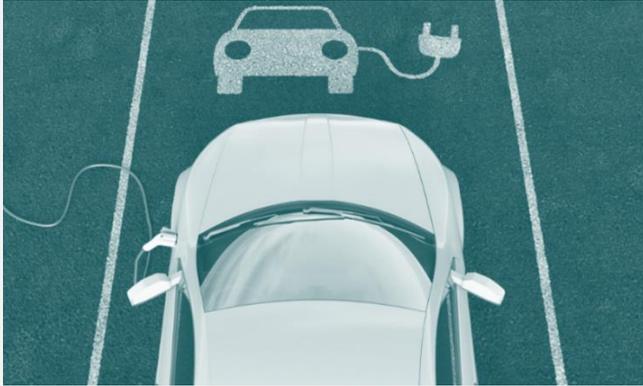


Virginia EV Policy Landscape

Going Electric in the Old Dominion



December 2020

Overview

As Virginia continues to drive toward an electrified transportation future, which policies, strategies, and partners can help it succeed? The Virginia EV Policy Landscape outlines how the state can move forward to achieve a more robust EV future. The Electrification Coalition (EC) developed this document to guide the work of the EC State EV Policy Accelerator over the next year, and it features our assessment of the policy opportunities, pathways, messaging, and key players that will be most effective in achieving progress in the near term. It reflects input from a wide range of on-the-ground stakeholders and builds upon the insights of previous roadmaps and guidance documents, including those developed by the EC. It reviews transportation’s current impacts to public health, safety, and the economy. From the collection of policy opportunities we examine here, the EC has identified a set of high-impact areas of engagement where we will dedicate our resources in partnership with other players. Our goal: Electrify the Old Dominion.

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Virginia Context for EV Policy Action

Virginia has already taken steps to support an electrified transportation future, with coordinated action by the state government, local governments, the private sector, utilities, non-governmental organizations, and other stakeholders. Key policy opportunities in the next couple of years include decisions in utility rate cases that impact EVs, decisions on additional allocations of the \$90 million awarded to Virginia in VW Settlement funds, and legislative decisions on incentives and building codes.

Virginia created a [State Energy Plan in 2018](#) with a goal of making the state the energy capital of the East Coast. EV-related priorities include adoption of the Advanced Clean Car Program (LEV/ZEV/Section 177), establishment of an EV Action Plan with charging goals by 2021, and promotion of EV fleets (and joint procurement) for state agencies. Public support for addressing climate change has moved in favor of mitigating climate impacts. In March 2020, the Virginia Senate passed SB 851, the Virginia Clean Economy Act, which established 100% clean power by 2045. The state created an early [Electric Vehicle Plan in 2010](#).

Governor Ralph Northam has supported electrification, prioritizing public health and social equity related to air quality impacts on minorities and low-income populations. Primary efforts include developing charging infrastructure and port electrification (including trucks and off-road equipment). Dominion Power is investing in school districts' procurement of electric school buses (Fig. 1). There is some buy-in on fleet

About the State EV Policy Accelerator and the Electrification Coalition

The Electrification Coalition (EC) launched the State EV Policy Accelerator in early 2020, with the goal of advancing state policies to drive widespread transportation electrification. Working with leaders across the government, private-sector and advocacy community, the EC will lead deep-dive policy action in the five priority states of Michigan, Nevada, North Carolina, Pennsylvania, and Virginia from 2020 through 2022. This work will include detailed market assessments, policy blueprints, resource toolkits, and customized bootcamps, alongside targeted implementation programs for bus electrification, fleet transitions, and other local programs to prove out electrification on the ground. In addition, the EC provides rapid response support for states across the country, in the form of targeted analysis, media and communications support, testimony, and policy comments.

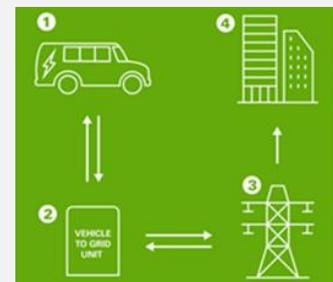
The EC is a nonpartisan nonprofit organization that promotes policies and actions to facilitate widespread deployment and adoption of plug-in electric vehicles (EVs) to overcome the national security and economic challenges created by America's dependence on oil.

"Commercially produced electric vehicles (EV) are a reality in Virginia today, and Virginia is well-positioned physically and economically to be a leader in electric vehicles. Embracing electric vehicle use in Virginia will assist statewide efforts to reduce vehicle emissions, increase energy independence, and generate positive economic development for the Commonwealth."

– Virginia Get Ready:
Initial Electric Vehicle Plan

Figure 1. Dominion Power Electric School Bus Program

Dominion Power is financing the added costs to school districts to purchase electric school buses and charging infrastructure. When not in use, they can be tapped as an energy resource through vehicle-to-grid technology to provide grid stability or as mobile power stations during a blackout.



"We're working to reduce the number of diesel school buses on Virginia's roads by helping school districts to replace them with cleaner, more efficient electric buses. The first 50 buses roll out in 2020, and in their first year will prevent almost 3 million pounds of carbon emissions."

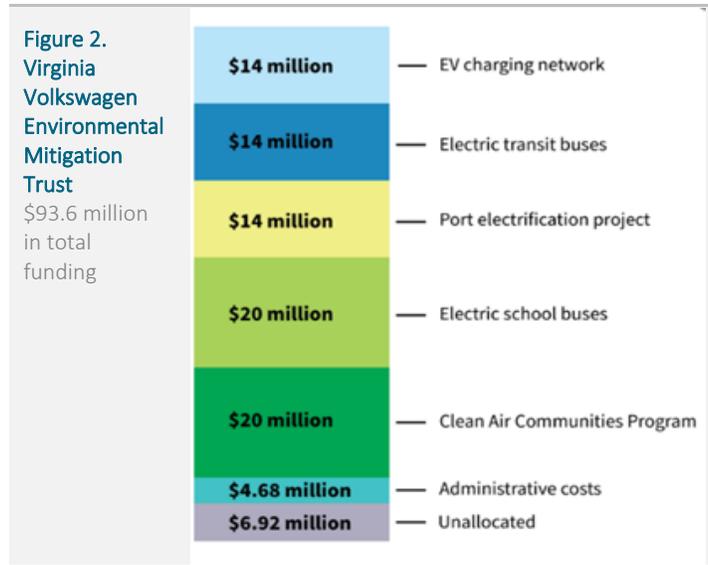
– Dominion Power

Source: <https://www.dominionenergy.com/electricschoolbus>

electrification by local governments, but efforts could be more coordinated. State policies to date include tax reductions for heavy-duty EVs¹² and the ability for non-utilities to be charging providers.³ New proposals are expected in the next legislative session.

To date, VW settlement funds have been allocated to charging, transit buses, school buses, port electrification, and the Clean Air Communities Program (Fig. 2).

EV market potential in Virginia is quite good because of a number of factors, including high household incomes, strong availability of charging infrastructure, a dramatic shift toward renewable energy, and concerns about climate change.



The Case for EVs in Virginia

Drivers for EV policy action in Virginia include the desire to reduce greenhouse gas emissions; the need to reduce levels of air pollutants, such as particulate matter (from diesel vehicles) and nitrogen oxides, which adversely impact public health, especially in disadvantaged communities; the economic development benefits associated with transportation electrification; and concerns over the adverse energy security impacts associated with oil dependency.

Jobs and Economic Development

A growing electric transportation industry can increase gross state product, employment, real household income, and state revenue.

Virginia’s economy already benefits from the electric vehicle value chain, and the state is poised to grow its EV industry (Fig. 3). Virginia is home to the largest Volvo Truck assembly plant in the world, several Tier 1 manufacturing operations, and the headquarters of Volkswagen of America. Volvo Trucks will manufacture its Class 8 battery-electric tractor in Virginia. Virginia’s knowledge base is supported by cutting-edge research at the second-largest university-level transportation institute in the U.S.⁴

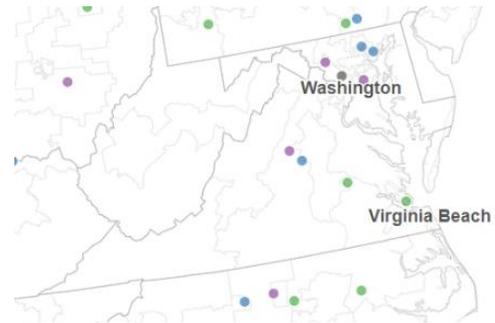


Figure 3. EV supply chain facilities in Virginia

Companies already involved in the [EV supply chain](#) include those focused on charging stations, batteries and their components, motors, and other automotive inputs (see “Key Players” section below for a detailed list). These companies design vehicles, deploy electric vehicles, and convert conventional vehicles to plug-in hybrids

² <https://afdc.energy.gov/laws/11631>

³ <https://afdc.energy.gov/laws/11767>

⁴ Virginia Economic Development Partnership (<https://www.vedp.org/industry/automotive>)

and battery electric vehicles. Northern Virginia is included within the 70-mile radius of the federally funded Washington, D.C., region of the ChargePoint America Program.⁵

Economic development benefits beyond the supply chain extend into growth in electricity generation and distribution, grid and infrastructure investments, sales of vehicles, and associated advertising and marketing services.

Many regional analyses identify growth of the electric transportation sector. A recent analysis of [clean vehicle jobs](#) found that Virginia is in the top 10 states of clean energy employment overall (with Richmond a top metro area), with 5,245 clean vehicle jobs (electric vehicles, hydrogen, plug-ins, fuel cell, and natural gas). Automotive companies employ over 21,500 people, and the total auto sector represents 2.8% of the state’s workforce – about 145,000 workers, including in automotive manufacturing, sales, repairs, rental, and maintenance.

“Virginia’s 179 automotive companies employ over 21,500 people in Virginia, and its top-ranked educational institutions offer world-class engineering programs that are training the workforce of the future to provide a pipeline of skilled workers to the automotive industry.”

– Virginia Economic Development Partnership

The potential avoided social cost of carbon between 2020-2060 is an incredible \$60 billion, and spending on oil is roughly \$11-12 billion per year.

Greenhouse Gas Emission Reductions

The transportation sector is the largest contributor to Virginia’s GHG profile at nearly 48% (Fig. 4), totaling 48 Mt CO₂ per year. This makes aggressive transportation electrification one of the most powerful opportunities to reduce the state’s GHG emissions. Such a transition would save 625 Mt of cumulative CO₂ emissions (Fig. 5).

Climate change impacts to Virginia include sea level rise, stronger storm surges, increased hurricane frequency and intensity, and coastal flooding. Recent frequent flooding in the Hampton Roads area is a local reminder of these threats.

Figure 4. Transportation is Virginia’s largest GHG emitting sector

Percent of GHG emissions by sector. Source: Energy Information Administration, [Table 4](#)

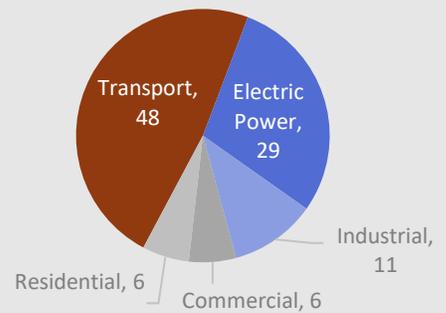
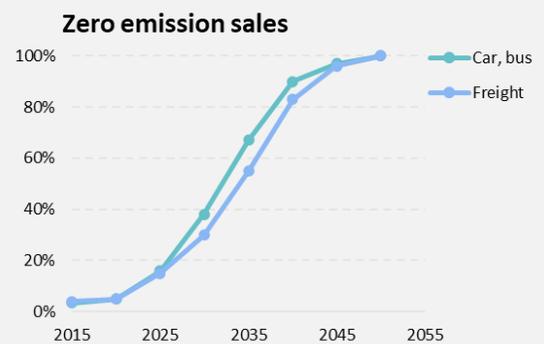
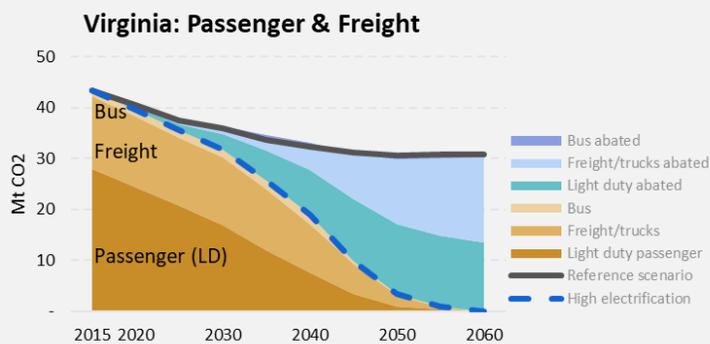


Figure 5. GHG reductions possible with aggressive electrification

Mt CO₂ reductions: About 31 Mt/year avoided in 2060; cumulative CO₂ saved from 2020-2060 is 625 Mt. Source: Hovland Consulting estimated, with inputs from IEA Energy Technology Pathways & other sources.



⁵ Virginia Get Ready: Initial Electric Vehicle Plan. October 13, 2010. Virginia Clean Cities

Air Quality, Public Health, and Social Equity

Health and environmental justice are top-line concerns in Virginia. Transportation is a major source of harmful air pollutants, particularly in high-density areas, because internal combustion engine (ICE) vehicles produce many types of air pollution. Transportation-related pollutants include particulate matter (PM_{2.5} and PM₁₀), carbon monoxide (CO), volatile organic compounds, and nitrogen oxides (NO_x), all of which negatively impact health. Under the Clean Air Act, the U.S. EPA sets limits on the levels of these “criteria pollutants” through the National Ambient Air Quality Standards.

Globally, PM_{2.5} from fossil fuel emissions is responsible for nearly [9 million premature deaths per year](#), amounting to nearly one in five deaths worldwide. Air pollutants from transportation are linked to health impacts including asthma, heart attacks, stunted lung development, reduced lung capacity, triggering reactions to allergens, chronic pulmonary disease, heart disease, and cancer.⁶

Air quality is critical to addressing health inequity, as pollutant exposure disproportionately affects Black, Latinx, Indigenous, and low-income communities. In Virginia these populations are significant: 39% of residents are people of color,⁷ and while 10% of all Virginia residents are below the poverty line, 16% of Black and 13% of Hispanic residents are below the poverty line.⁸ Recent studies suggest that higher exposure to PM_{2.5} increases COVID-19 mortality rate.

In Virginia, 2.4 million people live in areas with air quality non-attainment (high criteria emissions). The Virginia Beach-Norfolk area is of particular concern, with at least 22,000 deaths every year due to on-road air pollution.⁹ Virginia child and adult asthma cases are estimated at 8.5% of the population (more than 560,000 people).¹⁰

Battery electric vehicles (BEVs) and plug-in hybrid vehicles in electric drive have zero tailpipe emissions, thus drastically improving ambient air quality and health outcomes. A [study by the Denver Colorado Department of Environmental Health](#) found that BEVs charged on the city’s 2016 grid mix produced 38% lower NO_x and 99% lower VOC emissions than a new gasoline vehicle.

Virginia has equity champions and leaders. Examples include Congressman Donald McEachin, who supports the [Clean Economy Act](#), and Congressmen Gerald Connolly, Robert Scott, Donald McEachin, and Don Beyer, who co-sponsored the [Environmental Justice For All Act](#).

National Security and Energy Security

Oil accounts for about [90% of energy use in transportation](#) in the United States, and this dependence has bound the United States’ national, economic, and energy security to a highly volatile, cartel-influenced global oil market. Every year, the [U.S. military spends roughly \\$81 billion](#) to safeguard global oil supplies. Ninety percent of conventional crude oil reserves are held by OPEC member states or national oil companies that do not share U.S. strategic values or interests. Some economists have estimated that the financial resources spent by the military equate to an implicit [subsidy of up to \\$0.70 per gallon](#) of gasoline. While the United States has gone to great lengths to secure supply and reduce volatility globally, not all supply disruptions can be predicted or

⁶ Hood, Marlowe. “Fossil fuel pollution causes one in five deaths globally: study” Phys.org. <https://phys.org/news/2021-02-fossil-fuel-pollution-deaths-globally.html>. February 9, 2021.

⁷ Census Reporter, Virginia. ACS 2019 1-year. <https://censusreporter.org/profiles/04000US51-virginia/>

⁸ Kaiser Family Foundation. “Poverty Rate by Race/Ethnicity.” Virginia. 2019 Data. <https://www.kff.org/other/state-indicator/poverty-rate-by-raceethnicity/?currentTimeframe=0&selectedRows=%7B%22states%22:%7B%22virginia%22:%7B%7D%7D%7D&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>

⁹ Anenberg, S.C., J. Miller, D. Henze, R. Minjares, P. Achakulwisut (2019) The global burden of transportation tailpipe emissions on air pollution-related mortality.

¹⁰ https://www.cdc.gov/asthma/most_recent_data_states.htm#source. National Center for Environmental Health 2018.

prevented – and no matter where supply is disrupted, prices everywhere are affected. The recent collapse of the oil market is just the latest such disruption, which has not only damaged the domestic oil production sector but has also undermined innovation and investment in electrified transportation.

Virginians import over 150 million barrels of oil per year (13 million gallons per day), translating into spending of \$11-12 billion on petroleum for transportation every year.¹¹ National security concerns resonate with a substantial portion of Virginia’s population and government, due in part to the presence of the Norfolk Naval Station, Joint Base Langley-Eustis, and Fort Belvoir.

If the United States is to ever attain true energy security, we must accelerate the transition away from petroleum-dependent transportation to electric vehicles.

Key Players

The policy opportunity present in Virginia reflects a variety of actions by many players with good support from most key players.

Player	Description
Governor	Supportive of transportation electrification, especially when policy is supportive of health and environmental justice concerns.
State Agencies and Organizations	Individually, agencies enthusiastic about transportation electrification. State organizations involved include Department of Energy, Department of General Services, Department of Mines, Minerals and Energy, Economic Development Partnership, Motor Vehicle Dealer Board. The state is distributing VW funds to charging, transit buses, school buses, port electrification, and the Clean Air Communities Program
State Legislature	Recent legislation established a zero-carbon 2045, while the next session is primed for transportation electrification projects.
EV supply Chain Businesses	DuPont (automotive and battery inputs), Aker Wade Power Technologies (fast chargers), Cableform (motor controls, charging supplies), TE Connectivity (position sensors), CarCharging, Nova Charge
Businesses	Amazon (headquarters), Walmart, Volvo (freight assembly), Tesla, Volkswagen, Ford, General Motors, Nissan, Coulomb Technologies, Encell Technology, Evatran Group, Kollmorgen, Urban Grid Solar, Werres Corporation
Utilities	Dominion Power, APCO, Old Dominion Electric Cooperative. Historic resistance to change, although with strong switch to 100% clean energy by 2045 (committed in 2020), change will occur. So far, limited utility policies have been focused on EVs. Dominion has shown some initiative and funding availability with its school bus fleet replacement with electric buses, where Dominion would reserve the buses as grid assets during off hours.
Local & City Support	City of Richmond (EV plan), Fairfax County (currently developing a Climate Action Plan), Roanoke (part of Climate Mayors). Other interested counties: Albemarle, Arlington, Chesterfield, Henrico, Loudon
Fleet managers	Enthusiastic, though limited electrification to date
Public	Big shift in support of climate action during the last few years
Universities	Virginia Tech, University of Virginia, Virginia Commonwealth University.

¹¹ Low range estimated from net oil imports (150 million barrels per year and current prices of \$2.30/gallon). High range from Virginia Energy Plan (2018) Office of the Secretary of Commerce and Trade Department of Mines, Minerals and Energy using \$2.54/gallon. <https://www.governor.virginia.gov/media/governorvirginiagov/secretary-of-commerce-and-trade/2018-Virginia-Energy-Plan.pdf>.

Player	Description
Non-profits	Groups active in Virginia include Advanced Energy Economy, Advanced Vehicle Research Center, Clean Cities coalitions, Southern Environmental Law Center, Virginia Automobile Association, Municipal League, Sierra Club, Virginia Economic Development Partnership, Electrification Coalition. The environmental and transportation advocacy community has generally focused on transit-oriented development and Complete Streets efforts that aim to improve access to goods and services and fostering non-motorized transportation options.

Policy Opportunities

Virginia has a rich set of policy opportunities to pursue, with much groundwork already laid. The state will need to aggressively advocate for and adopt policies that will allow the EV market to thrive. Policymakers, stakeholders, and advocates must align strategic pathways and messages.

Based on our assessment to date, the top EV policy opportunities for Virginia are the following:

1. Incentives for light duty electrification and charging
2. Adoption of ambitious electrification targets for the medium- and heavy-duty sectors and related policies to meet adopted targets
3. Public-sector fleet electrification
4. EV-friendly electricity rates and charges.

Acknowledgements

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