harm to biological communities in affected streams.[1]
- *Nutrient pollution and harmful algal blooms (HABs)*: DEQ also cites phosphorus and nitrogen as prominent "stressors" which heighten the risk of impairments to biotic communities in thousands of miles of Virginia waters.[2] HABs, which may produce toxins that can kill fish and cause illness in humans, due to excessive levels of nutrients, have prompted swimming advisories in important recreational waters in recent years.[3]
- *PFAS contamination*: The **Virginia Department of Health (VDH)** issued a fish consumption advisory for the Chickahominy River watershed due to serious contamination by so-called "forever chemicals,"[4] and these chemicals are being identified as threats to drinking water sources across the state.[5]

State and federal laws provide a framework of regulatory authorities to restore degraded water bodies and prevent impairment of high-quality waters. We have an opportunity to strengthen that regulatory system by ensuring that existing **water quality standards (WQS)** are fully enforced and, where necessary, strengthened. Permits to control pollutant discharges can be improved by setting limitations that enforce all WQS and by adopting new water quality criteria. Basing water quality assessments and cleanup plans on **narrative and numeric criteria** will improve the effectiveness of these tools.

CURRENT LANDSCAPE

Water quality standards, including both numeric and narrative water quality criteria, are a crucial part of the regulatory system needed to protect our waters.

Numeric criteria set concentrations of specific pollutants not to be exceeded in water bodies. Virginia does not have numeric criteria for most waters to protect against sediment pollution, nutrients, and some toxic chemicals such as per- and polyfluoroalkyl substances (PFAS). DEQ began a process to develop numeric **turbidity** criteria in 2021[6] but further action has not been taken. DEQ stated in early 2025 its intent to develop numeric criteria for two forms of PFAS, but the timeline and substance of those criteria are yet to be determined.[7]

In the absence of numeric criteria, narrative criteria must be applied and fully enforced. However, state discharge permits and water quality assessments have not comprehensively addressed impairments caused by pollutants such as sediment, nutrients, and PFAS, which may violate narrative criteria. These criteria prohibit pollution that "interfere[s] directly or indirectly with **designated uses** of [state waters] or which are inimical or harmful to human, animal, plant, or aquatic life,"[8] including "substances that produce color, tastes, turbidity, odors, or settle to form sludge deposits" or "which nourish undesirable or nuisance aquatic plant life." However, DEQ does not assess violations of narrative criteria for sediment pollution or nutrient enrichment in most Virginia waters unless and until aquatic communities and human uses have been harmed.

Currently, Virginia does not have "routine monitoring programs for inland waters and freshwater harmful algal blooms," but rather identification and response to HABs are largely dependent on resident reports.[9] This approach fails to assure Virginians that threats from HABs will be reliably identified and that public protections will be adequate.

OPPORTUNITIES

DEQ should designate streams and reservoirs as "impaired" waters under its **Clean Water Act** authority in circumstances where the narrative criteria are violated by the presence of excessive sediments or turbidity, high levels of polluting nitrogen and phosphorus, and nuisance algal blooms and HABs. In developing permits for discharges to surface waters, the potential of activities to violate the narrative criteria must be assessed and permit limitations or other conditions must be imposed to prevent violations of WQS.

PFAS and "**emerging pollutants**" should be eliminated from discharges where they may violate narrative criteria. Given that Virginia has yet to begin processes to adopt numeric criteria for forms of PFAS and that it will be impossible to develop them for the thousands of different chemicals in the PFAS family, narrative criteria should be implemented now (*see PFAS Pollution, page 25*).

The regulatory process to develop numeric criteria for turbidity and/or solids should be re-initiated and the State Water Control Board should adopt appropriate criteria in 2026. Numeric criteria for forms of PFAS should be adopted in the current triennial review of WQS.

Enhancements to programs to identify and respond to HABs should be made, including increased and routine sampling by DEQ and VDH and acceptance of citizen monitoring data to supplement the agencies' results.

TOP TAKEAWAYS

Many of Virginia's waters are degraded by pollutants such as sediments, nutrients, resulting HABs, and toxic chemicals, not yet addressed by numeric water quality criteria.

Currently, DEQ does not designate waters as impaired by these types of pollutants until harm to aquatic ecosystems is shown or human health threats emerge, and does not limit pollutant discharges for these constituents based on narrative criteria.

Virginia has an important chance to improve protections and clean up many water bodies by fully enforcing narrative criteria and adopting new criteria to protect against sediment pollution, excessive nutrients, and PFAS.

Sinking Creek turbidity pollution
Photo provided by POWHR/Mountain Valley Watch

CLOSING THE WASTEWATER GAP

CLEAN RIVERS, CREEKS, & BAYS

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WHY IT MATTERS

Over the last 15 years, Virginia has made significant progress in reducing nutrient pollution through major wastewater treatment plant upgrades. These improvements, backed by state and local investments, have driven cleaner rivers, clearer water, and stronger recovery in the Chesapeake Bay. However, on the whole, there are still important opportunities to address pollutants from the wastewater sector.

The Commonwealth's **Phase III Watershed Implementation Plan** laid out a clear path forward, but some localities remain below their pollution reduction targets. Inflation, delayed projects, and competing needs make state follow-through more urgent than ever, and underscore the importance of existing initiatives like the **Enhanced Nutrient Removal Certainty Program (ENRCP)** in keeping progress moving forward.

At the same time, the state capital, Richmond, is still facing ongoing pollution from its outdated **combined sewer systems**, which sends untreated wastewater into rivers during rainfall events; these discharges are called **combined sewer overflow (CSO)** events. State deadlines are in place, but without meaningful financial assistance, Richmond, with a poverty rate near 20% and the highest wastewater bills in the state, is struggling to stay on track. Fortunately, Virginia's two other combined sewer system localities, Alexandria and Lynchburg, have recently completed projects, with state support, to address combined sewer overflows in their communities.

Beyond urban areas, failing and poorly maintained septic systems continue to leak nutrient pollutants and fecal bacteria into groundwater and local waterways, compounding the problem.

To meet its clean water commitments, Virginia must double down on wastewater pollution control: fund the already identified projects in the ENRCP, provide clear incentives for facilities to optimize performance, and support communities struggling with outdated systems. The science is clear, the solutions are known, and success depends on the state's continued leadership.

CURRENT LANDSCAPE

Since its inception in 2021, the ENRCP has been Virginia's strongest tool to secure nutrient pollution reductions at wastewater treatment facilities. Through mandates, financial support, and planning certainty, it moves major **wastewater treatment plants (WWTPs)** closer to full compliance with necessary nitrogen and phosphorus pollutant standards and strengthens the Commonwealth's overall strategy for restoring the Chesapeake Bay.

The facilities in the ENRCP have known upgrade timelines, but the funding to carry them out is not secured. The Commonwealth has provided funding for upgrades through the **Water Quality Improvement Fund (WQIF)** and, more recently, with federal American Rescue Plan Act funds. However, future funding commitments are uncertain, and the WQIF is currently under review by direction of the General Assembly, with a report due by November 1, 2026.[1]

For Richmond's combined sewer system, the City received a **Virginia Department of Environmental Quality (DEQ)**-approved final plan detailing the projects necessary to virtually eliminate combined sewer overflows and bring the system into compliance.[2] This final plan outlines 14 projects, with 12 having already allocated funding, many of which are in development currently, as well as two outstanding projects, which will further reduce CSO releases by over 90% of their current levels; these two final plan projects require an additional $550 million to ensure completion.

Additionally, DEQ operated a point-source pay-for-performance grant program to further optimize nutrient removal at existing wastewater treatment plants. Piloted in 2023, the program funded 14 facilities that achieved reductions beyond permit limits, removing over 118,000 pounds of nitrogen at an average cost of $8.44 per pound.[3] Though minimally funded, this effort delivered measurable results by incentivizing reductions that wouldn't have occurred under standard compliance, demonstrating the value of performance-based investment in water quality.

OPPORTUNITIES

Virginia's ENRCP is a proven strategy for achieving lasting reductions in wastewater pollution and restoring the Chesapeake Bay. With enforceable nutrient limits, clear deadlines, and strong bipartisan support, the program delivers measurable water quality improvements at scale. Yet, without continued funding, essential projects risk delay, putting compliance, equity, and environmental progress in jeopardy. To protect the state's clean water investments and meet long-standing restoration goals, Virginia must fully fund the ENRCP through completion.

Richmond's Combined Sewer Overflow (CSO) Final Plan lays out an achievable path to drastically reduce untreated discharges into the James River. Two critical projects, the Shockoe High Rate Disinfection Facility and the Southside Canoe Run Storage Tank, both with outsized impacts on water quality in the river, remain unfunded and are essential to meeting state-mandated deadlines. Delayed investment in these projects risks prolonging public health concerns, burdening overstretched ratepayers, and undermining decades of progress in water quality. The Commonwealth must partner with Richmond to deliver the funding needed to stay on track and complete the plan.

Virginia has more opportunities to improve water quality as well, by scaling up programs with proven results and targeting communities most in need. DEQ's 2023 pay-for-performance pilot demonstrated that modest investments can yield substantial nutrient reductions beyond regulatory requirements. Further, supporting households and communities with limited financial resources facing failing septic systems through sewer line hook-ups is a common-sense investment that, alongside proven performance programs, can drive cost-effective and equitable progress toward Virginia's clean water goals.

TOP TAKEAWAYS

Continuing investment in Virginia's wastewater treatment infrastructure, through the Enhanced Nutrient Removal Certainty Program, is fundamental to maintaining our water quality progress.

Richmond has a DEQ-approved final plan to address combined sewer overflows in the James River, but needs $500m over the next 4 years to reach the finish line.

A diversity of investment in wastewater issues, including addressing septic system pollution and utilizing existing infrastructure through the point-source pay-for-performance program, will yield meaningful water quality benefits for Virginians.

Oyster, VA
Photo by Sue Mangan

FLOOD & CLIMATE RESILIENCY

RELEVANT PROGRAMS & AGENCIES

See full glossary starting on page 155

COASTAL RESILIENCE MASTER PLAN
A plan that seeks to acknowledge the consequences of climate change, identify and address socio-economic inequities, work to enhance coastal adaptation and protection efforts, protect and enhance natural infrastructure, utilize community and regional scale planning, and focus on the most cost-effective solutions. The overall goal is to protect Virginia's highly vulnerable coastline communities from sea level rise and natural disasters.

COMMUNITY FLOOD PREPAREDNESS FUND (CFPF)
State-sponsored grant fund that provides financial assistance to localities to reduce the impacts of flooding within Virginia. High emphasis on projects that align with local, state, and federal floodplain management standards and plans. The only statewide source of funding for flood resilience capacity building and studies, as well as project implementation. Revenue derived from Virginia's participation in the Regional Greenhouse Gas Initiative.

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)
A federal agency with the goal of coordinating disaster response and recovery efforts at the federal level. They provide assistance and resources to individuals, communities, and governments in time of crisis like hurricanes, floods, wildfires, and earthquakes.

REGIONAL GREENHOUSE GAS INITIATIVE (RGGI)
A cooperative effort among Northeast and Mid-Atlantic states to reduce power sector carbon pollution by requiring power plants to purchase allowances for their greenhouse gas emissions. The proceeds from allowances are then distributed to the participating states, which can use the funds to help their citizens, including by creating energy-efficient, affordable housing and enhancing community flood prevention and protection.

RESILIENT VIRGINIA REVOLVING FUND (RVRF)
Provides financial assistance to localities for projects that mitigate flood impacts to private properties through low- to no-interest loans. Projects can include hazard mitigation of buildings, locality-operated loan programs, and relocation. Primarily a loan program with limited grant funds; revenue comes from the Federal Emergency Management Agency, Regional Greenhouse Gas Initiative, and General Fund.

SHORELINE EROSION ADVISORY SERVICE (SEAS)
Department of Conservation and Recreation program that assists private landowners and localities in Virginia to complete site investigations, written reports, design and permit reviews, construction inspection, and more.

SOIL AND WATER CONSERVATION DISTRICTS
Political subdivisions of the state of Virginia. The 47 Soil and Water Conservation Districts manage the Virginia Agricultural Cost-Share program, employ technical staff, and deliver conservation technical assistance to landowners and farmers free of charge.

TECHNICAL WETLANDS WORK GROUP
A team of state and federal experts who work together to improve how wetlands are studied, monitored, and managed to help protect them better.

TIDAL MARSH INVENTORY
A detailed map made by the Virginia Institute of Marine Science that shows where tidal marshes are, how big they are, and what they're like.

VIRGINIA'S COASTAL ZONE MANAGEMENT PROGRAM
A state program that works to protect the coast and help coastal communities by coordinating projects, funding, and policies for sustainable use of coastal areas.

VIRGINIA CONSERVATION ASSISTANCE PROGRAM (VCAP)
Cost-share program providing assistance as well as financial incentives to urban landowners installing Best Management Practices (BMPs) on their property. Eligible practices include the removal of impervious surfaces, rainwater harvesting, and other efforts to mitigate the effects of erosion and stormwater runoff.

VIRGINIA DEPARTMENT OF CONSERVATION & RECREATION (DCR)
A state agency within the Natural Resources secretariat tasked with protecting, managing, and overseeing natural habitat, state parks, open space, and access to the outdoors. Oversees private dam safety and administers the Virginia Agricultural Cost Share and Community Flood Preparedness Fund.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)
State agency responsible for administering laws and regulations related to air quality, water quality, water supply, renewable energy and land protection. DEQ issues permits, conducts monitoring, performs inspections, and enforces environmental law.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT (DHCD)
A state agency that oversees policies, programs, and funding to support affordable housing, community development, and energy efficiency projects, contributing to the state's overall development and sustainability goals.

VIRGINIA INSTITUTE OF MARINE SCIENCE (VIMS)
A marine research and education center that operates as a branch of the College of William and Mary. VIMS has a legal mandate to provide research, education, and advisory services to government, citizens, and industry.

VIRGINIA MARINE RESOURCES COMMISSION (VMRC)
State agency in charge of overseeing Virginia's marine and aquatic resources, and its tidal waters and homelands. One of the primary functions of VMRC is to zone water areas for recreation, oyster and clamming grounds, and commercial/recreational fishing.

VIRGINIA WETLAND PROGRAM PLAN
A road map that lays out how the state plans to protect, restore, and manage its wetlands to keep them healthy and meet environmental regulations.

WETLANDS POLICY TASK FORCE
A state-established group formed to assess and enhance policies for protecting, restoring, and creating tidal and non-tidal wetlands, aiming to integrate these strategies into broader state plans like the Virginia Flood Protection and Coastal Resilience Master Plans.

BUILDING RESILIENCE & STRENGTHENING RECOVERY

FLOOD & CLIMATE RESILIENCY

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WHY IT MATTERS

Virginia's exposure to climate-related disasters is growing at an alarming rate. Between 2020 and 2024, the Commonwealth experienced 40 weather and climate disasters where overall costs and damages exceeded $1 billion. Averaged annually, that equals eight such disasters per year–a dramatic increase from the average of 1.4 per year between 1980 and 1999.[1] These events include severe storms, hurricanes, and flooding, and the impacts have been felt in communities statewide. Notable events include the 2022 Appalachian floods, Tropical Storm Ophelia in 2023, and Hurricane Helene in 2024, which caused major flooding in western Virginia, resulting in three fatalities and extensive damage.[2]

The best way to reduce the damage, expenses, and suffering from weather disasters is to invest in **resilience** before storms hit. A 2024 study from the U.S. Chamber of Commerce, Allstate, and the U.S. Chamber of Commerce Foundation found that every $1 invested in resilience and disaster preparedness saves $13 in economic impact, damage, and cleanup costs after the event.[3] Several years ago, the General Assembly wisely established Virginia's **Community Flood Preparedness Fund (CFPF)** to support proactive pre-disaster flood mitigation planning and projects, and this has been a key component of Virginia's resilience efforts. [4]

However, with estimates from the Army Corps of Engineers projects in Virginia Beach and Norfolk together exceeding $6 billion, this funding pales in comparison to the resilience needs statewide, yet other critical state and federal funds that reduce climate risk and support resilience have been reduced or eliminated this year. And despite the newly created and narrowly directed Disaster Assistance Fund at **Virginia's Department of Housing and Community Development (DHCD)**,[5] Virginia also lacks a comprehensive resilience-based approach to post-disaster recovery, now more critical than ever in light of federal efforts to reduce the role of, and funding from, the **Federal Emergency Management Agency (FEMA)**.

As the federal landscape changes, Virginia must prepare now to invest in community and ecosystem resilience both ahead of and after the storm and ensure the state's resilience efforts prioritize natural infrastructure and an equitable distribution of resources.

CURRENT LANDSCAPE

Virginia's climate resilience approach faces significant challenges due to recent shifts in federal and state funding. The Trump administration has cut programs across multiple agencies, including FEMA's **Building Resilience Infrastructure and Communities (BRIC)** and the Environmental Protection Agency's Community Change Grants that supported resilience, reduced climate risk, and prioritized nature-based solutions.[6] Hampton Roads alone is poised to lose $50 million in much-needed grant investments to protect communities from climate impacts.[7] These cuts will directly increase Virginia's vulnerability, and, unfortunately, Virginia is not positioned to fill this gap.

With federal funding for resilience and recovery slashed, Virginia's oversubscribed CFPF dollars become even more precious. Established in 2020 and initially funded through the **Regional Greenhouse Gas Initiative (RGGI)**, the CFPF has allocated over $200 million to support local resilience planning and flood mitigation projects, with a strong focus on low-income communities. Funds from RGGI allocated to resilience have also supported critical resilience staffing and state planning efforts. However, Virginia's withdrawal from RGGI has jeopardized the CFPF's sustainability, leaving it reliant on unpredictable general fund appropriations while a legal challenge plays out.

Additionally, Virginia's resilience toolbox includes the critical, yet underutilized **Resilient Virginia Revolving Fund (RVRF)**, which provides a mechanism for supporting the resilience of private property owners and serving as a match for the federal Safeguarding Tomorrow Revolving Loan Fund. Both the CFPF and RVRF are important foundations for funding the state's long list of pre-disaster preparedness needs and both programs should be strengthened with programmatic changes that enable and empower localities to fully utilize these resources for resilience.

As for post-disaster recovery, the establishment of a permanent fund at DHCD in 2025 reflects recognition of the increased role Virginia will need to play in disaster recovery moving forward, but the eligible awardees of these funds are limited. The lack of a comprehensive approach to disaster recovery risks undermines resilience investments. Establishing a comprehensive approach would help ensure immediate recovery needs are met without diminishing the Commonwealth's crucial investment in disaster resilience.

OPPORTUNITIES

As Virginia navigates more frequent and intense climate-related disasters, there is a vital opportunity to reduce Virginia's climate risk with a more comprehensive approach to pre- and post-disaster funding that continuously aligns resilience priorities and effectively utilizes limited funds. Virginia should develop guidelines on when and how post-disaster funds can be used during recovery, ensuring that such decisions are made transparently and consistently. Improving coordination between state agencies involved in resilience, emergency management, and infrastructure planning would enhance the effectiveness of preparedness and response efforts. These improvements could be strengthened through inclusive stakeholder engagement and public reporting to promote transparency and ensure that best practices and community needs guide funding decisions.

Currently, the CFPF serves as the state's primary vehicle for proactive flood resilience, and while it reflects the state's resilience priorities, projects are not aligned with the state's resilience plans. Continued capitalization of the CFPF, coupled with improvements to the RVRF and the new Virginia Disaster Assistance Fund, and identification of a singular post-disaster assistance fund, create new opportunities for aligning priorities that ensure that investments are prioritized to meet critical needs in a manner that advances resilience. For example, in addition to ensuring resilience priorities are met, Virginia's Flood Freeboard Standard could be expanded to apply more broadly to efforts funded by state disaster recovery dollars.[8] Additionally, as Virginia's **Coastal Resilience Master Plan** Phase 2, statewide Flood Protection Master Plan, and Interagency Resilience Management Team are all launched this year, Virginia can act now to implement these plans and coordinate state action and resources to ensure nature-based and equitable solutions are prioritized in line with the Commonwealth's resilience goals.

Thankfully, Virginia's leanly staffed **Office of Commonwealth Resilience** is well-positioned to lead this effort and ensure that all programs work seamlessly together to advance the state's resilience priorities, including supporting nature-based solutions and equity.

TOP TAKEAWAYS

Virginia experienced 40 climate disasters between 2020 to 2024 that each cost at least $1 billion in overall costs and damages, underscoring the need for stronger, forward-looking climate resilience strategies.

Virginia lacks sufficient funds or a comprehensive approach to effectively reduce our climate risk or respond to disasters, and these vulnerabilities will only be exacerbated by the loss of federal funds and support.

This is a critical time to ensure that pre- and post-disaster programs and funds are aligned to support Virginia's resilience priorities and reduce climate risk across the Commonwealth.

WETLANDS RESOURCE RESILIENCE ACTION

FLOOD & CLIMATE RESILIENCY

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WHY IT MATTERS

Virginia's coastal **wetlands** are among the most critical natural resources in the Commonwealth for habitat and community safety.[1] But these ecosystems are increasingly threatened by accelerating development, rising sea levels, and climate change. According to the **Coastal Resilience Master Plan (CRMP)** Part I, released in 2021, up to 89% of Virginia's existing tidal wetlands could be permanently inundated by 2080 if no action is taken.[2] This loss would have profound environmental, economic, and public safety implications.

Wetlands act as natural buffers, absorbing storm surges and stabilizing shorelines from coastal erosion. Their ability to sequester carbon and filter pollutants makes them indispensable for climate mitigation and water quality protection–two statewide priorities under the Chesapeake Bay Program and Virginia's **Coastal Zone Management Program**. Without active intervention, their degradation will increase exposure for coastal communities, especially those with fewer resources to adapt to rising sea levels and increased flood risk.

Protecting and restoring the health of existing wetlands, along with conserving adjacent lands where wetlands can migrate as sea levels rise, are key strategies for building natural resource resilience. These efforts must be supported by proactive land use planning and targeted conservation funding. By investing in nature-based solutions, Virginia can safeguard biodiversity, strengthen shoreline stabilization, and protect the health and well-being of its residents. This is not only an environmental imperative but a matter of long-term community resilience.

CURRENT LANDSCAPE

Despite having a policy of "no net loss" for wetlands, the reality is that Virginia has seen significant reductions in tidal and non-tidal wetland acreage. Virginia is now taking meaningful, coordinated steps to strengthen wetlands policy and turn this downtrend around. Creating the **Wetlands Policy Task Force** (the Task Force) and **Technical Wetlands Work Group** (the Work Group) marks the first time the Commonwealth has formally focused on implementing a cohesive wetlands strategy. These efforts represent a shift from planning to action, informed in part by the **Virginia Wetland Program Plan**,[3] which has helped shape our understanding of statewide challenges and offered early direction for solutions. Together, the Task Force and Work Group aim to evaluate and improve how Virginia protects, restores, and manages both tidal and non-tidal wetlands, just as federal protections are being scaled back. With the EPA planning to limit jurisdictional permit reviews in line with the ***Sackett v. EPA*** Supreme Court decision,[4] state leadership has never been more critical.

While recent actions to accelerate planning are only half the equation, the next urgent step is to ensure that these convened bodies act and specifically answer the question: how will Virginia guide wetland migration and secure space for these essential ecosystems to adapt and persist? As sea level rise accelerates and regulatory gaps widen, the Commonwealth must act swiftly to ensure its wetlands persist into the future.

OPPORTUNITIES

With the Task Force and Work Group now in place, Virginia is finally in a position to shift from planning to action on long-overdue wetland priorities. One of the most pressing needs is a cross-agency framework that aligns the **Virginia Marine Resources Commission (VMRC)**, **Virginia Department of Environmental Quality (DEQ)**, and local wetlands boards so that wetlands, Chesapeake Bay resource protection areas, and living shoreline standards are applied consistently across the Commonwealth.

Just as important is ensuring reliable, long-term support for essential decision-making tools like DEQ's **Wetland Condition Assessment Tool (WetCAT)** and **Virginia Institute of Marine Science (VIMS)**'s **Tidal Marsh Inventory**. Progress on Chesapeake Bay cleanup goals also depends on building out a clear, integrated database that tracks wetland gains, losses, and unpermitted impacts, so that agencies and stakeholders alike have a shared, transparent view of where things stand. Without sustained funding, we risk falling behind on the science that guides everything from permitting to restoration.

And if we're serious about our wetlands keeping pace with sea level rise, Virginia needs to create a permitting path for thin-layer placement of dredged sediments to help wetlands persist in place and explore financial incentives to encourage the conservation of wetlands migration zones. Currently, there is resistance to using dredged sediment to raise sinking marshes, even though it's a recognized tool in other coastal states for maintaining critical habitat and the persistence of tidal wetlands. Additionally, we lack adequate financial incentives to encourage property owners to protect land where wetlands will migrate under sea level rise conditions. These are only two examples of the types of strategies the two wetlands workgroups will need to explore and offer tangible pathways to implementation. In order to make today's momentum count, we should remove these barriers and provide Virginia's wetlands the space, resources, and flexibility needed to survive what is to come.

TOP TAKEAWAYS

Up to 89% of Virginia's existing tidal wetlands could be lost to permanent inundation by 2080 without intervention to help wetlands migrate landward and persist in place, magnifying flood and water-quality risks.

The Wetlands Policy Task Force and Technical Work Group put Virginia on par with other states, but rapid action is needed to translate plans into implementable strategies.

Stable funding for decision tools, integrated shoreline guidance, financial incentives, and a comprehensive gains-and-losses database are state-level levers that can turn today's planning into durable action for wetland resilience.

Turtles at Mill Creek - Gloucester, VA
Photo by Mart Maiste

LIVING SHORELINES FOR COASTAL RESILIENCE

FLOOD & CLIMATE RESILIENCY

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WHY IT MATTERS

Living shorelines are nature-based approaches for shoreline protection and are the default stabilization method for tidal shorelines in Virginia. In addition to stabilizing shorelines, they conserve and restore natural wetland habitats and provide valuable ecosystem services. Living shorelines use plants, sand, and sometimes rock or oyster structures to protect coastlines by mimicking natural shorelines. Unlike hardened structures like **riprap** or **bulkheads**, living shorelines create habitats that enhance coastal resiliency, such as tidal marshes and oyster reefs. These features reduce erosion, filter pollutants, support biodiversity, and absorb wave energy, buffering communities from storm surges and flooding.[1]

There is a definitive, mutually beneficial relationship between ribbed mussels and living shorelines. Young ribbed mussels land on low marsh wetland grasses and nestle themselves into the root systems, filter nitrogen pollution from the water column, replenish the sediment, and stimulate wetland growth. This reduces the likelihood of excessive nitrogen in the water body, reducing opportunities for **harmful algal blooms** to thrive and creating healthier ecosystems. The byssal threads that mussels use to anchor themselves into wetland grasses and oyster structures installed at living shorelines create a strong webbing that reduces erosion. Erosion along fringe marshes is a key threat to wetlands throughout the coastal rivers of Virginia.[2]

CURRENT LANDSCAPE

There are technical and financial assistance programs available to residents to assist with the installation of living shorelines, but these programs are currently insufficient to meet the statewide need for implementing resilient practices to protect tidal shorelines. The **Virginia Conservation Assistance Program (VCAP)** is helpful, but it is not available to all Virginia residents. Landowners are only potentially eligible for funding if they live in a city or county with a participating **Soil and Water Conservation District**. The funding is also unavailable for sites with significant fetch, where wind can travel across open water to create large waves, limiting the types of projects that can be funded.

The **Shoreline Erosion Advisory Service (SEAS)** offers free technical assistance to private landowners and localities in Virginia with erosion problems. The work of SEAS staff had previously been focused on tidal areas of Virginia; however, SEAS services are now available in non-tidal areas of the state as well. The staffing levels at SEAS have remained the same in recent years, even as their scope of work (including technical assistance, site investigations, written reports, plan review, and construction inspections) has increased. SEAS staff are critical to helping landowners make informed decisions on managing their shorelines and disseminating information on what is required under state law.

OPPORTUNITIES

A statewide Living Shoreline grant program for landowners seeking to install living shorelines to restore their marshes and protect their properties from erosion would help incentivize the rate of installation of living shorelines, fill the gap not covered by VCAP, and support implementation in vulnerable coastal communities that lack resources to finance shoreline stabilization solutions. Such a program would rely on state funding to fill existing funding gaps and focus on the implementation of large-scale flood resilience projects. Two additional **Virginia Department of Conservation and Recreation (DCR)**-SEAS Full Time Employees (FTEs) would give dedicated capacity to the program to support property owners and further the use of living shorelines.

Living Shoreline on the Elizabeth River after installation, after 1 growing season, and after 2 growing seasons
Photo by ERP

Ribbed mussels growing on a living shoreline at the Norfolk Zoo
Photo by James River Association

TOP TAKEAWAYS

- Living shorelines are nature-based approaches for protection and are the default stabilization method for tidal shorelines in Virginia. They are enhanced by ribbed mussels that settle on low marsh wetland grasses, filter water pollution, and support shoreline resilience.
- Virginia Conservation Assistance Program (VCAP) and the Shoreline Erosion Advisory Service (SEAS) provide funding and technical support for living shorelines.
- A statewide Living Shoreline grant program would incentivize landowners to install living shorelines and fill the gap not covered by VCAP.

TOXIC POLLUTION

RELEVANT PROGRAMS & AGENCIES

See full glossary starting on page 155

CLEAN WATER ACT

The primary federal law governing water pollution established regulations on pollutant discharges into bodies of water and regulated water quality standards. The CWA recognizes both federal and state roles in its implementation and enforcement.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

A federal agency that safeguards public health and the environment through laws, programs, and research.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)

State agency responsible for administering laws and regulations related to air quality, water quality, water supply, renewable energy, and land protection. DEQ issues permits, conducts monitoring, performs inspections, and enforces environmental law.

VIRGINIA DEPARTMENT OF HEALTH (VDH)

State agency that oversees public health throughout the state, including the regulation of public drinking water.

VIRGINIA DEPARTMENT OF WILDLIFE RESOURCES (DWR)

Agency responsible for the management of inland fisheries, wildlife, and recreational boating for the Commonwealth of Virginia.

VIRGINIA HOUSEHOLD WATER QUALITY PROGRAM (VAHWQP)

A voluntary testing program for households served by private water supplies; led by the Virginia Cooperative Extension and Virginia Tech.

VIRGINIA POLLUTION ABATEMENT

Permit regulation to protect water quality and human health through the treatment, storage and land application of biosolids (treated sewage sludge), municipal wastewater, industrial wastes, and animal wastes.

VIRGINIA POLLUTION DISCHARGE ELIMINATION SYSTEM (VPDES)

Program administered by the Department of Environmental Quality (DEQ) designed to prevent pollutants from getting into state waters. DEQ issues permits for all point source discharges; stormwater discharges from Municipal Separate Stormwater Sewer Systems (MS4s); and stormwater discharges from industrial sites.

Aurora over Falling Springs Falls -Covington, Va
Photo by David Martin

STOPPING PFAS POLLUTION AT ITS SOURCE

TOXIC POLLUTION

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WHY IT MATTERS

PFAS are a group of over 15,000 chemicals that are dangerous to human health and the environment.[1] They are commonly known as "forever chemicals" because, unlike most other chemicals, they do not break down but instead build up and persist in our bodies, soil, water, and wildlife.[2] PFAS, even at very low levels, can cause significant human health harms, including cancers, impacts to the heart and the liver, developmental harm to infants and children, and reduced immune function.[3,4]

PFAS are used in many industrial processes and consumer products. This means people come into contact with PFAS when using everyday items like waterproof and stain-resistant fabrics and materials, food packaging, and non-stick cookware.[5] Concentrated streams of PFAS pollution enter the environment from sources like industrial wastewater and stormwater discharges (*see Erosion & Stormwater, page 7*), **landfill leachate**, land-applied sewage sludge (hereinafter "sludge"), and firefighting foams, and can contaminate drinking water (*see Well Health Protections, page 27*), ground and surface waters, soil, livestock, crops, food, and wildlife.[6] Studies show that members of low-income communities and communities of color are more likely to live within five miles of a PFAS-contaminated site and that these communities may be disproportionately exposed to PFAS in drinking water.[7,8] Where sludge is disposed of on land as a fertilizer ("**biosolids**"), federal agency research shows corresponding contamination of farmlands and ground- and surface waters, presenting a risk of cancer and other diseases to farming families and their communities.[9] Importantly, the most commonly used public and private water treatment systems do not remove PFAS from our drinking water or wastewater.[10]

CURRENT LANDSCAPE

PFAS water pollution is a statewide problem in Virginia. PFAS have already been detected in 16 drinking water utilities, impacting the drinking water of 2.5 million Virginians.[11] The **Department of Environmental Quality (DEQ)** maintains a public dashboard of current PFAS data, and over half of all surface water samples contain PFAS.[12] PFAS contamination is also frequently found in sewage sludge, a wastewater treatment byproduct, but currently there are no federal or Virginia requirements to test sludge or biosolids for PFAS.

The **U.S. Environmental Protection Agency (EPA)** has finalized enforceable drinking water standards for six types of PFAS,[13] though the new administration has announced plans to delay and potentially weaken them.[14] Importantly, these standards include non-enforceable maximum contaminant level goals of zero for two types of PFAS (PFOA and PFOS) since there is no safe level of exposure for human health.[15] DEQ is currently working to identify PFAS sources impacting public drinking water supplies with reported exceedances of the PFAS drinking water standards,[16] however, the standards do not apply to private wells, which means more than one million Virginians are excluded from this study.[17]

In May 2025, the **Virginia Department of Health (VDH)** issued a fish consumption advisory for the Chickahominy watershed due to elevated levels of PFOS (a type of PFAS) in several fish species.[18] Despite this, DEQ has failed to list the Chickahominy as impaired in its Water Quality Assessment Integrated Report, nor has it issued fish advisories or impaired status for other impacted **watersheds**.[19] Contamination of game and other wildlife remains unaddressed.

PFAS contamination in drinking water, fish tissue, and sludge is a downstream impact of the upstream industrial manufacture and use of PFAS. EPA has released guidance about how to use existing laws to require disclosure, monitoring, and control of industrial PFAS water pollution.[20,21] However, DEQ does not require disclosure or monitoring of PFAS or setting PFAS limits in water pollution discharge permits or biosolids land disposal permits, despite having the authority to do so.

OPPORTUNITIES

The most cost-effective and efficient way to tackle PFAS pollution is at the source – where PFAS is manufactured or used in industrial processes – before it reaches our drinking water sources and environment. Recent estimates show that Virginia's public water systems will need to spend hundreds of millions of dollars to comply with the PFAS drinking water standards[22] and individual households that rely on private wells could also face high costs associated with filtration improvements.[23] Until we stop PFAS pollution at its source, downstream waterworks, communities, and private well owners will continue to pay for the costs of PFAS pollution.

A substantial source of PFAS in our waters is concentrated pollution released in industrial wastewater and land-applied biosolids. DEQ has existing authority under the **Clean Water Act (CWA)** to control PFAS pollution discharges through the **Virginia Pollutant Discharge Elimination System (VPDES)** permit program. Wastewater treatment plants also have authority under the CWA to use their pretreatment program to control PFAS pollution.

Legal authorities should compel DEQ to require disclosure, monitoring, and control of PFAS in biosolids through the **Virginia Pollution Abatement (VPA)** permitting program to protect human health and the environment. Sludge is treated for certain toxic metals and pathogens before it is land-applied as biosolids, but not for PFAS, even though conventional wastewater treatment concentrates PFAS in sludge.

More information is needed about the occurrence of PFAS in our wildlife, including in fish, shellfish, deer, and other game species. DEQ has already identified levels of PFAS contamination in some state waterways that exceed EPA recommended levels for sustaining aquatic life and protecting human health, meaning consuming fish and shellfish from these waters could pose a risk to human health.[24] This information is vital for helping VDH determine whether PFAS consumption advisories are required to protect human health.[25]

TOP TAKEAWAYS

PFAS, even at very low levels, can cause significant human health harms, including cancers, impacts to the heart and the liver, developmental harm to infants and children, and reduced immune function.

Virginia has the authority under state and federal law to require disclosure, monitoring, and control of PFAS pollution in industrial wastewater, stormwater, and land-applied sludge or biosolids. Implementing this authority would place pollution control costs on industries using and discharging PFAS, protecting downstream communities and the environment.

Additional funding is needed to help VDH and DEQ monitor for and control PFAS pollution. Funding is especially needed to help private well owners, who are not protected by the PFAS drinking water standards, test for PFAS contamination. Sufficient funding for statewide fish and game tissue studies would also help VDH and DEQ protect public health.

PRIVATE WELL HEALTH PROTECTIONS

TOXIC POLLUTION

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WHY IT MATTERS

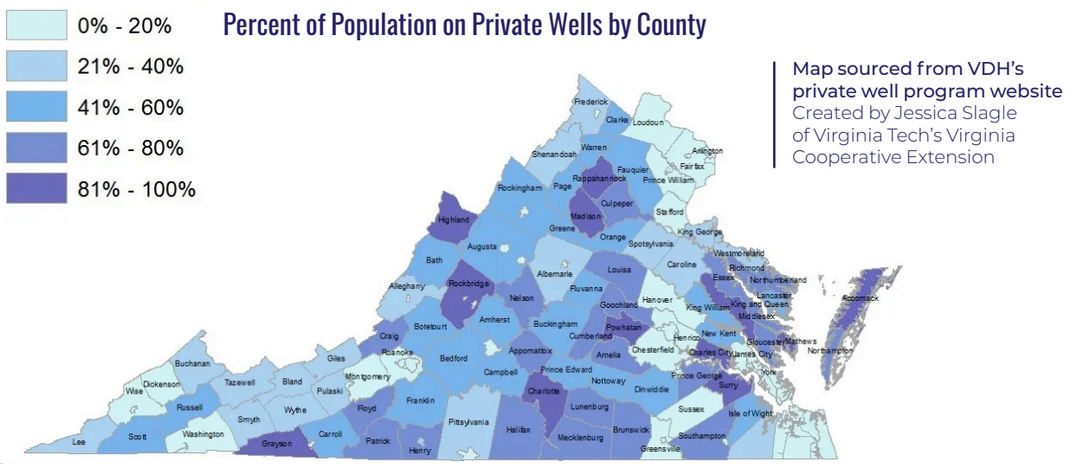
Roughly 1/5th of Virginians source their drinking water from private wells, with the frequency of residents relying on private systems approaching 80% in more rural Virginia counties.[1] Although federal and state laws require testing and treatment of water contaminants in public water systems, no such legal protection exists for private wells. In Virginia, the burden of testing and treating private well water is placed upon the property owner.[2]

Placing the burden on Virginia households creates several barriers to effectively protecting and promoting the health of rural Virginians, including the financial and technical considerations of conducting testing - and, if necessary, remediating contaminated water - to even become aware of the possibility of contamination. In the United States, there is an expectation that drinking water is safe for consumption, so Virginians who source their drinking water from private wells are often unaware of the possibility of contamination.[3]

Consumption of contaminated water can lead to a multitude of health impacts to residents, particularly vulnerable populations, including pregnant women, children, and the elderly. In agricultural areas of the state, where reliance on private systems is concentrated, this has historically included contamination from nitrates and pesticides, which leach into **groundwater** and then into wells after application in agricultural uses.[4] However, in addition to historic sources of contamination, an emergent threat to the health of Virginians is the practice of applying sewage sludge (marketed as "**biosolids**" fertilizer) to Virginia farm fields (*see PFAS Pollution, pg 25*). These biosolids are contaminated with **PFAS**, so-called "forever chemicals," which are linked to significant harms including numerous cancers, developmental and reproductive disorders, and neurodegenerative disease. The disposal practice of applying biosolids as fertilizer spreads PFAS contamination into agricultural areas and **watersheds** in the Commonwealth, and represents a significant vector for human exposure.[5]

CURRENT LANDSCAPE

The **U.S. Environmental Protection Agency (EPA)** has set a **maximum contaminant level (MCL)** for a variety of contaminants in drinking water. However, while the EPA recommends drinking water sources be maintained below the MCL, the MCL is only legally enforced for public systems.[6]



Map sourced from VDH's private well program website
Created by Jessica Slagle of Virginia Tech's Virginia Cooperative Extension

In Virginia, there are limited protections for residents who source their drinking water from private wells. Currently, Virginia requires that the owner conduct a one-time test for coliform bacteria for a new well.[7] However, there is no requirement to test for other contaminants or for ongoing testing or treatment, and the state requires no disclosure statement about the safety of the water or the state of the private well upon sale or rental of the property.

Although the **Virginia Department of Environmental Quality (DEQ)** does require certain permitting and monitoring to be conducted at some agricultural facilities, public disclosure of these data and of violations is not well shared, resulting in a lack of public awareness of potential contamination. Additionally, while DEQ has begun planning for PFAS contamination response in public systems and in some **surface waters**,[8] there is currently no groundwater testing or support for private well owners in assessing the degree of contamination from these highly toxic substances, despite DEQ approvals of permits for land disposal of contaminated biosolids that risk contamination of groundwater sources. Further, DEQ does not require disclosure or monitoring by **Virginia Pollutant Discharge Elimination System (VPDES)** permit-holders, which have significant potential to impact local groundwater sources.

Virginia encourages residents to contact their local health district for information related to private wells, but the quality of data collected and maintained by a given health district related to private wells varies in quality. Data related to groundwater quality are not collected and maintained by the agencies as a central reference for the region, even when private testing is conducted in the region.

OPPORTUNITIES

The Commonwealth needs to improve public data collection on well contamination and guidance to affected residents to improve awareness of potential contamination to their well systems. Absent awareness of risk, there will be significant gaps in residents taking action and resultant exposure to contamination. Virginia agencies should share existing data, collect private test information, disaggregate it, and make it publicly available through local health districts to improve contamination awareness.

The Commonwealth, through DEQ, should expand PFAS monitoring to include groundwater sources, especially in and around areas where biosolids land applications are conducted to create a baseline dataset for evaluating the spread of these contaminants. The DEQ should require permit-holders to test and disclose levels of PFAS contamination in biosolids applied to farmland.

Finally, the Commonwealth should join other states like Maryland that have placed basic safeguards for renters and purchasers of properties that rely on private well systems by requiring a test for contamination at the time of rental or property sale. Further protections should include a requirement for corrective remediation in the instance of rentals.

TOP TAKEAWAYS

The data collection already undertaken by agencies in the Commonwealth needs to be publicly accessible and shared across agencies to increase awareness of risk and harm to residents.

Companies permitted to apply biosolids on farms should be required to test and disclose the levels of PFAS in the biosolids applied to Virginia's farmlands, the soils the biosolids are applied to, and the private drinking water wells that may be contaminated.

Testing of private wells should be conducted for contaminants upon either the lease or sale of the property to protect new residents with incomplete knowledge of potential toxic contamination in their drinking water source.

PREVENTING HARMS FROM METALS MINING

TOXIC POLLUTION

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WHY IT MATTERS

Small-scale mining for gold, copper, zinc, and lead occurred in the 19th and early 20th centuries in Virginia and is now evidenced by hundreds of abandoned or unreclaimed mines.[1] The mine sites run along a geological **gold-pyrite belt** which extends from Fairfax to Halifax Counties. More recently, a large-scale version of this toxic industry has tried to move forward in the Commonwealth before a comprehensive regulatory framework and sufficient financial assurances are in place. This could put the public health and drinking water of millions of downstream residents at risk.

Metals mining is a land-intensive process and is the nation's #1 toxic pollution source.[2] Mineral or metal mining can be a very toxic process both during processing and in storage and waste operations. Mining procedures can result in perpetual **acid mine drainage**, catastrophic waste containment failures, destruction of cultural heritage, and the devastation of local economies as a result of the boom-and-bust cycle of the industry.[3,4] With recent federal efforts to expand drilling for metals on federal land, there must be proactive measures taken to ensure Virginia's safety.[5]

Virginia must be protected from the potential harms of the large-scale metals mining industry. This must include notifying the public when the industry may impact their communities, supporting communities along the gold-pyrite belt, especially rural and historically Black communities most at risk from potential mining contamination, and preserving our precious water resources and agricultural lands.

CURRENT LANDSCAPE

Community members in Buckingham County alerted the public after learning a junior mining company, or prospecting company, had been exploratory drilling near Virginia's gold-pyrite belt in Buckingham County since 2020.[6] The company announced "high grade" findings.[7] This led to legislation requiring the 2022 study, "Potential Impacts of Gold Mining in Virginia" conducted by the National Academy of Sciences. It highlighted many threats from gold mining: cyanide contamination, perpetual acid mine drainage, and catastrophic waste containment failures.[8] Legislation to prohibit the use of cyanide in mineral mining and processing passed unanimously in 2024, eliminating one potential threat to Virginia's water and environment and was reiterated in 2025 legislation.[9,10]

But, as there is no permitting or notification requirement for exploratory drilling for mineral mining, nor an in-depth study on the potential impacts of other likely pursued metals like copper, zinc, and lead, Virginia communities may be unaware of nearby prospecting and its potential impacts. Expanded exploration efforts for copper in Southside have also been announced.[11] Of additional consideration are federal efforts to expand the mining of critical minerals, or metals, on federal lands. This intensifies our need to proactively address any toxic processes associated with the industry.

But, Virginia's current mineral mining regulations are not designed to address modern-day industrial base and precious metals mining. Rather, they focus on the majority of active non-metals mining permits – sand, gravel, and stone aggregates, which involve distinctly different processing methods, and do not have the same toxicity impacts.

The gold-pyrite belt intersects innumerable **environmental justice communities**, often overburdened with existing pollution, and the surface drinking water systems for 3.2 million people are downstream of the belt.[12,13,14] The belt crosses the James River, which brings millions of dollars into Virginia's economy from commercial fishing and attracts over 7 million visitors annually.[15]

As the Commonwealth works to safeguard our **watersheds** and agricultural lands, the introduction of a new significant source of pollution – industrial metals mining – threatens the viability of those efforts. Additionally, hundreds of historic metal mines lie abandoned across Virginia's landscape.[16] The cost to taxpayers of reclaiming these abandoned sites is an economic burden, and the negative health and environmental impacts of not reclaiming these sites are dangerous.[17]

OPPORTUNITIES

To protect people and the Commonwealth's natural resources, specifically its rivers, streams, and agricultural lands, Virginia must put in place an effective regulatory framework for mining metals and be fully informed on the potential impacts from the metals mining industries.

While the Commonwealth exercises due diligence in reviewing outdated and insufficient regulations, it should implement a 'pause' on permitting any new metals mining projects to the extent of its authority. The granting of permits for the mining of gold, copper, lead, or zinc, for example, without sufficient knowledge of project impacts, or with deficient regulatory oversight of impacts is inappropriate given the potential environmental, human health, and economic harms.

To create an effective regulatory framework, the Commonwealth must seek a broad analysis of existing metals mining regulations, not limited to just one commercial product. The review should engage environmental, health, and energy state agencies. As the threat of large-scale mining is statewide, and would have both short- and long-term impacts, existing bonding, reclamation, closure, and monitoring regulations must also be comprehensively evaluated and updated.

Any review processes must include robust public engagement and education. Economic, human health, and environmental implications of metals mining and reclamation should be part of all evaluations. To increase public awareness, prospecting companies that are performing drilling operations should be required to notify county officials and nearby residents.

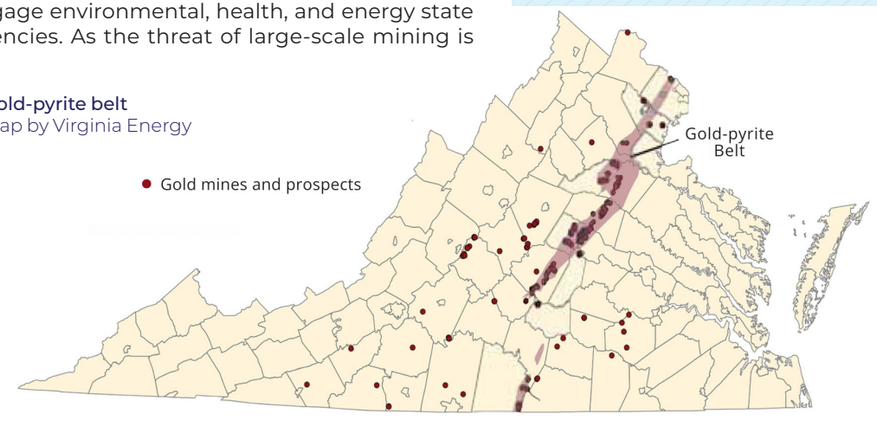
TOP TAKEAWAYS

Prospecting companies are performing drilling operations without the knowledge of county officials and nearby residents.

Virginia lacks regulations for large-scale mineral or metals mining. There is no existing comprehensive regulatory framework that includes bonding, reclamation, closure, or monitoring requirements for new metals mining projects.

Large-scale mineral or metals mining can use toxic materials in processing, and the impacts of toxic substances on Virginia's water resources could be catastrophic.

Gold-pyrite belt
Map by Virginia Energy



PLASTIC WASTE

BEVERAGE CONTAINER DEPOSIT PROGRAM

Adds a small refundable deposit to the purchase of beverages in containers. The goal of these programs is to encourage consumers to return their containers for recycling or refilling instead of throwing them away or littering. Also known as a “bottle bill” or “recycling fund.”

ENVIRONMENTAL PROTECTION AGENCY (EPA)

A federal agency that safeguards public health and the environment through laws, programs, and research.

EXTENDED PRODUCER RESPONSIBILITY (EPR) PROGRAM

A policy that holds manufacturers and importers responsible for a product’s entire life cycle, including its packaging, composition of recycled content, disposal, and waste management after it is no longer useful to consumers.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)

State agency responsible for administering laws and regulations related to air quality, water quality, water supply, renewable energy, and land protection. DEQ issues permits, conducts monitoring, performs inspections, and enforces environmental law.

VIRGINIA LITTER TAX

Virginia manufacturers, wholesalers, distributors, and retailers of frequently-littered products are subject to the litter tax. The fee is intended to fund litter reduction education and cleanups.

VIRGINIA POLLUTANT DISCHARGE ELIMINATION SYSTEM (VPDES)

Program administered by the Department of Environmental Quality (DEQ) designed to prevent pollutants from getting into state waters. DEQ issues permits for all point source discharges; stormwater discharges from Municipal Separate Stormwater Sewer Systems (MS4s); and stormwater discharges from industrial sites.

Litter found in Goode, VA
Photo by Patti Black

PLASTIC POLLUTION & PRODUCER RESPONSIBILITY

PLASTIC WASTE

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WHY IT MATTERS

Plastic derives from fossil fuels and almost 40% of all plastic produced is single-use,[1] creating pollution and further extraction of fossil fuels.[2] Unmanaged plastics end up in Virginia's environment. 94% of plastic entering the Chesapeake Bay remains there.[3,4] Single-use plastics result in devastating impacts on wildlife through entanglement and ingestion.[5] Plastic pollution harms economic activity, lowers property values, reduces tourism, and decreases spending at local businesses.[6,7,8]

Plastics fragment into microplastics, which spread through the air, water supply, and food chain. People routinely ingest and inhale microplastics, and microplastics have been found in all human organs tested, including the heart, lungs, brain, and reproductive organs like testes and ovaries.[9,10,11,12,13] Concerningly, microplastics are present in the placenta and newborn babies as evidenced by their first stool after birth. Babies are further exposed to plastics in breast milk or baby bottles.[14,15,16] Emerging research raises concerns about microplastics' impacts on fertility, cardiovascular disease, gastrointestinal disease, and dementia.

Plastics contain chemicals, including bisphenols (like BPA), **plasticizers** (phthalates like DEHP), flame retardants (like PBDE), and forever chemicals (like PFAS/PFOS).[17] Many are endocrine-disrupting chemicals,[18,19] and decades of studies have implicated them in obesity, type 2 diabetes, preterm birth, decreased sperm count, early puberty in females, and neurodevelopmental conditions like ADHD, autism, and IQ loss.[20] The economic burden of these health impacts is staggering. Three plastics-related chemicals (BPA, PBDE, and DEHP) cost the United States $920 billion in healthcare and lost economic productivity due to disability, disease, or premature death.[21]

Fossil fuel extraction and plastic production are concentrated in low-wealth or **BIPOC** areas, disproportionately harming these communities' health and economy.[22]

CURRENT LANDSCAPE

Multiple Virginia government agencies and task forces have acknowledged difficulties with recycling plastics and disposing of hard-to-manage waste,[23,24,25] but the issue remains: individual Virginians can do very little to reduce plastic pollution. Our waste systems are linear, meaning that products are created to be thrown away and do not reenter the marketplace. The issues creating and managing plastic pollution are not created by consumers.[26,27]

PRE-PRODUCTION PELLETS

Waste pollution happens long before consumers touch their products. Plastic manufacturers use pre-production plastic **pellets**, which are spilled at every stage of the supply chain through permitted discharges and transportation incidents, resulting in over 10 trillion pellets entering the ocean annually.[28] Virginia is home to at least seven plastic pellet production facilities, and the **Virginia Pollution Discharge elimination System (VPDES)**[29] is insufficient to protect Virginia's waters from the discharge of pre-production plastic pellets. Best management practices can be required to eliminate this harmful pollution.

SINGLE-USE PLASTICS

Low-quality, single-use plastics such as foam, bags, and packaging create a staggering amount of mismanaged waste due to overabundance and non-recyclability. Replacing these types of plastics through bans and reduction mandates is proven to be the best way to reduce pollution.[30]

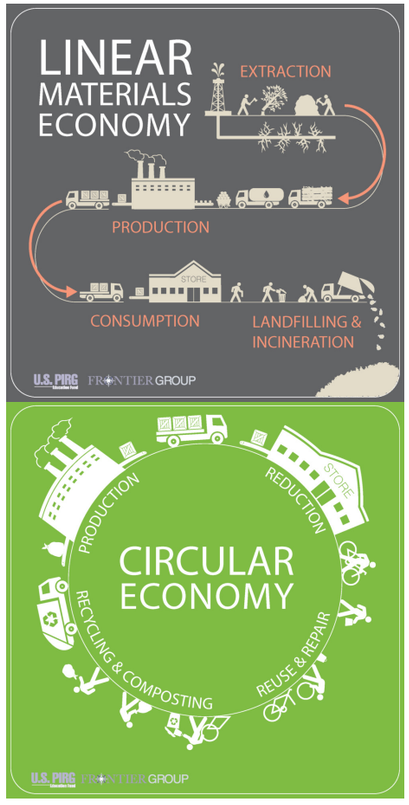
POST-CONSUMER WASTE

Since 2018, thirteen localities[31] in Virginia have ended curbside recycling programs, with more expected to end in the future. What isn't recycled is landfilled, littered, or incinerated.

The **Virginia Litter Tax** (paid by producers and distributors of frequently littered products) supports a cleanup program that relies predominantly on volunteers, with almost 40,000 Virginians[32] volunteering annually. Fifty years of community cleanups have demonstrated this is not enough. A task force is being formed as a result of House Joint Resolution 448 to identify opportunities to improve the litter tax. Source reduction policies, such as **extended producer responsibility** and the recently implemented ban on expanded polystyrene food and beverage containers, are necessary.

OPPORTUNITIES

MOVING FROM A LINEAR TO A CIRCULAR ECONOMY



PRODUCER RESPONSIBILITY

Virginia can reduce plastic pollution at every stage of the supply chain through eliminating harmful mismanaged waste, incentivizing sustainable disposal, increasing producer responsibility, and shifting to reusable products. Until producers are required to plan for their products' life cycles, we will continue to see more plastic litter. A **producer responsibility program** incentivizes a more efficient, productive waste system; decreases waste; increases recycled content; creates reusable or biodegradable products; and reduces the burden on local governments. According to the 50 States of Recycling report, this approach in Virginia could place $210 million of recycled material back in the market to support a circular economy and reduce the need for virgin material and avoid emissions of 2.5 million metric tons of carbon dioxide equivalent annually. Additionally, this approach increases employment opportunity by increasing recycling-related jobs from 3,600 to 11,000.[33]

BEVERAGE DEPOSIT PROGRAMS

Producer responsibility effectiveness is demonstrated by recycling refund programs, a policy supported by 65% of Virginia voters.[34] Oregon's program had an 88.5% bottle recycling rate in 2022. States with these programs have less beverage container litter found during cleanups. These programs are most impactful when they have strong collection mandates, benchmarks, and reporting requirements.

TOP TAKEAWAYS

Plastic and other harmful litter occur at every stage of the supply chain and break up into microplastics, which harm human, ecological, and economic health.

Current strategies to remove plastic pollution rely on individuals and do not address the amount of plastic pollution in Virginia.

Producers should be responsible for taking into account the lifelong impacts of their products at every stage, from manufacturing to the post-consumer stage.

PLASTIC-TO-FUEL: A FALSE SOLUTION

PLASTIC WASTE

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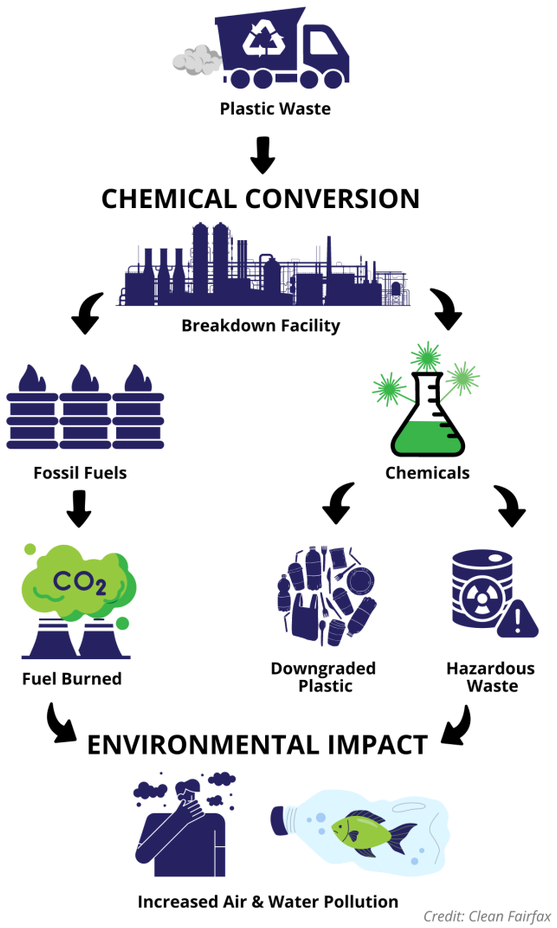
WHY IT MATTERS

Plastic production is increasing globally and in Virginia. As a result, the state's waterways are inundated by single-use plastic pollution, but "advanced" or "chemical" recycling, also known as pyrolysis, gasification, **chemical conversion**, and chemical depolymerization are not solutions to the plastic pollution crisis. These processes use chemicals and heat to incinerate plastic waste to create fossil fuels.[1] They do not reduce the use of single-use plastics but instead incentivize the continued use of plastics for plastics-to-fuel manufacturing. The resulting air pollution and hazardous waste put Virginia's communities and environmental health at risk.



Credit: Clean Fairfax

"Chemical recycling" has been introduced as the answer to plastic pollution by the plastics industry for more than 35 years.[2] In that time, plastic production and plastic pollution have drastically increased, while the plastic industry continues to look to these failed systems as justification to increase plastic production. Simply put, "chemical recycling" burns plastic to create fossil fuel (see graphic to left). Despite plastic industry lobbying, these processes are classified as "incineration" by the **U.S. Environmental Protection Agency (EPA).**[3] In addition, "chemical recycling" produces more greenhouse gases and hazardous waste than the production of virgin plastic,[4] while also incentivizing the production of more plastic.

Many of these facilities do not test, record, or report the environmental impacts of their incineration. Of the three operating facilities in the US, a 2018 report found that an Oregon facility released over 49,000 tons of waste styrene, a highly toxic chemical, into our air.[5] Pollution disproportionately burdens communities of color[6,7] and, as a result of this environmental injustice, Black people are three times more likely to die from exposure to air pollutants than white people. Seven of the eight "chemical recycling" facilities in the United States are located in **environmental justice communities**;[8] this, combined with the fact that these facilities are often out of compliance with EPA hazardous waste regulations,[9] further demonstrates that "chemical recycling" is a false, inequitable solution.

CURRENT LANDSCAPE

In 24 states,[10] including Virginia, "chemical recycling" facilities are effectively exempt from important waste regulations required of other waste industries. This carveout has been given with false promises from the **American Chemistry Council**, highlighting the "success" of a Tigard, Oregon polystyrene "chemical recycling" facility. However, between 2021 and 2023, this facility lost $4.5 million and the facility closed in early 2024 because it failed to produce a marketable product while also generating more than 200 tons of styrene waste from 2018 to 2022, all of which was burned off-site.[11]

Likewise, the short history of "chemical recycling" facilities in Virginia confirms "chemical recycling" as a false solution in need of a handout to the plastic industry and a burden to taxpayers. Braven Environmental LLC abruptly canceled its plans to build a facility that would serve as a "solution" to the state's plastic waste problem in Cumberland County[12] after being awarded over $200,000 in state grants in 2020.[13]

In March 2025, the **National Recycling Coalition** announced that any process using heat or chemicals to transform plastic waste into fossil fuels, fossil fuel additives, substitutes, or waxes does not meet their "definition of recycling."[14]

OPPORTUNITIES

The "chemical recycling" industry has repeatedly failed for decades due to issues surrounding technology scalability, high volumes of hazardous waste production, energy consumption, and overall inability to turn a profit. If Virginia is looking to truly tackle the plastic pollution crisis, the Commonwealth should look towards producer responsibility and proven solutions that reduce our reliance on single-use plastic (*see Plastic Pollution, page 33*) to protect human health, our waterways, the ocean, aquatic animals, and the economy.

State solid waste management policy follows the hierarchy: source reduction, reuse, recycling, resource recovery (waste-to-energy), incineration, and landfilling.[15] This hierarchy should be followed when discussing "chemical recycling" because it is considered incineration according to EPA regulations. Solid waste management should continue to focus on reducing single-use plastics in the waste stream and as litter, reusing products where possible, and if recycling is required, elevating solutions that reduce the amount of virgin plastics manufactured. Technologies that turn plastic into fuel are not recycling and should be excluded from extended producer responsibility and recycling development programs.

Failed technologies, such as "chemical recycling", should be robustly evaluated for safety, proof of scalability, and economic viability before being allowed in Virginia. Technologies should be profitable (i.e., not reliant on taxpayer dollars) and proven to achieve goals that advance Virginia's quality of life, such as litter reduction, plastic waste management, and environmental equity. Taxpayer money (loans, grants, subsidies, etc.) should not be used to recruit, retain, or support any private "chemical recycling" businesses.

TOP TAKEAWAYS

- Chemical recycling and burning plastics is environmentally unsustainable and enables the petrochemical industry to increase the production of plastics.
- Environmental justice communities are disproportionately impacted by "chemical recycling" facilities, with seven of the eight US facilities that are often out of compliance with EPA hazardous waste regulations sited in low-income and communities of color.

Hiker on McAfee Knob-winner of “Outdoor Recreation” photo contest category
Photo by Jenn Loving

LAND & WILDLIFE CONSERVATION

LAND CONSERVATION

RELEVANT PROGRAMS & AGENCIES

See full glossary starting on page 155

HISTORIC PRESERVATION FUND
A National Park Service program that provides financial assistance to State Historic Preservation Offices and underwrites grant programs to support the preservation of historic buildings, sites, districts, and objects.

HISTORIC REHABILITATION TAX CREDIT (HRTC)
A state tax credit program administered by Department of Historic Resources that incentivizes property owners to rehabilitate historic structures.

LAND AND WATER CONSERVATION FUND (LWCF)
A federal program that provides competitive grants to increase public access to and protection for federal public lands and waters — including national parks, forests, wildlife refuges, and recreation areas. It also provides matching grants to states and local communities for the acquisition and development of public parks and other outdoor recreation sites.

LAND PRESERVATION TAX CREDIT (LPTC)
A program that encourages voluntary private land conservation by providing tax credits equal to 40% of the value of donated land or conservation easements. Virginia Department of Conservation and Recreation is responsible for verifying the conservation value of LPTC donations.

VIRGINIA BATTLEFIELD PRESERVATION FUND (VBPF)
A state-funded competitive grant program run by the Department of Historic Resources to purchase land or conservation easements on Virginia battlefields from the Revolutionary War, War of 1812, and Civil War.

VIRGINIA BLACK, INDIGENOUS, AND PEOPLE OF COLOR (BIPOC) HISTORIC PRESERVATION FUND
A state-funded competitive grant program run by the Department of Historic Resources to support the acquisition, protection, and rehabilitation of historic and archaeological sites of significance for Virginia's BIPOC communities.

VIRGINIA DEPARTMENT OF CONSERVATION & RECREATION (DCR)
A state agency within the Natural Resources secretariat tasked with protecting, managing, and overseeing natural habitat, state parks, open space, and access to the outdoors. Oversees private dam safety and administers the Virginia Agricultural Cost-Share and Community Flood Preparedness Fund.

VIRGINIA DEPARTMENT OF FORESTRY (DOF)
A state agency within the Natural Resources secretariat tasked with developing and protecting healthy, sustainable forest resources. It provides technical and financial assistance to landowners and localities to manage their forests for timber, water quality, or wildlife habitat, and protects forested lands.

VIRGINIA DEPARTMENT OF HISTORIC RESOURCES
A state agency within the Natural Resources secretariat tasked with fostering, encouraging, and supporting the stewardship and use of Virginia's significant architectural, archaeological, and historic resources.

VIRGINIA GET OUTDOORS FUND
A competitive grant program administered by Virginia Outdoor Foundation that provides funding to localities and community organizations for projects that increase access to the outdoors in Virginia's communities, especially those that are underserved. This program is currently suspended due to lack of funding.

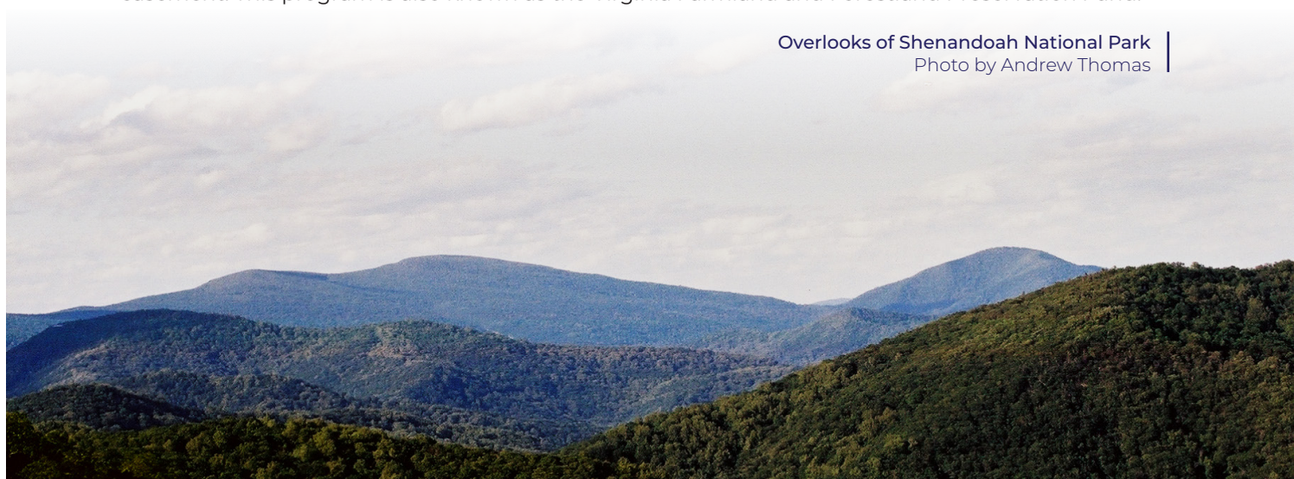
VIRGINIA LAND CONSERVATION FOUNDATION (VLCF)
A state-funded competitive grant program run by DCR to protect farmland, forestland, natural areas, open space and parks, and areas of historic and cultural importance in Virginia. State agencies, localities, non-profits, and tribes are eligible to apply for funding.

VIRGINIA OUTDOORS FOUNDATION (VOF)
An entity created and funded by the General Assembly to work with landowners, conservation organizations, and localities to protect farms, forests, parks, and historic landscapes. VOF is the legal holder of many conservation easements in Virginia, meaning they are responsible for ensuring the terms of the easement are adhered to.

VIRGINIA PRESERVATION TRUST FUND (PTF)
A grant program run by Virginia Outdoors Foundation that provides income-based cost-share assistance grants to landowners placing their land under a conservation easement and provides competitive matching grants to permanently protect, through acquisition or easement, open space for farming, forestry, recreation, wildlife, or water quality. These grants prioritize projects that enhance public access to the outdoors.

VIRGINIA SOLAR MITIGATION PROGRAM
Establishes standards for mitigation when a solar project under 150 MW causes significant impacts to agricultural and forest lands.

VIRGINIA WORKING LANDS FUND
A state-funded competitive grant program run by the Office of Working Lands Preservation within the Department of Forestry (DOF) to help landowners place working farm and forest lands under easement. This program is also known as the Virginia Farmland and Forestland Preservation Fund.



Overlooks of Shenandoah National Park
Photo by Andrew Thomas

LAND CONSERVATION FUNDING: A PRIMER

LAND CONSERVATION

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WHY IT MATTERS

To conserve land means to permanently protect it, and any unique features or characteristics it may have, from being changed by developing that land for a different use. **Land conservation** is the tool used to help ensure working farms and forests, unique historical sites, and rare habitats remain part of the landscape rather than being transformed into housing subdivisions, industrial warehouses, or highways.

Land conservation is important for protecting everything that land contributes to our wellbeing and ways of life: healthy ecosystems that provide clean water and air, the critical natural resources that anchor Virginia's agriculture, tourism, and forestry industries, and the natural landscapes that shape our history, define where we live, play, and work, and draw countless visitors to experience Virginia's beauty.

HOW LAND CONSERVATION WORKS

Imagine a sandwich where each layer of the sandwich represents a different right associated with owning a particular parcel of land. Examples include the right to control access, withdraw water, mine for minerals, and develop the land by adding roads and buildings.

Land conservation permanently protects the land by removing the right to development from this sandwich. This ensures the important characteristics of that land, such as high-quality farmland, habitat for rare plants or animals, or an important piece of history, are permanently protected for future generations.

Conservation easements are the most common tool to protect land. Easements are legally binding and enforceable agreements that amend the title of a piece of land to remove the right to development, even if the land is later sold to a different owner. Landowners interested in conserving their land work with a private conservation nonprofit or public agency to sell or donate a conservation easement. Landowners receive financial benefits from sale proceeds or through decreased tax bills. The organization they work with then "holds" the easement and is responsible for enforcing the terms of this legal agreement in perpetuity. Land in conservation easements typically remains privately owned.

Fee acquisitions are when the landowner donates or sells their land and all associated rights to a conservation organization or public agency (i.e., the whole sandwich!). Sometimes state agencies partner with nonprofits, which can move more nimbly, to acquire land.

Both conservation easements and fee acquisitions are only completed voluntarily and with willing landowners. Both of these tools help compensate landowners for their development rights and the future income they forgo by keeping land undeveloped.

HOW LAND CONSERVATION IS FUNDED

Few conservation projects are accomplished without multiple funding sources. Examples include:

- Federal and state grants, which are often paired to meet requirements for matching funds
- Appropriated state and local public funding for specific projects or a conservation fund
- Grants and donations from foundations and private individuals
- Tax incentives such as Virginia's highly successful **Land Preservation Tax Credit**

Having multiple sources of funding, all with their own requirements and deadlines, makes consistent public funding essential to effectively leverage funding and complete projects efficiently. Funding unpredictability creates uncertainty and delays for landowners and often leads to projects being lost to development or other non-conservation purposes.

KEY FUNDING SOURCES IN VIRGINIA

The **Virginia Land Conservation Foundation (VLCF)** is a state-funded competitive grant program run by the **Department of Conservation and Recreation (DCR)** to purchase land and conservation easements for the benefit of the public. Nonprofit land trusts and localities are eligible for 50% matching grants, while state agencies do not have a matching requirement.

DCR provides staff and administrative support. An interagency task force reviews and recommends grant applications to the Virginia Land Conservation Foundation Board of Trustees, who are appointed by the Governor. The criteria for awarding grants are reviewed and updated annually to ensure alignment with the best available data and any updates to relevant statewide plans.

VLCF routinely receives grant applications for twice the available funding. To date, it has awarded funds for over 380 projects preserving over 167,900 acres with state funds totaling about $137 million. Those funds have leveraged more than $400 million in funding from other sources.[1]

A quarter of VLCF's annual appropriation goes to the **Preservation Trust Fund (PTF)**, a grant program operated by the **Virginia Outdoors Foundation (VOF)**. PTF provides funding to

- Help private landowners afford the transaction costs to place their land in easements
- Protect new or expanded public access to open space, such as parks, trails, and outdoor classrooms
- Protect land through acquisitions or easements of high importance for farming, forestry, recreation, public access, wildlife, or water quality

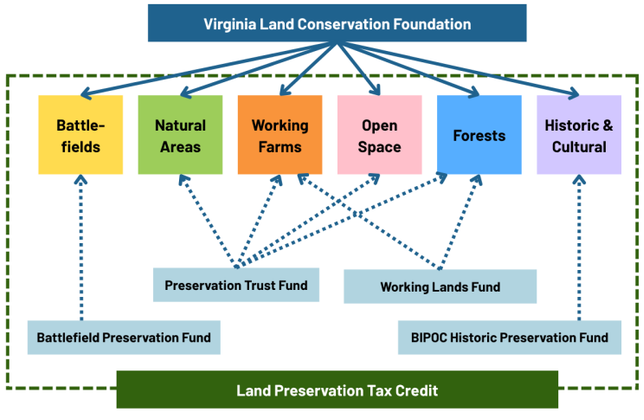
Several small state-funded grant programs provide additional funds to help protect specific types of land. These include the **Virginia Battlefields Preservation Fund**, the **BIPOC Historic Preservation Fund,** and the **Working Lands Fund**.

OPPORTUNITIES

These land conservation programs have a proven track record of success, but their impact has been hampered by inconsistent and insufficient funding in the state budget. Right now, Virginia is missing out on key land conservation opportunities because there isn't enough funding to make grants to fund every worthy application, nor fully fund every request, leading to scaled-down projects and prolonged timelines.

While many Virginia landowners are strongly conservation-minded, few can afford to wait 3 or more years for all the funding pieces to come together. Addressing these funding issues would help meet the demonstrated demand from landowners and ensure the lands that support our physical, mental, and economic well-being are safeguarded for future generations.

VIRGINIA'S LAND CONSERVATION PROGRAMS



TOP TAKEAWAYS

Land conservation is necessary to protect critical natural and historic resources that benefit all Virginians.

Conservation easements and fee acquisition are the two most common tools to permanently protect land from development, and both tools need public funding to incentivize landowners to participate.

Funding unpredictability creates uncertainty and delays for landowners and often leads to projects being lost to development or other non-conservation purposes.

PROTECTING WORKING FARMS & FORESTS

LAND CONSERVATION

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WHY IT MATTERS

Working farms and forests provide food, fiber, and wood products, scenic viewsheds, and outdoor recreation opportunities that support the Commonwealth's three largest industries - agriculture, tourism, and forestry.[1] Agriculture and forestry together have a total economic impact of over $105 billion and provide more than 490,000 jobs in the Commonwealth.[2] They support a constellation of businesses like suppliers, processors, manufacturers, retailers, and transportation and storage. Every job in agriculture and forestry supports 1.6 jobs elsewhere in Virginia's economy. When the employment and value-added impact of agriculture and forestry are considered together, they make up 9.3 percent of the state's total gross domestic product.[3]

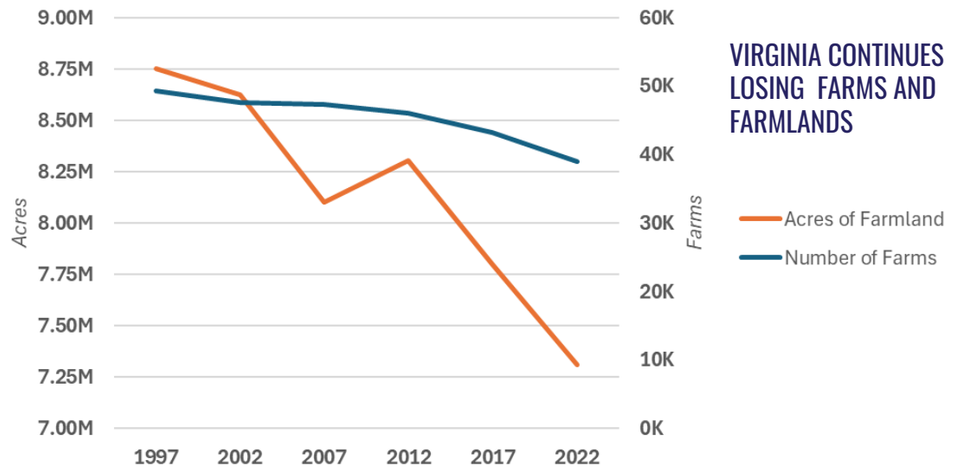
Farms and forests can also provide critical benefits to people and nature, like clean water, carbon sequestration, mitigating flood risks by absorbing and slowing water, sustaining wildlife and pollinators, and maintaining treasured open space, history, and heritage for many rural communities.

Working with willing private landowners to protect farms and forests from development keeps productive agricultural soils and high-quality forest land in production and helps keep rural communities strong. In the near term, compensating landowners for conserving their farms and forests allows them to reinvest funds into their businesses and implement long-term land and water stewardship practices and improvements. Retaining **working lands** in production is also a key step toward enabling land transition to the next generation of producers and addressing historic racial, generational, and economic disparities in land access by ensuring the continued availability and affordability of high-quality land.

CURRENT LANDSCAPE

Between 2012 and 2022, more than 7,000 Virginia farms comprising over 992,000 acres of farmland were converted to other, non-agricultural uses in Virginia.[4] Similarly, between 2001 and 2024, Virginia's forest canopy declined by approximately 19%.[5] The accelerating loss of farms and forests is negatively impacting Virginia's agricultural and forest product industries, which hurts rural communities and jobs, and hinders our ability to adapt to climate change.[6]

State agencies, nonprofit conservation organizations, and conservation-minded landowners are working hard together to combat this staggering loss by permanently protecting farms and forests.



State-funded programs like **Virginia Land Conservation Foundation (VLCF)** grants (*see Land Conservation Funding, pg 41*) and local initiatives like **Purchase of Development Rights (PDR)**, which help landowners place their land under a conservation easement, are successfully protecting highly productive and locally important farms and forests. The **Virginia Department of Forestry (DOF)** has protected 90,704 acres of working forest lands and 455 miles of watercourses throughout the state.[7] **Virginia Outdoors Foundation** data shows that state, local, and nonprofit land conservation efforts have conserved a total of 651,287 acres of land with prime and significant soils.

Demand from landowners for help protecting their land has outstripped available technical assistance and funding through programs like local PDR programs, VLCF, the **Land Preservation Tax Credit**, and the Working Lands Fund. Progress protecting Virginia's working lands has slowed because funding limitations introduce uncertainty about whether, when, and how much of a property can be protected. Landowners need certainty when making decisions that impact the future of their homes and livelihoods.

OPPORTUNITIES

Protecting Virginia's working lands requires full and consistent funding for key state-funded conservation programs. This provides consistency that makes conservation more financially feasible for landowners and enables nonprofit **land trusts** to better leverage additional funding by using state dollars as a match. For example, many nonprofit land trusts use VLCF to leverage federal funding available through the **Natural Resources Conservation Service (NRCS)** programs such as the **Agricultural Land Easement (ACEP-ALE)** program and the **Regional Conservation Partnership Program (RCPP)**.

DOF's **Office of Working Lands,** which operates the Working Lands Fund, also needs investment in additional staff capacity to meet its full potential. It currently does not have enough staff to successfully administer Virginia's new **Solar Mitigation Program**, meet existing demand for technical assistance and expertise, and engage in outreach and education to accelerate conservation of threatened working lands.

Nonprofit land trusts are already key partners in protecting farms and forests, but changes to state conservation programs could help them accelerate the pace of conservation. State law currently limits experienced accredited nonprofit land trusts to the role of co-holders of conservation easements that are purchased with state funding. This creates an unnecessary burden that hinders land conservation. Removing the VLCF requirement that accredited land trusts must have a co-holder can reduce administrative barriers and accelerate the pace of farmland and forest conservation to counter the current scale and pace of loss.

TOP TAKEAWAYS

VLCF and the Virginia Working Lands Fund need annual dedicated funding, at $30 million and $5 million, respectively, to provide consistency for landowners and enable land trusts to leverage additional funding sources.

The Office of Working Lands Preservation needs additional staff capacity and sufficient funding at $500,000 per year to administer the new solar mitigation program and meet landowner demand for help protecting their working lands.

Removing state co-holding requirements for easements funded by VLCF will increase the rate of working farm and forest conservation in Virginia.

PROTECTING HISTORIC & CULTURAL RESOURCES

LAND CONSERVATION

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WHY IT MATTERS

Virginia is home to a remarkable array of historic and cultural landmarks that span American history, from Indigenous capitals like Werowocomoco, to Revolutionary and Civil War battlefields, to Rosenwald schools and Civil Rights landmarks. While preservation efforts have made progress, many sites remain at risk from unchecked development, rising seas and flooding, and deferred maintenance. As population growth continues and development, such as data centers, accelerates, historic resources face mounting threats, including destruction due to rising land values. Sites of significance to Virginia's **Black, Indigenous, and People of Color (BIPOC)** communities are particularly vulnerable, having long been underrepresented in preservation priorities.

The upcoming 250th anniversary of American independence represents a moment of national reflection and an unparalleled opportunity for Virginia to lead in honoring the complex and layered stories that define our shared past. Heritage tourism generates more than $7 billion each year in Virginia, with a goal of increasing this impact during the commemoration. By investing in preservation now, we can ensure that future generations inherit a more inclusive and complete understanding of the people and events that shaped both Virginia and the nation.

PROGRAMS & OPPORTUNITIES

Impending cuts to funding programs at the federal level will inevitably impact the Commonwealth's budget in the coming years. The **Department of Historic Resources (DHR)** receives 17% of its budget from the National Park Service **Historic Preservation Fund**, which is in jeopardy of being severely reduced in the federal government's FY26 budget. Virginia will need to take action to protect existing programs and backfill for the decrease in federal funding.

HISTORIC REHABILITATION TAX CREDIT (HRTC)

The HRTC has revitalized thousands of properties statewide by incentivizing the rehabilitation of older buildings by individuals and organizations. It generated $6.8 billion in private investment between 1997 and 2020, benefiting communities large and small.[1] Currently, property owners can claim 20% of eligible rehabilitation costs, and credits can be carried forward up to 10 years.

US Army Old Guard march in the Yorktown Fourth of July Parade.
Winner of "historic & Cultural Resources" photo contest category
Photo by Brenna Behel

This tax credit delivers economic, environmental, and community benefits. Any move to restrict the program with an overall cap would undermine its effectiveness and limit access for smaller-scale users.

VIRGINIA LAND CONSERVATION FUND (VLCF)

Currently funded at $16 million annually, VLCF has a strong track record but struggles to keep pace with escalating prices. Increasing its allocation to $30 million annually would enhance its ability to safeguard priority properties across the Commonwealth.

LAND PRESERVATION TAX CREDIT

This program enables eligible landowners to receive an income tax credit up to 40% of the value of their donated land or conservation easement, up to $20,000 a year, and carry the credit over for up to 10 years (*see Land Conservation Funding, page 41*).

VIRGINIA BATTLEFIELD PRESERVATION FUND (VBPF)

VBPF preserves battlefield land from the American Revolution and Civil War, including sites associated with the Medal of Honor. Funded at $5 million annually, it successfully attracts significant federal and private matching funds, yielding a 6:1 return on state dollars. More than 11,000 acres have been protected through the program.

BLACK, INDIGENOUS, AND PEOPLE OF COLOR (BIPOC) FUND

The Virginia BIPOC Historic Preservation Fund is a newer program designed to address gaps in preservation by supporting underrepresented historic sites and stories. It plays a critical role in broadening public understanding of Virginia's diverse heritage. In its Spring 2025 grant round, DHR received 58 applications totaling $28 million in requests, demonstrating the tremendous need for the preservation of historic sites of color.

Sustained and increased funding is essential for this program to fulfill its mission of expanding access and elevating historically overlooked places. Early grant rounds have shown strong interest, confirming the need for at least $1 million in additional funding annually. DHR provides technical assistance to local organizations, enabling groups to apply who previously had not benefited from such a process.

SEMIQUINCENTENNIAL FUNDING

In anticipation of the quickly approaching 250th anniversary (semiquincentennial) of the Declaration of Independence, Governor Youngkin and the General Assembly established the Virginia 250 Preservation Fund during the 2024-2026 biennial budget process. The first grants were awarded early in 2025, totalling $20 million to 35 projects. DHR received 166 full applications totaling $95 million, demonstrating the clear enthusiasm for this funding source.

The $20 million set aside for 250th anniversary preparations is a strong start, but continued support will be needed. These funds will support preservation, interpretation, and infrastructure improvements that deepen public engagement with our shared heritage.

TOP TAKEAWAYS

Federal funding cuts will likely create budget shortfalls and staffing concerns for the Department of Historic Resources.

As the semiquincentennial quickly approaches, funding to support the preservation and restoration of Virginia's historic sites is needed more than ever before. Strong and continued funding for the land preservation grant programs ensures funding can keep up with rising property values.

Historic Rehabilitation Tax Credits have a significant track record of success and should not be capped.

INVESTING IN ACCESSIBLE PUBLIC LANDS

LAND CONSERVATION

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Michelle Schopp // Virginia Association for Parks // michelle.m.schopp@gmail.com

WHY IT MATTERS

A majority of Virginians agree that access to outdoor recreation is very important, and they turn to the outdoors as a place for exercise, experiencing nature, stress reduction, and socializing with family and friends.[1] Virginians and visitors alike are fortunate to have access to a wide range of public lands across the state, from small local parks to large national forests.

Public lands play many vital roles in Virginia:

- Safeguarding clean water and air by protecting the headwaters for many of our major rivers and key carbon sinks like forests, wetlands, and marshes
- Protecting habitat for game species, rare plants, and animals
- Providing access to the outdoors for people to relax, recreate, and connect with each other and nature
- Forming the backbone of a growing $13.4 billion outdoor recreation economic sector[2]

The purpose of public lands is to maximize public benefit and protect and steward best-in-class landscapes for future generations. Over 75% of land in Virginia is privately owned, which makes public lands key to ensuring that everyone can access and enjoy the outdoors.[3,4,5] Lack of equitable access to quality parks and green spaces poses a threat to mental and physical health outcomes in low-wealth urban communities and rural counties.[5,6] Enhancing access may include establishing public lands where there are few or none, expanding public lands in high-demand areas, and establishing infrastructure and programming to address physical or language access barriers.

Public lands also enable conservation of critical landscapes, ecosystems, and animal migration. They support economies of scale for environmental monitoring, research, and restoration activities. Natural resources agencies, which manage our public lands, are a trusted repository of best practices for land management and conservation based on decades of science and experience.

CURRENT LANDSCAPE

State parks are among the most recognized and popular types of public land in Virginia. State park operations are funded through agency operating budgets and partially offset by revenues from visitor spending. In 2024, Virginia State Parks generated an estimated $382.3 million in total economic impact and $12.29, on average, for every $1 of general tax revenue spent.[7]Maintenance and management investments are essential for determining whether parks and other public lands live up to their full environmental, experiential, and economic potential.

Compared to other states, Virginia historically ranks near the bottom of state park system spending per capita.[8]Our state park system faces a $388 million maintenance backlog stemming from inconsistent and insufficient funding over the past two decades, understaffing within the Parks Resources Division, and a lengthy state-mandated process to complete capital projects that leads to higher costs and public frustration.[9]

Father with sons at sunset-Shenandoah National Park
Photo by Patti Black

Foregoing routine maintenance to deal with critical repair issues has compounded a "budgeting by emergency" situation. Leaving repairs unattended until an emergency is highly cost-ineffective due to increases in the scale of needed repairs and increases in material and construction costs over time due to inflation. The large maintenance backlog also constrains the **Department of Conservation & Recreation (DCR)**'s ability to invest in improving and expanding existing parks to meet visitor demand and fully developing new parks in the system, like Clinch River and Culpeper Battlefields. Other public lands in Virginia face similar challenges in securing funding to maintain and update parking lots, signage, and other basic amenities that make public lands more accessible and visitor-friendly.

Much uncertainty exists in 2025 around the ownership and management of many federal public lands. Current efforts to slash federal budgets and staff and divest federal lands threaten Virginia's outdoor recreation economy and our long-standing collaborative relationship with federal agencies. Virginia does not have the capacity to assume ownership or management of these lands.

OPPORTUNITIES

Virginia's natural resources agencies and programs need increased and dedicated funding to address public lands' maintenance backlogs and unlock their full potential to support local communities through outdoor recreation opportunities and related tourism. Funding is needed for both repairs and staff to successfully address this problem and prevent it from recurring in the future. DCR has taken steps to update its infrastructure management system to support better project prioritization and is prepared to move quickly to address its maintenance backlog.

Dedicated funding will also enable agencies to respond to unique opportunities when they arise to acquire unique and strategic lands that enhance the existing public lands system. This could include increasing access to public lands in underserved or high-demand parts of the state, enhancing connectivity between protected lands, or creating larger buffers from development around important natural resources. The recent opportunity for Virginia to acquire Oak Hill, the home of former president James Monroe, for the state park system and provide increased public lands access for residents in Northern and Central Virginia is a prime example of how conservation is currently hampered by the lack of consistent funding.

Dedicated funding will help agencies make public lands more accessible and appealing to visitors by ensuring they meet user needs. All Virginians should feel welcome in parks, regardless of language, ethnicity, socioeconomic background, or physical and mental abilities. DCR has piloted initiatives like all-terrain wheelchairs, telescopes for colorblind users, and multilingual signage and programming that can be used at other parks.

TOP TAKEAWAYS

Public lands help keep Virginians healthy, provide environmental benefits like clean water, support the growing outdoor recreation industry and jobs, and protect critical natural resources for future generations.

The growing state parks maintenance backlog has led to an inefficient and costly "budgeting by emergency" system that limits the system's potential to meet visitor demand and generate revenue.

Dedicated funding will enable Virginia's public lands and natural resource agencies to invest in staff, maintenance, operations, and land acquisitions to make them accessible, inclusive, and desirable destinations.

ACCESS TO THE OUTDOORS
LAND CONSERVATION

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Justin Doyle // James River Association // jdoyle@thejamesriver.org
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WHY IT MATTERS

In 1948, African American lawyer Maceo Conrad Martin attempted to enter Staunton River State Park. Mr. Martin was refused entry, as he suspected he would be. He then filed suit against the Virginia Conservation Commission. Following the infamous "Separate but Equal" doctrine 50 years prior, the Board of Conservation and Development ruled that the Commission provide "comparable facilities for the Negroes," leading the Commonwealth to open Prince Edward State Park for Negroes. Prince Edward was the only park in Virginia accessible to Black folks until the passage of the Civil Rights Act. Resistance to integration mounted to the point where the Board of Conservation considered closing the park system altogether.[1]

Access to the outdoors is strongly linked to improved mental and physical health outcomes, especially for children and the elderly. Spending time outside improves cognitive and emotional well-being, reduces anxiety and depression, and fosters a deeper appreciation for nature. Many communities also use outdoor spaces to build and sustain community through gatherings like family picnics, outdoor exercise classes, live music, volunteer groups, and hobby groups like bird watchers or cycling clubs.[2,3]

All Virginians should have access to the outdoors and its benefits regardless of race, physical abilities, or income. Yet, historic patterns of inequitable public access to green space persist in both urban and rural areas, particularly in areas that are traditionally communities of color. Many of these same communities are also the ones that bear the brunt of environmental impacts from pollution and the effects of climate change.[4] James Baldwin said, "History is not the past. It is the present. We carry our history with us." The Commonwealth, localities, and the conservation community have taken steps to address the legacy of exclusion from nature; however, many of the programs tasked with addressing this legacy remain underfunded.

CURRENT LANDSCAPE

Public access to the outdoors is an issue across geographic areas, although it may manifest in different ways. Rural areas are defined by vast open spaces; however, many substantial tracts of land are privately held or inaccessible to the public, leading to a landscape marked by no-trespassing signs.[5] This makes it hard for non-landowning residents and visitors to access the outdoors, whether fishing in a river or stream or hiking or hunting in the woods. State and federal-owned public lands like parks, wildlife management areas, and public boat launches help address this need, but there are still significant geographic gaps. In addition, many need additional investment in infrastructure and programming to make them feel like safe and welcoming spaces for all Virginians.

Urban areas, particularly those resulting from rapid development and sprawl, also present access issues due to a lack of greenspace within safe walking distance of neighborhoods. In Richmond, 81% of residents are estimated to live within a 10-minute walk of a park, but in Portsmouth, only 50% do, and in Abingdon, only 28%.[6] In many instances, this lack of access is due to historic discriminatory practices like redlining, dividing of communities with major roadways, lack of investment in public or active transportation infrastructure, and even forced migration of communities to areas further from natural areas.[3]

Local governments are the main entity responsible for acquiring, developing, and maintaining green space for residents. They often lack the capacity and resources to meet access needs, and are limited in how much money they can generate through funding mechanisms like proffers and impact fees. Localities in the Greater Richmond Region are notably excluded in Virginia Code from funding the creation of parks, outdoor space, and related facilities through the use of impact fees.[7]

OPPORTUNITIES

Addressing current and historic inequities in access to the outdoors requires a multifaceted and multi-level approach shared by state and local government and community partners. The **Virginia Land Conservation Foundation (VLCF)** grant program is a key vehicle for establishing and expanding new open space (*see Land Conservation Funding, page 41*). Increased and dedicated funding for VLCF would increase funding for localities to increase the quantity and quality of open space available to residents.

Until last year, the **Virginia Outdoors Foundation** also ran the **Get Outdoors Fund (GOF)**. GOF provided flexible, competitive grant funding for projects that address barriers to accessing the outdoors, including diverse approaches such as building ADA accessible trails, developing multilingual materials to address information barriers, creating outdoor camps and programming for children, and providing transportation to outdoor spaces. Despite high demand and impact, this program was indefinitely suspended due to a lack of funding.

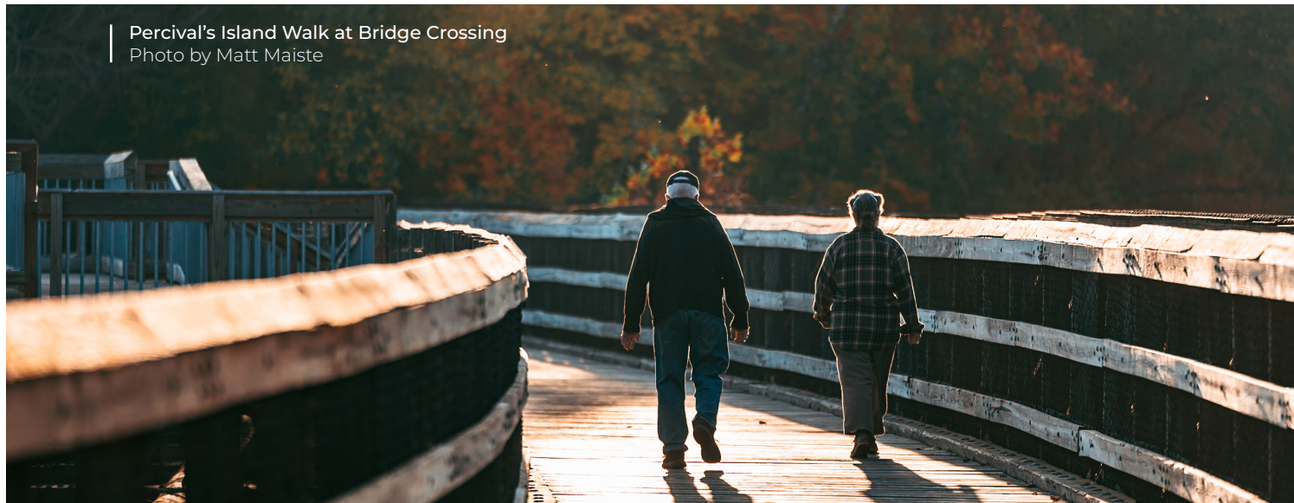
Increasing youth access to the outdoors is especially beneficial for developing curiosity, confidence, problem-solving, and appreciation for nature. The Virginia State Parks Youth Conservation Corps program is a two-week, residential program consisting of work projects during weekdays and environmental education and adventure opportunities on weeknights and weekends.[8] Many community-based organizations have also stepped into the gap to provide outdoor experiences for Virginians with physical and learning needs, from low-wealth communities, and non-English speakers. The outdoors can and should be for everybody, but not all Virginians have access to the outdoor spaces, facilities, and information that make it possible for them to safely and comfortably get outside

TOP TAKEAWAYS

Access to the outdoors is strongly linked to improved mental and physical health outcomes. The outdoors can build and sustain communities.

Systemic efforts to exclude groups from the outdoors based on racial, economic, and physical barriers still impact how Virginians interact with the outdoors.

The Get Outdoors Fund was a successful program, but is indefinitely paused due to lack of funding.



Percival's Island Walk at Bridge Crossing
Photo by Matt Maiste

NATIVE HABITATS & SPECIES

RELEVANT PROGRAMS & AGENCIES

See full glossary starting on page 155

ATLANTIC STATES MARINE FISHERIES COMMISSION (ASMFC)
Commission that coordinates and manages fishery resources including marine (saltwater) fish, shellfish, and anadromous fish along the Atlantic coast of the United States.

AQUATIC WILDLIFE CONSERVATION CENTER (AWCC)
Actively recovers Virginia's freshwater mussels under the Virginia Department of Wildlife Resources.

U.S. FISH AND WILDLIFE SERVICE (USFWS)
Federal agency with the primary responsibility of conservation and management of fish, wildlife, plants, and their habitats for the US population.

URBAN FORESTRY PROGRAM
A federal program dedicated to supporting the planting, protection, maintenance, and utilization of trees and forests in urban and community settings.

VIRGINIA DEPARTMENT OF CONSERVATION & RECREATION (DCR)
A state agency within the Natural Resources secretariat tasked with protecting, managing, and overseeing natural habitat, state parks, open space, and access to the outdoors. Oversees private dam safety and administers the Virginia Agricultural Cost-Share and Community Flood Preparedness Fund.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)
State agency responsible for administering laws and regulations related to air quality, water quality, water supply, renewable energy, and land protection. DEQ issues permits, conducts monitoring, performs inspections, and enforces environmental law.

VIRGINIA DEPARTMENT OF FORESTRY
A state agency within the Natural Resources secretariat tasked with developing and protecting healthy, sustainable forest resources. It provides technical and financial assistance to landowners and localities to manage their forests for timber, water quality, or wildlife habitat, and protects forested lands.

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)
State agency responsible for building, maintaining, and operating the state's roads, bridges, and tunnels.

VIRGINIA DEPARTMENT OF WILDLIFE RESOURCES (DWR)
Agency responsible for the management of inland fisheries, wildlife, and recreational boating for the Commonwealth of Virginia.

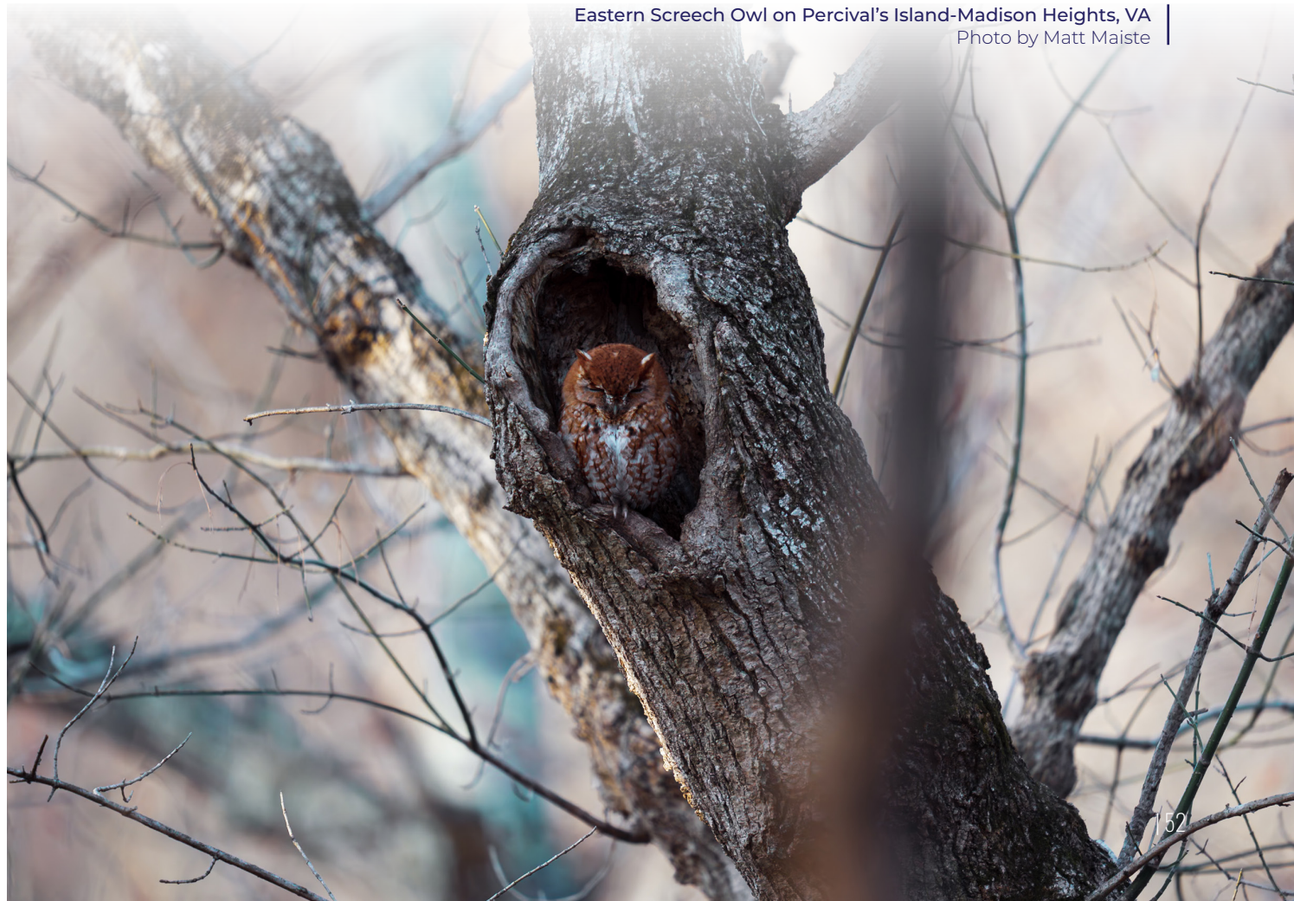
VIRGINIA INSTITUTE OF MARINE SCIENCE (VIMS)
A marine research and education center that operates as a branch of the College of William and Mary. VIMS has a legal mandate to provide research, education, and advisory services to government, citizens, and industry.

VIRGINIA INVASIVE SPECIES MANAGEMENT PLAN (VISMP)
Provides an overview of invasive species that threaten Virginia's natural and agricultural resources, state agency responsibilities, and goals shared by the many stakeholders who are part of the Virginia Invasive Species Working Group.

VIRGINIA MARINE RESOURCES COMMISSION (VMRC)
State agency in charge of overseeing Virginia's marine and aquatic resources, and its tidal waters and homelands. One of the primary functions of VMRC is to zone water areas for recreation, oyster and clamming grounds, and commercial/recreational fishing.

VIRGINIA TREES FOR CLEAN WATER GRANT PROGRAM
Funds tree-planting and tree giveaways to reestablish lost canopy, improve water quality, and educate communities.

WILDLIFE CORRIDOR ACTION PLAN (WCAP)
Plan to identify and protect wildlife corridors in Virginia, helping both people and wildlife move more safely.



Eastern Screech Owl on Percival's Island-Madison Heights, VA
Photo by Matt Maiste

LINKING LANDSCAPES FOR WILDLIFE & SAFETY

NATIVE HABITATS & SPECIES

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WHY IT MATTERS

From the Appalachians and Blue Ridge to the Piedmont and Coastal Plain, Virginia sits at the crossroads of East Coast ecosystems, climate migration corridors, and human development. Black bears, bobcats, wood turtles, and brook trout are among the many species that rely on safe road and stream passage across the state to feed, breed, and adapt to changing habitats. With the third-largest state-maintained highway system in the U.S., Virginia's 70,000+ miles of roads fragment Virginia's landscapes, restrict wildlife movement, isolate populations, and cause frequent wildlife-vehicle collisions.[1]

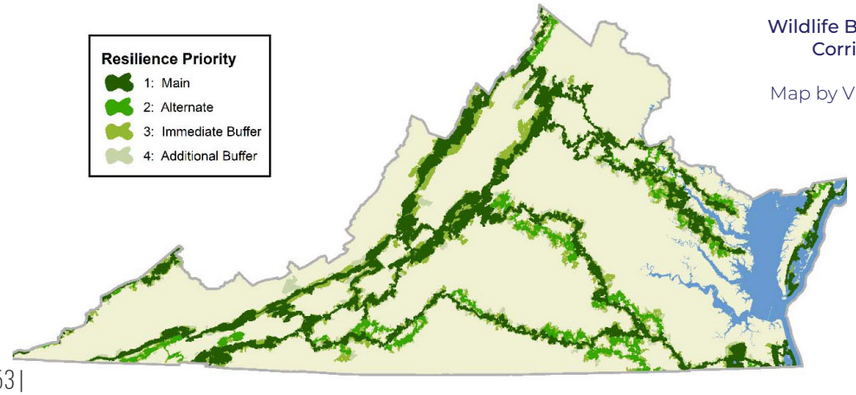
Wildlife crossings, or under/overpasses that facilitate safe animal passage, can improve public safety by significantly reducing collisions. After installing crossings, wildlife-vehicle collisions dropped by over 80% in Banff, Canada, and over 90% in Washington, Colorado, and Nevada.[2,3] A Central Virginia study found a 96% reduction after adding fencing to funnel wildlife through two existing underpass crossings.[4] These solutions save lives, lower public and state costs associated with collisions and wildlife population declines, and reconnect vital habitats.

Virginia has ample opportunities to retrofit existing underpasses with directional fencing, a cost-effective strategy that studies have shown can pay for itself in less than two years.[5] Fencing paired with underpasses designed to more closely resemble a natural streambed offers even greater returns for ecological function and boosts our infrastructure's resilience to floods. These nature-based solutions, such as upsized culverts and underpasses, reduce maintenance needs and are less likely to fail during extreme precipitation events than outdated structures that are easily blocked by debris.[6]

In a time when federal funding and policy are in flux, **habitat connectivity** must become a priority across local, regional, and state planning, with nature-based infrastructure treated as the norm, rather than the exception.

CURRENT LANDSCAPE

Virginia is making progress toward integrating habitat connectivity into planning frameworks. In 2023, the **Wildlife Corridor Action Plan (WCAP)** identified **Wildlife Biodiversity Resilience Corridors** across the state. These are priority landscapes where restoring habitat connectivity will effectively support species movement and long-term ecosystem resilience in a changing climate. The Virginia Land Conservation Foundation now awards higher scores to conservation projects located in these Wildlife Biodiversity Resilience Corridors, and in 2025, the legislature also recently allocated $450,000 in the state budget for priority wildlife crossing projects identified in the WCAP. While climate adaptation and resilience are increasingly encouraged in transportation planning, wildlife-friendly infrastructure is still not required. As a result, most projects continue to use conventional designs that do not support wildlife movement.



Wildlife Biodiversity Resilience Corridors for 2023 Wildlife Corridor Action Plan
Map by Virginia Department of Wildlife Resources

These steps are promising, but without sustained funding, agencies, Tribes, and localities face inconsistent and inequitable access to connectivity resources. When funds are limited, smaller, underinvested communities are left without support for crossing planning, implementation, or maintenance. Even in areas with high wildlife-vehicle collision or flood risks, limited capacity and low awareness of the long-term cost savings of wildlife crossings can stall progress.

Another major barrier to connectivity project implementation is Virginia's lack of consistent, statewide data on wildlife-vehicle collisions. While some **Virginia Department of Transportation (VDOT)** districts track where animals are struck and what species are involved, there is no required system in place across the state. This data gap makes it difficult to identify where wildlife crossings are most needed, build support for projects, and compete for federal, state, and private funding.

Virginia has the initial tools, public support, and agency collaboration in place to move from planning to implementing wildlife crossings. However, safe wildlife passage and permanent funding must be prioritized for long-term change, especially for communities most impacted by flooding, wildlife-vehicle collisions, habitat fragmentation, and historic underinvestment.

OPPORTUNITIES

Virginia has a promising opportunity to establish a **Wildlife Corridor Grant Fund**, supported by voluntary donations, grants, and potentially supplemented by state appropriations. This would empower agencies, Tribes, and localities with the funds needed to build wildlife crossings without relying on limited state infrastructure budgets. Importantly, the fund would be guided by clear criteria to ensure resources are directed where they are needed most, including prioritizing projects within identified Wildlife Biodiversity Resilience Corridors, high flood-risk areas, and underserved communities.

At the same time, strategic investment in data collection is essential to identify priority areas for wildlife-vehicle conflict mitigation. A pilot carcass removal app is currently used in select areas, but VDOT contractors could utilize it statewide to ensure agencies have the information they need to place crossings in the best possible locations. A modest investment of $50,000 would enable a statewide rollout of the app, costs that could be supported through the Wildlife Corridor Grant Fund.

Finally, training for VDOT staff on the importance of habitat connectivity would strengthen support and implementation of wildlife-safe passage and broaden awareness of the long-term cost benefits of wildlife crossings. Together, sustainable funding, training, and comprehensive data collection can lay the groundwork for agencies, especially VDOT, to adopt policies that include connectivity in all state infrastructure planning efforts.

TOP TAKEAWAYS

Wildlife crossings are a proven, cost-effective solution that reconnects fragmented habitats, reduces collisions, and strengthens both ecological and community resilience across Virginia's increasingly developed landscapes.

Incorporating terrestrial and aquatic connectivity training into state agency professional development programs and requiring better data collection will help identify priority areas for wildlife crossings and target investments where they will have the greatest impact.

A Wildlife Corridor Grant Fund with clear distribution criteria will provide resources and incentives to advance connectivity statewide.

REBUILDING HEALTHY FISHERIES

NATIVE HABITATS & SPECIES

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WHY IT MATTERS

Healthy, productive fisheries are of critical economic, ecological, and recreational importance to communities throughout the Commonwealth. Fisheries support a wide range of livelihoods–from commercial harvesters and seafood processors to charter boat operators and local tourism and outdoor recreation businesses. Beyond their economic value, these fisheries are woven into Virginia's cultural fabric, offering generations of residents the opportunity to fish, connect with nature, and preserve long-standing traditions.

However, many of Virginia's most iconic migratory fish species are in a state of alarming decline.[1] Populations of American shad, river herring, and Atlantic sturgeon have all dropped to historically low levels, and striped bass remain overfished and will struggle to rebound due to years of historically low spawning success. There isn't a more illustrative example than that of the James River, where, for the last 5 years, American shad have been at 0% of their management goal through population assessments completed by the **Virginia Institute of Marine Science (VIMS)**.[2] Once-abundant in Virginia's rivers and estuaries, today these species face habitat degradation, water quality issues, bycatch, overfishing, and climate change. Atlantic menhaden, a keystone forage species that is critical to the marine food web, has been at the center of management debates, reflecting broader concerns about the sustainability of our marine ecosystems and the concentrated industrial menhaden reduction fishery in Virginia.

Blue crabs, another culturally and economically significant species of Virginia's fisheries, are also experiencing declines. According to the **Virginia Marine Resources Commission (VMRC),** the commercial harvest was 18.6 million pounds valued at $41.5 million.[3]

Protecting and restoring these populations is not only a biological imperative but also a matter of preserving the Commonwealth's heritage and economic resilience. Investing in peer-reviewed and science-based management, habitat restoration, and conservation partnerships is essential to ensuring that Virginia's fisheries remain a vital resource for future generations.

CURRENT LANDSCAPE

Fisheries management regulations aim to balance ecological sustainability with economic and recreational interests. For migratory fish species, the VMRC and the **Atlantic States Marine Fisheries Commission (ASMFC**) oversee these declining populations with support from the **Department of Wildlife Resources (DWR)**. American shad and river herring have been under statewide fishing moratoriums for decades, while the striped bass fishery has been under emergency management measures for over two years.[4]

Despite these restrictions, American shad, and to a similar extent, river herring, have shown little response to stocking or the moratoriums. In 2023, VIMS published a recovery plan for American shad in the James River, highlighting regulatory blind spots and calling for further study to support this species. Only one of the 20 action items identified in the plan has received funding.

A single industrial reduction facility dominates coastwide menhaden harvests and is allowed to operate within Virginia waters. This fishery removes immense volumes of menhaden from in and around the Chesapeake Bay, raising concerns about long-term ecological impacts. Despite growing evidence of ecosystem stress, including declining osprey reproduction and reduced catch rates for small-scale menhaden bait fishers, Virginia lacks the localized science needed to make informed menhaden management decisions within its waters. Although a comprehensive menhaden study plan has been developed and broadly supported, it remains unfunded.

The Chesapeake Bay's blue crab population has plummeted to 238 million, the second-lowest level since monitoring began in the 1990s, closely following 2022's record low of 226 million. Experts report declines across adult males, females, and juveniles, with particular concern over juveniles. The causes remain uncertain but likely involve habitat loss, predation by invasive species, pollution, and extreme weather from climate change, which disrupts larval return to the Bay.

Blue Catfish, a highly invasive introduced species, can be found in all of Virginia's major tributaries to the Chesapeake Bay. These voracious predators consume a range of species including migratory fish, blue crabs, and oysters. While commercial and recreational blue catfish landings have steadily increased, market demand has not. Efforts to address market demand for blue catfish are ongoing. Recommendations from the Blue Catfish Work Group are due by September 1st on how to reduce the negative ecological effects of blue catfish and increase the market demand forblue catfish. Continued support through the Blue Catfish Processing, Flash Freezing, and Infrastructure Grant Program[5] encourages political subdivisions to strengthen related infrastructure and operations.

OPPORTUNITIES

VIMS released a recovery plan for American shad in the James River that outlines 20 targeted actions, projects, and initiatives aimed at restoring this declining population. Many of these actions are expected to benefit a wide range of aquatic species in addition to American shad. Funding projects prioritized by VIMS and other agency staff will begin this process and help these native species.

Opportunities to improve menhaden management include fully funding and implementing the VIMS' Menhaden Study Plan to provide the Bay-specific science needed for responsible management. Additionally, adopting precautionary measures such as seasonal or area-based closures and reducing industrial fishing can offer immediate ecological relief while science catches up.

To protect the long-term sustainability of the blue crab population and its economic benefits, Virginia will need to respond to the annual winter dredge survey and the upcoming Chesapeake Bay Blue Crab Stock Assessment with a focus on changes that will help restore the population. Virginia should consider reducing direct harvest pressure on the population, particularly male crabs, to facilitate the stock's rebound while expanding efforts to restore and improve critical crab habitats, control invasive blue catfish, and improve Chesapeake Bay blue crab science.

Funding the Blue Catfish Work Group's recommendations, alongside sustained or increased funding for the Blue Catfish Processing, Flash Freezing, and Infrastructure Grant Program could boost the market for wild blue catfish harvested from the Chesapeake Bay and its tributaries.

TOP TAKEAWAYS

Virginia's native migratory fish species, such as American shad, river herring, and endangered Atlantic sturgeon, are severely depleted, with some at historic lows. Striped bass face six years of historically low spawning success and are currently subject to restrictive management measures to promote population rebuilding.

Funding for projects, studies, and work group recommendations, like those identified in the James River American Shad Recovery Plan, is essential to boost populations of imperiled native species.

Coastwide menhaden removals are concentrated in Virginia, where signs of ecosystem stress are mounting, yet there is limited menhaden science specific to the Bay. Supporting menhaden science and precautionary management strategies is critical to ensuring the long-term sustainability of the Chesapeake Bay ecosystem.

PROTECTING FRESHWATER MUSSELS

NATIVE HABITATS & SPECIES

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WHY IT MATTERS

Freshwater mussels are to the health of rivers and streams what oysters are to the Chesapeake Bay. They are a powerful natural filtration system that can filter up to 15 gallons of water per day and play a critical role in protecting and improving water quality.[1] They also stabilize streambeds, prevent erosion, and provide food and habitat for many other species of birds and mammals.

Virginia is home to 80 freshwater mussel species spanning the state's rivers from Southwest Virginia to the coast. This is roughly a quarter of North America's nearly 300 species, and some spots in Virginia, like the Clinch River, are considered global biodiversity hotspots for freshwater aquatic species. Unfortunately, the Clinch River has also seen the largest single loss of endangered mussel species due to a toxic chemical spill in 1998 that the river system is still working to come back from.[2]

Nationwide, freshwater mussels represent the most endangered class of organisms with 65% of species vulnerable to extinction.[3] Freshwater mussel populations have been heavily impacted by pollution, disease, the spread of invasive species, the loss of protective habitat buffering rivers and streams, and the construction of dams that disrupted the flow of rivers. Climate change has been exacerbating population losses by raising water temperatures, making it harder for these species to reproduce successfully.

These small, nearly invisible creatures buried in the mud are easy to overlook but they are foundational to the continued health and survival of Virginia's river ecosystems. They also play an invaluable role in removing pollutants like nitrogen from our waterways, which benefits the downstream communities and ecosystems that rely on clean water to survive and thrive.[4] Virginia must take action to protect and restore these populations before they are completely gone.

CURRENT LANDSCAPE

Mussel restoration is primarily achieved by breeding mussels at fish hatcheries and, when they are old enough to have a good chance of survival, releasing them into rivers to populate mussel beds. Mussel restoration is supported by measures to protect and restore river and stream buffers, particularly forest ecosystems, and reduce pollution entering waterways by implementing conservation practices on private land and addressing sources of industrial pollution.[5]

Hatchery-raised *Utterbackiana implicata* that were released into the James River in 2024
Photo provided by James River Association

Mussel restoration efforts have been slowed by limited and inconsistent funding for research, staff capacity, and critical facilities maintenance at the hatcheries where mussel breeding takes place.[6] Freshwater mussels have complex reproductive cycles that rely on unique symbiotic relationships between specific species of mussels and fish. Virginia **Department of Wildlife Resources (DWR)** has had many successes identifying and replicating these relationships, but research funding is needed to continue this work, as well as survey rivers for more sites with the highest chance of success to rebuild populations. Restoration work is also limited by the physical state of the Harrison Lake and **Aquatic Wildlife Conservation Center (AWCC)**, both of which are in significant need of basic repairs to water and electrical infrastructure and facility upgrades to increase the number of mussels that can be bred.

Mussel restoration is also hampered by the reliance on mitigation dollars, which are only aimed at returning what was lost and don't support proactive work to restore species and rivers that require intervention to prevent local extinction or decline. Recent and likely cuts to federal programs and staff at the **US Fish and Wildlife Service (USFWS)** also threaten mussel restoration work. DWR is a non-general fund agency that relies significantly on federal funding through block and competitive grants. If that funding goes away, mussel restoration work will significantly slow right when Virginia needs to be accelerating efforts to protect these vital river cleaners.

OPPORTUNITIES

DWR is one of the foremost experts on freshwater mussel breeding in the East Coast–scientists at the AWCC have successfully produced and reared approximately 27 species, including 15 federally endangered species. No other facility in the country can boast such a track record. There is also a strong statewide network of research and implementation partners working within universities and conservation organizations to advance this work. DWR is currently developing a statewide plan to accelerate freshwater mussel restoration, modeled after existing regional plans to restore and monitor mussel populations in the Tennessee River and James River watersheds.

Successful plan implementation will hinge on having adequate facilities to carry out the work. There have been no significant upgrades to the AWCC since 2003, when the buildings were first adapted for mussel propagation. Updating the facility would enable scientists to accelerate propagation of freshwater mussels from 15,000 to over 60,000 mussels per year. This would be a major step towards restoring the water quality and biodiversity in the Clinch and Powell Rivers and successfully implementing Virginia's 10-Year Mussel Augmentation Plan drafted by DWR, USFWS, and state non-profit conservation partners.

Virginia may also need to provide funding to backfill the gap left by federal funds to support freshwater mussel research and restoration activities. DWR does not have any way of filling this gap. Restoration actions, including those identified in the James River Basin Mussel Restoration Plan[7] and Clinch River Mussel Restoration Plan[8] also rely on sufficient state funding, which supports direct implementation costs, staffing, and the propagation of threatened mussels.

TOP TAKEAWAYS

Mussels have significant ecological, water quality, and cultural significance and represent the most endangered class of organisms with 70% of species vulnerable to extinction.

Virginia's ability to successfully propagate and restore populations of mussels has advanced in the past decade but is threatened by federal cuts to programs and staffing.

Restoration programs and DWR need sufficient state funding for infrastructure, staffing, and restoration to be successful in implementing their mussel restoration programs.

PRESERVING & EXPANDING TREE CANOPY

NATIVE HABITATS & SPECIES

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WHY IT MATTERS

Despite replanting efforts, Virginia continues to lose **tree canopy**[1] and the benefits trees provide to our environment, economy, and communities. From absorbing carbon emissions to producing the oxygen we breathe, trees sustain us. Trees filter pollutants from air and water, provide habitat, reduce energy use, and cool our landscapes. Trees also intercept rain and absorb water, which in turn reduces stormwater management costs and localized flooding.[2] Tree roots also hold soil in place, reducing erosion and sediment flowing into our creeks, streams, and the Chesapeake Bay. Trees also reduce healthcare costs by clearing the air of pollutants while cooling urban areas, which reduces emergency room visits due to heat-related and respiratory illnesses.

Unfortunately, trees are neither prioritized nor considered early enough in the design process during road construction, new developments, and redevelopments. With more thoughtful design, mature trees could be protected during construction and provide environmental and community benefits for years to come.

Ensuring that tree canopy preservation is considered early in the development process, particularly for dense housing, would ensure a holistic approach to livable communities and prevent the approval of lot line to lot line projects that remove mature trees. While developers are required to replant, the trees being planted today won't mature and provide the same benefits as lost trees for at least 15 years. Meanwhile, local ecosystems are disrupted by the removal of mature trees, and the negative health effects of **heat islands** are felt by those living in these areas, too often affecting marginalized communities.

CURRENT LANDSCAPE

Virginia's tree replacement statutes regulate the percentage of canopy that developers must replace when trees are removed during construction. The percentages vary by zoning and the code establishes a maximum (note, not a minimum) percentage canopy that must be achieved in 20 years. For example, for a one-quarter-acre lot of single-family homes, the replacement percentage is 25%, so you'll see a single 2" caliper red maple planted in the front yard. In 20 years it should cover 25% of the lot. These percentages are inadequate to enable localities to achieve their stated goals. For example, the Metro Council of Governments signed a resolution that established a goal of having 50% tree canopy by 2050 in each of its localities.

But "replacement" is too late. Trees are free infrastructure and preserving them should be the priority instead of replacing them. If they are considered early in the design process, mature trees can be protected throughout the construction process. Currently, only localities within Planning District 8 of northern Virginia have the authority to conserve mature tree canopy during construction.[3]

Starting July 1st, 2025, local governments can now establish a tree canopy fund where developers can pay fees if they cannot fully meet on-site tree canopy requirements. The fund can be used to plant trees on public or private property or to provide grants to community-based organizations focused on tree planting, community beautification, and environmental education.

Tree planting in **Virginia Department of Transportation (VDOT)** rights-of-way offers opportunities to offset heat island effects and mitigate stormwater impacts along roads. However, the cost of doing so can quickly add up to hundreds of dollars per tree over and above the permitting fees, due to the application requirements, as experienced by Fairfax County in 2021, creating a cost-prohibitive situation despite the immense opportunity.

OPPORTUNITIES

The **Virginia Department of Forestry**'s **Virginia Trees for Clean Water grant program**[4] provides vital resources for local community tree planting efforts. Ensuring the program is sufficiently funded and expanding it to include maintenance of both young and mature trees would reduce homeowner burdens and preserve healthy trees on private property.

Virginia receives Federal funding for its **Urban and Community Forestry program**. Cuts at the federal level could mean that Virginia is at risk of losing staff within the Department of Forestry who review and administer grant applications, oversee plantings, and provide technical guidance to local governments.

As Virginia localities approve higher-density residential developments to make housing more attainable, the need to maintain urban trees cannot be underestimated, especially as heat waves and intense rainfall become increasingly frequent.[5] Higher-density development projects should include setbacks for green space, incentivize preservation of mature trees, and reduce road widths to accommodate **tree lawns**, **tree wells**, and **bioswales**.

Localities can update municipal codes to reduce or eliminate parking minimums that too often require large-capacity parking lots in retail shopping developments. Creating incentives to depave and reforest parking lots would reduce stormwater runoff and urban heat island effects.

Designs for linear transportation projects, like roads and highways, should prioritize tree preservation and, when tree removal is unavoidable, incorporate robust tree replacement and native landscaping into design and budgeting processes. If replacement minimums are not feasible, the responsible agency should mitigate the loss by paying into the Trees for Clean Water Fund. Planting native tree species and disease-resistant cultivars will reduce maintenance and maximize canopy potential. Prioritizing the removal of invasive plant species in our right-of-ways will protect the public and remove the seed source that's driving their spread.

Expanding local government authority to conserve trees and establish higher tree canopy replacement minimums are immediate opportunities for reducing tree canopy loss in Virginia. Localities can allocate funds to prioritize historically disinvested areas and known heat islands. Ensuring greenspace equity addresses several social determinants of health and supports a more resilient, healthy community.

TOP TAKEAWAYS

Prioritizing the preservation of mature trees during the design process of all construction projects (roads, subdivisions, commercial and industrial centers) and adequately protecting their roots during the construction process will reduce stormwater management costs.

Preserving adequate space for trees in higher-density areas, especially when upzoning, ensures affordable and healthy communities.

Losses of federal funding from the U.S. Forest Service to states for their urban and community forestry programs will require Virginia to find new funding streams to continue investing in communities' tree canopy restoration.

Tree Canopy–Shenandoah Valley
Photo by Kristin West

PREVENTING HARMS FROM INVASIVE PLANTS

NATIVE HABITATS & SPECIES

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WHY IT MATTERS

Every day, invasive plants overtake another 4,600 acres in the United States,[1] damaging and even tearing down our forest canopy trees and leaving a tangled mess that can prevent birds from nesting, pollinators from nectaring, and wildlife from accessing water and food. Invasive species can exacerbate the impacts of climate change, making communities more vulnerable. Kudzu and Japanese knotweed accelerate the greenhouse effect by releasing carbon stored in the soil into the atmosphere.[2]

Invasive species play a key role in 60% of global plant and animal extinctions and are one of the five most important drivers of biodiversity loss.[3] The rapid growth of invaders like kudzu (one foot per day, or 60 to 100 feet per summer), Japanese knotweed, and autumn olive can turn diverse forests and riparian areas into ecological "dead zones" within a few growing seasons, affecting insects, birds, mammals, and reptiles that have evolved to rely on native plants for food.

The invasive plant crisis deeply affects us all. Farmers face punctured tires from invasive Callery pears, fountain grass ruins pastures, and oriental bittersweet poisons livestock.

Invasive Wisteria vines in Albemarle County
Photo by William Hamersky, Blue Ridge PRISM

Property owners and local governments face the constant, significant financial burden of managing invasive species on their land. Recreationally, when people see vines like porcelain-berry smothering trees and overtaking trails, they experience sadness, frustration, and even depression. Dedicated conservationists and land managers are overwhelmed and demoralized by the sheer scale of the problem, working tirelessly with dwindling resources to protect the natural heritage that sustains us.

The **Virginia Department of Conservation and Recreation (DCR)** has identified 103 species of invasive plants threatening the Commonwealth,[4] with more under assessment.

Invasive plants pose a significant threat to climate resilience. By disrupting ecosystem structure and function, they weaken the capacity of natural systems to adapt to climate change, while also endangering local livelihoods and economies. Managing invasive plants helps restore healthy ecosystems and build communities that are more resilient to drought, floods, wildfires, and other climate-related challenges.[5]

CURRENT LANDSCAPE

Virginia has made recent policy progress on invasive species and, in 2025, passed the consumer education bill, requiring retail signage in proximity to each invasive plant effective January 2027.

Recently enacted policies in Virginia include: partial funding of the **Virginia Invasive Species Management Plan (VISMP)**; prohibiting state agencies from planting, selling, or propagating invasive plants; requiring tradespersons involved with proposing or installing plants to provide written notification to property owners for all plants proposed for installation that are included on the list of invasive plants; and allowing localities to permit the supervised use of herbicides by volunteers on public lands. These are important policies but their scope only allows localities to make incremental progress, whereas measurable reductions to the harms caused by invasive plants to our state's economy, environment, and human and animal health are needed statewide.

Our state also faces a unique challenge. Virginia's Noxious Weeds Law[6] requires that the "commercial viability" of plants be considered, limiting decision-makers' ability to add new invasive plants to the Noxious Weeds List and conduct eradication and suppression activities — even if these plants harm the economy, environment, or human, animal, or plant health. Per the **Virginia Invasive Species Working Group**, the impact of all invasive flora and fauna on the Commonwealth's economy is estimated to cost more than $1 billion per year.[7]

The **Virginia Department of Transportation (VDOT)** may no longer plant invasive plants along Virginia's roadsides; however, requirements to control invasive plants within any state highway right-of-way are limited to only two invasive species.[8]

Funding cuts have interrupted wavyleaf grass control in the core area of infestation surrounding Shenandoah National Park, threatening the wildlife and natural beauty that visitors come to enjoy.

OPPORTUNITIES

ALIGNING PRIORITIES

The Code of Virginia's Noxious Weeds Law requires plants to be evaluated for their "commercial viability,"[9] even if these plants cause harm to our economy, environment, or human, animal, or plant health. Removing this requirement would allow decision-makers to add new invasive plants to the noxious weeds list, protecting our farmers, wildlife, and communities, and helping build a more resilient Virginia.

EMPOWERING COMMUNITIES

Current law allows **public service districts** to be established to manage transportation, water, solid waste, and infrastructure. The law also allows for controlling dangerous insects and other pests per the Virginia Pest Law,[10] as well as beautification and landscaping. Adding invasive plants to this list will assist communities in funding invasive plant removal and control.

MANAGING SPREAD

Roads act as significant pathways for the spread of invasive plants, providing a network of disturbed soils and habitats that are easily colonized, and they serve as corridors for seeds and reproducing plant fragments to move long distances. The Virginia Department of Transportation manages nearly 60,000 miles of public roads, making it the third-largest state-maintained highway system in the United States. VDOT needs adequate resources to control invasive plants along our roadways.

CONTINUING EFFORTS

The rapid spread of invasive wavyleaf grass poses an accelerated threat in and around Shenandoah National Park (SNP), a crown jewel of Virginia's public access parks. Empirical data from within the core area of infestation have shown that treating wavyleaf grass for five consecutive years reduced large populations to remnant individual plants. Providing recurring funding for wavyleaf grass treatment in communities near SNP will help protect the park and the surrounding local economies.

TOP TAKEAWAYS

The requirement to consider the "commercial viability" of invasive plants restricts decision-makers' ability to add new invasive species to the state's Noxious Weeds List and limits Virginia's ability to efficiently protect natural resources and build more resilient communities.

Public service districts provide an existing common-sense policy solution for raising funds to control invasive plants.

Controlling invasive plants along roadways and sustaining wavyleaf grass treatment have been shown to reduce rapid spread.

Sunset at Leesville Lake
Photo by Patti Black

LAND USE & TRANSPORTATION

3

RESPONSIBLE DEVELOPMENT

RELEVANT PROGRAMS & AGENCIES

See full glossary starting on page 155

JOINT LEGISLATIVE AUDIT & REVIEW COMMISSION (JLARC)

A legislative agency that conducts program evaluation, policy analysis, and oversight of state agencies on behalf of the Virginia General Assembly.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT (DHCD)

A state agency that oversees policies, programs, and funding to support affordable housing, community development, and energy efficiency projects, contributing to the state's overall development and sustainability goals.

Gainesville data center construction–Prince William County, VA
Photo by Hugh Kenny, Piedmont Environmental Council

HOUSING FOR THE CLIMATE

RESPONSIBLE DEVELOPMENT

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WHY IT MATTERS

Housing has a profound effect on our lives. It shapes where we work, how we get around, and the community around us. Yet, we are not building enough housing near jobs, services, and transit to keep up with demand, fueling a statewide housing shortage and suburban sprawl. This shortage has resulted in large increases in home and rent prices. The pain is real: nearly 2 in 3 renters and 1 in 4 homeowners in Virginia are "cost-burdened," meaning they spend over 30% of their income on rent or mortgage. [1] To cope with rising rents and home prices, residents move away from walkable cities, into car-dependent suburbs, increasing carbon emissions with longer commutes. [2]

Zoning policies in Virginia's cities and counties limit the vast majority of our residential land to single-family only housing, which typically consumes twice the energy of multi-family homes.[3] When zoning prohibits small, affordable homes on small lots in our cities, towns, and existing suburbs, people will continue to be forced into living farther out in car-dependent sprawl. Today, Virginians already face one of the nation's longest commutes, straining household budgets and increasing greenhouse gas emissions.[4,5]

CURRENT LANDSCAPE

Restrictive zoning and land use policies enacted by local governments have contributed to a shortage of over 105,000 housing units in the Commonwealth and are a key factor in an all-time high housing prices.[6,7] Consequently, families are facing financial insecurity, struggling to live close to jobs and amenities, and being priced out of communities they have called home for decades. Because of high demand and systemic failure to provide a diversity of home types and sizes, the same housing stock that was affordable a generation ago is now out of reach for young families.[8]

Zoning provisions that limit the majority of residential land in urban, town, and village centers to large-lot, single-family homes with parking mandates restrict the types and amount of housing built, pushing development out into agricultural and natural areas.[9,10] Additionally, the upfront cost of land, infrastructure, and materials necessitates a higher sale price for these types of homes. This kind of sprawl results in car-dependent development patterns that are defined by long commute times and high vehicle emissions.[11]

Recently, some localities have adopted zoning codes that allow for a wider diversity of home designs (duplexes, small multi-family, etc.) that use land more efficiently and sustainably while providing homes that are affordable to a wider range of incomes. In response, many of these localities are being sued by residents who disagree with these changes.[12,13,14,15] As a result, other localities are reluctant to implement zoning changes that legalize a variety of homes to avoid the risk of costly litigation.

Old Town Alexandria town homes demonstrate high-density, infill housing in a walkable, tree-lined community
Photo by Julia Giancaspro

The General Assembly can support local government efforts to address Virginia's housing shortage by providing zoning, permitting, and process improvements. When aligned with zoning flexibility, these changes conserve green space and mature tree canopy, reduce sprawl, and limit climate vulnerabilities that sprawl creates.[16]

OPPORTUNITIES

Virginia can leverage housing and land use policy to reach sustainability goals and ensure that Virginians and those who want to call Virginia home can afford a safe and stable home. In Virginia's urban cores, any of the following policy opportunities could contain provisions to allow for flexibility within zoning codes and create incentives to promote the preservation of existing trees. Adding more homes of varied styles in town centers preserves natural areas, reduces car-dependency, and allows for smaller, energy-efficient homes.[17]

TRANSIT-ORIENTED DEVELOPMENT

Incentivize local governments to zone for multi-family housing and eliminate parking minimums within a half mile of all high-frequency transit, light-rail, and Metro routes in Virginia. Incentives could include a **Virginia Department of Housing and Community Development** grant program or awarding extra weight when evaluating funding for infrastructure projects in localities that upzone such areas.

ACCESSORY DWELLING UNITS

Allow homeowners to build **accessory dwelling units (ADUs)**, including mother-in-law suites and backyard cottages, without an expensive and confusing special use process. ADUs support multi-generational living, can supplement household income if rented, and provide new homes in communities of opportunity. Localities would still require these units to meet building code standards, water and sewer capacity, and floodplain and stormwater standards.

HOUSING IN JOB CENTERS

Allow for the conversion of acres of commercial parking lots, vacant storefronts, and office buildings into mixed-use, walkable, and tree-lined communities. Allowing housing and mixed-use development in commercial areas without expensive and lengthy rezonings within urban cores would encourage infill development, adding new homes where people can drive less, reduce stormwater runoff, and remove tree-less surface parking lots that contribute to urban heat islands (*see Tree Canopy, page 59*).

AFFORDABLE HOUSING ON FAITH-BASED PROPERTIES

Many faith institutions are looking to support their congregations and communities using their most valuable asset – their land – to provide income-restricted homes. However, the process of building new multi-family homes, especially affordable homes, is extremely challenging. Removing zoning barriers and shortening development timeframes while preserving green space will enable faith-based organizations to build income-restricted homes in urban centers with access to jobs, services, and transit.

TOP TAKEAWAYS

Restrictive zoning and land use policies are a cause of Virginia's 105,000 home shortage, and a key factor in causing housing prices to reach all-time highs. Zoning reform efforts at both the local and state level are important tools to simultaneously address both housing and climate challenges.

Leveraging zoning flexibility and incentives can help intentionally incorporate greenspace into infill development, supporting environmental goals without significantly increasing the cost of building new homes.

Allowing more and diverse types of housing within already developed neighborhoods will provide a myriad of benefits, including economic growth, increased tax base, fewer carbon emissions, lower combined housing and transportation costs, more conserved land, and decreased homelessness and housing insecurity.

ADDRESSING DATA CENTER IMPACTS & ENSURING TRANSPARENCY

RESPONSIBLE DEVELOPMENT

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WHY IT MATTERS

Virginia hosts the world's largest **data center** market, with nearly 3 times more operational capacity than the next closest region of Beijing.[1] Data center development was initially concentrated in an industrializing portion of northern Virginia that came to be called "data center alley," with its impacts largely isolated from neighboring land uses. Currently, however, data center site proposals are getting larger, with warehouse-sized buildings constructed on campuses that can exceed a thousand acres. They are also increasingly constructed in new areas throughout the Commonwealth, resulting in industrial sprawl that is damaging natural resources and historic landscapes; impairing public parkland; impacting adjacent neighborhoods, schools, and medical facilities; and inflating land prices.

Data centers can also use a huge amount of water, and researchers project that cooling the more powerful data centers that artificial intelligence (AI) requires will significantly increase water consumption.[2] This raises concerns about the community and ecological impacts of lower water levels, especially in the face of increased drought. Local and regional air quality, as well as greenhouse gas emissions, are also a concern as data center developers increasingly propose gas turbines on-site to meet power demands and the industry continues to use diesel generators for backup power.[3] According to records from the Department of Environmental Quality, data centers in Virginia hold air permits for nearly 9,000 backup diesel generators. Researchers with the University of California, Riverside recently published a study showing that just 10% of these backup generators' permitted emissions could result in an annual public health burden of $190-260 million in Virginia and nearby states.[4]

Although data centers have brought tangible benefits to some Virginians, planning for and mitigating the damaging impacts of this industry at the state level can help manage its quickly compounding growth and use of resources.

CURRENT LANDSCAPE

Despite the challenges already facing impacted communities, the data center industry is expected to continue its fast pace of growth in Virginia,[5] leading to further land use, water, and energy impacts. Localities often have the only say in approving or rejecting a data center proposal, yet they lack the purview to analyze key impacts to the grid, air quality, and regional water supply. In addition to this lack of state-level oversight, researchers have highlighted limited transparency and the widespread use of non-disclosure agreements (NDAs), which hinder public access to crucial information on data center proposals.[6]

Ashley Ponds senior living community sits next to a three-building data center campus that operates 110 back-up diesel generators
Photo by Hugh Kenny, PEC

Further, Virginia offers a sales tax exemption to the data center industry, approaching a billion dollars in foregone state revenue each year.[7] Although many factors impact industry siting decisions, the state sales tax exemption is a significant incentive. This is the largest industrial tax break in the state,[8] and it has no conditions that protect communities or the environment, promote transparency around impacts, or foster state oversight of regional effects.

A recent report from the General Assembly's **Joint Legislative Audit and Review Commission (JLARC)** focused primarily on the growth projected in data center power demand, the new infrastructure necessary to meet that demand, and the resulting impact on Virginians' electric bills (*see Data Center Energy Demand, page 95*). But the report also referenced important community impacts related to land use, water supply, and air quality, where three conclusions stand out: 1) the industrial scale of data centers makes them "largely incompatible with residential uses;" 2) localities need water use information from data centers to plan adequately for future water availability; and 3) the diesel back-up generators most data centers use could impact local air quality during outages or if used for demand response.

OPPORTUNITIES

Currently, localities typically have the only say about whether and where new data centers may be built, even though they are not considering the more regional impacts data centers generate. Under this framework, localities continue to approve data centers, with adverse impacts spreading into new localities and regions in the Commonwealth, including new statewide and interstate transmission lines, new gas power plants, and regional water impacts (*see Safeguarding Water Supplies for All Beneficial Users, page 5*). The JLARC report helped shine a light on many of the challenges this expanding industry is creating in Virginia, while making clear that most of the solutions require state-level action and involvement because they exceed localities' purview and authority.

At both the local and state level, more transparency is needed. In the local application review process, more information about the details of projects could help localities to better plan and protect communities, parks, and natural and cultural resources. A new state-level review could allow for consideration of broader-scale data center impacts that typically fall outside the purview of local officials, such as regional air quality and water supplies, as well as the new energy infrastructure data centers necessitate far beyond their local jurisdictional boundaries.

Information about on-site power and backup generators could help localities and the state better prevent excessive air pollution, and information about water consumption could help ensure holistic regional water supply planning. New transmission lines built to serve these data center campuses often go through parks, community open space, trails, riparian buffers, and farmland, and energy generation projects to feed additional power demand are fraught with impacts like air pollution and consumption of large quantities of water. More information and a state-level review, in addition to the local review, could allow these issues to be evaluated more comprehensively.

TOP TAKEAWAYS

State review and oversight, in addition to existing local review, could help Virginia plan for and mitigate land use, water, air quality, and energy impacts from this expanding industry.

Greater transparency about the impacts of data centers could help regulators, elected officials, and the public to make responsible, informed land use decisions.

Existing incentives could be adjusted to encourage environmentally responsible development.

TRANSPORTATION

RELEVANT PROGRAMS & AGENCIES

See full glossary starting on page 155

CLEAN CAR STANDARDS

A set of regulations to reduce transportation pollution and greenhouse gas emissions. This program requires automakers to provide an increasing amount of EVs each year to states with Clean Car Standards. States can only adopt federal regulation of clean car standards, but cannot make their own standards.

SMART SCALE

Virginia's nationally-recognized transportation funding prioritization process that evaluates and ranks proposed projects based on key factors to help determine which ones should be funded. Projects are evaluated on anticipated benefits such as safety, reduced congestion, accessibility, economic development, efficient land use, and environmental impact.

TRANSFORMING RAIL IN VIRGINIA PROGRAM (TRVA)

A multi-corridor, multi-year, multi-phase passenger rail development program that includes capital projects and new services; it will ultimately provide five more new round-trip Amtrak Regional trains, extension of service from Roanoke to Christiansburg, and ten more Virginia Railway Express (VRE) trains as well as the addition of weekend service.

TRANSIT RIDERSHIP INCENTIVE PROGRAM (TRIP)

A state-level program that provides funding to transit agencies for the purpose of supporting the deployment of zero-fare and/or reduced-fare pilot programs to support low-income communities. These programs will aim at increasing a system's ridership and accessibility

VIRGINIA DEPARTMENT OF RAIL AND PUBLIC TRANSPORTATION (DRPT)

A state agency responsible for planning, coordinating, and funding a variety of public transportation and rail initiatives in Virginia.

VIRGINIA PASSENGER RAIL AUTHORITY (VPRA)

Promotes, sustains, and expands the availability of passenger and commuter rail service in the Commonwealth and increases ridership of such service by connecting population centers with passenger and commuter rail service.

VIRGINIA STATE RAIL PLAN

A long-term strategy guiding the development in Virginia's rail network to meet the needs of the people.

Calf Mountain Overlook at Skyline Drive
Photo by Peter Forister

TRANSFORMING TRANSPORTATION

TRANSPORTATION

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WHY IT MATTERS

Virginia urgently needs a cleaner, more equitable transportation system. For decades, transportation planning and funding have focused heavily on highway expansion and construction to the detriment of safer, healthier, and greener choices. As a result, transportation is Virginia's largest source of carbon pollution[1] and a significant source of other air pollutants. Communities of color and underserved communities bear a disproportionate share of the health burdens from transportation pollution.[2] In addition, new and expanded roads destroy natural resources—such as forests and wetlands—that absorb carbon and increase communities' resilience to flooding. They also add to the maintenance costs that taxpayers must cover, while often doing little to reduce congestion or improve mobility and access, particularly for the hundreds of thousands of Virginians who do not own a personal vehicle. Further, more than 900 people were killed in traffic-related accidents in 2023, and there was a 15% increase in crashes involving pedestrians,[3] highlighting the need to make our roads safer and provide more transportation choices.

Virginia's transportation system currently provides few alternatives to driving in most places, especially in under-resourced communities. There are numerous opportunities to leverage recent progress and transform our transportation approach to advance projects and policies that reduce traffic, improve safety, protect our environment and our health, and help communities withstand the impacts of climate change.

CURRENT LANDSCAPE

Although significant transportation reforms have been adopted in recent years, including increased funding for transit, rail, and highway maintenance and the groundbreaking **Transforming Rail in Virginia** initiative, over 70% of funding in the state's latest draft six-year spending plan remains allocated to highways.[4] The emphasis on new and expanded roads has continued despite decades of studies and experience showing that new and wider highways incentivize sprawling development, encourage more driving, and fail to provide long-term congestion relief.[5] In contrast, transit investments have been shown to provide a significant return on investment.[6]

In addition, efforts to weaken or sidestep **SMART SCALE**, Virginia's nationally recognized transportation prioritization process, have continued. SMART SCALE provides an objective and transparent basis for determining which proposals receive funding and has helped advance cleaner transportation modes. However, recent budget earmarks and changes to the scoring system skew more funding to highways.

Meanwhile, changes at the federal level have jeopardized investments in transportation electrification, hindering access to cleaner transit options and to safe, easy, and equitable charging opportunities along the Commonwealth's highways. Federal changes have also reduced the level of environmental and public health review for infrastructure projects.

OPPORTUNITIES

Improving the health, equity, and mobility of Virginians, addressing the climate crisis, and spending tax dollars wisely requires prioritizing the safety, maintenance, and resilience of existing infrastructure and shifting the focus of state and regional transportation programs from construction to transit, rail, bicycle, and pedestrian projects. These changes offer substantial environmental, health, and equity benefits and are essential for economic competitiveness. Transit and other alternatives to driving can provide critical access to jobs, healthcare, and essential services, and businesses and workers increasingly seek to locate in walkable communities with access to public transportation.

Investments in transit, rail, and fuel-efficient vehicles already are paying dividends. Gasoline consumption is down by almost 6% since before the pandemic, even as **vehicle miles traveled** have increased.[7] Significantly increasing investments in cleaner transportation options would ensure an even greater return for our environment.

In addition, consistent use of the data-driven, objective approach of the SMART SCALE prioritization process, revisiting recent changes to SMART SCALE, and opposing attempts to fund projects outside of this process can ensure transportation funds are spent on projects that will have the greatest impact.

Consideration of the environmental impacts of transportation plans and projects needs to be strengthened as well, particularly in light of curtailed federal protections. Among other things, state and regional plans and projects should reduce—rather than exacerbate—carbon emissions and other harmful pollutants by setting a specific goal for reducing vehicle miles traveled. And state funding and programs should incentivize accelerated vehicle electrification and expansion of charging infrastructure for the remaining vehicle miles traveled.

Finally, our transportation system needs to be resilient to increasingly severe flooding and heat. This includes defending federal funding for this purpose, implementing Virginia's recently developed resilience improvement plan, and ensuring that design and construction standards for new and repaired facilities account for climate change.

TOP TAKEAWAYS

Transportation is Virginia's largest source of carbon pollution, and the burdens of transportation-related pollution fall disproportionately on communities of color and under-resourced communities.

Transportation planning and funding focuses heavily on new and expanded roads that increase driving and pollution—harming our environment, health, and economy.

Substantial federal funding and policy changes increase Virginia's need to transform its transportation approach and focus on: fixing existing infrastructure and making it safer; improving analysis of environmental and health impacts of proposals; revisiting recent changes to SMART SCALE and prioritizing cleaner, more equitable transportation; reducing vehicle miles traveled; accelerating vehicle electrification; and promoting resilient projects and communities.

York River bridge
Photo by Saravanan Rajamanickam

EXPANDING OUR TRANSIT SYSTEMS

TRANSPORTATION

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WHY IT MATTERS

Robust public transportation and rail systems are essential to Virginia's environmental sustainability, economic competitiveness, and public health. Transportation accounts for approximately 47% of Virginia's greenhouse gas emissions, with single-occupancy vehicles being a major contributor.[1] Expanding and improving transit options not only reduces emissions but also improves air quality, supports equitable mobility, and connects communities to economic opportunities. Investments in public transit and rail can significantly reduce household transportation costs, which are the second-highest expenditure for most Virginians after housing.

Reliable transit also helps reduce traffic congestion, a major source of localized air pollution. According to the American Public Transportation Association (2022), every $1 invested in public transit generates approximately $5 in economic returns.[2] Rail infrastructure also helps mitigate urban sprawl and conserves green space, further reinforcing Virginia's climate and land use goals.

Ensuring long-term funding and policy support for transit and rail is therefore critical to achieving the Commonwealth's climate goals and strengthening the well-being of its residents.

CURRENT LANDSCAPE

Virginia has made notable progress in expanding transit and rail through initiatives like the **Virginia Passenger Rail Authority (VPRA)** and the **Transforming Rail in Virginia (TRV) program**. The **Commonwealth Transportation Fund (CTF)** supports public transportation through dedicated state and federal funding, including revenues from fuel taxes, vehicle registration fees, sales tax, and an assortment of other fees. The **Department of Rail and Public Transportation (DRPT)** administers these programs and provides planning as well as technical and financial support to local transit agencies.

The establishment of the **Transit Ridership Incentive Program (TRIP)** in 2020 within the **Commonwealth Mass Transit Fund** was a pivotal development for public transit. TRIP provides grants for low or zero-fare programs that have demonstrated significant increases in ridership, particularly for low-income and transit-dependent populations; safety improvements including bus shelters and benches; and multi-jurisdictional regional routes. However, the current law includes a **sunset clause** that threatens the TRIP's safety and the bus stop improvement program's long-term viability.

Virginia continues to face challenges in ensuring consistent, sustainable funding for transit operations, especially as federal pandemic relief dollars expire. Local governments often carry the burden of matching funds, creating disparities in service across the Commonwealth.

OPPORTUNITIES

To maintain and grow a sustainable, equitable transportation future, Virginia should focus on three critical areas:

- Ensuring the continued success of the TRIP program's safety and bus stop improvement program.
- Increase and Stabilize State-Level Transit Funding: Virginia should consider adding additional dedicated, sustainable, and recurring revenue sources for our transit and passenger rail programs.—A statewide funding model would relieve pressure on local budgets and create more uniform access across urban, suburban, and rural communities.
- Ensure that transit gets a portion of any regional transportation revenue.

Virginia has a unique opportunity to lead the South in modernizing its transportation infrastructure while reducing emissions and increasing access to jobs, education, and healthcare.

TOP TAKEAWAYS

Transportation is Virginia's largest contributor to greenhouse gas emissions, and investing in transit is critical for meeting climate and equity goals.

The Transit Ridership Incentive Program (TRIP) has proven successful and the removal of the safety and bus stop improvement program's sunset clause could allow that success to continue.

New statewide and regional funding for transit could enable us to maintain our current levels of service.

Richmond skyline over the James River
Photo by Duncan Griffiths

EXPANDING RAIL
TRANSPORTATION

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WHY IT MATTERS

Compelling energy, economic, health, and environmental benefits flow from maximizing the use of rail to move both people and goods. Virginia has made significant progress in expanding and improving passenger rail in recent years, which has resulted in a 74% increase in service, a 157% increase in ridership, and expanded daily Amtrak Regional service to 2.5 million more Virginians.[1] Recent ridership on our Amtrak trains is setting new records, with our trains carrying nearly 2.4 million passengers this year.[2] As a result, rail has diverted an estimated 704 million passenger miles on our roads, reducing fuel consumption by about 14.8 million gallons, and preventing the release of 132,000 metric tons of carbon pollution.[3]

CURRENT LANDSCAPE

Since December 2019, Virginia has finalized agreements with CSX and Norfolk Southern to purchase a total of 412 miles of railroad right-of-way and 251 miles of railroad track, as well as construct 50 miles of new railroad track and double the rail capacity between Washington, DC and Virginia by expanding the Potomac River railroad crossing.[4] These agreements are core parts of the **Transforming Rail in Virginia program (TRVA)**, which is a multi-corridor, multi-year, multi-phase passenger rail development program. These agreements will allow six new round-trip Amtrak Regional trains, an extension of service from Roanoke to Christiansburg, and five more Virginia Railway Express trains on the Fredericksburg line (including weekend service). In addition to the increased service, these projects should reduce travel time and increase the reliability of our trains.

The TRVA agreements will allow for future phased electrification of our rail service when the DC-Richmond-North Carolina corridor is completed. Still, further research could determine additional opportunities and technologies to allow decarbonization of our rail corridors before the completion of the corridor.

The state has completed a feasibility study for the return of direct east-west passenger rail service along the Commonwealth Corridor as part of their 2022 **Virginia State Rail Plan** which was submitted to the **Federal Railroad Administration's (FRA)** Corridor Identification Program. This proposal was placed in the federal project pipeline.

Further, the **Virginia Department of Rail and Public Transit (DRPT)** is updating its station modernization and improvement plan, which could call for long-overdue upgrades to passenger rail stations in the Commonwealth.

OPPORTUNITIES

Passenger rail needs continued and increased investment to achieve even greater benefits. Train travel times and reliability need to be improved, many stations need repair and updating, and transit connections between rail stations and activity centers are frequently limited or lacking altogether.

Additional service is needed as well. Our passenger rail network is primarily set up for north-south travel and there is very limited east-west service. And although train travel is far less polluting and more energy efficient than driving, electrifying rail in Virginia—which is already in place along the Northeast Corridor—is much cleaner and saves passengers' time. To date, however, cost and other barriers have blocked this.

For freight rail, a central challenge is that the major railroads are privately owned and focus on maximizing short-term returns to shareholders ,which conflicts with the public interest. Recently, railroad companies have concentrated on downsizing and disinvesting their assets and workforce, resulting in longer freight trains and more frequent breakdowns. Combined, these short-term-focused strategies result in longer wait times for passenger trains.

Redirecting freight traffic from roads to rail would reduce pollution and congestion and support the transition to zero-emission trains. We could look at incentives for moving freight from trucks to rail while being prepared for the abandonment of rail lines by the major freight railroads and ensuring the Commonwealth is ready to purchase abandoned rail lines for future passenger and/or freight rail service. We could also explore opportunities to make freight railroads more responsive to public interest concerns, including the need to decarbonize their train fleets.

TOP TAKEAWAYS

Virginia's Amtrak ridership is growing and setting new records, breaking 2 million passengers for the first time in FY 2023, and we need to continue to fund Virginia-supported Amtrak trains to further reduce fuel use and carbon emissions.

The success of Virginia's rail system depends on consistent and increased funding and the advancement of the Transforming Rail in Virginia program.

Our Amtrak trains are much more environmentally friendly than driving, but transitioning to more zero-emission technologies would be much cleaner and save passengers' time.

Amtrak train in Richmond, VA
Photo by TJ Byrd

ACCELERATING OUR TRANSITION TO ELECTRIC CARS

TRANSPORTATION

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WHY IT MATTERS

To effectively fight climate change, we must tackle the largest source of carbon pollution in Virginia: transportation.[1] Virginians' personal vehicles collectively emit more carbon pollution than our power plants.[2] Vehicles are also major sources of harmful tailpipe pollution that has been linked to respiratory and heart diseases and premature death.[3,4] Diesel trucks are especially harmful, with pollution from freight disproportionately impacting communities of color and low-income communities.[5] Students suffer exposure to these pollutants daily on Virginia's diesel school buses.

While the most important strategy to reduce pollution from vehicles is to help reduce driving overall (*see Transforming Transportation, page 73*), we must also rapidly transition our remaining driving to **electric vehicles (EVs)**, which have zero harmful tailpipe emissions. Electricity to power an EV emits less than one-sixth of the carbon pollution of an equivalent gas-powered vehicle, and will emit even less over time as Virginia's electrical grid becomes cleaner.[6]

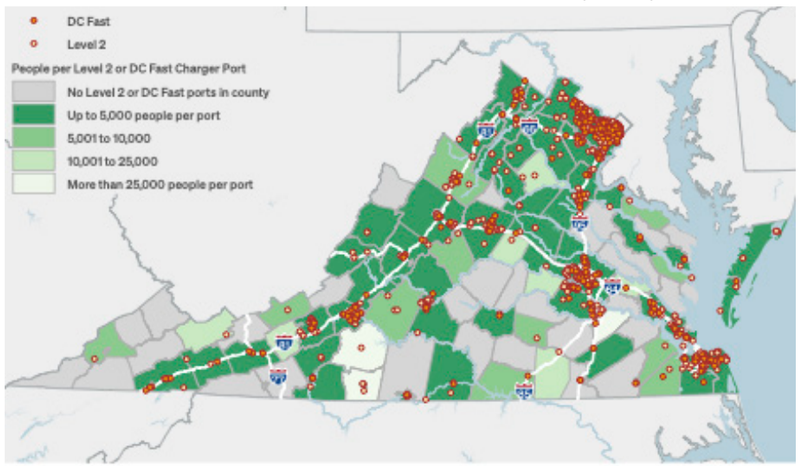
Cleaner vehicles will also save Virginians money. EVs require significantly less maintenance than gas cars.[7] EV drivers typically spend the equivalent of $1.28 per gallon for a full charge in Virginia.[8] Owning an EV will save an average driver $6,000 to $12,000 over the lifetime of the vehicle.[9]

However, the benefits of EVs are not equally accessible to all drivers in Virginia. More affordable models of EVs are not always available at local dealerships. People living in rural areas, multi-unit housing, and rental properties often have limited charging options. Public EV charging infrastructure, which has grown dramatically in the past few years, still has gaps that the free market has been slow to fill, and the federal government is pulling back historic investments to support EVs and expand the public charging network. This highlights the need for state-level leadership to maintain progress and protect access to clean transportation.

CURRENT LANDSCAPE

In 2021, the General Assembly adopted the **Clean Car Standards**, which requires the Commonwealth to implement standards that would bring more affordable electric vehicles to Virginia and improve public health by reducing tailpipe pollution. Despite this legislative mandate, the Governor announced his administration would stop implementing the Clean Car Standards at the end of 2024.[10] Regardless of its implementation status, there are other steps Virginia can take to accelerate transportation electrification.

A comprehensive, statewide public charging network is necessary to make EVs work for every driver and every trip by supporting longer journeys. Today, rural and exurban areas have fewer convenient public charging options than urban areas and along major highways. Additionally, single-family homeowners can more easily install EV charging infrastructure and take advantage of residential utility rates, whereas people who live in apartments, townhomes, and buildings without dedicated parking may not have a convenient and cost-effective option to charge their EVs.



Map created by: Miller Cochran (mcochran@selcnc.org)
Last updated: August 15, 2024

Utilities are also key to making EV charging more convenient and affordable. Electricity use patterns will change as home charging and public charging become more common, and anticipating the change in patterns is essential to the opportunity that EVs provide to the grid. With the right policies in place, Virginia can meet its energy needs, transition quickly to EVs, and even reduce the electricity rates that all customers pay, including under rapid adoption scenarios. [11]

OPPORTUNITIES

The market is shifting towards EVs, but our climate and our health require a more rapid transition. A suite of policies, in addition to the Clean Car Standards, could both bring more affordable EVs to Virginia and make it more convenient to charge them at home and across the state while supporting the electric grid.

Proactively planning for EV adoption and policies that encourage EV adoption can reduce the utility costs of preparing the grid for EVs. **Demand-side management** strategies like **EV rate designs**, **managed charging**, and **vehicle-to-grid** integration can help to manage the impact of EVs on the grid and even improve grid stability.[12] However, these benefits will only be realized with proactive and comprehensive planning.

Another significant barrier to EV adoption is equitable access to charging infrastructure, both in urban and rural areas. Policies could support the installation of EV charging stations or EV-ready parking spaces at workplaces or multi-unit dwellings like apartment complexes, where residents currently have limited ability or incentive to install their charging infrastructure.[13] This could be complemented by a buildout of public charging with a focus on rural and underserved areas. New single-family homes could be required to have electric panels with enough capacity to support adding an EV charger.

Some of the most significant benefits of EVs come from transitioning major fleets to zero-emissions. Nearly one million Virginia students are transported daily on the Commonwealth's 16,000 school buses.[14] Phasing out fossil fuel school buses will help protect Virginia students from asthma and other respiratory illnesses. Approximately 3% of Virginia's school buses are electric (or planned to transition to electric).[15] Fully implementing the 2022 total cost of ownership law, which requires state agencies to consider the full lifetime cost of vehicles when making fleet purchases, could gradually replace state-owned gas-powered cars with EVs while saving taxpayer dollars.

TOP TAKEAWAYS

Virginians' personal vehicles collectively emit more carbon pollution than our power plants and are a major source of harmful pollutants. Accelerating the transition to electric vehicles, including maintenance of the Clean Cars Standard, will reduce carbon emissions and improve public health.

A comprehensive statewide charging network and access to convenient charging for multi-unit residents would deliver the economic benefits of EVs more equitably across Virginia.

Utilities are key players in the EV transition, and proactive planning could help to achieve electrification in a manner that is beneficial for both utilities and ratepayers.

WALKABLE, BIKEABLE COMMUNITIES

NEIGHBORHOOD TRAFFIC PROGRAM

Virginia Department of Transportation program that neighborhoods, acting through their local governing bodies, may use to address certain traffic problems on their local streets. They include "Through Truck Restrictions," "Watch for Children" signs, "Additional $200 Fine" signs, the "Traffic Calming" program, "Residential Cut-Thru Traffic Program," and the "Person with Disability Area" signs.

STATE TRAILS OFFICE

A state office within the Virginia Department of Transportation responsible for developing the Statewide Trails Plan, coordinating with other relevant agencies and stakeholders, conducting public outreach, and maintaining a trail resource hub.

Percival's Island Walkway-Madison Heights, VA
Photo by Mart Maiste

RELEVANT PROGRAMS & AGENCIES

See full glossary starting on page 155

RECREATIONAL TRAILS PROGRAM (RTP)

A federal program that allocates funding to states for construction, restoration, and maintenance of paved and unpaved recreational trails and trail-related facilities. Virginia awards these funds through a competitive grant program.

SMART SCALE

Virginia's nationally-recognized transportation funding prioritization process that evaluates and ranks proposed projects based on key factors to help determine which ones should be funded. Projects are evaluated on anticipated benefits such as safety, reduced congestion, accessibility, economic development, efficient land use, and environmental impact.

STATE BICYCLE POLICY PLAN

Ensures bicyclists are an integral component of Virginia's multimodal transportation system and provides bicycle policy recommendations that will guide the planning, design, construction, operation, and maintenance of bicycle accommodations. Developed by the Virginia Department of Transportation.

STATEWIDE TRAILS PLAN

Developed by the Office of Trails to create a comprehensive network of regional multi-use trails that encompasses an inventory of existing and proposed trails, identifies key gaps in the network, outlines development steps and best practices, and seeks to offer opportunities for community engagement and visioning.

TRANSPORTATION ALTERNATIVES PROGRAM (TAP)

A federal reimbursement program administered by Virginia Department of Transportation that provides funding for design, planning, and construction of paved and unpaved trails to provide increased non-motorized travel route options. It also supports trail improvements.

VIRGINIA DEPARTMENT OF CONSERVATION & RECREATION (DCR)

A state agency within the Natural Resources secretariat tasked with protecting, managing, and overseeing natural habitat, state parks, open space, and access to the outdoors. Oversees private dam safety and administers the Virginia Agricultural Cost-Share and Community Flood Preparedness Fund.

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

State agency responsible for building, maintaining, and operating the state's roads, bridges, and tunnels.

VIRGINIA OUTDOORS PLAN

Virginia's comprehensive blueprint for land conservation, outdoor recreation, and open-space planning.

VIRGINIA SAFE ROUTES TO SCHOOL PROGRAM

Helps schools and communities make walking and biking to school a safe, convenient, natural activity.

CONNECTING & INVESTING IN VIRGINIA'S TRAIL NETWORK

WALKABLE, BIKEABLE COMMUNITIES

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WHY IT MATTERS

Trails are an essential part of our state's recreation and transportation infrastructure that enable carbon-free travel, critical to reducing vehicle miles traveled and related carbon emissions. Trails also foster a greater connection within and between communities and nature by providing safe, accessible, and usually free opportunities to get outside.[1] Because of trails' complete separation from automobile traffic, trails are often the only place where people feel comfortable biking or walking in their communities.[2]

This has significant dividends for mental and physical wellbeing, particularly in rural areas and for at-risk populations, and promotes both a conservation mindset and protection of key natural landscapes and historic and cultural resources along trail corridors.[3] Many trails are built to highlight or connect users with important sites and stories, like the Tobacco Heritage Trail, which takes users through the story and landscape of Virginia's historic tobacco-producing region, or the W&OD Trail, which connects urban and suburban residents to multiple parks.

Trails are not only an amenity for residents, they are often significant economic drivers.[4] Trails are both large infrastructure projects with maintenance needs and attractions that draw visitors and new residents, and consequently businesses, who want to experience the trail and related events, like the annual Cap2Cap ride between Richmond and Williamsburg or the Appalachian Trail Days Festivals in Damascus.[5] Many Planning District Commissions and economic development partnerships have identified existing and potential trail networks as growth engines.[6]

CURRENT LANDSCAPE

Virginia has a large network of trails across the state, from small local neighborhood walking trails to regional trails, like the Capital Trail, and multi-state trails like the Potomac Heritage and Appalachian Trails. These trails comprise a mix of surface types, from dirt and gravel to asphalt. Many routes make use of historic infrastructure, like old rail lines, and existing infrastructure, like unpaved roads in rural areas, but **protected trail infrastructure** is the highest priority for development because it provides maximum safety, accessibility, and long-term usability.

Trails are funded, built, and managed by a complex mix of local, state, and federal agencies and non-profit organizations. Civic volunteer groups and non-profit organizations often play an important role in long-term upkeep. At the state level, the **Department of Conservation and Recreation (DCR)** oversees the **Virginia Outdoors Plan,** which provides policy and guidance for outdoor recreation resources, including trails. DCR also manages over 1,000 miles of natural surface trails on state park lands alone and administers the federally funded **Recreational Trails Program (RTP),** which provides competitive grants to localities for building and rehabilitating trails and trail-related amenities.[7]

The **Virginia Department of Transportation (VDOT)** administers the **Transportation Alternatives Program (TAP)** and **SMART SCALE** programs, which are critical sources of funding for **multi-use trails**. However, the current program rules prioritize larger-scale road and transit investments, presenting challenges for trail advancement. VDOT also manages the **State Trails Office**, which is responsible for developing **Virginia's Statewide Trails Plan** and creating a central hub of trail-related information and coordination. The State Trails Advisory Committee (STAC) is intended to support coordination between VDOT and DCR on the development of Virginia's trail network.

The FY2023 and FY2024 Virginia General Assembly budgets included approximately $89 million in dedicated funding for trails. This historic investment reflects the growing recognition of the economic, recreational, and health benefits that a connected trail network provides to communities across the Commonwealth.[8] However, there have been no additional investments since then.

OPPORTUNITIES

There are many exciting and ambitious regional trail projects underway in Virginia, like the Eastern Shore Trail, which aims to connect rural communities along the coast; the Fall Line Trail, which will connect Ashland to Petersburg; and Trail757, which will create a regional trail system connecting the Hampton Roads region. There are also significant opportunities to repair and improve natural trails, like updating infrastructure along the Appalachian Trail and improving accessibility and connectivity of natural surface trails on public lands such as state parks, wildlife management areas, and state forests.

Strong coordination between agencies is key to deploying dollars towards shovel-ready, high-impact projects that foster greater connectivity within and between communities. In the near term, a strong State Trails Plan could guide coordinated, strategic investment and development across Virginia's trail network. Recent policy changes underscore the urgency for Virginia to better reflect the transportation, health, environmental, and equity benefits of active transportation and multimodal infrastructure.

VDOT could also take into greater account the role gravel roads play in supporting low-stress biking and walking opportunities, and work with localities to improve them rather than solely prioritizing paving these roads.[9]

Looking to the future, adequate dedicated annual funding to expand trail development and improvement is vital to successful and timely project completion. Natural surface trails are relatively low-cost to develop but currently receive no state funding. The multi-use trails currently under development are large, regional construction projects that will need funding from multiple sources to be completed. Dedicated funding for trails would help localities build these trails and more effectively leverage outside funding.

Trail signs at Montvale Park in Bedford, VA
Photo by Patti Black

TOP TAKEAWAYS

Trails provide vital infrastructure for recreation and transportation that reduce travel-related carbon emissions, support physical and mental health by providing safe opportunities for recreation, and help people connect with important natural and historic resources

Dedicated annual funding is needed to expedite and improve trail construction, improvement, and maintenance.

Align state policy and programs to better reflect the transportation, health, environmental, and equity benefits of active transportation and multimodal infrastructure.

BIKING AND WALKING SAFETY & ACCESSIBILITY

WALKABLE, BIKEABLE COMMUNITIES

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WHY IT MATTERS

Increased active mobility is essential to achieving Virginia's climate goals. Motor vehicles pollute the air, shed microplastics, and drip petroleum and heavy metals into the environment. Transportation is Virginia's largest generator of climate change emissions.[1] Shifting trips to walking or bicycling will reduce emissions and contribute to healthy habits and overall health. Unfortunately, safety and infrastructure concerns are a key deterrent to people of all ages and abilities.[2,3,4] In addition to the climate impact of driving, motor vehicle crashes have been and continue to be the leading cause of death for children in the United States.[5,6] Improving safety for people who would walk or bike yet are hesitant to face such dangerous conditions, especially in communities with disproportionate rates of traffic fatalities and serious injuries, would increase active travel. Many traffic fatalities, which affect Black and Brown people at more than twice the average rate, are preventable with the right infrastructure.[7]

Traffic fatalities take nearly 1,000 lives in Virginia each year. Reducing car speeds and redesigning our roadway network for better bicycle and pedestrian protection are proven methods to improve safety. Creating safe streets for vulnerable road users can (or has the power to) improve air quality, reduce fossil fuel consumption, and reduce demand for the destructive expansion of highways. Active transportation to school also increases regular physical activity and improves long-term social, emotional, and physical health outcomes, and improves the air quality in and around schools.[8] It's imperative to shift our transportation model away from reliance on automobiles by taking concrete steps to make walking, biking, and other multimodal forms of transportation realistic for more Virginians of any age.

CURRENT LANDSCAPE

The **Virginia Department of Transportation**'s $8.8 billion annual budget does not prioritize designs at the scale necessary to significantly curb the danger to vulnerable road users. An effective way to improve safety is to redesign our commercial and residential roads with safety-oriented infrastructure such as raised crosswalks, dedicated bicycle lanes, speed humps, narrower lanes, bump-outs, and pedestrian refuges et cetera, and ensure the current network of **Automated Speed Enforcement Cameras** are used equitably and effectively.

Virginia has yet to legalize the **Bicyclist Safety Yield**, otherwise known as the Idaho Stop, which improves bicyclist access and convenience and affords bicyclists the crash-prevention benefits of yielding at certain intersections. The Safety Yield reduces crashes because bicyclists can clear intersections faster, reducing conflicts from behind and oncoming side traffic.[9] Virginia also places excessive and ambiguous restrictions on two-abreast bicycling that impede the safety and movement of bicyclists who are riding in groups. Virginia transportation agencies regularly report that riding in groups is safer, while the law impedes this essential practice.

A modern update to the **State Bicycle Policy Plan,** last updated in 2011, and VDOT's Complete Streets program is critical to decision-making for investments in bicycle infrastructure, implementing policies supportive of behavior change and safety, and building accessible and equitable connectivity to bicycling, focusing on transportation and economic opportunity, and **Safe Routes to School** programs. Safe Routes to School develops life-long habits to ensure better driving behavior and higher familiarity with safe biking and walking which is critical to a culture of transportation safety needed in Virginia.[10]

OPPORTUNITIES

To meaningfully encourage people to choose biking and walking and to address the largest sector of Virginia's greenhouse gas emissions would require a focus on improved safety and expanded accessibility for these modes. Dedicated funding for a more complete network of multi-use trails throughout Virginia and allowing bicyclists more freedom of movement to reduce bicycling injuries are two key strategies.

Greater emphasis on roadway reconfigurations would cost-effectively increase dedicated space for people biking and walking and reduce speeding. Quick-build projects can expedite conversions, saving considerable time, effort, and money. Many of VDOT's biking and walking facilities are in disrepair due to a lack of attention and/or funding; proactive maintenance of these existing active mobility assets would increase usage.

VDOT's **Neighborhood Traffic Program** works with communities to decrease the impacts of traffic and enhance safety in neighborhoods. However, before traffic calming is applied to dangerous roads, VDOT requires 50.1% of the residents to approve the designs. This requirement could be eliminated so that safety decisions can be made by professionals.

Automated Speed Enforcement Cameras are an effective deterrent to speeding, the number one predictor of crash mortality.[11] Further studies can ensure speed safety cameras, and data they collect, are used as intended to increase safety without disproportionate impacts on low resourced communities and communities of color.

Bikers on Virginia Creeper Trail
Photo by Patti Black

TOP TAKEAWAYS

To reduce Virginia's top source of carbon emissions and other pollutants, expanding safety and accessibility for active transportation is essential.

Expand funding for active transportation infrastructure, quick-build and roadway reconfiguration projects, and reestablish Virginia's Safe Routes to School program.

Allowing for expanded bicycling freedom and a focus on pedestrian-scale improvements would better protect vulnerable road users.

Sunrise on Skyline Drive-Shenandoah, VA
Photo by Robert Blanton

CLIMATE & ENERGY

DECARBONIZING OUR GRID

COASTAL VIRGINIA OFFSHORE WIND (CVOW)

Offshore wind project being constructed by Dominion Energy about 27 miles offshore of Virginia Beach. When completed in 2026, it will have a total capacity of 2.6 GW.

COMMUNITY FLOOD PREPAREDNESS FUND (CFPF)

State-sponsored grant fund that provides financial assistance to localities to reduce the impacts of flooding within Virginia. High emphasis on projects that align with local, state, and federal floodplain management standards and plans. The only statewide source of funding for flood resilience capacity building and studies, as well as project implementation. Revenue derived from Virginia's participation in the Regional Greenhouse Gas Initiative.

ENERGY EFFICIENCY RESOURCE STANDARD (EERS)

A component of the Virginia Clean Economy Act which establishes specific, long-term targets for energy savings that utilities must meet through customer energy efficiency programs.

HOUSING INNOVATIONS IN ENERGY EFFICIENCY (HIEE) FUND

Designated to support energy efficiency improvements to reduce energy bills in low-income housing through the Virginia Department of Housing and Community Development. Funded exclusively by the Regional Greenhouse Gas Initiative (RGGI).

JOINT LEGISLATIVE AUDIT & REVIEW COMMISSION (JLARC)

A legislative agency that conducts program evaluation, policy analysis, and oversight of state agencies on behalf of the Virginia General Assembly.

REGIONAL GREENHOUSE GAS INITIATIVE (RGGI)

A cooperative effort among Northeast and Mid-Atlantic states to reduce power sector carbon pollution by requiring power plants to purchase allowances for their greenhouse gas emissions. The proceeds from allowances are then distributed to the participating states, which can use the funds to help their citizens, including by creating energy-efficient, affordable housing and enhancing community flood prevention and protection.

RENEWABLE PORTFOLIO STANDARD (RPS)

A standard established by the Virginia Clean Economy Act that sets annual requirements for the generation of renewable energy in a utility's service territory.

STATE AIR POLLUTION CONTROL BOARD

Citizen board authorized to make regulations for the control and abatement of air pollution throughout the Commonwealth.

STATE CORPORATION COMMISSION (SCC)

An independent department of state government with delegated administrative, legislative, and judicial powers. The Commission has regulatory authority over utilities, insurance, state-chartered financial institutions, securities, retail franchising, and railroads.

RELEVANT PROGRAMS & AGENCIES

See full glossary starting on page 155

VIRGINIA CLEAN ECONOMY ACT (VCEA)

Virginia law outlining a clear path to achieving a zero-carbon energy future by mandating the retirement of fossil fuel electricity generators, sets renewable energy standards through wind and solar power, and sets energy efficiency standards. The VCEA also establishes a renewable energy portfolio standard (RPS), which mandates that the two major utilities in the state, Dominion Energy and Appalachian Power Company, produce 100 percent clean energy by 2045 and 2050, respectively.

Sunset over transmission lines in Chesterfield, VA
Photo byTJ Byrd

CHARTING VIRGINIA'S CLEAN ENERGY PATH

DECARBONIZING OUR GRID

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WHY IT MATTERS

Experts around the world continue to warn that governments must rapidly reduce greenhouse gas emissions to ensure a stable, healthy climate for current and future generations.[1] In Virginia, nearly one-third of all carbon pollution comes from the electricity sector.[2] The **Virginia Clean Economy Act (VCEA)**, passed in 2020, outlines a path for Virginia's two largest electric utilities—**Dominion Energy** and **Appalachian Power Company**—to transition to clean energy by 2045 and 2050, respectively.

Shifting to clean energy will protect Virginia's health, climate, and communities. Fossil fuel pollution has been linked to asthma, heart disease, and premature death—especially in vulnerable populations.[3] Transitioning to clean electricity reduces harmful emissions, improves air quality, and can even improve grid stability amid increasingly severe climate events. The VCEA also supports energy independence, local job creation, and community resilience.

The VCEA sets targets for clean energy resources, including solar, wind, energy efficiency, and battery storage, to replace retiring fossil fuel power plants and complement Virginia's existing nuclear power. The impacts are already visible. Solar and wind represented 6.95% of Virginia's electricity generation in 2024, a fivefold increase from 2020 (1.33%).[4] Virginia's GDP has grown by 11% during that same period,[5] and the clean energy sector now supports more than 118,000 jobs across the Commonwealth.[6]

Looking ahead, Dominion Energy projects that its latest Renewable Portfolio Standard (RPS) plan will save customers $118.5 billion in fuel costs over the lifetime of its clean energy investments.[7] Additionally, Virginia's transition to clean energy is expected to reduce health-related costs by up to $7 billion over the next 20 years.[8] While electricity demand is expected to increase significantly over the next decade, modeling shows that zero-carbon energy can meet this projected increase in a more cost-effective, reliable way than proposals that include fossil generation.[9]

CURRENT LANDSCAPE

The VCEA makes Virginia a leader in the clean energy transition and puts the Commonwealth in a position to meet future **load growth** in a way that is more affordable than building out new fossil fuel generation. The VCEA requires Virginia's monopoly utilities to plan to build over 25 GW of new clean energy capacity by 2035—including 16.7 GW of solar and onshore wind, 3.1 GW of battery storage, and 5.2 GW of offshore wind.[10] These new generation resources will replace the utilities' existing fossil fuel plants, which Dominion and Appalachian Power must retire by 2045 and 2050, respectively.[11] Other VCEA provisions, including the **Renewable Portfolio Standard (RPS)** and **Energy Efficiency Resource Standard (EERS)**, ensure the utilities remain on track to meet those retirement targets by gradually requiring them to rely on more renewable, zero-carbon sources and to meaningfully utilize energy efficiency measures to reduce their energy load (*see Energy Efficiency, page 99*).[12]

Both utilities are well on their way to meeting those clean energy development goals. Construction of Dominion's 2.6 GW **Coastal Virginia Offshore Wind (CVOW)** project—the largest such project in the U.S.—is underway and on track to begin producing energy by 2026. Once complete, CVOW will generate enough power for about 660,000 homes (*see Offshore Wind, page 101*). To date, Dominion and Appalachian Power also have collectively petitioned the State Corporation Commission for approval of projects totaling more than 5 GW of new solar and onshore wind and over 600 MW of new batteries, with many projects already operational or under construction.[13]

In addition to improved air quality, these efforts have also generated many new jobs and significant economic development. For example, the construction of CVOW has resulted in over $200 million in annual economic output, wages, and revenue, and supported nearly 1,000 jobs–with similar numbers expected once it's operational.[14]

OPPORTUNITIES

The clean energy path laid out in the VCEA makes economic and strategic sense. While the VCEA has had adjustments made almost every year since its original passage, further opportunities for improvement remain. For example, a recent report by Virginia's Joint Legislative Audit and Review Commission (JLARC) found that data centers, if left unregulated, could almost double the state's energy use in the next decade.[15] Increasing demand makes the VCEA more important than ever, because the data is clear: the least expensive and most reliable path forward to meet this demand is with clean energy.[16] Solar and wind—especially when paired with battery storage—are now consistently less expensive than gas.[17]

Given this load growth, it may be prudent to view the VCEA's build requirements as a floor, rather than a ceiling—particularly for battery storage. Utilities could be encouraged or required to develop storage beyond the 3.1 GW required by the VCEA. Increasing battery storage in combination with existing wind and solar targets will improve grid resiliency and reduce system upgrade costs.[18] More storage is particularly valuable because it has a small physical footprint and can back up vital infrastructure, like hospitals and emergency response centers (*see Battery Storage, page 107*).

Being a clean energy leader also makes Virginia an attractive place for business development, particularly industries with environmental commitments.[19] As seen with CVOW, more solar, wind, and storage projects will result in continued job creation and significant economic development, including in related industries. For example, an undersea cable manufacturer recently broke ground on a $700 million facility in Chesapeake, following the development of CVOW.[20] The VCEA charts a bold, shared vision for Virginia's energy future—one that embraces more affordable, more reliable, and cleaner energy sources to power our homes and businesses.

TOP TAKEAWAYS

The Virginia Clean Economy Act is reducing air pollution that is harmful to public health and our climate, creating economic growth, and benefiting communities.

The VCEA has made Virginia a leader in the clean energy transition and sets the Commonwealth up to meet increasing demand affordably and reliably, particularly if the state leans into battery storage to support clean energy in the near term.

Solar, wind, and battery storage are faster to deploy and more affordable than new fossil fuel generation.

REJOINING THE REGIONAL GREENHOUSE GAS INITIATIVE

DECARBONIZING OUR GRID

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WHY IT MATTERS

To protect the environment, health, safety, and economy of Virginia, it is critical that the state rein in power plant greenhouse gas emissions and other air pollution.

Climate change has already arrived in Virginia. In recent years, we have experienced increasingly frequent extreme precipitation events, leading to floods that have devastated communities. Virginians have struggled through dangerous heat waves and drought conditions that put workers, livestock, and crop yields at risk. Virginia's power plants are contributing to this global problem, and burning fossil fuels also directly harms the health of nearby communities. For example, Dominion's most recent long-term plan, which calls for a large-scale buildout of gas plants in Virginia, will burden nearby communities with $7.4 to $13.9 billion in health harms.[1]

Thankfully, Virginia has a proven solution to tackle this source of air pollution while providing benefits to and strengthening its communities. The **Regional Greenhouse Gas Initiative (RGGI)** is a proven and effective multi-state program that cuts pollution by requiring power plant owners to purchase an **allowance** for every ton of carbon dioxide their plant emits. The supply of these allowances reduces over time, which is how RGGI has successfully driven down emissions in participating states while providing billions in economic and health benefits since the start of the program, about 16 years ago.

Virginia Beach oceanfront
Photo by Kristin West

RGGI ensures that electric utilities steadily reduce harmful air pollution and impacts on Virginians, and by reducing utility reliance on fossil fuels, it leads to greater energy independence and security, and steadier, more predictable customer bills. Revenues generated by RGGI produce consistent funding for participating states. In Virginia, this funding is used to improve community resilience to flood impacts and reduce electricity bills for low-income households through energy efficiency programs (*see Energy Efficiency, page 99 and Building Resilience, page 17*).

CURRENT LANDSCAPE

The General Assembly passed a law in 2020 requiring Virginia to participate in RGGI.[2] Thereafter, Virginia participated in RGGI for three years, from 2021 to 2023. During this period, Virginia saw its carbon pollution drop by 22%.[3] Participation in RGGI also brought in hundreds of millions of dollars to the state, with 45% of the proceeds directed to the **Community Flood Preparedness Fund (CFPF)** to help localities address flood risk and 50% to the **Housing Innovations in Energy Efficiency (HIEE)** fund to help low-income families slash their energy bills while reducing energy demand and air pollution. These funds were helping families and communities across the Commonwealth.

That success came to an end in 2024. After an executive order directed officials to pull Virginia out of RGGI, the **Virginia Air Pollution Control Board** repealed the underlying regulation in July 2023, and the state has been out of RGGI since the start of 2024. A lawsuit was immediately filed against the state, and in November 2024, the Floyd County Circuit Court ruled that the Air Board's repeal was "unlawful and without effect."[4] The state, however, has been permitted to remain out of RGGI while it appeals the ruling–an ongoing process.

While Virginia sits on the sidelines, emissions have already jumped back up significantly. In the year since Virginia left RGGI, Virginia's emissions increased by 20.5%. Furthermore, Virginia continues to lose out on the steady funding source that the program had been providing. Localities that had just begun to develop the expertise needed to address flooding issues in their communities now face tremendous difficulties with uncertain funding sources. The RGGI-funded programs that were helping low-income households reduce electric bills have also seen their steady funding disappear.

OPPORTUNITIES

RGGI is a proven solution that will keep Virginia on track to meet its climate goals, while also improving air quality and public health. While other policies, like the Virginia Clean Economy Act (*see Virginia's Clean Energy Path, page 91*), continue to support Virginia's transition to a carbon-free electric system, RGGI is both necessary and complementary. RGGI ensures that utilities across the state steadily reduce their reliance on fossil fuels, including "merchant" power plants that are not covered by the VCEA, while tackling the impacts of climate change. Without our reentry to RGGI, Virginia faces mounting costs in flood mitigation and energy efficiency improvement efforts and risks falling behind in our efforts to build a more resilient Commonwealth.

TOP TAKEAWAYS

RGGI was working for Virginians for three years, steadily and cost-effectively reducing pollution from power plants.

Thanks to RGGI, families and communities benefited from lower air pollution and a steady revenue source for the Community Flood Preparedness Fund and Low-Income Energy Efficiency programs.

In order to come back into compliance with the law, Virginia should rejoin RGGI as soon as possible.

ADDRESSING DATA CENTER ENERGY DEMAND

DECARBONIZING OUR GRID

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WHY IT MATTERS

Understanding the impacts of **data center** growth on the electric system and the associated risks to Virginians is a critical undertaking.

A single data center can use as much energy as thousands of households; in fact, a large "hyperscale" data center can consume over 100 megawatts of power,[1] which equates to the power consumed by approximately 80,000 households.

Virginia is already home to the largest concentration of data centers in the world.[2] The Commonwealth currently has hundreds of data centers,[3] and the industry is expected to further grow with the expansion of artificial intelligence. A recent report by Virginia's **Joint Legislative Audit and Review Commission (JLARC)** found that data centers could almost double the state's energy use in the next decade.[4]

Regular Virginians face a significant risk if this data center growth occurs. As JLARC concluded, "[i]t will be difficult to supply enough energy to keep pace with growing data center demand, so energy prices are likely to increase for all customers."[5] For example, according to JLARC, data centers could drive up **Dominion Energy**'s residential bills by $444 per year by 2040.[6]

To the extent this data center demand does materialize, new resources will be needed to power it. Independent modelling shows the more affordable, reliable way to meet the demand is through clean energy and storage (*see Battery Storage, page 107*).[7] Dominion's latest proposed plan, however, suggests building multiple new gas plants, which would place further financial risk on ratepayers and increase public health harms (*see Fossil Fuel Infrastructure, page 113*). For example, gas prices are projected to nearly double this year and continue climbing in 2026,[8] subjecting regular Virginians to increasingly unpredictable and high utility bills. Furthermore, fossil fuel facilities such as gas plants and pipelines emit pollutants that are harmful to nearby communities and accelerate climate change. If Dominion's gas plan were accepted, Virginia communities would be saddled with $7.4-$13.9 billion in health harms just through 2039.[9]

Non-utility companies are also proposing polluting projects to serve data centers. For example, last year the corporation Balico proposed a data center campus with 3.5 gigawatts of gas power plants in Pittsylvania County – the equivalent of more than half of Dominion's proposed gas buildout on a single site.[10]

Even if data center growth does not fully materialize – which is a real possibility, given the uncertainties in the data center market[11] – Virginians still face significant risk. Data center load may be lower than projected for various reasons, including speculative data center projects failing to proceed,[12] advances in computing equipment reducing electricity requirements, or a single big technology company changing its business plans.[13] If utilities rush to build new gas plants and other infrastructure for demand that doesn't materialize, regular Virginians may be left footing the bill for potentially billions of dollars of unnecessary utility investment.[14]

CURRENT LANDSCAPE

For years, statewide tax incentives and active recruitment by both state and local economic development offices have encouraged data centers to locate in Virginia, predominantly Northern Virginia.[15] On the one hand, data centers bring in significant personal property taxes to localities. On the other hand, data centers receive by far the largest tax break in Virginia, on the sales and use tax that would otherwise apply to their expensive computing equipment (*see Addressing Data Center Impacts & Ensuring Transparency, page 69*).

The recent JLARC report highlighted Virginia's sales and use tax exemption as one of the top factors influencing data center siting decisions. Virginia lost out on almost $1 billion in tax revenues in fiscal year 2023 because of the data center tax exemption, with 82% of that tax handout going to just the five top data center companies. JLARC concluded that the exemption only provides "moderate economic benefits and return in revenue" and "does not pay for itself when considering just the state portion of the exemption cost and the state return in revenue."

The **State Corporation Commission (SCC)** also plays an important role in managing the risks and costs associated with data center energy demands. The Commission regulates utilities like Dominion to ensure that they comply with laws like the Virginia Clean Economy Act (*see Virginia's Clean Energy Path, page 91*), that they make reasonable investments based on future uncertainties and other risks, and that different types of customers pay their fair share of costs. All of these responsibilities come with heightened importance given the scale and pace of projected data center growth.

OPPORTUNITIES

Reevaluating the incentives available to data centers, including the sales and use tax exemption, could be one approach to responsibly managing growth of the expanding industry in Virginia. The current approach continues to attract significant development without asking for much in return. With its outsized market share, Virginia could be more selective in the types of data centers it is attracting. For example, incentives could be provided only to those data centers that can demonstrate their facility will meet certain environmentally responsible standards.

Meanwhile, there are opportunities for the Commission and other decision-makers to protect regular Virginians from unfairly bearing the risks and costs driven by data center growth. These opportunities include evaluating and addressing whether large energy users like data centers should be a separate electric utility rate class, whether traditional cost allocation methodologies are fairly distributing the huge costs being driven by data centers, and whether utility contracts with data center companies could be updated to better protect regular customers. It also includes steps to improve understanding of and address the Virginia data center industry's regional and statewide energy impacts (*see Addressing Data Center Impacts & Ensuring Transparency, page 69*).

TOP TAKEAWAYS

Understanding the impacts of data center growth on the electric system and the associated risks to Virginians is a critical undertaking. Virginians face financial, environmental, and health risks from potentially unsustainable data center growth; utility plans powered by gas rather than affordable clean energy and storage; and a potentially overbuilt system in the event data center demands fail to materialize.

Data center growth is likely to increase utility bills for Virginians. Decision-makers have tools available to safeguard non-data center customers in the face of rising costs and to ensure sustainable and responsible data center growth in the future.

Reevaluating incentive structures such as the sales and use tax exemption, with a focus on sustainability standards, could help ensure the sustainable growth of the industry.

CLEAN ENERGY

BROWNFIELD AND COAL MINE RENEWABLE ENERGY GRANT FUND AND PROGRAM
Administered by Virginia Energy for the purpose of awarding grants to renewable energy projects that are located on brownfields or previously coal-mined lands.

COASTAL VIRGINIA OFFSHORE WIND (CVOW) PROJECT
Offshore wind project being constructed by Dominion Energy about 27 miles offshore of Virginia Beach. When completed in 2026, it will have a total capacity of 2.6 GW.

ENERGY EFFICIENCY RESOURCE STANDARD (EERS)
A component of the Virginia Clean Economy Act which establishes specific, long-term targets for energy savings that utilities must meet through customer energy efficiency programs.

HOME EFFICIENCY REBATES
Two residential energy efficiency programs for single and multi-family homes funded through the IRA and managed by Virginia Energy. Home Efficiency Rebates will provide up to $8,000 per household to support energy retrofit projects resulting in at least 15% energy savings. High Efficiency and Appliance Rebates will provide up to $14,000 per household in up-front rebates to support households in purchasing certain types of high efficiency electric appliances.

HOUSING INNOVATIONS IN ENERGY EFFICIENCY FUND (HIEE)
Designated to support energy efficiency improvements in low-income housing through the Virginia Department of Housing and Community Development. Funded exclusively by the Regional Greenhouse Gas Initiative (RGGI).

INFLATION REDUCTION ACT (IRA)
Aims to curb inflation by reducing the federal government budget deficit, lowering prescription drug prices, and investing in domestic energy production while promoting clean energy.

LOW INCOME HOME ENERGY ASSISTANCE PROGRAM (LIHEAP)
Provides federally-funded heating and cooling assistance, weatherization, and minor energy-related home repairs to about 6.7 million households nationwide.

PJM (PENNSYLVANIA-NEW JERSEY-MARYLAND INTERCONNECTION)
The regional transmission organization that coordinates the movement of electricity in Virginia, 12 other mid-Atlantic states, and the District of Columbia.

RENEWABLE PORTFOLIO STANDARD (RPS)
A standard established by the Virginia Clean Economy Act that sets annual requirements for the generation of renewable energy in a utility's service territory.

SOLAR FOR ALL
$7 billion initiative by the U.S. Environmental Protection Agency (EPA) to provide solar energy to low-income and disadvantaged communities.

RELEVANT PROGRAMS & AGENCIES

See full glossary starting on page 155

STATE CORPORATION COMMISSION (SCC)
An independent department of state government with delegated administrative, legislative, and judicial powers. The Commission has regulatory authority over utilities, insurance, state-chartered financial institutions, securities, retail franchising, and railroads.

VIRGINIA CLEAN ECONOMY ACT (VCEA)
Virginia law outlining a clear path to achieving a zero-carbon energy future by mandating the retirement of fossil fuel electricity generators, sets renewable energy standards through wind and solar power, and sets energy efficiency standards. The VCEA also establishes a renewable energy portfolio standard (RPS), which mandates that the two major utilities in the state, Dominion Energy and Appalachian Power Company, produce 100 percent clean energy by 2045 and 2050, respectively.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)
State agency responsible for administering laws and regulations related to air quality, water quality, water supply, renewable energy, and land protection. DEQ issues permits, conducts monitoring, performs inspections, and enforces environmental law.

VIRGINIA ENERGY
State agency tasked with developing and advancing the plan for Virginia's energy, mining, and mineral polvicies and initiatives.

WEATHERIZATION DEFERRAL REPAIR (WDR)
Makes repairs on houses so that they can be approved for the federal Weatherization Assistance Program (WAP). WDR is funded exclusively by RGGI.

Night sky at Stony Man Overlook at Shenandoah National Park
Photo by Peter Forister

ENSURING ACCESS TO ENERGY EFFICIENCY

CLEAN ENERGY

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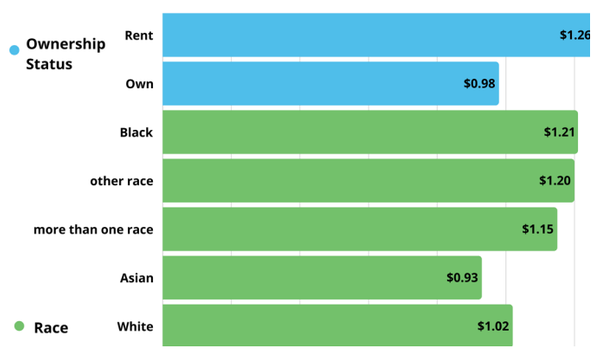
WHY IT MATTERS

The cleanest, most affordable way to address both rising energy demand and rising energy prices is through energy efficiency. Energy efficiency is performing the same task while using less energy, whether that task is heating, cooling, lighting, appliance use, industrial processes, or utility programs. Energy efficiency reduces wasted energy and its attendant pollution and health impacts.

Energy efficiency's benefits exceed lowering utility bills. Efficient homes, schools, and commercial buildings better control moisture, air quality, and temperature, are more comfortable, and are climate resilient. They provide health benefits such as fewer asthma attacks and emergency department visits for respiratory-related illnesses.[1] Energy efficiency and **demand-side management** contribute to a more reliable electric grid and reduce the need for new energy generation.[2] In 2024, over 9,000 energy efficiency businesses employed over 76,000 Virginians.[3]

While 25% of Virginia households are energy insecure,[4] barriers prevent customers from taking full advantage of energy efficiency to lower their bills. Upfront costs put upgrades out of reach for **energy-insecure** households, who are unable to meet basic household energy needs and often live in the most inefficient homes.[5] Energy-insecure households are underserved by energy efficiency programs, and in 2020, were billed 27% more per square foot on average than households not experiencing energy insecurity.[6] Renters cannot make improvements, and landlords are not incentivized to invest in upgrades when tenants pay the utility bills. State **weatherization** repair and energy efficiency programs for income-qualified Virginians have not been adequately funded due to Virginia illegally being removed from the Regional Greenhouse Gas Initiative (RGGI) (*see Regional Greenhouse Gas Initiative, page 93*). Despite the many local, state, federal, and utility programs, there is no identified long-term goal and plan to ensure programs seamlessly work together to ensure energy affordability for Virginians.

Average U.S. household energy expenditures per square foot



CURRENT LANDSCAPE

Virginia law mandates investments in energy efficiency by investor-owned electric utilities (IOUs) through the **Energy Efficiency Resource Standard (EERS)** in the **Virginia Clean Economy Act** (*see Virginia's Clean Energy Path, page 91*). Utilities earn the same percentage profit on these programs as they do on building new generation, but customers reduce volatile fossil-fuel surcharges and their attendant pollution.

If IOUs fail to meet mandatory energy savings targets, the **State Corporation Commission (SCC)** must disallow new fossil-fuel generation, unless a threat to reliability or security of electric service exists.[7] While Appalachian Power has met existing targets, Dominion has not. Future targets have been set by the SCC and reflect past performance.[8]

Many **low-income** households benefited from Virginia's past participation in RGGI, which funded the **Housing Innovation in Energy Efficiency (HIEE) fund**. While the federal **Weatherization Assistance Program (WAP)** and the **Low Income Home Energy Assistance Program (LIHEAP)** bring weatherization and efficiency upgrades to around 1,800 income-qualifying households in Virginia each year, RGGI provided a higher level of funding for improvements.[9] Importantly, it funded critical pre-weatherization repairs through the **Weatherization Deferral Repair (WDR)** program that ensured access to upgrades through WAP. HIEE also provided energy efficiency funding for new affordable housing. Around $80 million remains in HIEE from earlier RGGI auctions that need to be distributed.

Home Energy Rebate programs, created by the **Inflation Reduction Act (IRA)** and administered by **Virginia Energy**, will provide substantial efficiency savings to households.[10] However, Congress cut energy efficiency tax credits and rescinded some IRA energy efficiency funding.[11] Federal funding for WAP is delayed, and all federal LIHEAP staff were fired. Standards for energy-efficient appliances may be lowered.

OPPORTUNITIES

Energy efficiency is an underutilized resource that should play a larger role in how we power our homes and businesses. Efficiency upgrades can cost-effectively reduce energy use by a third for low-income households in Virginia.[12] Virginia has the opportunity to help our residents by increasing energy efficiency efforts across the state.

The state could commit to an energy efficiency goal and plan, and designate Virginia Energy as the "one-stop shop" with staff to help Virginians coordinate across all government and non-government programs, prioritizing energy-insecure households.

Rejoining RGGI will secure needed funding so thousands more Virginians can access energy efficiency. Renters also need access and should be protected from displacement when homes are improved. Landlords should be encouraged to take advantage of no-cost and low-cost upgrades for income-qualifying rentals, utility programs, and HIEE. Workforce training and support is also essential.

Virginia would save residents even more money by requiring that new construction meet, at least, the minimum efficiency requirements of the International Energy Conservation Code. Unfortunately, despite statutory standards, regulators have not kept up with the national model code.

Pay As You Save allows homeowners and renters to make energy efficiency upgrades without upfront costs through a fixed charge on utility bills. Because the charge is lower than the savings from the efficiency improvements, customers save money from the first month.

Electric and gas IOUs could increase energy efficiency savings by better connecting customers to programs and offering comprehensive energy upgrades. Importantly, utilities can be better held to account for not meeting efficiency savings targets. Making the process more transparent could also help with meeting efficiency goals.

TOP TAKEAWAYS

Energy efficiency is the cleanest and lowest-cost way to address energy affordability.

Virginia could establish a long-term energy efficiency plan to ensure that local, state, and utility programs work seamlessly together to address energy affordability.

Rejoining RGGI will provide more Virginians with access to energy efficiency and reduce energy insecurity. Distributing $80 million from previous RGGI auctions to effective low-income energy efficiency programs can help Virginians lower their energy bills sooner.

BUILDING OUR OFFSHORE WIND FUTURE

CLEAN ENERGY

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WHY IT MATTERS

The **offshore wind (OSW)** industry is thriving in Virginia, bringing significant investment, job creation, and clean energy leadership to Hampton Roads.[1] The **Coastal Virginia Offshore Wind project, or CVOW**, is set to be the largest OSW project in the nation, demonstrating the role OSW can play in our clean energy transition and helping Virginia become a pioneer in the industry.

OSW has environmental, public health, and economic benefits, all while helping meet growing energy demand. Deployment of large-scale wind power is also better for Virginia's coastal communities,[2] which face rising temperatures[3] and more frequent extreme storms[4] due to climate change. Not only will OSW help the Commonwealth confront the climate crisis head-on by reducing carbon pollution from the electricity sector, but it will also provide massive economic development opportunities and create thousands of local, long-term, family-supporting jobs for Virginians – including high school and college graduates, returning citizens, and veterans transitioning to the civilian workforce.[5]

Studies have repeatedly shown that a robust OSW industry will deliver substantial economic returns to the Commonwealth. The buildout and operation of the CVOW project alone is expected to support thousands of jobs and result in hundreds of millions in annual economic output.[6] The full potential economic benefits are enormous, upwards of $109 billion[7] in revenue from the OSW industry[8] and related supply chains. For example, LS GreenLink invested $700 million[9] in Chesapeake for an underwater cable manufacturing facility and broke ground on the project in early 2025. OSW also increases domestic energy independence, enhances energy security,[10] and provides a stable and highly efficient means of power. OSW complements solar energy in a clean power grid by generating electricity at night and at greater capacity during winter months.[11]

CURRENT LANDSCAPE

Virginia remains a pioneer in OSW in the U.S. In 2020, Dominion Energy, one of Virginia's **investor-owned utilities**, began operating the first offshore wind farm in U.S. federal waters – the 12 megawatt (MW) CVOW pilot project, which is about 27 miles offshore of Virginia Beach. In 2024, Dominion began construction on the nearby commercial-scale CVOW project, which is expected to be completed by 2026. Once finished, it will be the largest OSW project in the country – producing 2,600 MW of electricity, enough clean energy to power over 660,000 homes, and avoid as much as 5 million tons of carbon emissions annually.[12] Dominion is also planning to build another 3,400 MW of OSW energy during the 2030s,[13] exceeding even the requirements of the **Virginia Clean Economy Act** (*see Virginia's Clean Energy Path, page 91*), which outlines the development of an additional 2,600 MW (for a total of 5,200 MW) during that decade.[14]

As part of the construction and operation of CVOW, Dominion has implemented strong wildlife protection measures including: avoiding construction in **migratory corridors** and important feeding areas;[15] designing a construction schedule that avoids seasons when at-risk species like whales are most present; forgoing nighttime pile driving; and using **Protected Species Observers**, **bubble curtains**,[16] and vessel speed restrictions during construction. Public trust in these protection measures has been bolstered by clear findings from **NOAA Fisheries**,[17] the Ocean Conservancy,[18] and the Marine Mammal Commission[19] that all confirm no credible evidence links OSW to North Atlantic right whale mortalities. Dominion is also making efforts to minimize the onshore impacts of **transmission lines** on natural and cultural resources and **environmental justice communities**.[20] CVOW's turbine foundations will enhance rocky marine habitat and support some local fisheries (*see Rebuilding Healthy Fisheries, page 55*).[21] OSW can also be developed responsibly, with protections for marine mammals and other wildlife.

OPPORTUNITIES

Virginia's geographic strengths – strong Atlantic wind resources, deep-water ports, and a skilled maritime workforce – make Virginia the ideal state for OSW development.[22] Studies have shown this will diversify Virginia's energy supplies, strengthen **grid resilience** amid rising energy demand from data center expansion, and expand manufacturing capabilities (*see Data Center Energy Demand, page 95*).[23]

As evidenced by CVOW, OSW can be done in a way that protects wildlife and minimizes impacts from onshore and offshore development. State agencies can continue to ensure the responsible development of future OSW infrastructure by using least-conflict siting and the best available science to avoid, minimize, and mitigate impacts on ocean and onshore wildlife and habitats, cultural resources, and communities.[24] Prioritizing existing **energy corridors**, co-locating new infrastructure, and engaging communities early will help address visual, noise, and traffic concerns.

To truly unlock the potential of OSW energy in Virginia, action can be taken to promote robust OSW business and supply chains in the Commonwealth. OSW workforce development can be prioritized at the state level, including by establishing training programs and resources to enable participation in those programs, while ensuring that these opportunities are available to workers from historically economically disadvantaged communities.[25] Such programs could be augmented by partnerships with union apprenticeship programs, community colleges, trade schools, and veteran programs to create curricula for worker safety certifications, turbine installation, operations, maintenance, and port logistics. Apprenticeship and pre-apprenticeship programs with wage-progression guarantees and Job Readiness Center alignment would also provide increased opportunities for residents in underserved communities along Hampton Roads and the Eastern Shore. Additionally, tax incentives for turbine component manufacturing and subsea-cable operations at Virginia ports will localize supply chains and catalyze new local businesses.

TOP TAKEAWAYS

Virginia is the national leader in the OSW sector, bringing substantial energy, environmental, and economic benefits such as reduced emissions, increased resiliency, and job creation.

The Coastal Virginia Offshore Wind project clearly demonstrates that responsible OSW development can protect wildlife and provide positive impacts to onshore communities.

To fully take advantage of the state's potential, policymakers, industry leaders, and conservation groups can encourage OSW workforce development and plan collaborative frameworks that integrate community and conservation priorities.

Virginia Coastline
Photo by Stephanie Cannizzaro

MAXIMIZING ROOFTOP SOLAR & DISTRIBUTED GENERATION

CLEAN ENERGY

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WHY IT MATTERS

Virginia must rapidly decarbonize its electricity sector to protect current and future generations from the worst impacts of climate change.[1] Historically, the clean energy transition has prioritized replacing expensive fossil fuels with utility-scale renewable energy. **Distributed energy resources (DERs)** are a complementary and underappreciated tool for accelerating this transition while maximizing affordability, equity, energy independence, and resilience. DERs refer to clean energy technologies that produce power or moderate power usage close to where that power is used. These technologies include rooftop, commercial, and **community/shared solar**, as well as smaller batteries and **demand response** programs, which provide incentives to decrease electric consumption during peak hours. DERs can be pooled into networks and managed as a collective known as a **Virtual Power Plant (VPP)**. Collectively, these technologies can play the role of gas peaker plants with a much faster installation timeline, lower cost to ratepayers,[2] and without jeopardizing health or the environment with carbon emissions.

DERs can help Virginia meet energy demand in a way that decarbonizes the power sector, spurs local economic development, protects households from utility rate hikes, and boosts **grid resilience** and reliability.

DERs provide a wide range of benefits to the public and services to the grid. Homeowners, tenants, local businesses, and governments can use DERs to save money on utility bills; support electricians, home retrofitters, and installers; and improve air and water quality and public health by reducing reliance on fossil fuels. DERs also make the grid more affordable and reliable by minimizing power lost along transmission lines and deferring investments into expensive transmission and distribution infrastructure.[3] Additionally, their distributed nature and use of energy storage increase the grid's resilience to large-scale disruptions, like extreme weather and blackouts, providing Virginians with energy independence.

CURRENT LANDSCAPE

Virginia is committed to powering the Commonwealth with 100% carbon-free electricity from investor-owned utilities by 2050.[4] The **Virginia Clean Economy Act (VCEA)** requires that **Dominion Energy** meet one percent of its annual **Renewable Portfolio Standard (RPS)** requirement through DERs.[5]

Virginia's **net metering** law[6] allows customers with solar to be compensated for the electricity they generate. The **State Corporation Commission (SCC)** is currently re-evaluating net metering rates,[7] and both **Appalachian Power Co. (APCo)** and Dominion seek to substantially decrease their compensation rates by undervaluing the benefits of DERs and shifting blame away from the drivers of high energy costs, like gas price volatility.[8] Under-compensating net metering would impede the adoption of rooftop solar when the industry is just getting off the ground. Only 1.3% of Virginians net meter,[9] and Virginia ranks 31st in the nation in per-capita residential solar and 28th in per-capita non-residential solar.[10]

In 2024, Dominion's **shared solar** program was expanded and a program was created for APCo.[11] However, high minimum bills disincentivize participation for most customers.[12] The SCC is currently evaluating Dominion and APCo's minimum bills, with a legislative directive to give a full and balanced consideration of costs and benefits.[13]

In April 2024, Virginia received $156 million under the federal **Solar for All** program to design and expand residential solar and multi-family solar-plus-storage programs serving marginalized communities.[14] This program will run from January 2026 until December 2029 and will guarantee a minimum 20% total electricity bill savings for participants.[15]

In 2024, **Virginia Energy** published a report exploring incentives to steer shared solar projects onto rooftops, **brownfields**, landfills, parking lots, and **dual-use agricultural facilities**.[16] Despite widespread support from the public, parking lot solar and other projects on previously developed sites remain unfunded.[17]

OPPORTUNITIES

Virginia imports more energy than any other state, and data center-driven demand is projected to double energy needs in the next 15 years (*see Data Center Energy Demand, page 95*).[18] Accelerated implementation of DERs will quickly connect energy, mitigate the impacts of utility-scale generation on natural resources, and create a more resilient grid. Current rates signal to DER businesses to continue to invest in the state, while saving individual homeowners tens of thousands of dollars on utility bills over time.[19] Asset owners must continue to be fully compensated for the value of the electricity they provide to the grid.[20]

Virginia law currently limits the amount of DERs on the grid and the size of qualifying facilities. Raising or removing these caps would facilitate more rapid deployment of clean energy, because smaller projects do not face the same interconnection and construction delays as larger centralized projects like gas plants. Increasing the **carve-out** for facilities built on previously disturbed lands helps avoid impacts to natural resources.

Virginia needs tens of thousands of jobs to deploy clean energy technologies at the speed and scale required. Requirements to pay prevailing wages for these jobs will attract a robust clean energy workforce, and apprenticeship requirements ensure a steady pipeline of Virginians who are well-trained in clean energy technologies.

New permitting software, such as SolarApp+, can decrease permitting times for rooftop solar projects by 30%,[21] saving localities significant time and resources, benefitting consumers by decreasing soft costs on solar over time, and speeding up the connection of clean energy to the grid.

In light of reduced federal support for DERs, innovative state-level financing mechanisms are more crucial than ever. Pay As You Save allows homeowners to install DERs without upfront costs through a fixed charge on utility bills. Because the charge is set at a level lower than the savings from the DERs, this program results in day one savings for all participants.

TOP TAKEAWAYS

Distributed energy resources (DERs) refer to local, clean energy like rooftop solar and battery storage. DERs are a critical component of our clean energy future, spurring local economic development, protecting households from utility rate hikes, and boosting grid resilience and reliability.

Virginia should improve shared solar programs, implement the Solar for All grant, and incentivize the installation of DERs on previously developed sites like parking lots. Asset owners must receive full compensation for the electricity they provide to the grid.

Roanoke skyline
Photo by Saravanan Rajamanickam

ACCELERATING LARGE-SCALE SOLAR WHILE PROTECTING NATURAL RESOURCES

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WHY IT MATTERS

Utility-scale solar facilities are a necessary piece of Virginia's transition to a clean energy future. Utility-scale solar is the cheapest form of new generation available, and its environmental impacts pale in comparison to the fossil fuels we are transitioning away from.[1]

While **distributed energy resources (DERs)** play an important role in decarbonization, demand management, and **grid resiliency** (*see Rooftop Solar & Distributed Generation, page 103*), we will not be able to meet our energy needs with these sources alone.[2] Utility-scale solar projects will play a critical role in Virginia.

On average, in Virginia, utility-scale solar requires less than 7 acres per megawatt of electricity produced, with the average site in Virginia being 47 MW.[3] Most utility-scale solar projects are being constructed in rural communities where such projects are often the most significant land use change to have occurred in such communities.[4] These rural localities often have little experience permitting large construction projects, with some of these localities lacking an established **solar ordinance**.[5] Having protections in place can help avoid impacts to Virginia's natural resources and minimize such impacts where they cannot be avoided.

CURRENT LANDSCAPE

Virginia has created an attractive environment for utility-scale solar through potential tax exemptions and revenue-sharing models for localities.[6] The **Virginia Clean Economy Act (VCEA)** requires **Dominion Energy** to propose 16,100 MW of **onshore wind** and solar by the end of 2035, and **Appalachian Power** must propose 600 MW of onshore wind and solar by the end of 2030 (*see Virginia's Clean Energy Path, page 91*).[7] Since the VCEA's passage, Dominion has petitioned for approval of roughly 4,336 MW (including both Company-owned and third-party owned power)[8] and APCo has petitioned for approval of almost 155 MW of Company-owned and 471 MW of third-party owned solar.[9] Counties have already approved a significant amount of solar, roughly 15,100 MW.[10] However, over two-thirds of these projects have yet to commence construction. There is no guarantee that they will be used for our utilities' compliance with the VCEA and some may fail to come to fruition due to financing or interconnection issues.

Misinformation has fueled local resistance to approving solar facility siting.[11] Likewise, ongoing inadequate construction practices at some projects have raised local concerns. An increasing number of Virginia localities have enacted restrictive ordinances that limit or ban the development of utility-scale solar.[12] Fortunately, cost-effective technologies, such as **all-terrain trackers**, can help developers minimize **grading disturbance** that increases stormwater runoff and delays vegetation growth. The **Virginia Department of Environmental Quality (DEQ)** finalized a new stormwater handbook in 2024 that addresses utility-scale solar as well as regulations that mitigate impacts to prime agricultural soils and contiguous forest lands for solar projects that seek approval through the **permit by rule** process *(see Erosion Runoff & Managing Stormwater, page 7*).[13] Forthcoming regulations will focus on additional protections for our highest-value **ecological forest cores**.[14]

Resource modeling conducted by intervenors in Dominion's recent **Integrated Resource Planning (IRP)** proceeding found that the benefits of existing solar development and new utility-scale solar required through the VCEA can be maximized through complementary investments in battery storage, to meet long-term demand projections (*see Battery Storage, page 107*). The modeling found that doubling the amount of storage available in the model resulted in a portfolio that saves **ratepayers** approximately $11 billion and builds 3 gigawatts of less solar, thereby reducing land use requirements, as compared to the portfolios that allowed less storage to be built. These findings underscore the efficiencies—in terms of land use and cost—that can be gained by adding storage to complement existing solar.

OPPORTUNITIES

Many of the localities that are seeing an increasing number of solar projects do not have the resources necessary to appropriately review projects. State-supported technical assistance could provide localities with the tools they need, and regional planning to meet Virginia energy needs with clean energy may help areas of the Commonwealth smartly plan for solar deployment in their regions. This will ensure that localities can operate from a position of strength and facilitate successful projects, and have access to a peer-reviewed database that can address misinformation.

Agrivoltaics, or projects in which solar production and agricultural production occur on the same site,[15] is an area ripe for growth. As many utility-scale projects will be sited on agricultural lands, incentivizing beneficial dual-use can reduce the impact of these projects on soils while continuing to contribute to the local agricultural economy. Grazing and growing crops under panels will help preserve prime agricultural soils, conserve water, and provide economic benefits to the owner, while dispelling the perception that agriculture and clean energy cannot co-exist.

Community Benefit Agreements (CBAs) are legally enforceable contracts in which a project developer agrees to fund or implement programs in exchange for community support. Benefits can include hiring directly from the community, local workforce training, contributions to local environmental remediation projects, and benefits to local agricultural networks and facilities. These benefits, in addition to the revenue generated for the locality from projects, can help balance local budgets. For example, Charlotte County was able to balance its $3M budget deficit in 2025 with revenue from recently approved solar projects.[16]

Between the VCEA and the **Brownfield and Coal Mine Renewable Energy Grant Fund and Program**, Virginia's law has structures to incentivize the development of utility-scale solar in the built environment. This includes brownfields, previous coal mines, landfills, parking lots, and industrial sites. Virginia should continue to incentivize projects in these locations to the maximum extent possible. **Virginia Energy**'s 2024 Shared Solar Workgroup Report found implementation will remain severely limited without incentives.

TOP TAKEAWAYS

Utility-scale solar will be a key component of meeting Virginia's energy needs. Its value is maximized and impacts minimized through complementary investment in battery storage.

To build environmentally responsible projects, developers can use practices that minimize grading, tree removal, and impacts on topsoil. Agrivoltaics can be encouraged and incentivized as an effective dual use of land and preserve future viability.

Incentivizing projects on the built environment would help mitigate pressures on natural resources. The allocation of renewable energy on "previously disturbed project sites" in the VCEA could be increased and funding for the Brownfield and Coal Mine Renewable Energy Grant Fund and Program to speed the development of these projects.

LEVERAGING BATTERY STORAGE

CLEAN ENERGY

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WHY IT MATTERS

Energy storage provides a critical opportunity for Virginia to meet its energy needs through reliable, affordable, and clean power that creates jobs and economic development. A robust storage buildout in Virginia allows our existing renewables to deliver clean energy much more reliably, decreasing new energy development and mitigating impacts to our natural resources. Energy storage refers to any technology that captures energy produced at one time and makes it available for use later. It comes in many forms–most commonly batteries,[1] but also pumped hydro, compressed air, and thermal storage.

The critical role of storage in a zero-carbon future was on display in Dominion's recent long-term planning proceeding, during which intervenors' modeling showed that Dominion can meet projected demand, avoid building new gas, and achieve zero carbon by 2045 by investing significantly in storage in the near- and long-term.[2] In the face of Dominion's proposal to build 6 GW of new gas resources by 2039, this finding was significant, demonstrating that storage represents a no-regrets alternative that can serve near-term system capacity needs while also eliminating carbon emissions in a way that is more affordable for ratepayers over the long term.

Batteries are highly flexible, which complements a grid with increasing renewable energy. Batteries are also "enabling technologies," in that they increase the ability of renewables to provide dispatchable, reliable power.[3] Batteries are less land-intensive than solar and can be readily sited in built environments or to relieve distribution and transmission constraints, which can help avoid costly upgrades.[4] Investments in storage have paid off in Texas, where batteries saved $750 million in energy costs and prevented grid shutdowns throughout several weather events.[5] In Danville, officials estimate that two approved grid-scale batteries will save ratepayers tens of millions of dollars by mitigating transmission and capacity costs.[6]

For homeowners and businesses, storage provides back-up power, helping to meet critical needs for food, shelter, and safety during outages. When paired with rooftop solar, storage can also help lower utility bills and manage excess generation. Better yet, customer batteries can be aggregated through a **virtual power plant (VPP)** and coordinated to meet energy needs for all Virginians (*see Rooftop Solar & Distributed Generation, page 103*). By doing so, private investment and market competition can quickly build resources that are 40-60% more affordable than dispatchable energy sources.[7]

CURRENT LANDSCAPE

The **Virginia Clean Economy Act (VCEA)** requires **investor-owned utilities** to procure 3,100 megawatts (MW) of storage by 2035 (*see Virginia's Clean Energy Path, page 91*).[8] Even more will be needed. Recent modeling showed that Dominion will need significantly more storage to support a 100% carbon-free grid by 2045.[9]

Virginia utilities are actively pursuing storage. Dominion is ahead of its current storage targets,[10] with over 600 MW approved,[11] and is piloting three **long-duration energy storage (LDES)** projects.[12] In May 2025, Appalachian Power (APCo) requested approval to build a 52.2 MW battery.[13]

As of June 2024, there were about 45 GW of **Battery Energy Storage System (BESS)** supply waiting in **PJM**'s interconnection backlog.[14] Despite recent efforts to facilitate quicker interconnection of storage at certain sites,[15,16] permitting and interconnection requirements remain a barrier, and further PJM reform is urgently needed.[17]

Individual customers are also installing storage. 16% of APCo's solar customers already have batteries.[18] Given the benefits of pairing solar and storage, that trend will likely continue statewide and will be aided by two recent developments in Dominion's territory. In September 2024, Dominion received a federal grant for a 150-MW VPP project in Suffolk.[19,20] Additionally, a new law requires Dominion to propose a 450-MW VPP pilot program by the end of 2025.[21] In a VPP program, customers voluntarily allow the utility to manage their batteries and other resources in aggregate and receive bill credits in return. These pilots will prove that local energy sources can deliver significant, real-time clean power when and where it is needed most.

Federal funding for battery storage has been vital.[22,23] In August 2024, Virginia and other states received a grant of approximately $190 million to fund, among other things, a battery at the Iron Mountain data center in Prince William County.[24] However, additional funding faces political headwinds; while the tax credit for utility-scale storage was maintained in the recent "Big Beautiful Bill" legislation, new **Foreign Entity of Concern (FEOC)** provisions could complicate development.[25]

OPPORTUNITIES

A robust buildout of multiple battery technologies will increase the value and production of existing and future clean energy, decrease the impacts on our prime agricultural lands and forests, and mitigate against transmission impacts. Strong battery policy will also attract investment in battery manufacturing that has benefited other states in the Southeast.[26]

A strong procurement target[27] for LDES technologies, such as those being piloted by Dominion, would help get the Commonwealth ahead of the duck curve,[28] in which excess solar production during peak times has to be curtailed and lost, since there is not enough storage on the grid. By creating best practices for these projects, these early LDES projects can gain more local buy-in and a greater rate of success, regardless of the technology type.

At the same time, short-duration storage in the 2- to 6-hour range is affordable and available now. Advancing battery chemistry technology and vast improvements in fire codes and standards have made newer grid-scale batteries much safer.[29,30] These batteries can provide demand response, mitigate against transmission demands, and provide other critical grid services.[31]

TOP TAKEAWAYS

Energy storage technologies are a crucial tool to bring capacity online quickly to meet increasing load. At the same time, investing in energy storage will lay the foundation for a zero-carbon economy.

Storage can help make the most of existing energy resources; avoid expensive, polluting, and inefficient peaker plants; increase the flexibility and resiliency of our grid; and provide a market signal to attract domestic battery production.

A non-prescriptive model ordinance, created with input from state agencies and local organizations, would encourage best practices in early energy storage projects and create a strong foundation for a nascent industry.

TRANSITIONING ENERGY INFRASTRUCTURE

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)

An international panel of scientists under the United Nations who construct Assessment Reports about the state of scientific, technical, and socio-economic knowledge on climate change, its impacts and future risks, and options for reducing the rate at which climate change is taking place.

JOINT LEGISLATIVE AUDIT AND REVIEW COMMISSION (JLARC)

A legislative agency that conducts program evaluation, policy analysis, and oversight of state agencies on behalf of the Virginia General Assembly.

PJM (PENNSYLVANIA-NEW JERSEY-MARYLAND INTERCONNECTION)

The regional transmission organization that coordinates the movement of electricity in Virginia, 12 other mid-Atlantic states, and the District of Columbia.

POWER INNOVATION FUND

A fund created in 2023 to be used for the purposes of research & development of innovative energy technologies, including nuclear, hydrogen, carbon capture and utilization, and energy storage.

REGIONAL GREENHOUSE GAS INTIATIVE (RGGI)

A cooperative effort among Northeast and Mid-Atlantic states to reduce power sector carbon pollution by requiring power plants to purchase allowances for their greenhouse gas emissions. The proceeds from allowances are then distributed to the participating states, which can use the funds to help their citizens, including by creating energy-efficient, affordable housing and enhancing community flood prevention and protection.

RENEWABLE PORTFOLIO STANDARD (RPS)

A standard established by the Virginia Clean Economy Act that sets annual requirements for the generation of renewable energy in a utility's service territory.

STATE CORPORATION COMMISSION (SCC)

An independent department of state government with delegated administrative, legislative, and judicial powers. The Commission has regulatory authority over utilities, insurance, state-chartered financial institutions, securities, retail franchising, and railroads.

VIRGINIA CLEAN ECONOMY ACT (VCEA)

Virginia law outlining a clear path to achieving a zero-carbon energy future by mandating the retirement of fossil fuel electricity generators, sets renewable energy standards through wind and solar power, and sets energy efficiency standards. The VCEA also establishes a renewable energy portfolio standard (RPS), which mandates that the two major utilities in the state, Dominion Energy and Appalachian Power Company, produce 100 percent clean energy by 2045 and 2050, respectively.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)

State agency responsible for administering laws and regulations related to air quality, water quality, water supply, renewable energy and land protection. DEQ issues permits, conducts monitoring, performs inspections, and enforces environmental law.

VIRGINIA ENERGY

State agency tasked with developing and advancing the plan for Virginia's energy, mining, and mineral policies and initiatives.

VIRGINIA ENVIRONMENTAL JUSTICE ACT

Virginia law established to promote the fair treatment and meaningful involvement of all people regardless of race, color, national origin, income, faith, or disability with respect to the development, implementation, and enforcement of environmental laws and policies.

Wachapreague, VA
Photo by Tori Nutt

APPROACHING NUCLEAR WITH CAUTION

TRANSITIONING ENERGY INFRASTRUCTURE

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WHY IT MATTERS

All around the country and world, data centers are driving increases in electricity needs and interest in emerging technologies to meet that need, including new investments in nuclear technologies. But there is a great deal of uncertainty as to where this demand growth will occur, when it will occur, and how much will occur. Numerous issues are contributing to this uncertainty, including supply chain constraints for computing equipment, the constantly evolving race for artificial intelligence, and regulatory shifts.[1] Moreover, many data center projections may be failing to account for the quantity of speculative projects that will never be constructed; according to one estimate, proposals for data centers could be 5 to 10 times greater than the number of data centers that are actually built.[2]

With Virginia at the forefront of data center projects (*see Data Center Energy Demand, page 95*), it is important for the Commonwealth to address this significant uncertainty sensibly—aiming to protect ratepayers from bearing all of the financial risks both for projects that go forward and projects that may never materialize—while ensuring we stay on track for Virginia's clean energy transition (*see Virginia's Clean Energy Path, page 91*). If data center-driven growth projections do materialize, it appears likely that Virginia will need some amount of new dispatchable carbon-free generation to support this growth by 2045. Analysis shows that new nuclear power could play a role in this scenario, but that Virginia also has time to assess electricity growth and the viability of still-developing carbon-free technologies, including **small modular reactors (SMRs)**[3] and even commercial fusion reactors–one of which is being developed in Chesterfield, Virginia.[4]

At the same time, nuclear projects require a lot of capital and many years to develop, representing major financial risks to developers until they reach commercial operation. Given these dynamics, monopoly utilities are often attracted to nuclear projects, as they can generate significant returns for the utility while pushing much of the risk onto captive ratepayers rather than the utility's shareholders. The recent track record, especially in the Southeast, is not great.

Georgia Power recently commissioned two new units at its Vogtle nuclear plant, but they were delivered 7 years late and ran $17 billion over budget.[5] In South Carolina, South Carolina Electric & Gas (now Dominion Energy South Carolina) and Santee Cooper abandoned a nuclear project in 2017. Even though this failed project provides no electricity, customers are on the hook for $2.3 billion, which will likely take more than 15 years to pay off, or about $8 a month for a typical residential customer.[6]

CURRENT LANDSCAPE

Small modular reactors continue to hold promise, yet also face setbacks. Proponents of SMRs cite the fact that these reactors have been used in submarines, and the promise that SMRs could be produced in a more standardized and modular way than conventional nuclear power plants.[7] This standardization could, in theory, reduce costs. Yet, opponents point out that there are no operational SMRs for commercial energy production in the United States[8] and that one of the leading projects was recently cancelled after costs nearly tripled.[9] People living near proposed new nuclear sites have also expressed concerns about safety, including geologic stability and onsite storage of spent fuel.

Whether SMRs prove commercially viable or not, it is critical that Virginia strike a balance between safe and secure operations, protecting Virginia customers from the serious financial risks of new nuclear projects, and the potential need for new nuclear as a carbon-free power source.

It is notable that Virginia law already provides significant support to nuclear resources. For example, the **Virginia Clean Economy Act** already recognizes the role new and existing nuclear power plants and other zero-carbon technologies may play in Virginia's clean energy transition. These carbon-free resources (including new such resources that come online after 2030) reduce each utility's **renewable portfolio standard (RPS)** requirement in direct proportion to the energy produced by the resources. In addition, Virginia established the **Power Innovation Fund** in 2023 to assist with research and development of energy technologies, including nuclear.[10] The General Assembly also passed legislation in 2024 that allows Dominion and Appalachian Power to charge customers for early SMR development costs, even if the project never produces electricity.[11]

However, the role that states can play in supporting new carbon-free dispatchable technologies like SMRs is limited. Licensing of commercial nuclear reactors, including SMRs, is determined at the federal level. In 2024, the U.S. Congress passed, and the president signed, the bipartisan ADVANCE Act, which cuts regulatory costs nearly in half for developers and should significantly shorten application processing.[12]

OPPORTUNITIES

With significant state policy support already, Virginia can continue using these policies to explore nuclear projects like SMRs. But efforts to streamline permitting around nuclear should be approached with extreme caution and a thorough understanding of the risks involved with nuclear development. Companies and decision makers should understand that early and transparent engagement with potential host communities is not only necessary, but may actually speed up long project development timelines. The significant risks, which include lifecycle environmental risk (uranium mining, transport, and waste disposal), operational risk (accident risk and security), and financial risk (long development timelines, emerging designs), must be thoroughly examined by regulators and explained to community members.

The **State Corporation Commission (SCC)** can also use available tools to shield ratepayers from the financial risks associated with the development of new nuclear projects, including SMRs. If utilities choose to pursue new nuclear, exhausting federal funding options is one sensible way to minimize costs to ratepayers. Moreover, the SCC and regulated utilities could consider innovative financing structures that place more risk on the private sector and less risk on ratepayers. These tools may include financing arrangements with large commercial energy users like data center companies. Data center companies have entered into agreements with developers and utility companies across the country in recent years to finance new dispatchable generation resources like geothermal and new nuclear. Decision makers should carefully consider these opportunities to shield captive customers from cost risks associated with these first-of-a-kind projects.

It will take more than a decade to bring new nuclear and other new carbon-free dispatchable technologies online. In the meantime, our legislators and regulators must set Virginia up for success by emphasizing proven low-cost technologies that provide clean power and grid resilience, like solar, wind, and storage. A short-term focus on these proven technologies will allow more certainty around electricity demand to unfold and enable better decision-making (*see Battery Storage paper, page 107*).

TOP TAKEAWAYS

Focusing on proven low-cost technologies like wind, solar, and battery storage will protect Virginia customers while we decarbonize. It will also give lawmakers, regulators, and other stakeholders time to assess electricity demands and emerging carbon-free generation resources.

Regulators could look to innovative financing structures for new nuclear projects that place more financial risk on the private sector and limit the risks to regular Virginians.

A thorough permitting process is needed for nuclear technology, given the significant safety, environmental, and cost risks.

PREVENTING NEW FOSSIL FUEL INFRASTRUCTURE

TRANSITIONING ENERGY INFRASTRUCTURE

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WHY IT MATTERS

Virginia faces a pivotal choice: expand fossil fuel infrastructure that endangers public health and the climate, or accelerate a just transition to clean energy that protects communities and lowers energy costs. Surging electricity demand from data centers—21% of Dominion Energy's sales in 2022[1]—is driving new fossil fuel proposals and complicating the retirement of aging coal plants. The **Joint Legislative Audit & Review Commission** warns data center energy demand could double within a decade (*see Data Center Energy Demand, page 95*).[2]

Fossil fuel facilities, including fracked gas and coal-fired power plants, pipelines, and export terminals, emit pollutants that degrade air and water quality and accelerate climate change.[3] The **Intergovernmental Panel on Climate Change** warns that "climate change is causing dangerous and widespread disruption in nature,"[4] and Virginia is already experiencing these impacts through recurrent flooding, sea-level rise, and intensifying storms that threaten infrastructure, agriculture, and public safety.[5]

Sunset over the Carillon-Richmond, VA
Photo by TJ Byrd

Fossil fuel dependence causes price volatility by tying Virginia to unpredictable global markets, causing significant energy bill spikes in recent years.[6] Clean energy offers more stable, long-term protection for households. Nationally, new power plant costs are now at a 10-year high, while wind and solar remain the most affordable.[7]

Pollution burdens are not shared equally. The 2020 Virginia **Department of Environmental Quality** Environmental Justice Study found that fossil fuel infrastructure is disproportionately located in low-income and Black and Brown communities. These communities are 1.5 times more likely to live within one mile of a major polluting facility and experience asthma hospitalization rates up to 2.5 times the state average.[8] Eliminating fossil fuel generation in Virginia could prevent up to 32 premature deaths annually and save up to $355 million in health costs.[9]

Virginia's path forward is clear: an equitable transition to renewable energy that protects our environment, public health, and communities, not continued fossil fuel expansion that deepens existing harms.

CURRENT LANDSCAPE

Virginia has long relied on fossil fuels, and this reliance has wreaked havoc across the Commonwealth. In Southwest Virginia, coal mining contributes to elevated rates of cancer, black lung, and heart disease.[10,11] Reclamation efforts fall short, compounding the burden on rural and low-income residents (*see Reclaiming Coal Mines, page 117*).[12] Despite bearing the brunt of cumulative environmental and health harms, communities most affected by fossil fuel infrastructure often lack the resources, access, or political power to participate meaningfully in decision-making. After passing the **Virginia Environmental Justice Act** in 2020, the Commonwealth took a step backward by stripping citizen air and water boards of permitting authority for polluting facilities in 2022.[13]

Dominion Energy is adding to these ills by planning to build six large new gas plants, including the 944-megawatt **Chesterfield Energy Reliability Center (CERC)**.[14] Moreover, three interstate gas pipelines are proposed for Southside (*see Preventing Pipelines, page 115*), and Dominion has recently been awarded 3 new fast-tracked gas projects for Virginia by **PJM**, the regional organization managing the largest U.S. power grid, of which Virginia is a part.[15]

These projects will extend and exacerbate the harmful consequences Virginians have endured for decades. Health costs from CERC alone are estimated at at least $13-$21 million annually, with $3.3-$4.8 million falling on Chesterfield County.[16] Beyond heavy health burdens, they cost nearly double clean energy alternatives.[17]

Non-polluting, least-cost options are essential for transitioning aging energy infrastructure to modern, resilient, and reliable electric systems. The **Virginia Clean Economy Act (VCEA)**, a critical tool in reducing our fossil fuel dependency (*see Charting Virginia's Clean Energy Path, page 91*), covers Appalachian Power Company and Dominion Energy territories, but "merchant generators" also provide power to the regional electric grid. Although the VCEA doesn't cover merchant generators, the **Regional Greenhouse Gas Initiative (RGGI)** does, making participation necessary to reduce emissions across Virginia.

OPPORTUNITIES

Virginia can meet projected electricity demand with clean energy. Expanding projects like new power plants, pipelines, terminals, and fracking sites undermine the state's carbon-reduction goals and **environmental justice** commitments.[3] A moratorium on new fossil fuel development would help meet climate targets while protecting communities already overburdened by pollution.

Without a moratorium, stronger safeguards are essential for protecting communities: requiring cumulative health impact assessments for new infrastructure, improving air and water quality monitoring, enforcing meaningful accountability for polluters, and re-empowering citizen boards. Equally important is ensuring authentic community participation by strengthening public notification processes and prioritizing the voices of those most impacted (*see Advancing Environmental Justice, page 123*).

A well-designed, just transition can deliver high-quality, family-sustaining jobs, workforce training, and new opportunities in communities historically dependent on fossil fuels. Scaling solar, wind, and energy efficiency helps stabilize local economies, reduce emissions, and ensure that no community is left behind. Since the passage of the VCEA, clean energy jobs have grown more than three times faster than overall employment and now support over 118,000 workers statewide.[18]

As Virginia utilities and localities deal with the ever-increasing impact of data center development in the Commonwealth, decision-makers must reject false solutions like new methane gas plants and instead commit fully to clean energy that protects communities and meets our climate goals.

TOP TAKEAWAYS

Fossil fuel facilities harm public health and accelerate climate change. Virginians already experience these impacts through flooding, extreme heat, and intensifying storms.

New fossil fuel infrastructure is expensive, fails to improve grid reliability, and undermines VCEA goals of achieving energy efficiency standards, limiting new carbon-emitting power plants, and retiring polluting plants for utility companies by 2045 and 2050.

A moratorium spanning generating facilities, terminals, pipeline expansions, refineries, merchant plants, and fracking sites would advance Virginia's carbon-reduction commitments.

PREVENTING PIPELINE HARMS

TRANSITIONING ENERGY INFRASTRUCTURE

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WHY IT MATTERS

Fracked-gas pipeline construction is expanding rapidly across the Southeast, even as clean energy sources, like solar and battery storage, offer more reliable and cost-effective energy generation.[1] Overbuilding fossil fuel infrastructure is at odds with a healthy environment and future for the Commonwealth and runs counter to climate mitigation measures recommended by the **Intergovernmental Panel on Climate Change (IPCC).**[2] Pollution from fossil fuel infrastructure impedes Virginia's ability to meet climate goals, and the resulting air and water pollution tend to fall disproportionately on communities of color, households of low income, and elderly communities.[3]

Specifically, the construction of new methane-gas pipelines further traps Virginia into risky dependence on fossil fuels. Gas pipelines pose enormous safety risks for those along their routes and within evacuation or **blast zones**.[4] Construction of pipelines in very close proximity to existing pipelines, or co-location, increases the safety risk should a leak or explosion occur. The operation of these facilities is associated with the emission of methane, a potent greenhouse gas, as well as downstream carbon dioxide emissions and releases of volatile organic compounds and toxic substances like benzene and formaldehyde during compressor station blowdowns.[5] These emissions pose serious consequences to the climate, environment, and nearby communities. Virginia communities bear the brunt of negative public health impacts to water and air quality, economic harm to farmland and other critical agricultural lands, and the threat of explosive high-pressure pipes routed through their neighborhoods.

CURRENT LANDSCAPE

Virginia is home to a large network of fracked-gas pipelines. Recently completed and proposed projects bring significant harm and risk to communities. During and after its construction, the **Mountain Valley Pipeline (MVP)** in Southwest Virginia damaged fragile water resources and ecosystems. MVP has accrued over 350 violations of water quality protections in Virginia, revealing deficiencies in existing erosion and sediment control requirements.[6] The pipeline's construction also damaged Indigenous cultural and sacred sites and adversely impacted rural communities and residents' livelihoods.[7,8] The use of degraded construction materials; the pipeline's route through steep slopes, fragile **karst** areas, and seismic zones; and the lack of **odorant** in the line add to the risk of failure or explosion during operation.[9] MVP was allowed to complete construction due to unprecedented congressional interference that attached the pipeline's completion to an unrelated budget bill in 2023, and federal efforts to circumvent important permit review processes are currently intensifying.[10]

Sedimentation caused by the Mountain Valley Pipeline flowing into Sinking Creek, Giles County
Photo by Mountain Valley Watch

Three major pipelines are now proposed for Southside Virginia, all beginning at a fracked-gas compressor station terminus in Chatham, VA. MVP has proposed the Southgate extension, a high-capacity pipeline that would extend into North Carolina.[11] Transcontinental Gas Pipe Line Company, LLC, a Williams Companies subsidiary, wants to expand its network of pipelines with the 54-mile Southeast Supply Enhancement Project into North Carolina, and the recently proposed Power Express pipeline, which would travel north to the Maryland border.[12,13]

The yearly emissions from these proposed pipelines would add 41 million metric tons of greenhouse gas emissions, equivalent to over 9.6 million gas-powered cars.[14] The climate impacts from greenhouse gas emissions are felt widely through intensified weather and recurrent flooding in both coastal and inland areas of Virginia. Adding new gas infrastructure impedes Virginia's climate progress.

OPPORTUNITIES

Projects like the Mountain Valley Pipeline have demonstrated that existing laws and regulations do not adequately protect water resources, public health, or the environment from the construction of new fossil fuel infrastructure. Ongoing issues with the MVP also highlight the dangers of construction in fragile karst landscapes and through seismic zones. This reinforces the importance of state agencies hearing from local communities about the real-world impacts they experience from pipeline construction.

Absent a ban on intrastate pipelines, any new fossil fuel pipeline build-out, including both interstate and intrastate pipelines, must fully engage and respect the public's views and interests. Increased outreach from state agencies to impacted residents at the start of review processes and during a project's construction would both strengthen local participation in those reviews. It would also increase agencies' abilities to identify potential concerns in determining whether projects should be approved and more effectively address environmental violations during construction. This could help both protect sensitive waterways in the proposed path of a pipeline and place greater emphasis on a project's health and environmental impacts (*see Fossil Fuel Infrastructure, page 113*).

Bonding requirements to appropriate funding or insurance coverage for pipeline construction and land restoration would provide additional assurances that localities are not burdened with additional costs because of a pipeline project. Improvements in pipeline leak detection, like the use of odorant or a chemical additive that identifies gas leakage in all pipelines regardless of size, would strengthen safety measures for the public.

Enforcement of pollution laws must be prioritized, and companies must be held fully accountable for the impacts of their infrastructure, regardless of project completion or abandonment.

TOP TAKEAWAYS

Construction of new methane-gas pipelines can result in damage to waterbodies, fragile ecosystems, and neighbors' properties and safety. Emissions from operational pipelines harm the health of nearby communities.

Methane-gas pipelines are proposed and built without bonding or safety funding requirements, which can leave communities and local emergency services footing the costs if a pipeline is abandoned. A lack of odorant in larger transmission pipelines increases the risk of an undetected leak, which could cause explosions.

Communities are often left without proper notice of surveying, route changes, permit review, and safety testing dates for pipeline projects.

RECLAIMING COAL MINES

TRANSITIONING ENERGY INFRASTRUCTURE

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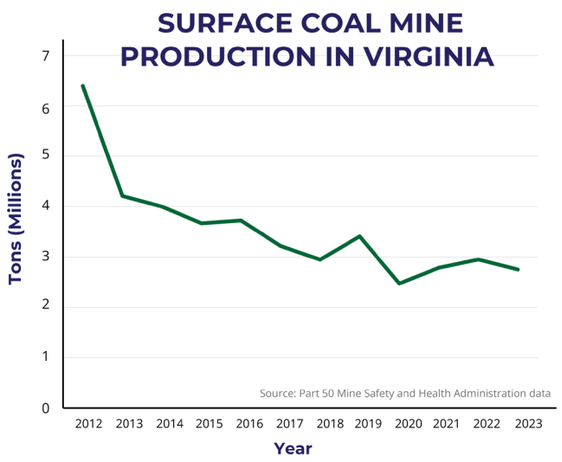
WHY IT MATTERS

Amidst the picturesque mountains of Southwest Virginia, nearly 53,000 acres of surface coal mines sit idle, or practically so.[1] Without regular maintenance on these functionally abandoned mine sites, stormwater runs off of unvegetated, steep, and unstable areas; ponds and waterways get clogged with sediment; and water is diverted into nearby woodlands and neighborhoods, often causing landslides along the way. These mines harm the environment and threaten nearby residents by polluting waterways and exacerbating flooding.

Reclamation refers to the process by which mined lands are cleaned up, regraded, and revegetated. Coal companies are required to provide financial assurances, known as bonds, before mining to ensure that funds are available to complete reclamation. Companies are supposed to reclaim as they mine, but they often neglect this responsibility. Coal production in Virginia has decreased by 34.8% over the last decade, and an increasing number of mines are now functionally abandoned, having neither produced coal nor made appreciable reclamation progress in recent years.[2]



As the industry declines, the state's reclamation bonding system is under stress. **Virginia Energy** has the authority to escalate enforcement for mine operators that fail to reclaim, and the agency has the ultimate duty to revoke the permit for any mine that is not complying. After revocation and bond forfeiture, the coal company's insurer can either reclaim the mine or transfer the bond amount to the state, which then manages reclamation directly. But bond amounts are often insufficient to fully reclaim sites after forfeiture, especially for mines that have sat unreclaimed for years.

Reclaiming functionally abandoned mines would protect nearby communities from increased flooding risk and water pollution, create jobs, and repair the environment of Southwest Virginia.

CURRENT LANDSCAPE

Today, permits in Virginia are bonded in one of three ways: (1) the permittee posts a **full cost bond**, generally in the form of an assurance provided by an independent surety company; (2) the permittee submits financial disclosures and commits to covering the full cost of reclamation themselves (a "**self-bond**"); or (3) regardless of the expected cost of reclamation, the permittee pays only an entrance fee and a flat per-acre fee into a state-managed **bond pool**, relying on the balance of funds in the pool to pay for reclamation if the permit is forfeited. If a self-bonded permit is forfeited and there are insufficient funds to cover reclamation, that shortfall is also covered by the bond pool.

While full cost bonds provide the best assurance that reclamation will be completed, cost estimates are often insufficient, a matter made worse when mines sit idle and conditions degrade. In addition, Virginia's per-acre bond pool fee was put in place in 1991 and has not been adjusted for inflation since, meaning that coal companies are now paying these fees at a real dollar value roughly 58% lower than they did when this rate was established.[3] Finally, Virginia eliminated new self-bonds in 2014, but 20 permits are still self-bonded.[4] According to data obtained from Virginia Energy in 2020, forfeiture of any one of the three most costly self-bonded mines would bankrupt the bond pool.[5]

Collectively, these stressors have put the state's coal mine bonding and reclamation program in dire straits, with a 2021 analysis estimating that existing bonds would cover only 39-47% of the total reclamation liability in the state.[6]

OPPORTUNITIES

If **reclamation bonds** were sufficient, Virginia Energy would have the necessary leverage to compel compliance with applicable standards and the agency would have access to adequate funds to complete reclamation of bond-forfeited mines. This would mitigate some of the worst impacts of flooding, put miners back to work performing reclamation, and improve the environment, one of Southwest Virginia's most important cultural and economic assets.

The **Joint Legislative Audit and Review Commission** could partner with Virginia Energy to assess reclamation costs for each mine based on current conditions. This study would provide Virginia Energy with the information needed to adjust required bond amounts and fully assess the sufficiency and funding needs of the bond pool.

To address bonding inadequacies, the bond pool system could be phased out, remaining self-bonds could be eliminated, and all coal mines in the state could be required to provide a full cost bond upon issuance of new permits and renewal of existing permits. If the bond pool remains in place, the bond pool cap could be eliminated, while per-acre fees could be raised to reflect decades of inflation, with these fees being hereafter pinned to the consumer price index.

After forfeiture has occurred on a surety-bonded mine, the insurer currently has an indefinite period to determine whether to reclaim the site itself or transfer the bonded amount to Virginia Energy to manage reclamation. A timeline of one year could be imposed on this process to expedite reclamation.

TOP TAKEAWAYS

Virginia has nearly 53,000 acres of land on current surface mine permits in need of reclamation. These mines harm the environment and threaten nearby residents by contributing to water pollution and exacerbating flooding.

Current coal mine bonding mechanisms are inadequate to secure the full cost of needed reclamation; an overhaul of this system could remedy ongoing problems.

Completing coal mine cleanup will improve health and safety for nearby communities, create jobs for miners, and enhance the environment of Southwest Virginia.

Abandoned coal mine
Photo courtesy of Appalachian Voices

Aurora in Clover Hollow–Giles County, VA. Photo contest winner of "Vistas & Landscapes" category
Photo by David Marting

GOOD GOVERNANCE

5

EQUITY, ACCESS, & ACCOUNTABILITY

RELEVANT PROGRAMS & AGENCIES

See full glossary starting on page 155

INTEGRATED RESOURCE PLAN (IRP)
A long-term planning document that regulated electric utilities—such as Dominion Energy Virginia and Appalachian Power Company (APCo)—must file with the SCC. It outlines how the utility plans to meet future electricity demand over a 15-year-plus horizon.

INVESTOR-OWNED UTILITY (IOU)
A private, for-profit company with a defined monopoly service territory that operates as an electrical utility. In Virginia, the two largest utilities–Dominion Energy and Appalachian Power–are investor-owned utilities.

STATE CORPORATION COMMISSION (SCC)
An independent department of state government with delegated administrative, legislative, and judicial powers. The Commission has regulatory authority over utilities, insurance, state-chartered financial institutions, securities, retail franchising, and railroads.

VIRGINIA COUNCIL ON ENVIRONMENTAL JUSTICE
An advisory council with members appointed by the governor that advises the governor on environmental justice and provides recommendations intended to protect vulnerable communities from disproportionate impacts of pollution.

VIRGINIA DEPARTMENT OF CONSERVATION & RECREATION (DCR)
A state agency within the Natural Resources secretariat tasked with protecting, managing, and overseeing natural habitat, state parks, open space, and access to the outdoors. Oversees private dam safety and administers the Virginia Agricultural Cost-Share and Community Flood Preparedness Fund.

VIRGINIA DEPARTMENT OF EDUCATION (DOE)
State agency that leads and facilitates the development and implementation of a quality public education system.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)
State agency responsible for administering laws and regulations related to air quality, water quality, water supply, renewable energy, and land protection. DEQ issues permits, conducts monitoring, performs inspections, and enforces environmental law.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT (DHCD)
A state agency that oversees policies, programs, and funding to support affordable housing, community development, and energy efficiency projects, contributing to the state's overall development and sustainability goals.

VIRGINIA ENERGY
State agency tasked with developing and advancing the plan for Virginia's energy, mining, and mineral policies and initiatives.

VIRGINIA ENVIRONMENTAL JUSTICE ACT (VEJA)
Virginia law established to promote the fair treatment and meaningful involvement of all people regardless of race, color, national origin, income, faith, or disability with respect to the development, implementation, and enforcement of environmental laws and policies.

VIRGINIA ENVIRONMENTAL LITERACY PLAN (VELP)
Provides a framework for integrating environmental education into the K-12 curriculum, emphasizing hands-on, outdoor learning experiences.

"Sitting By the Dock Near the Bay"–Rappahannock River
Photo by Mike Wells

ADVANCING ENVIRONMENTAL JUSTICE

EQUITY, ACCESS, & ACCOUNTABILITY

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WHY IT MATTERS

Throughout the United States, communities of color and lower-wealth communities continue to bear unfair burdens of pollution and other environmental harms while enjoying fewer environmental benefits.[1] In Virginia, this disparity can take many forms, including substandard wastewater infrastructure and septic systems, concentrations of industrial sources of air pollution, and a higher percentage of income devoted to home energy costs. The effects of climate change only exacerbate these imbalances, as extreme heat, more intense rainfall, and increased flooding also disproportionately affect people of color and of lower wealth.[2]

Addressing these inequities and ensuring all people have equal access to and influence over environmental decisions that affect them is at the heart of **environmental justice**. The **Virginia Environmental Justice Act** defines environmental justice as "the fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy."[3] While we cannot – and must not – erase the legacy of past injustices, we can right them by ensuring our future is one where all Virginians breathe clean air, drink clean water, and access clean and affordable energy.

CURRENT LANDSCAPE

Since the 2020 passage of the Virginia Environmental Justice Act, it has been the official policy of the Commonwealth to promote environmental justice and ensure it is carried out throughout the state.[4] The Act's express objectives are that no group of people bears a disproportionate share of any adverse environmental consequence and that affected residents can influence decisions about activities that affect their environment or health.

However, Virginia has taken halting steps in the intervening years to realize the Act's promise. In 2022, the **Virginia Department of Environmental Quality (DEQ)** took the positive step of launching **Virginia EJScreen+**, a web mapping application that provides public access to a range of community-specific demographic, health, and environmental data.[5] But other measures moved Virginia in the wrong direction. DEQ's 2023 draft guidance to outline how the agency would incorporate environmental justice into its permitting process fell well short of the Act's mandate and has never been finalized.[6] The General Assembly's removal of permitting authority from Virginia's citizen boards in 2022 eliminated an avenue for public involvement in the state's environmental decision-making.

More recently, on the federal level, the current presidential administration has revoked executive orders and guidance documents outlining the government's approach to achieving environmental justice,[7] eliminated programs and offices that addressed pollution in disadvantaged communities,[8] and taken steps to cancel congressionally appropriated funding for projects that support environmental justice communities, including in Virginia.[9] The federal government's abdication of its role in addressing environmental injustice presents a challenge for Virginia, but also an opportunity to lead on environmental justice.

OPPORTUNITIES

Because actions taken by state agencies can have an outsized effect on the health and well-being of environmental justice communities, prime opportunities for progress on environmental justice begin with state government.

State agencies whose actions affect the environment could develop and implement an official environmental justice policy to include procedures for identifying and engaging communities of color and lower-wealth communities in agency decision-making and for considering the effects the agency's activities may have on such communities. In particular, permitting agencies such as the DEQ could consult with affected community members early in the permitting process, and be empowered to deny a permit or require minimization of adverse impacts where issuance of the permit would cause disproportionate adverse impacts on a community of color or a lower-wealth community.

Virginia could also prioritize the appropriation and allocation of funds to support local efforts to address environmental challenges in overburdened communities. For example, Virginia could ensure that **Department of Housing and Community Development's Housing Innovations in Energy Efficiency (HIEE)** program[10] funding is expended, as intended, on energy efficiency upgrades in residents' homes; invest in technological solutions to the problem of fugitive coal dust escaping coal terminals and settling in adjacent neighborhoods; or devote funds to help lower-wealth residents make needed improvements to their septic systems (or, if necessary, to relocate to areas with adequate wastewater infrastructure).

Finally, the **Virginia Council on Environmental Justice** is pivotal in keeping the administration abreast of issues across Virginia and making recommendations on advancing environmental justice through agency actions. The Council is often the state entity most accessible to grassroots community members. An annual budget of $150,000 to increase the administrative support provided by the Secretary of Natural and Historic Resources would enable the Council to make site visits throughout Virginia and host four to six meetings per year to hear concerns directly from impacted communities; to research issues raised through testimony at these meetings; and to prepare the annual report to make recommendations to the governor.

Fully implementing the objectives of the Virginia Environmental Justice Act will have long-term, positive impacts for communities across every demographic.

TOP TAKEAWAYS

At the heart of environmental justice are efforts to address the historic pollution burden communities of color and lower-wealth communities face and to ensure members of these communities have influence over environmental decisions that affect them.

With the federal government abdicating its role in furthering environmental justice, Virginia has an opportunity to lead by promoting the fair treatment and meaningful involvement of all Virginians in environmental decision-making.

State agencies could develop procedures to incorporate environmental justice into permitting and other decision-making and could prioritize funding to address environmental challenges in overburdened communities.

Wild allium blooming non the York River
Photo by Katelyn Hellman

ENVIRONMENTAL LITERACY: BUILDING TOMORROW'S WORKFORCE

EQUITY, ACCESS, & ACCOUNTABILITY

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WHY IT MATTERS

Virginia's environmental challenges—from sea-level rise to water quality degradation—demand a workforce that is not only environmentally aware but also equipped with the skills to address complex, real-world problems. Environmental literacy prepares students to meet this demand by fostering the knowledge, competencies, and habits necessary to navigate and contribute to a rapidly changing world. As defined by the **Virginia Department of Education (VDOE)**, "Environmental Literacy is having the knowledge, skills, and dispositions to solve problems and resolve issues individually and collectively that sustain ecological, economic, and social stability."[1]

Environmental education is more than a requirement within the Virginia Standards of Learning (SOLs)—it is a strategic investment in the Commonwealth's economic future. Students who participate in high-quality environmental education experiences gain valuable workforce skills: critical thinking, problem-solving, effective communication, teamwork, and the ability to design local actions to improve community wellbeing.[2] These are foundational skills not only for green careers, such as renewable energy, sustainable agriculture, and natural resource management, but also for a wide range of professions essential to an efficient and sustainable economy in Virginia.

Employers in sectors like construction, healthcare, manufacturing, technology, and public administration increasingly seek employees who understand sustainability principles, can collaborate across disciplines, and are prepared to work in a resource-constrained, innovation-driven economy.[3] For example: construction and engineering professionals use environmental knowledge to design infrastructure that is resilient to climate risks; healthcare providers with an understanding of environmental impacts can better address issues like asthma, heat stress, and waterborne diseases; and policy-makers and business leaders rely on environmental literacy to make informed decisions that balance economic growth with regulatory compliance and environmental protection.

Investing in environmental education ensures that Virginia students, regardless of the careers they pursue, enter the workforce better equipped to think critically, act responsibly, and contribute meaningfully to both the economy and their communities.

CURRENT LANDSCAPE

Environmental literacy in Virginia is advanced primarily through SOLs and strengthened by community-based partnerships. VDOE mandates that environmental education be included in science instruction and encourages interdisciplinary approaches. Programs like **Virginia Naturally** and the **Virginia Environmental Literacy Plan (VELP)** promote **Meaningful Watershed Educational Experiences (MWEEs)**—hands-on, outdoor learning opportunities that build real-world knowledge and skills.

Despite these frameworks, implementation remains uneven across the Commonwealth. Many schools—especially those in under-resourced areas—lack the curriculum materials, funding, and teacher professional development opportunities needed to deliver high-quality environmental education. MWEEs are a critical component of environmental literacy, but these experiences are still not universally accessible to Virginia students, despite being a commitment of the Commonwealth under the Chesapeake Bay Agreement.[4]

State funding for environmental education remains limited. The **Virginia Department of Conservation and Recreation (DCR)** administers the **Virginia Watershed Education Program Fund**, which anticipates awarding $250,000 to schools and community partners to support programming during the 2025-2026 school year. However, the need far outpaces available resources—DCR reported receiving $1,052,061 in funding requests in 2025, demonstrating a substantial funding gap.[5]

Compounding the problem, federal support for environmental education has declined. From 2020 to 2024, Virginia received more than $2.8 million in funding through NOAA's **Bay Watershed Education and Training (B-WET) program,** plus an additional $1.2 million through multi-state B-WET awards.[6] These funds supported high-quality MWEEs through local partnerships. However, recent cuts to federal education and environmental programs—including B-WET—will leave significant gaps that the state must fill.

OPPORTUNITIES

Through the Chesapeake Bay Watershed Agreement, Virginia has committed to providing every student with at least three MWEEs during their K–12 education. Yet, the state invests just 30¢ per student, 89% less than Maryland ($2.78 per student) and 48% less than Pennsylvania (58¢ per student). With only $250,000 allocated annually, Virginia risks falling short of its commitment and leaving students behind.

This gap has widened with the recent loss of critical federal funding sources. Without these federal resources, state-level investment is more important than ever to maintain and expand access to hands-on learning experiences that foster environmental stewardship.

To meet the Commonwealth's commitments and ensure every student has access to high-quality environmental education, we recommend increasing the DCR Virginia Watershed Education Program Fund from $250,000 to $1.5 million annually (allocating $3 million across the biennium) to support and scale MWEE implementation statewide. This investment is not only essential for education, but also for building a skilled and competitive workforce.

TOP TAKEAWAYS

Environmental literacy is essential to preparing Virginia's students for careers in both environmental and non-environmental sectors.

As Virginia loses key federal funding sources like NOAA B-WET, state investments are more critical than ever. Virginia is at risk of falling behind neighboring states that are outpacing Virginia's investments in environmental literacy and workforce readiness.

Virginia is far behind other states in our region and leading states (nationally) on support for these critical environmental literacy programs.

Touching the ocean
Photo by Stephanie Cannizzaro

CURBING MONOPOLY ELECTRIC UTILITY POLITICAL INFLUENCE

EQUITY, ACCESS, & ACCOUNTABILITY

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WHY IT MATTERS

Virginia's largest **investor-owned utilities (IOUs), Dominion Energy** and **Appalachian Power**, have used their monopoly status and captive customer base to influence politics in favor of shareholder profits rather than the public interest. This political influence is enabled by Virginia's status as one of only five states in the country without overall campaign contribution limits or a limit or ban on corporate contributions, thus enabling IOUs to make unlimited political donations.[1] Additionally, Virginia's code lacks explicit restrictions to consistently track and prevent the use of rate-payer funds for lobbying, trade associations, and public relations.

From 2013 to 2023, Dominion Energy spent over $221 million to influence the political and regulatory landscape. This sum includes $25.3 million in direct political contributions, $39.8 million on institutional and goodwill advertising, and $155.9 million on industry association dues.[2,3]

Dominion and Appalachian Power also fund charitable foundations, issue advertising, and "grassroots" groups—like Power for Tomorrow and the Virginia Energy Reliability Alliance—to sway public opinion and influence regulators.[4]

These political expenditures have a real impact on Virginians, as they allow utility monopolies to exert significant influence over the laws and regulations that apply to them. For example, utilities pushed for a series of laws that prevented the State Corporation Commission from resetting electricity rates, allowing Dominion to overcharge ratepayers by an estimated $2.9 billion from 2009-2020.[5,6] The burden falls hardest on low-income, rural, and minority households, who spend a greater share of their income on disproportionately higher electricity bills.[7,8]

Without reform, utilities will continue to obstruct clean energy solutions and consumer protections while shaping laws in ways that entrench their monopoly power and maximize profits.

CURRENT LANDSCAPE

Virginia grants Dominion and Appalachian Power exclusive monopoly status, with rates and profits overseen by the General Assembly and the **State Corporation Commission (SCC)**. Despite SCC rulings determining utilities cannot charge customers for certain political expenditures and charitable contributions, several factors make preventing those charges difficult in practice.[9,10]

The ambiguous nature and limited scope of SCC rulings provide leeway for utilities to recover lobbying and promotional initiatives from ratepayers. As the Federal Energy Regulatory Commission notes, "the line between public outreach and educational expenses and lobbying expenses [...] has not been clearly delineated."[11] For example, the industry association Edison Electric Institute (EEI) spends almost 70% of its expenditures on broader political activities, including "legislative advocacy; legislative policy research; regulatory advocacy; regulatory policy research; advertising; marketing; [and] public relations," but utilities consider only 17% of their dues to EEI as political and unrecoverable under the Internal Revenue Code.[12] The remaining portion of the dues may be recovered. Dominion classified an average of $15 million per year from 2017 to 2024 of such dues as non-political.[13]

Utilities have consistently attempted to recover these expenses through improper reporting. In Dominion's last four rate cases, SCC auditors found nearly $10 million in miscategorized charges to customers.[14] This includes over $306,000 in 2023 for lobbying and charitable donations, $5.39 million in 2021 for lobbying expenses, $45,000 in 2015 for political purpose industry association dues, and $3.9 million in 2013 for advertising.[15,16,17,18]

Virginia has no laws explicitly preventing such charges, which means such rulings are enforced on a voluntary and inconsistent basis. Dominion's past attempts to improperly charge ratepayers were only found through exhaustive audits. Without express language in Virginia's code preventing the recovery of charitable and political expenses from ratepayers, the utility may attempt to pass on those costs every year.

OPPORTUNITIES

Virginia is one of only five states in the U.S. where utility monopolies can make unlimited political contributions due to the absence of either overall contribution limits or a corporate contribution ban.[19] Prohibiting political donations from publicly regulated monopolies—companies that serve captive customers and are subject to state oversight—could reduce conflicts of interest and help ensure that decision makers remain accountable to the public rather than to their utility donors.

Additionally, customers would benefit from fairer electricity rates if state law expressly prohibited utilities from recovering direct and indirect costs such as:

- Lobbying at the state or federal level
- Campaign donations or election-related activity
- Industry association dues (e.g., Edison Electric Institute, Virginia Chamber of Commerce)
- Charitable contributions made to gain political favor[20]
- Issue advertising and public relations campaigns

States like Colorado, Maine, and Connecticut have passed legislation explicitly barring utilities from recovering lobbying expenses through rates.[21]

Utilities also spend large sums of money in regulatory proceedings advocating for higher consumer electricity rates. While utilities can recover these rate case costs from customers, consumer advocates must utilize their own funds to challenge increases. Other states have sought to address this through legislation, such as a recently proposed bill in Maine that would cap the amount utilities can recover from ratepayers for legal and consulting fees during appeals for contested rate cases.[22]

Finally, transparency through itemized, public disclosures of all political, trade, and public relations expenditures, whether or not they are included in rate cases, would allow regulators to understand utility spending on political activity. If audited, publicly reported, and made searchable online, then watchdog groups, lawmakers, and the public would also be able to hold utilities accountable. Clear statutory definitions of "political activity" could help regulators enforce these rules effectively and consistently.

Together, these changes could create a regulatory and political environment more responsive to consumer needs, public health, and climate goals.

TOP TAKEAWAYS

Political campaign contributions from regulated utility monopolies create conflicts of interest in energy policymaking.

Dominion has repeatedly attempted to charge customers for political and promotional expenses—nearly $10 million across four rate cases.

Prohibiting utilities from recovering political, charitable, and advertising costs through customer rates could align Virginia with national best practices and protect captive ratepayers.

SHIFTING UTILITY INCENTIVES TO REDUCE COSTS

EQUITY, ACCESS, & ACCOUNTABILITY

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WHY IT MATTERS

Virginians are facing increasing energy costs, which disproportionately impact low-income households. The current regulatory system governing Virginia's **investor-owned utility monopolies (IOUs),** Dominion Energy and Appalachian Power Company, lacks incentives for utilities to control spending, lower customer energy bills, and minimize environmental harm.

The profits of utility monopolies are entirely composed of their return on capital investments. In such a regulatory structure, the more utilities spend on capital-intensive projects, the more profit shareholders can earn.[1] This incentivizes utilities to address increasing load growth (*see Data Center Energy Demand, page 95*) through expensive investments, including continued reliance on costly and high-risk fossil fuel generation. This approach discourages equally effective and lower-cost alternatives such as solar plus storage, energy efficiency, **demand response**, customer-owned energy, technologies to maximize existing infrastructure, and buying cheaper energy through **power purchase agreements (PPAs)**.

Simultaneously, the current planning process is not an effective tool for maximizing least-cost solutions. The last three Dominion **Integrated Resource Plans or IRPs** (2018, 2020, and 2023) have been rejected by the **State Corporation Commission (SCC)** or by the assigned SCC hearing examiner.[2] Although the 2024 IRP was deemed "legally sufficient," the SCC directed critical improvements. Improvements,[3] however, will not be submitted until 2026. Thus, the utility will continue selecting resources under a flawed plan. Appalachian Power Company is not required to file an IRP.

Finally, utilities can recover many costs through **"rate adjustment clauses" (RACs)** or riders. Unlike other cost recovery mechanisms, riders permit a utility to adjust customer rates to recover exactly the amount it spent, even if it exceeds projected costs, without impacting shareholder profits, thereby transferring investment risk to customers.[4,5] Notwithstanding expert advice against the widespread use of riders, more than 71% of utility costs are eligible for rider treatment.[6,7] The extensive use of this mechanism in Virginia is unparalleled in other states.[8]

Overall, the current regulatory framework reduces incentives to control ratepayer and environmental costs by externalizing them onto customers.

CURRENT LANDSCAPE

Virginia has taken steps toward joining more than 20 other states actively exploring tools to reform the regulatory structure governing IOUs. In 2023 and 2024, the General Assembly passed two bipartisan initiatives for the SCC and **Virginia Energy** to study **performance-based regulation (PBR)**. Reforms under the PBR umbrella aim to incentivize cost containment and reward utilities for good performance, rather than exclusively rewarding them based on the size of their capital investments.

The 2023 legislation established an SCC proceeding to implement "performance-based adjustments," also known as **"performance incentive mechanisms" (PIMs)**.[9] PIMs reward or penalize utilities based on their performance in achieving specific target outcomes. The SCC's draft regulations resulting from this proceeding include metrics to help establish these targets in areas such as distributed energy resource interconnection times, peak load reductions, and savings from **demand-side management (DSM)** programs.[10] However, the impact of PIMs would be minimal if the monetary compensation for improving specific metrics is eclipsed by the financial compensation received by maximizing capital investments. In this case, PIMs alone would not alter utility incentives to reduce costs and improve performance.

The 2024 legislation established a study process in which the SCC, Virginia Energy, and stakeholders would evaluate further potential reforms to align the current financial incentives of IOUs with state policy goals. The stakeholder report recommended several areas for further analysis, including:[11]

- An examination of the use of riders, assessing the costs and benefits to ratepayers.
- An evaluation of alternative cost recovery mechanisms, such as multi-year rate plans that more fairly balance risk between shareholders and customers.
- A study of mechanisms that could improve utility spending and performance, such as fuel-cost sharing and expanded use of PIMs.
- An assessment of the current regulatory structure's alignment or misalignment with clean energy and energy efficiency goals.

OPPORTUNITIES

In addition to systemic reforms, other opportunities exist to strengthen utility incentives to decrease costs. For example, improving IOUs' resource planning process is essential during a period when Virginia utilities are experiencing unprecedented load growth. Ensuring large utilities adopt a least-cost, least-regrets plan that is trusted by stakeholders and decision-makers is a step toward meeting energy needs affordably.

In addition, expanding competitive procurement standards would allow all least-cost resources to compete fairly against proposed fossil fuel facilities. Currently, utilities must use competitive solicitations to select clean energy resources. However, when they propose new fossil fuel infrastructure, there is no requirement for a competitive solicitation to compare the proposed facility with a clean alternative or combination of alternatives that could offer the same services at a lower ratepayer and environmental cost.

Finally, third-party-owned utility-scale projects are another low-cost opportunity that may currently be underused. PPA costs for utility-scale solar have dramatically declined nationwide. However, current law caps PPAs at 35% of utilities' solar energy investments.[12] Thus, utilities limit their use of qualified third-party-owned projects, even when they would be cheaper than utility-owned projects that provide investors with a return. Utilities should be encouraged to consider all qualified and cost-competitive PPAs to reduce energy infrastructure costs.

TOP TAKEAWAYS

Current utility incentives are counterproductive to meeting energy demand affordably and achieving the state's clean energy goals. The current system shifts economic and environmental risk to ratepayers.

Virginia has just begun a process to evaluate and design a different regulatory framework that could enhance cost-containment incentives and reward utilities for performance rather than for the magnitude of their capital investments.

Other utility business reforms, such as expanding the cap on PPAs and expanding competitive procurement processes, could also better align incentives with the state's energy goals and decrease customer costs.

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GLOSSARY

TERMS & DEFINITIONS: A – C

Accessory Dwelling Unit (ADU): A smaller, independent residential dwelling unit located on the same lot as a stand-alone (i.e., detached) single-family home.

Acid mine drainage: The buildup and outflow of highly acidic water, often rich in heavy metals, from mining sites occurring when rainwater or groundwater comes into contact with rocks containing sulfur-bearing minerals leading to the production of sulfuric acid and the leaking of toxic metals..

Agricultural best management practices (BMPs): A science-backed set of conservation practices and/or structures that farmers can use to reduce the amount of nonpoint source pollution, like fertilizer, animal waste, and washed away soils, reaching waterways.

Agricultural Land Easement Program: A Farm Bill program administered by NRCS that provides funding to help landowners permanently protect cropland and grasslands on working farms and ranches.

Agricultural Needs Assessment: A systematic review process that identifies specific needs of farmers and/or rural communities to improve agricultural practices and livelihoods. Virginia started meeting the VACS program needs assessment in 2022.

Agrivoltaics: Ground-mounted solar facilities where agricultural activities such as animal grazing, foraging, or crop production are simultaneously taking place alongside clean energy generation. Also referred to as agrisolar or dual-use solar.

All-terrain tracker: Solar panel mounting technology that eliminates the need for land grading and allows a large scale solar facility to adapt to an area's natural landscape.

Allowance: A limited authorization for a power plant owner to emit a certain amount of greenhouse gases. These allowances are available for purchase through auctions run through the Regional Greenhouse Gas Initiative.

American Chemistry Council (ACC): The lobbying organization for the petrochemical industry in the United States. Some ACC member organizations include ExxonMobil, DuPont, Chevron Phillips Chemical Company LLC, Shell Chemical LLC, and the Dow Chemical Company.

Anadromous: Fish that primarily live in saltwater but migrate to freshwater to spawn.

Appalachian Power Compaby (ApCo): A utility provider in Virginia, West Virginia, and Tennessee that supplies electricity to customers.

Aquatic Wildlife Conservation Center (AWCC): Actively recovers Virginia's freshwater mussels under the Virginia Department of Wildlife Resources.

Atlantic States Marine Fisheries Commission (ASMFC): Commission that coordinates and manages fishery resources including marine (saltwater) fish, shellfish, and anadromous fish along the Atlantic coast of the United States.

Automated speed enforcement (ASE): Cameras that detect speeding cars and issue a civil fine for exceeding 10mph over the posted limit. Currently only authorized in school and work zones in Virginia.

Battery Energy Storage System (BESS): A group of batteries that stores energy when it's abundant (often from renewable sources) and releases it when needed, such as during peak demand or power outages.

Bay Watershed Education and Training Program (B-WET): Program administered through the National Oceanic and Atmospheric Administration that provides funding for locally relevant environmental education for K-12 audiences.

Beverage container deposit program: Adds a small refundable deposit to the purchase of beverages in containers. The goal of these programs is to encourage consumers to return their containers for recycling or refilling instead of throwing them away or littering. Also known as a "bottle bill" or "recycling fund.".

Bicyclist Safety Yield: Allows bicyclists to treat stop signs as yield signs. These laws allow bicyclists to mitigate risk to their advantage.

Biosolid: Organic matter recycled from treated sewage sludge, oftern applied to land as fertilizer.

Bioswale: Vegetated, shallow depressions designed to capture polluted runoff from impervious surfaces, allowing pollutants and sediment to settle out while allowing water to soak into the ground, replenishing groundwater.

Blast or evacuation zone: Area that persons would need to move beyond in order to avoid risk of a burn injury in the event of a pipeline explosion.

Blue catfish: An invasive freshwater species of fish introduced to Virginia's tidal river systems of the Chesapeake Bay.

Brownfield: Abandoned or unused commercial or industrial site that might be contaminated by hazardous substances, pollutants, or contaminants that pose public health and environmental risk.

Brownfield and Coal Mine Renewable Energy Grant Fund and Program: Administered by Virginia Energy for the purpose of awarding grants to renewable energy projects that are located on brownfields or previously coal-mined lands.

Bubble curtains: An underwater noise mitigation system in offshore wind construction that uses compressed air bubbles rising from seabed pipes to scatter and absorb piledriving sound waves and protect marine life

Buidling Resilient Infrastructure and Communities Program (BRIC): A FEMA pre-disaster hazard mitigation grant program, providing supports states, local communities, tribes, and territories in reducing risks from natural hazards through mitigation projects.

Bulkheads: Artificial vertical shore protection structures installed to withstand the forces of waves or currents.

Bycatch: Discarded catch of marine species and unobserved mortality due to a direct encounter with fishing vessels and gear.

Carve-out: A specific exclusion or exception in a broader policy framework that allows certain conditions or situations to be treated differently from the general rules.

Chemical Recycling: Also known as "advanced recycling" or "chemical conversion", a broad term encompassing a variety of failed and experimental processes where plastic is incinerated in an oxygen-free environment to render a raw material to create fossil fuel.

Chesapeake Bay Watershed Implementation Plan (WIP): Provides scientific and technical guidance on the Chesapeake Bay Program on measures to restore and protect the Chesapeake Bay. Works to enhance scientific communication and outreach through reports, discussion groups, reviews, and workshops.

Circular economy: Aims to minimize waste and pollution by keeping resources in use for as long as possible, rather than the linear model of extract, produce, and discard.

Clean Car Standards: A set of regulations to reduce transportation pollution and greenhouse gas emissions. This program requires automakers to provide an increasing amount of EVs each year to states with Clean Car Standards. States can only adopt federal regulation of clean car standards, but cannot make their own standards.

Clean Water Act: The primary federal law governing water pollution established regulations on pollutant discharges into bodies of water and regulated water quality standards. The CWA recognizes both federal and state roles in its implementation and enforcement.

GLOSSARY

Coastal Resilience Master Plan: A plan that seeks to acknowledge the consequences of climate change, identify and address socioeconomic inequities, work to enhance coastal adaptation and protection efforts, protect and enhance natural infrastructure, utilize community and regional scale planning, and focus on the most cost-effective solutions. The overall goal is to protect Virginia's highly vulnerable coastline communities from sea level rise and natural disasters.

Coastal Virginia Offshore Wind (CVOW): Offshore wind project being constructed by Dominion Energy about 27 miles offshore of Virginia Beach. When completed in 2026, it will have a total capacity of 2.6 GW.

Coliform bacteria: A strain of bacteria that is used in testing to signify the likelihood of other bacterial contaminants that would render food or water unsafe for consumption.

Combined sewer overflow (CSO): An antiquated system where rainwater runoff, domestic sewage, and industrial wastewater are combined and routinely overflow into nearby bodies of water. These systems can cause beach closures, algae growth, and reduced oxygen levels in waterways.

Commonwealth Mass Transit Fund (CMTF): State fund dedicated to the operational and capital needs of Virginia's public transit services.

Community solar: A program that allows multiple individuals or businesses to subscribe to a share of a single solar array, enabling them to receive the benefits of a solar project without needing to install solar panels on their own property. Also referred to as shared solar.

Community benefit Agreement (CBA): Legally binding contracts between coalitions of community-based organizations and developers that shape how local development projects will contribute to improving the quality of life of nearby residents.

Community Flood Preparedness Fund (CFPF): State-sponsored grant fund that provides financial assistance to localities to reduce the impacts of flooding within Virginia. High emphasis on projects that align with local, state, and federal floodplain management standards and plans. The only statewide source of funding for flood resilience capacity building and studies, as well as project implementation. Revenue derived from Virginia's participation in the Regional Greenhouse Gas Initiative.

Conservation easement: A binding legal agreement that limits or removes the right to development in order to protect identified conservation values on a property. The easement is tied to the land title and exists in perpetuity, even if the land is later sold to a new owner.

Construction stormwater general permit: Construction projects resulting in at least one acre of land disturbance must apply for this state permit to mitigate stormwater runoff at the construction site.

Data center: Industrial facility housing computers and networking equipment that store, process, and distribute large amounts of digital information and require massive amounts of energy, land, and water to operate.

Decarbonization: The process of reducing carbon emissions by improving energy efficiency, electrifying appliances, and integrating renewable energy sources.

Demand response program: A program in which electricity consumers temporarily reduce their power usage in response to price signals or incentives, helping to balance supply and demand on the power grid. Demand response is an important source of flexibility for managing the stability and reliability of electricity grids.

Demand-side management: A set of utility strategies for controlling electricity demand. It encourages customers to reduce their electricity use, either during peak hours or their overall use. It can offer significant benefits for customers, including increasing grid reliability, lowering bills, and avoiding costly new generation.

Designated uses: These are defined in the water quality standards regulation as uses that must be protected in all state waters and include recreation and the propagation and growth of a balanced indigenous population of aquatic life. Designated uses that apply to particular waterbodies include public water supplies.

Distributed energy resource (DER): A variety of technologies that produce 5 MW or less of energy near the point of use. DERs include rooftop, commercial, and community/shared solar, as well as smaller batteries and demand response programs.

Dominion Energy: Energy company that provides electricity and natural gas to customers in the US, and operates increasing renewable energy plants.

Dual-use agricultural facilities: Structures that serve agricultural and non-agricultural purposes that can support multi-functionality, sustainability, and economic viability. For example, farms that incorporate renewable energy systems, such as solar panels.

Ecological forest cores: Areas within forests that have high levels of biodiversity and ecological cohesion, that serve as critical habitats and play a vital role in ecosystem functions. These biodiversity hotspots are a priority in conservation efforts.

Effective load carrying capacity (EPCC): A metric used to evaluate the reliable capacity contribution of a resource to the electricity grid.

Electric vehicles (EVs): Vehicles powered entirely or partially by electricity. Battery electric vehicles (BEVs) operate using electric motors and rechargeable batteries, producing zero tailpipe emissions. Plug-in hybrid electric vehicles (PHEVs) combine an electric motor with a gasoline engine.

Emerging pollutants: Chemical and biological agents whose presence and effects in aquatic systems are more recently understood and of growing concern because of the inability of the traditional wastewater plants systems to remove them.

Energy corridor: Designated areas for the placement of energy infrastructure such as transmission lines, pipelines, or power cables. Energy corridors help organize development, reduce environmental impact, and streamline permitting.

Energy efficiency: The practice of using less energy to perform the same function, thereby reducing energy waste and lowering costs while achieving the same level of energy service without the need for new power generation.

Energy Efficiency Resource Standard (EERS): A component of the Virginia Clean Economy Act which establishes specific, long-term targets for energy savings that utilities must meet through customer energy efficiency programs.

Energy storage: Any technology that captures energy produced at one time and makes it available for use at a later time. It comes in many forms–most commonly batteries, but also pumped hydro, compressed air, flywheels, and thermal storage. Some types of energy storage can hold energy for relatively short amounts of time (a few hours), while others can hold energy for days, weeks, or even seasons.

Energy-insecure: Inability to adequately meet basic household energy needs. Households who forgo or reduce basic necessities to pay their energy bill, who receive a disconnection notice, who keep their home at an unsafe or unhealthy temperature, or who are unable to use heating or cooling equipment are considered energy insecure.

Enhanced Nutrient Removal Program: This program incorporates technologies that allow sewage treatment plants to provide a highly

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advanced level of nutrient pollution removal by building on previously set biological nutrient removal (BNR) systems.

Environmental justice: The fair treatment, meaningful involvement, and remediation of environmental harms for every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy.

Environmental justice community: Specific population or neighborhood that is disproportionately impacted by environmental hazards, pollution, and/or climate change. These communities are at a higher risk of experiencing adverse health outcomes.

Environmental Protection Agency: A federal agency that safeguards public health and the environment through laws, programs, and research.

Equity: The quality of justice, impartiality, and fairness within the procedures, processes, and distribution of resources by institutions or systems. Avoid confusing equity and equality, as equity refers to fairness and justice while equality refers to 'sameness.'

Erosion and Sediment Control (ESC): Practices and techniques used to prevent or minimize soil erosion and the movement of sediment off construction sites and other disturbed areas. These measures are crucial for protecting water quality, preventing damage to infrastructure, and minimizing environmental impact.

EV rate design: Refers to electric utility rate structures tailored to support electric vehicle charging and adoption. These often include time-of-use (TOU) pricing that offers lower rates during off-peak hours to encourage grid-friendly charging behavior.

Extended producer responsibility: A policy that holds manufacturers and importers responsible for a product's entire lifecycle, including its packaging, composition of recycled content, disposal, and waste management after it is no longer useful to consumers.

Federal Emergency Management Agency (FEMA): A federal agency with the goal of coordinating disaster response and recovery efforts at the federal level. They provide assistance and resources to individuals, communities, and governments in time of crisis like hurricanes, floods, wildfires, and earthquakes.

Fee acquisition: A land conservation mechanism where the landowner donates or sells their land and all associated rights to a conservation organization or public agency..

Fracked-gas pipeline: Pipelines that are responsible for transporting natural gas that is extracted using hydraulic fracturing (fracking) methods.

Full-cost bond: A reclamation bond that applies to a specific mining permit, which corresponds to a specific geographic area. The bond may be a third-party bond provided by an independent company, a deposit of money held by a bank, or a combination of the two.

Gold-pyrite belt: A nine- to sixteen-mile wide, nearly 140-mile-long northeast trending mineral deposit that extends from Fairfax County to Halifax County.

Grading disturbance: Disruptions in the natural grading or contour of land, caused by natural events or human activities, that can impact drainage, erosion, and vegetation.

Greenhouse gas emissions: Greenhouse gas emissions are gases released by human activities, such as burning fossil fuels, that trap heat in the atmosphere and contribute to global climate change.

Grid resilience: The ability of an electrical grid to withstand and recover from major power disruptions, ensuring continuous power supply.

Groundwater: Water that collects in subsoil aquifers as rain or surface water permeates the soil. Groundwater serves as a predominant source of water for wells.

Grid-scale batteries: Batteries with at least 1 MW of energy storage capacity that are mostly owned by electric utilities or independent power producers to provide grid services.

Habitat connectivity: The ability for wildlife to move between significant patches of habitat; crucial for sustaining wildlife and ecosystems.

Harmful algal bloom (HAB): Overgrowth of toxin-producing algae that increases toxicity of water and leads to illness of humans and animals. Algae blooms frequently result from excessive nutrient pollutants such as nitrogen and phosphorus.

Heat island: Highly urbanized community containing a high level of brick, cement, and asphalt. These materials absorb the sun's heat, and cause temperatures within city structures to be 1-7 degrees higher than compared in a rural area.

Historic Preservation Fund: A National Park Service program that provides financial assistance to State Historic Preservation Offices and underwrites grant programs to support the preservation of historic buildings, sites, districts, and objects.

Historic Rehabilitation Tax Credit (HRTC): A state tax credit program administered by Department of Historic Resources that incentivizes property owners to rehabilitate historic structures.

Home Efficiency Rebates: Two residential energy efficiency programs for single and multi-family homes funded through the IRA and managed by Virginia Energy. Home Efficiency Rebates will provide up to $8,000 per household to support energy retrofit projects resulting in at least 15% energy savings. High Efficiency and Appliance Rebates will provide up to $14,000 per household in up-front rebates to support households in purchasing certain types of high efficiency electric appliances.

Housing Innovations in Energy Efficiency fund (HIEE): Designated to support energy efficiency improvements to reduce energy bills in low-income housing through the Virginia Department of Housing and Community Development. Funded exclusively by the Regional Greenhouse Gas Initiative (RGGI).

Impervious surface: Impenetrable surfaces, often made of asphalt or concrete, prevent water from naturally filtering into soils and groundwater and increase stormwater runoff.

Inflation Reduction Act (IRA): Aims to curb inflation by reducing the federal government budget deficit, lowering prescription drug prices, and investing in domestic energy production while promoting clean energy.

Integrated Resource Plan (IRP): A long-term planning document that regulated electric utilities—such as Dominion Energy Virginia and Appalachian Power Company (APCo)—must file with the SCC. It outlines how the utility plans to meet future electricity demand over a 15-year-plus horizon.

Intergovernmental Panel on Climate Change (IPCC): An international panel of scientists under the United Nations who construct Assessment Reports about the state of scientific, technical, and socio-economic knowledge on climate change, its impacts and future risks, and options for reducing the rate at which climate change is taking place.

Invasive species: With regard to a particular ecosystem, a non-native organism whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health.

Investor-owned utility (IOU): A private, for-profit company with a defined monopoly service territory that operates as an electrical utility. In Virginia, the two largest utilities–Dominion Energy and Appalachian Power–are investor-owned utilities.

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TERMS & DEFINITIONS: J – N

Joint Legislative Audit & Review Commission (JLARC): A legislative agency that conducts program evaluation, policy analysis, and oversight of state agencies on behalf of the Virginia General Assembly.

Karst: An environmentally sensitive landscape underlain by limestone that has been eroded by the dissolving of bedrock, producing ridges, towers, fissures, sinkholes, and interconnected caves. Karst provides habitat for rare animal and plant species, and many private and public water supplies in Virginia are sourced from karst groundwater.

Land and Water Conservation Fund (LWCF): A federal program that provides competitive grants to increase public access to and protection for federal public lands and waters — including national parks, forests, wildlife refuges and recreation areas. It also provides matching grants to states and local communities for the acquisition and development of public parks and other outdoor recreation sites.

Land conservation: to permanently protect land and any unique features or characteristics it may have from being changed by developing that land for a different use. Land conservation is the tool used to help ensure working farms and forests, unique historical sites, and rare habitat remain part of the landscape rather than being transformed into housing subdivisions, industrial warehouses, or highways.

Land Preservation Tax Credit (LPTC): A program that encourages voluntary private land conservation by providing tax credits equal to 40% of the value of donated land or conservation easements. Virginia Department of Conservation and Recreation is responsible for verifying the conservation value of LPTC donations.

Land trust: A community-based non-profit organization that works to permanently protect land through fee acquisition or conservation easements. They often also manage and restore lands they own and may provide technical assistance to landowners to implement conservation practices and steward their land according to conservation values..

Landfill leachate: a liquid that forms when water filters through a landfill, picking up contaminants from the decomposing waste. This contaminated liquid can pose a serious threat to groundwater and surface water if not properly managed. It contains a mix of organic and inorganic compounds, heavy metals, and even pathogens.

Linear economy: An economic system where resources are extracted, transformed into products, consumed, and then discarded as waste.

Living Shoreline: A shoreline management practice that provides erosion control and water quality benefits; protects, restores, or enhances shoreline habitat; and maintains coastal processes through the strategic placement of plants, stone, sand fill, and other structural and organic materials.

Long-duration energy storage (LDES): Systems that can store a significant amount of energy and release it over extended periods, typically 10+ hours.

Low-impact development (LID): managing stormwater in a way that mimics natural hydrological processes, reducing runoff, and improving water quality. Site-specific practices include rain gardens and permeable pavement.

Low-income: A classification for households or individuals who earn less than a specific threshold, often making them eligible for various forms of assistance and support due to financial constraints.

Low-Income Home Energy Assistance Program (LIHEAP): Provides federally-funded heating and cooling assistance, weatherization, and minor energy-related home repairs to about 6.7 million households nationwide.

Managed charging: Methods that optimize EV charging to benefit both the driver and the grid—ranging from passive user-scheduled off-peak charging to active utility-controlled charging that responds to real-time grid conditions. It can even extend to hyper-local orchestration (like WeaveGrid's DISCO) to avoid overloading neighborhood transformers.

Maximum contaminant level (MCL): The maximum amount of a given concentration of a contaminant legally allowable in drinking water, set by the EPA.

Meaningful Watershed Education Experience (MWEE): Learner-centered framework that focuses on investigations into local environmental issues and leads to informed action. MWEEs are made up of multiple components that include learning both outdoors and in the classroom and are designed to increase environmental literacy by actively engaging students in building knowledge and meaning through hands-on experiences.

Megawatt (MW): A unit of power equal to one million watts often used as a measure of the capacity output of a power station.

Migratory corridors: Designated pathways used during seasonal migrations. These corridors are often considered in environmental planning to avoid harmful disruptions during development.

Mountain Valley Pipeline (MVP): A multi-billion dollar natural gas pipeline project that cuts through 303 miles of mountains, rivers, and farmlands from northwestern West Virginia to southern Virginia to transport fossil fuel across state borders. It has received over 500 water quality protection violations and was subject to a safety order from the Pipeline and Hazardous Materials Safety Administration.

Mountain Valley Pipeline Southgate Extension (MVP SE): Newly-redesigned, proposed 31-mile, 30-inch diameter pipeline routed to start in Pittsylvania, Va. at the terminus of the MVP mainline, and travel into Rockingham, N.C.

Multi-use trail: A trail physically separated from motor vehicle traffic designed for use by pedestrians, cyclists, and other non-motorized users. Multi-use trails are typically paved and have low grades to make them accessible to a wide variety of users.

Municipal Separate Storm Sewer System (MS4): Large drainage system designed to carry stormwater runoff in urban and suburban areas directly to nearby bodies of water. Virginia's largest localities must be permitted for these systems.

Narrative and numeric criteria: Statements or quantitative measures that describe the desired goals for conditions of quality in waterbodies.

National Oceanic and Atmospheric Administration Fisheries (NOAA): Responsible for managing U.S. marine resources, including the protection of endangered species, issuing permits for offshore work, and enforcing the Marine Mammal Protection Act and Endangered Species Act.

Natural Resource Conservation Service: An agency within the USDA that conducts research and provides technical and financial assistance to landowners to protect and conserve privately owned natural resources. NRCS programs focus on supporting soil health, water quality, and thriving agricultural communities.

Nature-based solution: An approach that reduces the impacts of flood and storm events through the use of environmental processes and natural systems. A nature-based solution often provides additional benefits beyond flood control, including recreational opportunities and improved water quality.

Neighborhood traffic programs: Virginia Department of Transportation program that neighborhoods, acting through their local governing bodies, may use to address certain traffic problems on their local streets. They include "Through Truck Restrictions," "Watch for Chil-

dren" signs, "Additional $200 Fine" signs, the "Traffic Calming" program, "Residential Cut-Thru Traffic Program" and the "Person with Disability Area" signs.

Net-metering (behind-the-meter): A metering and billing agreement that allows customers to interconnect approved renewable generation systems to the electric grid and provide electricity to their own residence or business facility. The agreement credits solar energy system owners for the electricity they add to the grid.

Non-point source pollution (NPS): Pollution from land runoff, precipitation, drainage, seepage, or hydrological modification. NPS pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources.

Nutrient pollution: Pollution caused by excess nutrients, mainly nitrogen and phosphorus, which can cause abnormal effects, such as overgrowth of algae.

Odorant: Chemical additive added to fracked gas to add an artificial smell to gas. As methane gas is odorless, odorant is used as a safety precaution to help detect leaks in homes.

Office of Commonwealth Resilience: Coordinate and plans across multiple state agencies to protect communities from disaster and extreme weather impacts through all regions of the Commonwealth under the Secretary of Natural and Historic Resources.

Office of Working Lands Preservation: This DOF office advances the protection of working farms and forests in Virginia by providing technical and financial assistance to landowners interested in protecting their land, working with localities to develop PDR programs and policies to protect working lands, and educating the public on the importance of working lands conservation.

Offshore wind (OSW): Energy derived from winds at sea moving windmills, which is then transformed into electricity and supplied to the electrical grid onshore.

Pellets: Pre-production plastic pellets, also known as nurdles, are small, pre-formed plastic resin particles, typically 1-5 mm in diameter, used as raw materials for manufacturing plastic products

Pennsylvania-New Jersey-Maryland Interconnection (PJM): Regional transmission organization that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia, including Virginia.

Per- and polyfluoroalkyl substances (PFAS): Also known as "forever chemicals", PFAS are a group of thousands of chemicals used to make fluoropolymer coatings and products that resist heat, oil, stains, grease, and water. PFAS do not break down in nature because of their strong chemical bonds. PFAS have been found in the blood of humans and animals. Studies show PFAS may cause a variety of health effects, including cancer, thyroid disease, liver damage, reduced immune response, and impacts on pregnancy.

Performance incentive mechanism (PIM): Metric, target, and/or financial incentive designed to improve utility performance in targeted areas.

Permit by rule (PBR): Process used by DEQ to enable the construction and operation of renewable energy projects.

Planned obsolescence: Is a purposeful strategy to ensure the current version of a product will become out of date or useless within a known time period.

Plastic-to-fuel technologies: A process also referred to as "chemical conversion", "chemical recycling" or "advanced recycling" in which plastics are superheated to chemically convert them to fuels. Chemical conversion is a high-cost, energy-intensive, and risky process that releases over half of plastic materials' carbon content as greenhouse gasses along with toxic materials. Rather than reducing plastic waste, this process allows the plastic industry to continually create more plastic and release more greenhouse gasses.

Plasticizers: Substances added to materials like concrete and plastic to increase durability and flexibility. It can be found in a wide variety of products like medical devices, personal care items, and toys.

Pool bond: A bonding mechanism wherein coal companies provide financial securities assessed to cover only a fraction of the cost of reclamation of a specific mining permit. These securities are regarded as a single collective fund by Virginia Energy, and the agency may draw down that fund as necessary to pay for the reclamation of any pool-bonded mines for which the permit is revoked.

Potomac aquifer: The largest and deepest aquifer in eastern Virginia and its primary groundwater supply.

Power Innovation Fund: A fund created in 2023 to be used for the purposes of research & development of innovative energy technologies, including nuclear, hydrogen, carbon capture and utilization, and energy storage.

Power Purchase Agreement (PPA): A long-term contract in which a third-party electricity provider installs, owns, and operates an energy system on a customer's property. The customer then purchases the system's electricity for a predetermined price. A PPA allows the customer to receive stable and often low-cost electricity with no upfront costs.

Protected Species Observers (PSOs): Specialists trained to monitor and mitigate impacts on marine wildlife (like whales, dolphins, and sea turtles) during offshore industrial activities. PSOs ensure compliance with environmental regulations and may call for work stoppages if protected species are detected nearby.

Public Service Districts (PSDs): Created by local governments to provide specialized services, like water, sewer, or transportation, to a specific geographic area within a locality, or across multiple localities. They are designed to offer services that are more complete, timely, or additional to those provided to the locality as a whole.

Purchase of Development Rights (PDR) program: A landowner sells their development rights to a state agency, locality, or non-profit land trust. PDR programs function very similarly to conservation easements but do not involve entering into a voluntary legal agreement.

Rate Adjustment Clause (RAC): A specialized rate mechanisms that allow utilities to recover specific costs outside of their general base rates, also known as "riders".

Ratepayer: A person who pays for a public utility, like electricity or gas, based on consumption.

Reclamation: All clean-up and remediation activities required at coal mines, including regrading and revegetating the land, addressing sources of water pollution, and removing any roads, sediment structures, coal loading facilities, or other auxiliary infrastructure.

Reclamation bond: A financial security or assurance provided by a coal company that Virginia Energy can seize to pay for reclamation of a given mining permit if the coal company fails to do so itself in a proper and timely manner, resulting in that permit being revoked.

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Recreational Trails Program (RTP): A federal program that allocates funding to states for construction, restoration, and maintenance of paved and unpaved recreational trails and trail-related facilities. Virginia awards these funds through a competitive grant program.

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TERMS & DEFINITIONS: R – T

Regional Greenhouse Gas Initiative (RGGI): A cooperative plan among twelve Northeast and Mid-Atlantic States to reduce power sector carbon emissions by requiring power plants to purchase allowances for their greenhouse gas emissions. The proceeds from allowances are being used to create more energy-efficient, affordable housing units, help low-income families reduce energy bills, and enhance community flood prevention and protection.

Renewable Portfolio Standard (RPS): Standard established by the Virginia Clean Economy Act that sets annual requirements for the generation of renewable energy in a utility's service territory.

Resilience: In the context of climate change, resilience means the capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats. The first step towards resilience is understanding the infrastructure's vulnerability to climate change.

Resilient Virginia Revolving Loan Fund (RVRF): Provides financial assistance to localities for projects that mitigate flood impacts to private properties through low- to no-interest loans. Projects can include hazard mitigation of buildings, locality-operated loan programs, and relocation. Primarily a loan program with limited grant funds; revenue comes from the Federal Emergency Management Agency, Regional Greenhouse Gas Initiative, and General Fund.

Riprap Revetments: A shoreline or streambank stabilization method using a layer of large stones (riprap) to protect against erosion caused by water flow, waves, or currents. These structures are typically built on a sloping surface and are designed to absorb and dissipate the energy of the water, preventing the underlying soil from being washed away.

Sackett v. EPA: 2023 US Supreme Court decision removing federal protections from vast swaths of the nation's wetlands.

Sediment pollution: Excessive amounts of soil particles and other debris in waterbodies, resulting in cloudiness, unnatural colors, and deposits on bottom surfaces negatively affecting recreational activities, aquatic habitats, and wildlife species.

Self-bond: Reclamation bond that lacks any financial guarantee from a third party or real-value collateral, but consists only of the word of the coal company.

Shoreline Erosion Advisory Service (SEAS): Department of Conservation and Recreation program that assists private landowners and localities in Virginia to complete site investigations, written reports, design and permit reviews, construction inspection, and more.

Small Modular Nuclear Reactor (SMR): Nuclear reactor designs that are smaller than conventional nuclear power plants, and are designed to be more modular and standardized in design. SMRs have been used successfully on aircraft carriers, but the commercial viability of this technology for utility-scale power generation is not yet established with no operational facilities in the United States.

SMART SCALE: Virginia's nationally-recognized transportation funding prioritization process that evaluates and ranks proposed projects based on key factors to help determine which ones should be funded. Projects are evaluated on anticipated benefits such as safety, reduced congestion, accessibility, economic development, efficient land use, and environmental impact.

Soil & Water Conservation Districts (SWCDs): Political subdivisions of the state of Virginia. The 47 Soil and Water Conservation Districts manage the Virginia Agricultural Cost-Share program, employ technical staff and deliver conservation technical assistance to landowners and farmers free of charge.

Solar for All: $7 billion initiative by the U.S. Environmental Protection Agency to provide solar energy to low-income and disadvantaged communities.

Solar ordinance: Local regulation that outlines the provisions of an acceptable application by a solar developer regarding the construction, operation and decommissioning of a solar power generating project.

State Air Pollution Control Board: Citizen board authorized to make regulations for the control and abatement of air pollution throughout the Commonwealth.

State Bicycle Safety Plan: Ensures bicyclists are an integral component of Virginia's multimodal transportation system and provides bicycle policy recommendations that will guide the planning, design, construction, operation, and maintenance of bicycle accommodations. Developed by the Virginia Department of Transportation.

State Corporation Commission (SCC): An independent department of state government with delegated administrative, legislative, and judicial powers. The Commission has regulatory authority over utilities, insurance, state-chartered financial institutions, securities, retail franchising and railroads.

State Trails Office: A state office within the Virginia Department of Transportation responsible for developing the Statewide Trails Plan, coordinating with other relevant agencies and stakeholders, conducting public outreach, and maintaining a trail resource hub.

Statewide Trails Plan: Developed by the Office of Trails to create a comprehensive network of regional multi-use trails that encompasses an inventory of existing and proposed trails, identifies key gaps in the network, outlines development steps and best practices, and seeks to offer opportunities for community engagement and visioning.

Stormwater: Rainwater or melted snow that runs off surfaces, collecting debris and pollutants. With more intense and frequent storm events due to climate change, there is a higher risk of pollution and debris from these surfaces ending up in local waterways

Stormwater Local Assistance Fund (SLAF): A 50-50 state and local matching grant program that protects and improves the health of our waterways by funding local stormwater resiliency projects.

Sunset clause: A provision in a law that sets an expiration date unless further legislative action is taken.

Surface water: Water that collects in above ground basins (e.g., reservoirs, streams, etc.). Surface water is often drawn to supply public drinking water supplies, and can permeate the soil to become groundwater.

Technical Wetlands Work Group: A team of state and federal experts who work together to improve how wetlands are studied, monitored, and managed to help protect them better.

Tidal Marsh Inventory: A detailed map made by the Virginia Institute of Marine Science that shows where tidal marshes are, how big they are, and what they're like.

Traffic calming: A collection of infrastructure tools to reduce speeding and to increase compliance with speed limits and other traffic direction built into the roadway rather than relying on voluntary compliance and police enforcement.

Transforming Rail in Virginia Program (TRVA): A multi-corridor, multi-year, multi-phase passenger rail development program that includes capital projects and new services; it will ultimately provide five more new round-trip Amtrak Regional trains, extension of service from Roanoke to Christiansburg, and ten more Virginia Railway Express (VRE) trains as well as the addition of weekend service.

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TERMS & DEFINITIONS: T – V

Transit Ridership Incentive Program (TRIP): A state-level program that provides funding to transit agencies for the purpose of supporting the deployment of zero-fare and/or reduced-fare pilot programs to support low-income communities. These programs will aim at increasing a system's ridership and accessibility.

Transit-oriented development (TOD): A type of urban development that maximizes the amount of residential, business, and leisure space within walking distance of public transportation.

Transmission line: Conductors designed to carry electricity over large distances in a way that minimizes energy losses.

Transportation Alternatives Program: A federal reimbursement program administered by Virginia Department of Transportation that provides funding for design, planning, and construction of paved and unpaved trails to provide increased non-motorized travel route options. It also supports trail improvements.

Tree canopy: A measurement that encompasses the layer of leaves, branches, and stems of trees that shelter the ground when viewed from above. This measurement is expressed as a percentage of ground area that is covered by tree crowns and relates to the branching spread of the trees in an urban forest.

Tree lawns: The area between the street and sidewalk; an area 6' in width provides adequate soil volume for larger canopy trees.

Tree wells: Designated areas along streets where trees are allowed to be planted and don't interfere with utilities, also called "tree pits".

Turbidity: A measure of the amount of particles, such as sediment, plankton, or other organic matter, that are present in water. One source of turbidity is suspended solids, which are fine particles of sediment that remain in the water column of a waterbody.

U.S. Fish and Wildlife Services (USFWS): Federal agency with the primary responsibility of conservation and management of fish, wildlife, plants and their habitats for the US population

Urban and Community Forestry Program (UCF): A federal program dedicated to supporting the planting, protection, maintenance, and utilization of trees and forests in urban and community settings.

Utility-scale solar: A large-scale solar facility, over 5 MW, that generates renewable energy and feeds it into the grid.

Vehicle miles traveled: The total number of miles traveled by vehicles within a certain area (e.g., statewide, locality, particular highway) in a certain time period.

Vehicle-to-grid: Refers to the coordinated charging—or discharging—of electric vehicles (EVs) using technologies, policies, and strategies that alter when, how much, or where EVs charge or export power, all to benefit the electrical grid while still meeting drivers' transportation needs.

Virginia Agricultural Cost-Share Program (VACS): A state-funded program that offers financial incentives and technical assistance to farmers to adopt agricultural best management practices that reduce pollution reaching waterways while enhancing farm productivity.

Virginia Battlefield Preservation Fund (VBPF): A state-funded competitive grant program run by the Department of Historic Resources to purchase land or conservation easements on Virginia battlefields from the Revolutionary War, War of 1812, and Civil War.

Virginia Black, Indigenous, and People of Color (BIPOC) Historic Preservation Fund: A state-funded competitive grant program run by the Department of Historic Resources to support the acquisition, protection, and rehabilitation of historic and archaeological sites of significance for Virginia's BIPOC communities.

Virginia Clean Economy Act (VCEA): Virginia law outlining a clear path to achieving a zero-carbon energy future by mandating the retirement of fossil fuel electricity generators, sets renewable energy standards through wind and solar power, and sets energy efficiency standards. The VCEA also establishes a renewable energy portfolio standard (RPS), which mandates that the two major utilities in the state, Dominion Energy and Appalachian Power Company, produce 100 percent clean energy by 2045 and 2050, respectively.

Virginia Conservation Assistance Program (VCAP): Cost-share program providing assistance as well as financial incentives to urban landowners installing Best Management Practices (BMPs) on their property. Eligible practices include the removal of impervious surfaces, rainwater harvesting, and other efforts to mitigate the effects of erosion and stormwater runoff.

Virginia Council on Environmental Justice: An advisory council with members appointed by the governor that advises the governor on environmental justice and provides recommendations intended to protect vulnerable communities from disproportionate impacts of pollution.

Virginia Department of Conservation & Recreation (DCR): A state agency within the Natural Resources secretariat tasked with protecting, managing, and overseeing natural habitat, state parks, open space, and access to the outdoors. Oversees private dam safety and administers the Virginia Agricultural Cost-Share and Community Flood Preparedness Fund.

Virginia Department of Education (DOE): State agency that leads and facilitates the development and implementation of a quality public education system.

Virginia Department of Environmental Quality (DEQ): State agency responsible for administering laws and regulations related to air quality, water quality, water supply, renewable energy, and land protection. DEQ issues permits, conducts monitoring, performs inspections, and enforces environmental law.

Virginia Department of Forestry (VOF): A state agency within the Natural Resources secretariat tasked with developing and protecting healthy, sustainable forest resources. It provides technical and financial assistance to landowners and localities to manage their forests for timber, water quality, or wildlife habitat, and protects forested lands.

Virginia Department of Health (VDH): State agency that oversees public health throughout the state, including the regulation of public drinking water.

Virginia Department of Histroic Resources (DHR): A state agency within the Natural Resources secretariat tasked with fostering, encouraging, and supporting the stewardship and use of Virginia's significant architectural, archaeological, and historic resources.

Virginia Department of Housing and Community Development (DHCD): A state agency that oversees policies, programs, and funding to support affordable housing, community development, and energy efficiency projects, contributing to the state's overall development and sustainability goals.

Virginia Department of Rail and Public Transportation (DRPT): A state agency responsible for planning, coordinating, and funding a variety of public transportation and rail initiatives in Virginia.

Virginia Department of Transportation (VDOT): State agency responsible for building, maintaining, and operating the state's roads, bridges, and tunnels.

GLOSSARY

Virginia Department of Wildlife Resources (DWR): Agency responsible for the management of inland fisheries, wildlife, and recreational boating for the Commonwealth of Virginia.

Virginia EJScreen+: A web mapping application administered by the Virginia Department of Environmental Quality that provides access to community-specific demographic, health, and environmental data.

Virginia Energy: State agency tasked with developing and advancing the plan for Virginia's energy, mining, and mineral policies and initiatives.

Virginia Environmental Justice Act (VEJA): Virginia law established to promote the fair treatment and meaningful involvement of all people regardless of race, color, national origin, income, faith, or disability with respect to the development, implementation, and enforcement of environmental laws and policies.

Virginia Environmental Literacy Plan (VELP): Provides a framework for integrating environmental education into the K-12 curriculum, emphasizing hands-on, outdoor learning experiences.

Virginia Get Outdoors Fund (GO Fund): A competitive grant program administered by Virginia Outdoor Foundation that provides funding to localities and community organizations for projects that increase access to the outdoors in Virginia's communities, especially those that are underserved. This program is currently suspended due to lack of funding.

Virginia Household Water Quality Program (VAHWQP): A voluntary testing program for households served by private water supplies; led by the Virginia Cooperative Extension and Virginia Tech.

Virginia Institute of Marine Science (VIMS): A marine research and education center that operates as a branch of the College of William and Mary. VIMS has a legal mandate to provide research, education, and advisory services to government, citizens, and industry.

Virginia Invasive Species Management Plan (VISMP): Provides an overview of invasive species that threaten Virginia's natural and agricultural resources, state agency responsibilities, and goals shared by the many stakeholders who are part of the Virginia Invasive Species Working Group.

Virginia Invasive Species Working Group: A group addressing the invasive species that threaten the Commonwealth through cooperation and coordination of government agencies, the business community, conservation organizations, and public citizens.

Virginia Land Conservation Foundation (VLCF): A state-funded competitive grant program run by DCR to protect farmland, forestland, natural areas, open space and parks, and areas of historic and cultural importance in Virginia. State agencies, localities, non-profits, and tribes are eligible to apply for funding.

Virginia Litter Tax: Virginia manufacturers, wholesalers, distributors, and retailers of frequently-littered products are subject to the litter tax. The fee is intended to fund litter reduction education and cleanups.

Virginia Marine Resources Commission (VMRC): State agency in charge of overseeing Virginia's marine and aquatic resources, and its tidal waters and homelands. One of the primary functions of VMRC is to zone water areas for recreation, oyster and clamming grounds, and commercial/recreational fishing.

Virginia Naturally Schools (VAN): The official environmental education school recognition program administered by Virginia Department of Wildlife Resources. The program recognizes schools' efforts to increase students' environmental literacy.

Virginia Outdoors Foundation (VOF): An entity created and funded by the General Assembly to work with landowners, conservation organizations, and localities to protect farms, forests, parks, and historic landscapes. VOF is the legal holder of many conservation easements in Virginia, meaning they are responsible for ensuring the terms of the easement are adhered to.

Virginia Outdoors Plan (VOP): Virginia's comprehensive blueprint for land conservation, outdoor recreation, and open-space planning.

Virginia Passenger Rail Authority (VPRA): Promotes, sustains, and expands the availability of passenger and commuter rail service in the Commonwealth and increases ridership of such service by connecting population centers with passenger and commuter rail service.

Virginia Pollutant Discharge Elimination System (VPDES): Program administered by the Department of Environmental Quality (DEQ) designed to prevent pollutants from getting into state waters. DEQ issues permits for all point source discharges; stormwater discharges from Municipal Separate Stormwater Sewer Systems (MS4s); and stormwater discharges from industrial sites.

Virginia Pollution Abatement (VPA): Permit regulation to protect water quality and human health through the treatment, storage and land application of biosolids (treated sewage sludge), municipal wastewater, industrial wastes, and animal wastes.

Virginia Preservation Trust Fund (PTF): A grant program run by Virginia Outdoors Foundation that provides income-based cost-share assistance grants to landowners placing their land under a conservation easement and provides competitive matching grants to permanently protect, through acquisition or easement, open space for farming, forestry, recreation, wildlife, or water quality. These grants prioritize projects that enhance public access to the outdoors.

Virginia Safe Routes to School program: Helps schools and communities make walking and biking to school a safe, convenient, natural activity.

Virginia State Rail Plan: A long-term strategy guiding the development in Virginia's rail network to meet the needs of the people.

Virginia Trees for Clean Water Grant Program: Funds tree-planting and tree giveaways to reestablish lost canopy, improve water quality, and educate communities.

Virginia Water Protection Permit Program (VWP): A permit program and an associated compliance program that regulates impacts to surface waters, surface water withdrawals, and non-agricultural impoundments. Virginia law requires a VWP permit must be obtained before disturbing a wetland or stream.

Virginia Watershed Educational Program grant fund: Funds school environmental education programs, managed by the Virginia Department of Conservation & Recreation.

Virginia Wetland Program Plan: A roadmap that lays out how the state plans to protect, restore, and manage its wetlands to keep them healthy and meet environmental regulations.

Virginia Working Lands Fund: A state-funded competitive grant program run by the Office of Working Lands Preservation within the Department of Forestry (DOF) to help landowners place working farm and forest lands under easement. This program is also known as the Virginia Farmland and Forestland Preservation Fund.

Virginia's Coastal Zone Management Program: A state program that works to protect the coast and help coastal communities by coordinating projects, funding, and policies for sustainable use of coastal areas.

GLOSSARY

Virginia Solar Mitigation Program: Establishes standards for mitigation when a solar project under 150 MW causes significant impacts to agricultural and forest lands.

Virtual power plant (VPP): A network of small-scale energy resources that work together to balance energy supply and demand on a large scale. VPPs can be made up of hundreds or thousands of households and businesses, including their thermostats, electric vehicles, appliances, batteries, and solar arrays.

Wastewater: Liquid waste or sewage that originates from households, industrial and commercial sites, and agricultural operations.

Wastewater treatment plants (WWTPs): Facilities designed to remove contaminants from sewage and industrial wastewater, producing treated effluent that is returned to the environment and solid waste (sludge, biosolids) for disposal or other uses.

Water Quality Improvement Fund (WQIF): Fund that directs Virginia Department of Environmental Quality to assist local government and individuals in reducing point source nutrient loads to the Chesapeake Bay.

Water quality standards (WQS): A regulatory condition administered by the DEQ that identifies the designated use for water bodies and establishes standards to protect state waters. Water bodies are then categorized as either "supporting" their designated use or "impaired", generally based on pollutants present in the water body.

Watershed: The area of land that "sheds" precipitation to a creek, river, or waterbody.

Watershed Implementation Plan (WIP): A plan identifying the practices that will be used to achieve the pollution reduction goals of a particular water body or watershed.

Weatherization: The practice of protecting buildings from the elements (e.g., wind, rain) and improving energy efficiency by sealing leaks and adding insulation, which reduces energy consumption and enhances comfort.

Weatherization Deferral Repair (WDR):Makes repairs on houses so that they can be approved for the federal Weatherization Assistance Program (WAP). WDR is funded exclusively by RGGI.

Wetland: A swamp, marsh, and other area saturated by surface or groundwater. Wetlands reduce storm surges and absorb rainfall, reducing flood risk, and also regulate water quality, trap carbon, and provide habitat for wildlife.

Wetland Condition Assessment Tool (WetCAT): WetCAT is an online mapping tool used by the DEQ to evaluate and visualize the condition, ecological value, and potential stressors of wetlands to support environmental planning and conservation efforts.

Wetlands Policy Task Force: A state-established group formed to assess and enhance policies for protecting, restoring, and creating tidal and nontidal wetlands, aiming to integrate these strategies into broader state plans like the Virginia Flood Protection and Coastal Resilience Master Plans.

Wildlife Biodiversity Resilience Corridor: Priority landscapes identified in the Wildlife Corridor Action Plan where protecting and restoring habitat connectivity will most effectively support species movement, climate adaptation, and long-term ecosystem resilience.

Wildlife Corridor Action Plan (WCAP): Plan to identify and protect wildlife corridors in Virginia, helping both people and wildlife move more safely.

Wildlife crossing: Infrastructure that provides safe road crossings for wildlife. Crossings can take the form of overpasses, underpasses, culverts, and fencing.

Working lands: Working farms and forests, collectively known as working lands, are lands actively used to produce food, fiber, materials, and fuel products like timber, food, tobacco, cotton, biofuels, animal feed, wool, hemp, and much more.

VCN NETWORK PARTNERS

BALD EAGLE

CARDINAL

- Alliance for the Shenandoah Valley
- Appalachian Citizens' Law Center
- Casa
- Climate Cabinet Education
- Community Climate Collaborative
- Environment Virginia
- Friends of the Rappahannock
- Garden Club of Virginia
- Generation180
- James River Garden Club
- Land Savers United
- Lynnhaven River Now
- Mothers Out Front
- Natural Resources Defense Council
- New Virginia Majority
- Potomac Conservancy
- Potomac Riverkeeper Network
- Powered By Facts
- Shenandoah National Park Trust
- Shenandoah Valley Conservancy
- The Conservation Fund
- The Nature Conservancy in Virginia
- Virginia Interfaith Power & Light
- Wetlands Watch

TIGER SWALLOWTAIL BUTTERFLY

- Allegheny-Blue Ridge Alliance
- Appalachian Voices
- Bike Walk Rva
- Blue Green Alliance
- Blue Ridge Prism
- Capital Region Land Conservancy
- Capital Trees
- Center for Progressive Reform
- Chesapeake Climate Action Network
- Clean Fairfax Council
- Coalition for Smarter Growth
- East Coast Greenway Alliance
- Edith J. Carrier Arboretum at James Madison University
- Fairfax County Park Foundation
- Faith Alliance for Climate Solutions
- Friends of the Lower Appomattox River
- Indigenous Conservation Council
- Keep Virginia Beautiful
- Loudoun Wildlife Conservancy
- Nature Forward
- New River Land Trust
- Northern Virginia Bird Alliance
- Oceana
- Partnership for Smarter Growth
- Preservation Virginia
- Rockbridge Conservation
- Rva Rapid Transit
- Shenandoah Valley Bicycle Coalition
- Solar United Neighbors
- Southwings
- Spotswood Garden Club
- Trust for Public Land
- Unitarian Universalist Church of Roanoke
- Uva School of Law, Environmental, and Regulatory Law Clinic
- Virginia Association for Biological Farming
- Virginia Association for Parks
- Virginia Association of Soil & Water Conservation Districts
- Virginia Capital Trail Foundation
- Virginia Clinicians for Climate Action
- Virginia Native Plant Society
- Virginia Organizing
- Virginia Wilderness Committee
- Virginia's United Land Trusts
- Virginians for High Speed Rail
- Waterkeepers Chesapeake
- Wild Virginia
- Wildlands Network

DOGWOOD

- Back Bay Restoration Foundation
- Black Family Land Trust
- Boxwood Garden Club
- Bus Riders of Roanoke Advocacy Group
- Clean Virginia Waterways
- Climate Action Alliance of the Valley
- Concerned Citizens of Charles City County
- Drive Electric RVA
- Ecoaction Arlington
- Elders Climate Action- VA Chapter
- Friends of Accotink Creek
- Friends of Buckingham
- Friends of Dyke Marsh
- Friends of the Dahlgren Railroad Heritage Trail
- Friends of the Rivers of Virginia
- Garden Club of Norfolk
- Garden Club of the Middle Peninsula
- Greater Richmond Fit4Kids
- Groundwork RVA
- Henrico Conservation Action Network
- Hunting Creek Garden Club
- Lake Anna Civic Association
- Loudoun Climate Project
- Mattaponi & Pamunkey Rivers Association
- Mill Mountain Garden Club
- Nelson County Garden Club
- New River Valley Bicycle Association
- Northern Virginia Families for Safe Streets
- Rail Solution
- Rappahannock League for Environmental Protection
- Rappahannock Valley Garden Club
- Rivanna Conservation Alliance
- RVA YIMBY
- Shenandoah Green
- Sierra Club-Coastal Virginia Group
- Sierra Club-Falls Of The James Group
- Sierra Club-Great Falls Group
- Sierra Club-Piedmont Group
- Sierra Club-Potomac Region Outings
- Sierra Club-Potomac River Group
- Sierra Club-Rappahannock Group
- Sierra Club-Roanoke Group
- Sierra Club-Shenandoah Group
- Sierra Club-York River Group
- Southside Releaf
- Sustainable Mobility for Arlington County
- The Clinch Coalition
- Trailhead Collective
- Tree Fredericksburg
- Virginia Bicycling Federation
- Virginia Council of Trout Unlimited
- Virginia Green Travel Alliance
- Virginia Society of Ornithology
- Virginia Transit Association
- Virginia Saltwater Sportfishing Association
- Washington Area Bicycle Association
- Winchester-Clarke Garden Club
- Yimby Hampton Roads
- Yimbys of Northern Virginia
- York River Stewards

SUPPORT VIRGINIA CONSERVATION NETWORK:

VIRGINIA'S POWERFUL, DIVERSE, & HIGHLY COORDINATED CONSERVATION MOVEMENT

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