



## **Comprehensive Decarbonization of Virginia’s Transportation Systems**

April 1, 2024

## Executive Summary

The Virginia Department of Environmental Quality (DEQ) developed the Commonwealth of Virginia’s Priority Climate Action Plan (PCAP) to meet the requirements of the U.S. Environmental Protection Agency’s (EPA) Climate Pollution Reduction Grant (CPRG) program. The Virginia PCAP identifies priorities for reducing greenhouse gas (GHG) emissions across the Commonwealth. Virginia has a clear and vested interest in promoting cleaner air, reliable and affordable clean energy generation, and improved resilience to increased storm frequency and intensity. Many areas of Virginia and its critical infrastructure are vulnerable to changing climatic conditions and require significant strategic investments, for which Virginia’s PCAP lays a strong foundation. Virginia’s PCAP was developed by DEQ with support and input from Commonwealth Agencies and includes GHG emissions reduction measures reflecting the Commonwealth’s priorities as they relate to implementation funding opportunities through the CPRG program.

Virginia’s PCAP identified several priority measures to reduce emissions in key sectors, including the transportation sector, which on average, between 2016 and 2020, was responsible for 37% of the Commonwealth’s total emissions. The transportation sector consists of both on-road and off-road sources of emissions resulting from the combustion of fuels and electricity consumption. Virginia is home to the nation’s third-largest state-maintained highway system, in addition to six major interstate highways, more than a dozen railroads, several commercial airports, and one of the largest port systems in the United States (Port of Virginia), all of which traverse a diversity of landscapes and urban, suburban, and rural regions. Thus, it is of the utmost importance that Virginia take a proactive approach to reducing GHG emissions and associated co-pollutants in the transportation sector while improving access, transit equity, and economic opportunities across the state.

This proposal, *Comprehensive Decarbonization of Virginia’s Transportation Systems*, lays out a clear path forward for implementing truly transformative electrification and emissions reductions projects across Virginia’s transportation networks. DEQ and its implementation partners, the Virginia Department of Transportation (VDOT), the Department of Rail and Public Transportation (DRPT), Virginia Energy (VA Energy), and the Virginia Port Authority (VPA) will work with DEQ to implement four projects that directly and significantly address two Virginia PCAP measures – Measures 1 and 3 - focused on reducing emissions in Virginia’s on-road and off-road transportation sectors. Collectively, these projects involve electrifying VDOT’s light duty fleet, DRPT’s public transit fleet, and a variety of VPA operations equipment, as well as funding Virginia’s electric vehicle (EV) Rebate program.

With the successful funding and implementation of these projects, Virginia will demonstrate what’s possible when multiple state agencies work hand in hand toward a shared vision to reduce GHG emissions and maximize community benefits. Ultimately, these projects will amount to 275,333 mtCO<sub>2</sub>e of GHG emission reductions from 2025 through 2050 (66,170 mtCO<sub>2</sub>e for 2025 through 2030) and provide significant co-benefits for Virginia’s Low-Income and Disadvantaged Communities (LIDACs) including cleaner air through reduced tailpipe and diesel emissions, reduced transportation-related noise pollution, as well as improved public health. As the state’s leading agency for developing and implementing nonpoint source (NPS) pollution control programs and services, DEQ is supremely qualified to serve as the lead agency for this proposal and to drive change throughout other state agencies whose operations create significant emissions and impact air and water quality. CPRG funding is essential to building momentum around current progress and creating synergy amongst state agencies at the forefront of transportation innovation.

## Work Plan Outline for General Competition

### 1. OVERALL PROJECT SUMMARY AND APPROACH

The Virginia Department of Environmental Quality (DEQ) proposes to undertake the significant greenhouse gas (GHG) reduction measures described in this workplan if awarded funding under the CPRG implementation grants general competition. The four projects identified in this proposal directly relate to two of the priority GHG reduction measures included in Virginia’s Priority Climate Action Plan (PCAP) and are focused on comprehensively reducing emissions from the transportation sector within the Commonwealth of Virginia, predominantly through the implementation of on-road and off-road fleet transformation strategies. These measures and projects outlined in Table 1, aim to reduce vehicle- and equipment-related emissions through large-scale electrification and operational management strategies that will substantially reduce energy and fuel consumption.

**Table 1. Measures and Associated Projects included in the Comprehensive Decarbonization of Virginia’s Transportation Systems CPRG Application**

Measure	Project
<b>Measure 1. Reduce GHG emissions from the on-road transportation sector through vehicle electrification and other zero- and low-carbon fuels.</b>	Project 1: Electrification of Virginia Department of Transportation’s (VDOT) Light-Duty Fleet
	Project 2: Electrification of Department of Rail and Public Transportation’s (DRPT) Public Transit Fleet
	Project 3: Fund Virginia’s Electric Vehicle (EV) Rebate Program
<b>Measure 2. Reduce GHG emissions from the off-road transportation sector, including ports and airports.</b>	Project 4: Electrification of Virginia Port Authority (VPA) Operations

Key implementation partners include the Virginia Department of Transportation (VDOT), Virginia Department of Rail and Public Transportation (DRPT), Virginia Energy (VA Energy), and the Virginia Port Authority (VPA). Roles and responsibilities of each project partner include the purchase and management of their respective vehicle and equipment fleets, installation and maintenance of electric vehicle charging infrastructure to support electrification, and the administration of programmatic elements necessary for implementation. These measures, and the associated projects for each are described in more detail below.

#### a. Description of GHG Reduction Measures

**Virginia PCAP Reduction Measure 1: Reduce GHG emissions from the on-road transportation sector through vehicle electrification and other zero- and low-carbon fuels.** Two projects under this measure will support the electrification of public fleets and transit vehicles through the purchase of electric vehicles (EVs), with a focus on deploying EVs in Low-Income and Disadvantaged Communities (LIDACs) served by public agencies throughout the Commonwealth. A third project under this measure will support the provision of rebates for Virginians to purchase EVs. The three proposed projects to implement this measure are:

*Project 1: Electrification of VDOT’s Light-Duty Fleet.* With a subaward from DEQ, VDOT will purchase 50 light-duty electric trucks and install vehicle monitoring and charging infrastructure. Electric trucks will be

deployed across the state but will be primarily housed at nine VDOT District Office Headquarters. A training program for drivers and maintenance staff will be developed and two regional trainings will take place upon the purchase of the trucks. A research and analysis team will provide a detailed assessment of the impact of this fleet transformation.

*Project 2: Electrification of DRPT’s Public Transit Fleet.* With a subaward from DEQ, DRPT will administer a zero-emission bus fund to complement its existing Making Efficient and Responsible Investments in Transit (MERIT) Capital Program to support the purchase of 108 heavy and light duty battery electric busses (BEBs) prioritizing small and rural transit agencies in the Commonwealth. DRPT uses an FTA-compliant prioritization process to allocate and assign resources to transit capital projects and investments across the Commonwealth. DRPT intends to use the existing framework of MERIT to prioritize vehicle purchases based on state and federal transit asset management standards and will use CPRG funding to meet the demand for zero-emission vehicles. Transit agencies may apply for capital funding each year funding is available.

*Project 3: Fund Virginia’s EV Rebate Program.* With a subaward from DEQ, VA Energy would administer an EV Rebate Program to support Virginians’ purchases of EVs. The Virginia Department of Motor Vehicles (DMV) established an Electric Vehicle Rebate Program in 2022, effective until 2027, that offers rebates of \$2,500 for residents who purchase EVs (with an additional \$2,000 available for enhanced rebates for qualified residents whose annual household income does not exceed 300 percent of the current poverty guidelines), new or used, from participating dealers. This program is and has been unfunded since its establishment and VA Energy would leverage the existing EV Rebate Program structure to administer CPRG funding and provide rebates to Virginia residents for the purchase of EVs.

#### **Measure 1 Tasks and Milestones:**

Upon award, the following tasks and milestones will be accomplished as indicated by month and calendar year for the 5-year period of performance. Timelines are based on the assumption funds will be awarded by December of 2024.

##### *Project 1: Electrification of VDOT’s Light-Duty Fleet*

- **Task 1- EV and Equipment Procurement:** VDOT to finish analysis of potential locations for initial fleet conversion, with a priority on VDOT District Offices and residencies located in or adjacent to LIDACs to inform procurement decisions. VDOT to purchase EVs and EV Monitoring Devices. *December 2024–December 2025*
- **Task 2- Planning:** VDOT to develop EV training program for staff to ensure proper education, use and maintenance. *January–April 2025*
- **Task 3- Training:** VDOT to offer training to all staff. *May 2025–July 2025*
- **Task 4- Monitoring Equipment Installation:** VDOT to install monitoring equipment on electrical vehicles. *August 2025–December 2025*
- **Task 5- Charging Infrastructure Installation:** VDOT to enter into contract for EV charger installations and install all EV charging infrastructure in appropriate locations. *January 2026–July 2026*
- **Task 6- Internal Research:** VDOT to conduct research, including initial interviews with electric truck operators, fleet managers, and maintenance staff and studies, reports, and/or data published regarding fleet conversion. *January– September 2025 and June–July 2026*
- **Task 7- Analysis and Reporting:** Ongoing activities including follow-up interviews, analysis of data collected, development final report detailing all findings, lessons learned, and recommendations, and rollout of use of CPRG-funded EV fleet. *January 2027–June 2029*

- **Task 8- Closeout:** Close out the project and finalize all reporting requirements. *June 2029–December 2029*

*Project 2: Electrification of DRPT’s Public Transit Fleet*

- **Task 1- Program Design:** DRPT to conduct a comprehensive study on the current state of electric buses in the region. DRPT to identify key locations to target investments, develop strategies for deploying electric buses in LIDAC communities, and design a program based on findings. *December 2024–January 2025*
- **Task 2- Stakeholder Engagement:** DEQ and DRPT to engage key stakeholders to get feedback on program design and target locations. *February 2025–March 2025*
- **Task 3- Open Program Application:** Transit agencies in the Commonwealth become eligible to apply for Battery Electric Bus (BEB) funding through MERIT process. *March 2025–April 2025*
- **Task 4- Close Application Period:** Funding opportunity closes. *April 2025*
- **Task 5- Application Evaluation:** DRPT review applications and a draft funding scenario is presented to the Commonwealth Transportation Board (CTB) for review and public comment period. *May 2025–July 2025*
- **Task 6- Finalize Awards:** CTB finalizes awards. *July 2025*
- **Task 7- Awards Obligations:** Contracts are executed, and funding is awarded to selected transit agencies. *August 2025–September 2025*
- **Task 8- Procurement of BEBs:** Subawarded transit agencies procure and deploy BEBs. *September 2025–December 2025*
- **Task 9-** Tasks 3–8 repeat each year for the 5-year grant period. *December 2025–December 2029*
- **Task 10- Closeout:** Close out the project and finalize all reporting requirements. *July 2029–December 2029*

*Project 3: Fund Virginia’s EV Rebate Program*

- **Task 1- Establish Working Group:** VA Energy to establish Working Group and host meetings. *December 2024–December 2027*
- **Task 2- Contract Procurements:** VA Energy to conduct procurement and contracting processes for EV Rebate Program Management and Technical Support/Community Outreach. *December 2024–February 2025.*
- **Task 3- Program Design:** VA Energy to design program based on Commonwealth Legislation and Working Group as well as design and launch program website. *February 2025–April 2025.*
- **Task 4- Solidify Partnerships:** Complete agency partnerships with dealers. *February 2025–April 2025.*
- **Task 5- Community Outreach:** Host three webinars, in-person workshops, and distribute informational materials about Rebate Program. *March 2025–May 2025.*
- **Task 6- Program Launch:** Implement the Rebate Program. *May 2025–March 2027.*
- **Task 7- Program Evaluation:** Evaluate program implementation, success, and impacts on GHG reductions. *April 2027–June 2027*
- **Task 8- Closeout:** Closeout the project and finalize all reporting requirements. *June 2027–December 2027*

**Potential Risks and Mitigation Strategies:** There may be risks from extended procurement or equipment purchasing processes for transit vehicles as original equipment manufacturers (OEMs) scale to meet growing demand for electric vehicles. GHG reductions may be affected by these risks through a timeline delay for program implementation at scale statewide, but it is expected that once the program

is implemented and efficiencies are found that the expected reductions will be met. Additionally, Virginia’s EV Rebate Program is complex, and the complexity may lead to contracting or rollout delays. These will need to be mitigated on a scale that meets with the program timelines including program lifetime. It is anticipated that the high level of technology interest will consume the program in positive ways and with a sense of urgency that mitigates risk.

**PCAP Measure, Prioritization, and CPRG Goals Alignment:** These GHG reduction measures and projects relate to Virginia’s PCAP Measure 1: Reduce GHG emissions from the on-road transportation sector through vehicle electrification and other zero- and low-carbon fuels. The implementation of this measure will support the four main goals of the CPRG program by both reducing GHG emissions and reducing other harmful air pollution from tailpipe emissions through the electrification of diesel- and gas-powered vehicles. These projects will provide substantial community co-benefits including cleaner air and reduced noise pollution as most of these projects replace old combustion-based light- and heavy-duty vehicles with EVs. The deployment of the EVs will be prioritized in disadvantaged communities. The funding of the EV Rebate Program would enable more widespread adoption of EVs throughout the Commonwealth. The opportunity for EV technology to be incentivized at reduced costs is an economic opportunity and a methodology for Virginia to transition energy to lower cost, higher reliability, higher innovation, leading to jobs and opportunity and quality of life gains in the Commonwealth. The deployment of EVs will be prioritized in and to support LIDACs. These projects also complement other funding sources that are currently in the pipeline to help build momentum around transportation electrification holistically in Virginia. These projects are highly scalable as they can be replicated across the state and the country to showcase real fleet transformation and EV rebate program successes. These projects can provide valuable data and decision-making tools to other state agencies and fleet managers in Virginia, as well as other state transportation agencies throughout the country.

Overall, the implementation of this measure was selected as a priority due to the opportunity to build momentum around existing programs and opportunities within the state, as well as the scale of funding necessary to implement holistic transportation electrification projects and the quantity of emissions reductions that could take place if successful. CPRG funding for these projects will fill an important gap in funding for the purchase of EVs as state and transit agencies have begun to electrify their fleets, but additional funding is needed to deploy and incentivize EVs at scale.

**Virginia PCAP Reduction Measure 3 (hereby referenced as ‘Measure 2’ for simplicity): Reduce GHG emissions from the off-road transportation sector, including ports and airports.** With a subaward from DEQ, the VPA will execute a comprehensive decarbonization project for port facilities that will amount to significant GHG emission reductions. Complementing over \$1.4 Billion in infrastructure optimization and electrification investments and furthering the Port’s ambitious goal of achieving net-zero by 2040, this project has three components that will amount to significant GHG emission reductions. The three components include the implementation of a terminal reservation system, the deployment of battery systems, and the electrification of vehicles and equipment to reduce emissions at port facilities. These components were selected as priorities because the VPA has been working for over a decade to decarbonize their operations through Scope 1 and Scope 2 GHG reductions. While the VPA is already leading the way as the only port in the nation powered by procuring 100% clean power (through a Power Purchase Agreement with Dominion Energy), this project will help them achieve net-zero status and set an example for ports across the country while providing benefits directly in Virginia. The proposed project elements will be implemented at the following three VPA facilities: Virginia International Gateway (VIG), 1000 Virginia International Gateway Blvd., Portsmouth, Virginia 23703; Pinnars Point Container Yard (PPCY), 6 Harpers Avenue, Portsmouth, Virginia 23707; and Richmond

Marine Terminal (RMT), 5000 Deepwater Terminal Road, Richmond, Virginia 23234. The project and three associated components are as follows:

*Project 4: Electrification of VPA Port Operations.* The first component of this project will involve the deployment of microgrid battery storage systems at VIG and PPCY facilities to reduce peak load fossil fuel generation. The use of fossil fuel-generating equipment for VPA operations is at its highest during peak loads. The deployment of battery storage systems will have the greatest impact short-term by providing load management, resilience, and efficiency benefits to the local grid in Portsmouth, which is already near capacity, and reduce the impact of additional port electrification projects on the local energy grid. This project will reduce peak demand for grid electricity (primarily from fossil generation) – an estimated peak shaving of 8,640 MWh/yr – by using battery storage to implement peak shaving and energy efficiency measures. The second component of this project involves the installation of a new gate complex with a Terminal Reservation System at PPCY to reduce turn times and idling hours within VPA properties. The gate complex will have an integrated truck reservation system that will have a substantial impact on PPCY truck traffic by reducing turn times and eliminating truck idling hours. The Port has successfully implemented a truck reservation system at the NIT and VIG terminals in Norfolk and Portsmouth, reducing turn times and truck idling hours by 40%. The same system is expected to yield similar results at the PPCY, using the same software and tools. This will allow the port to maintain continuity and fluidity of operations for truck drivers, labor force, and staff. It is expected that there will be substantial traffic and congestion mitigation benefits for nearby roads and communities as well as significant emission reductions from reduced idling in the facility. The third component of this project will entail the electrification of vehicles and equipment across VPA’s facilities and operations that are used primarily for off-road purposes. The VPA will electrify older diesel- and gas-powered vehicles and equipment that are heavily used and critical for operations. The VPA will electrify the following:

- Mobile Harbor Crane (MHC) – The Port will repower the Liebherr Mobile Harbor Crane, which currently runs on diesel and is used daily. The repower will reduce all annual emissions associated with the use of the diesel mobile harbor crane and the infrastructure will be used for many years into the future.
- Maintenance Vans – The VPA will replace 17 diesel maintenance vans at all Port facilities, which are in need of replacement due to their heavy utilization by transporting technicians and equipment for repairs across various terminals. Replacing these aging units with zero-emission alternatives will have substantial long and mid-term emissions benefits, especially since they are some of the most utilized pieces of equipment that the VPA owns.
- Utility Tractor Rigs (UTR) – The VPA will replace 7 aging diesel UTRs with 7 new battery electric UTRs for the same purpose at the Pinners Point Container Yard (PPCY).
- Shuttle Carriers – The VPA will replace 4 shuttle carriers with hybrid electric ones to not only reduce emissions in the short and mid-term but also provide long-term benefits by helping determine how to transition challenging equipment lines to zero-emission solutions.
- Empty Container Handlers (ECH) – The Port will replace 21 aging diesel ECHs with 21 new battery powered electric ECHs for the same purpose. The Port uses diesel ECHs at many facilities, but most of that equipment line is located at the PPCY and the PPCY has yet to receive any zero-emission equipment as it is not one of the traditional marine terminals.
- Forklifts – The Port will replace 13 propane light forklifts with electric. The PPCY, as the empty container yard, is home to the oldest light forklifts. While these forklifts are propane, they are heavy emissions emitters due to their age. The Port expects these units to have long-term emission reduction benefits as well as helping restore fluidity to operations in the short-term.

## Measure 2 Tasks and Milestones:

Upon award the following tasks and milestones will be accomplished as indicated by month and calendar year for the 5-year period of performance. This timeline is based on the assumption funds will be awarded by December 2024, and the project timelines assume that all project designs and engineering are taken to a 30% conceptual design ahead of award.

### *Project 4: Electrification of VPA Operations*

- **Procurement of EV Contract:** Procure a supplier for EVs and enter into a formal purchase agreement. *December 2024–February 2025*
- **Finalize Engineering and Design:** Complete the Gate System Design including details on how the structure will be installed and ensure truck reservation system will be incorporated into the project. Electrical System Design should also detail transformers and chargers and how they will be powered. *January 2025–February 2025*
- **Procurement of Supplies & Equipment:** Selection and purchase of all equipment and supplies for the proposed battery system and new gate complex. *January 2025–March 2025*
- **Procurement of EVs:** VPA will place orders for Mobile Harbor Crane repowering infrastructure, Maintenance Vans; Utility Tractor Rigs; Shuttle Carriers; Empty Container Handlers; Forklifts. *February 2025–December 2025*
- **Commissioning:** Commissioning of equipment (lights, radios installed, telemetry equipment, etc.). *July 2025 and January 2026*
- **Installation of Infrastructure:** Installation of all electrical battery storage infrastructure. Installation of all new gate complex infrastructure such as installing duct banks, concrete foundations/pads for equipment, construction of an automated gate, modify fencing, and resurface paving utility cuts to make the gate system operational. *April 2025–December 2025*
- **Field Tests:** Rollout of new EVs in a series of tests to address any challenges. *October 2025 and October 2026*
- **System Tests:** Conduct tests to ensure all new equipment and infrastructure work properly. *December 2025–January 2026*
- **System Deployment:** Deploy new battery storage system at facilities. Deploy new gate system at facility. *January 2026*
- **Rollout of EVs:** Fully utilize all EVs purchased under this funding. *November 2026*
- **Project Closeout:** Close out the project and finalize all reporting requirements. *February 2027–January 2028*

**Potential Risks and Mitigation Strategies:** The primary identified risks are to the implementation schedule and include.

- **Equipment Delivery Timelines:** The surge in demand due to multiple grant opportunities may stress the supply chains of equipment manufacturers, especially for Build America, Buy America (BABA) compliant products, posing a risk to timelines. To mitigate this, VPA will finalize designs and select manufacturers early, securing preliminary contracts with confirmed delivery dates, and will start design work ahead of the formal grant award to expedite electrification of operations.
- **Sea-level rise impacts to infrastructure:** In response to regular coastal flooding, VPA is designing all electric infrastructure above the 500-year flood plain, using extensive modeling and simulations of weather patterns conducted with a local university to inform resilient design and mitigate risk.
- **Electric grid availability:** Electrification activities under this project will nearly double the electric load at the facilities, which will be mitigated the included grid-scale batteries for peak shaving and

even energy use, and by collaborating with the local electricity provider to ensure sufficient energy capacity for both the initial equipment transition and future zero-emission operations.

**PCAP Measure, Prioritization, and CPRG Goals Alignment:** Project 4 relates to Virginia’s PCAP Measure 3: Reduce GHG emissions from the off-road transportation sector, including ports and airports. This measure was selected as a priority to support VPA’s ongoing efforts to become net zero by 2040 and grow and maintain their impressive leadership in emissions reductions in Virginia’s off-road sector. The implementation of this measure will support the four main goals of the CPRG program by both reducing GHG emissions and reducing other harmful air pollution from diesel- and gas-powered vehicles that receive heavy daily use at port facilities. These projects will provide substantial community co-benefits including cleaner air and reduced noise pollution as most of these projects replace old combustion-based light- and heavy-duty vehicles and equipment with EVs and batteries. These projects also complement other funding sources that are currently in the pipeline to help build momentum around transportation electrification holistically in Virginia. These projects are highly scalable as they can be replicated at ports and within other off-road agencies across the state and country to showcase real equipment electrification transformations. These projects can provide valuable data and decision-making tools to other off-road transportation agencies in Virginia and across the country. Overall, the implementation of this measure was selected as a priority due to the opportunity to build momentum around the VPA’s existing leadership within the state, as well as the scale of funding necessary to implement port electrification projects and the quantity of emissions reductions that could take place if successful.

#### **b. Demonstration of Funding Need**

**Measure 1 (Projects 1-3):** CPRG implementation funding is necessary to support targeted fleet and equipment procurement for Virginia’s public and transit agencies, enable the provision of EV rebates to Virginians. Virginia is actively pursuing several funding opportunities to support the purchase of EVs and deploy EV charging infrastructure statewide, which will be complemented by expansion of state EV fleets and infrastructure through CPRG funds. A number of federal funding programs are currently being administered by Virginia agencies related to the implementation of Measure 1 and can be leveraged with CPRG funds. Some examples include \$100M in funding from the U.S. Department of Transportation’s National Electric Vehicle Infrastructure (NEVI) Program to install public EV charging infrastructure and \$165M from the U.S. Federal Highway Administration’s (FHWA) Carbon Reduction Program (CRP) for projects to reduce transportation emissions, including investing in transportation choice, efficiency and alternative fuels, and low emissions construction and equipment. While these opportunities are supporting progress towards vehicle electrification and charging infrastructure deployment in the Commonwealth, Virginia agencies have assessed all available funding sources and determined that they are insufficient to meet the demand for and/or are not applicable for the vehicle electrification needs described in this proposal.

**Project 1:** CPRG funding is needed to support the purchase of a sufficient number of EVs to prove their feasibility in a range of use cases across public agencies to enable comprehensive electrification of the VDOT fleet and fleets across the Commonwealth. Funding opportunities from key vehicle electrification programs focus on transportation decarbonization and air quality improvement, including NEVI, CRP, and Congestion Mitigation and Air Quality Improvement Program (CMAQ), and are not eligible for use for state fleet electrification. VDOT evaluated the Credit for Qualified Commercial Clean Vehicles established under the Inflation Reduction Act but is not able to pursue the credit as part of this project due to the up-front capital cost of purchasing the vehicles initially and the risk of potentially being unable to qualify for and receive the credit following delivery of the electric trucks.

**Project 2:** DRPT has strategized to fill gaps in fleet electrification needs but faces a significant capital budget shortfall. Based on the most recent five-year capital budgets submitted by transit agencies, the state’s MERIT capital funding is unlikely to meet the zero-emission fleet replacement and expansion plans. Over the next five years, Virginia’s transit operators are projected to implement capital projects totaling \$1.48B, with a need of \$440M in DRPT State Capital funds. However, DRPT anticipates a \$45 million shortfall in capital needs for transit agencies between FY25 and FY29. Actual capital shortfalls have significantly exceeded projections due to unexpected costs and shifting priorities. Large-urban agencies look to cover this gap by applying for federal discretionary funding or seeking more funding from the localities they serve, but rural and small-urban agencies often struggle to secure additional funding.

**Project 3:** Virginia’s EV Rebate Program remains unfunded due to lack of appropriations from the state General Assembly, even though legislators have floated draft language in each session for the past few years. Therefore, federal funding represents an ideal opportunity. VA Energy has explored other opportunities for funding and has identified that federal investments in EV chargers, federal electric vehicle tax credits, and federal tax credits on renewable energy and alternative fuel all represent leverage areas for this grant.

**Measure 2 (Project 4):** VPA has pursued various funding opportunities to support its net-zero by 2040 goal, successfully securing grants from the Federal Highway Administration, Volkswagen Environmental Mitigation Trust Fund, and the EPA Clean Diesel Grant Program. A Public-Private Partnership invested \$320M to add electric cranes to the VPA’s container yard, expanding the zero-emissions fleet. The Carbon Reduction Program grant of \$3M supported the deployment of six battery electric Utility Tractor Rigs at the Pinnars Point Container Yard, while Volkswagen funds enabled the implementation of four battery electric rigs at Norfolk International Terminals. The VPA has also secured several Diesel Emissions Reduction Act grants, contributing to the transition of over 100 diesel straddle carriers to hybrid shuttle carriers. Despite these efforts, funding gaps remain to get to net zero, and CPRG funding would enable full electrification of port operations across VPA’s facilities. VPA is also exploring the use of the EPA Clean Ports Program funding, but the potential results of that highly competitive program are unknown, and the program applications are still open through May 2024.

### **c. Transformative Impact**

**Measure 1 (Projects 1-3):** The implementation of Measure 1 will reduce GHG emission reductions by 132,136 mtCO<sub>2</sub>e through 2050. Transportation, being the largest source of GHG emissions in Virginia, is a key focus for the state’s PCAP, with the aim to significantly reduce emissions, support the deployment of electrified state fleet vehicles, and promote widespread adoption of EVs. This transformative initiative will lead to lower energy costs, increased reliability, innovation, job creation, and improved quality of life for Virginian’s. VDOT’s electrification efforts can serve as a model for fleet operators across the Commonwealth. CPRG funding will enable significant scaling of public agency fleet electrification, with VDOT providing guidance on vehicle prioritization for electrification, charging infrastructure, and training for maintenance and operations staff. DRPT, leveraging its experience in transit fleet electrification, aims to provide comprehensive resources to rural and small-urban agencies for zero-emissions fleet transition planning. DRPT fleet modernization would demonstrate a commitment and provide a successful and transformative example that can build momentum across the state. The implementation of the EV Rebate Program by VA Energy will further accelerate the adoption of EVs across the state. Collectively, these projects will lead to truly comprehensive EV leadership within the state and across the US.

**Measure 2 (Project 4):** The Port’s comprehensive implementation of Measure 2 will reduce GHG emission reductions by 143,197 mtCO<sub>2</sub>e through 2050, and numerous benefits for each facility location and adjacent communities. The Port’s PPCY, an integral part of operations, is set for a transformative electrification project targeting its oldest and most active equipment lines. This project, anticipated to coincide with volume growth, will significantly reduce emissions and accelerate net-zero progress. The addition of micro grid battery storage solutions will further reduce generation emissions by leveling the local grid load. The Port’s shuttle carriers, one of the hardest equipment lines to transition, could move towards zero emission if this pilot proves successful. Investments in the Richmond Marine Terminal Mobile Harbor Crane, the most utilized equipment at the terminal, will support operations growth and reduce associated emissions for decades. The Port’s maintenance vans, widely used across terminals, are set to be the first to electrify, potentially prompting a fleet-wide transition and influencing other state agencies and local governments to follow suit.

## 2. IMPACT OF GHG REDUCTION MEASURES

### a. Magnitude of GHG Reductions from 2025 through 2030

Cumulative GHG emission reductions from each project and measure, and for the total application for 2025 through 2030 are summarized in Table 2 below. These are proportioned by CPRG requested funds and the total projects/program costs for Projects 2 and 3 as detailed in attachment *Techappx\_VADEQ.pdf*.

**Table 2. Cumulative GHG Reductions from 2025 to 2030 by Project, Measure, and Total**

Measure	Project	Cumulative GHG reductions (metric tons CO <sub>2</sub> e), 2025-2030
<b>Measure 1</b>	<b>Projects 1-3 Total: 27,851.68</b>	
	<i>Project 1: Electrification of VDOT’s Light-Duty Fleet.</i>	1,949.19
	<i>Project 2: Electrification of DRPT’s Public Transit Fleet</i>	13,704.72
	<i>Project 3: Fund Virginia’s Electric Vehicle Rebate Program</i>	12,197.77
<b>Measure 2</b>	<i>Project 4: Electrification of VPA Operations</i>	<b>38,318.73</b>
<b>Total</b>		<b>66,170.41</b>

Within each project, DEQ and its partners are making efforts to ensure the durability of these GHG emission reductions. For example, through VDOT training of employees and monitoring devices, the performance of equipment purchased with CPRG funds will be assured. The use of battery storage with a microgrid by VPA will be necessary to cleaning use electric equipment and will also allow for continued use of electric equipment during grid outages or blackouts, reducing the need to rely on diesel or other less clean back up generation and ensuring continued net zero port operations.

DEQ acknowledges that the batteries and other electric equipment have limited lifespans. The assumed lifetimes of the different types of equipment have been estimated using the best information available from the original equipment manufacturers and current equipment lifecycles. While the lifetimes of some equipment are well known (e.g., chargers, vans, EVs, forklifts), some other equipment is newer technology that has not fully demonstrated an “average lifespan”. These replacements will accelerate GHG reduction timelines, and once electric technologies are used and chargers are accessible, those technologies will continue to be used over time, limiting any regression to higher emitting vehicles and

equipment in the future while also providing tangible demonstrations of the use of electric equipment (vehicles, charger, forklifts, etc.) to lead by example and help amplify the potential GHG reduction benefits seen over time.

There are also additional factors that were not incorporated into this analysis. For example, the cost of decommissioning a vehicle produces additional CO<sub>2</sub>, referred to as “cradle to grave” emissions. There is also additional cost associated with battery mining and manufacturing. Studies generally agree that even when incorporating these factors, battery electric vehicles are estimated to have a 30–40% reduction in greenhouse gas emissions over their lifespans.

#### b. Magnitude of GHG Reductions from 2025 through 2050

Cumulative GHG emission reductions from each project and measure, and for the total application for 2025 through 2050 are summarized below in Table 3. See above discussion on durability and permanence of GHG reductions which apply for these long-term reductions (through 2050) as well. These are proportioned by CPRG requested funds and the total projects/program costs for Projects 2 and 3 as detailed in attachment *Techappx\_VADEQ.pdf*.

**Table 3. Cumulative GHG Reductions from 2025 to 2050 by Project, Measure, and Total**

Measure	Project	Cumulative GHG reductions (metric tons CO <sub>2</sub> e), 2025-2050
<b>Measure 1</b>	<b>Projects 1-3 Total: 132,135.72</b>	
	<i>Project 1: Electrification of VDOT’s Light-Duty Fleet</i>	3,348.21
	<i>Project 2: Electrification of DRPT’s Public Transit Fleet</i>	105,610.12
	<i>Project 3: Fund Virginia’s EV Rebate Program</i>	23,177.40
<b>Measure 2</b>	<i>Project 4: Electrification of VPA Operations</i>	<b>143,196.98</b>
<b>Total</b>		<b>275,332.70</b>

#### c. Cost Effectiveness of GHG Reductions

The cost effectiveness (calculated as requested CPRG implementation grant dollars divided by the quantified GHG emission reductions for the period 2025-2030 calculated the CPRG funding request) for each project, measure and this application overall are:

**Table 4: Cost Effectiveness for Each Project, Measure, and Full Application**

Measure	Project	Cost-Effectiveness (\$/mtCO <sub>2</sub> e) 2025-2030
<b>Measure 1</b>	<b>Projects 1-3: \$3,952</b>	
	<i>Project 1: Electrification of VDOT’s Light-Duty Fleet</i>	\$2,091
	<i>Project 2: Electrification of DRPT’s Public Transit Fleet</i>	\$6,198
	<i>Project 3: Fund Virginia’s EV Rebate Program</i>	\$1,727
<b>Measure 2</b>	<i>Project 4: Electrification of VPA Operations</i>	<b>\$2,347</b>
<b>Total</b>		<b>\$3,022</b>

There are several factors that will affect the cost effectiveness presented above and the estimates above only represent raw equipment and rebates cost, which miss many benefits and are distinct from the more conventional marginal abatement cost curve type of cost-effectiveness metric for GHG reduction strategies. For example, this calculation misses two critical elements – the lasting benefits of more efficient and low-carbon long-lifetime equipment and the financial benefits that will be realized by fleet managers, EV owners and VPA.

Simply considering a longer-term framing of the cost-effectiveness would result in a \$/metric CO<sub>2</sub>e of \$726 (assuming CPRG funding and the resulting GHG reductions from 2025-2050). As supply chains continue to expand for equipment because of nationally transforming markets, it is expected that equipment costs will decline over time. Further, electric vehicles tend to have lower operations and maintenance costs, reducing the total cost of ownership over time. Looking beyond just the project and program financials in the short and long-term, many other societal economic benefits will be realized through this application that are not captured in the CPRG cost-effectiveness calculations. For example, reduced health care costs due to improved air quality.

#### **d. Documentation of GHG Reduction Assumptions**

GHG emission reduction methods are detailed in the attachment *TechAppx\_VADEQ.pdf* and calculations are documented in the file *GHGcalcs\_VADEQ.xlsx*.

### **3. ENVIRONMENTAL RESULTS – OUTPUTS, OUTCOMES, AND PERFORMANCE MEASURES**

The four projects to be funded under this proposal collectively support EPA’s Fiscal Year (FY) 2022-2026 Strategic Plan, Goal 1, “Tackle the Climate Crisis”; Objective 1.1, “Reduce Emissions that Cause Climate Change by producing substantial GHG emissions reductions outcomes.” If funding is awarded, DEQ and implementation partners are prepared to track progress towards achieving these outcomes.

#### **a. Expected Outputs and Outcomes**

**Measure 1 (Projects 1-3):** This measure will improve air quality through reduced emissions of nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), fine particle pollution (PM<sub>2.5</sub>), and sulfur dioxide (SO<sub>2</sub>) because of the transition away from fossil-fuel based internal combustion engines. A key objective of this measure is to deploy electric vehicles and equipment in LIDACs to maximize the direct benefits to these communities such as decreased air pollution and improved air quality and health outcomes. This will be particularly impactful in the electrification of diesel equipment and subsequent reduction of harmful pollutants such as ground-level ozone and particulate matter. Reductions in GHG emissions are correlated with a drop in emergency room visits related to respiratory diseases and conditions, such as asthma. Air quality improvements provide societal benefits including reduced respiratory distress, sick days from work and school, as well as healthcare costs. For transit electrification, as ridership increases due to the deployment of new zero-emissions vehicles, overall community vehicle miles traveled are also reduced. Not only is public transit a more energy efficient option, but it also typically serves communities that are dependent on these public services as one of their primary mobility options.

#### **Project 1:**

- Replacement of 50 gasoline trucks with 50 electric trucks
- Cumulative GHG emission reductions from 2025-2030: 1,949.19 metric tons of CO<sub>2</sub>e
- Cumulative GHG emission reductions from 2025-2050: 3,348.21 metric tons of CO<sub>2</sub>e

**Table 5: Annual Criteria Pollutants (lbs) from 5660 Gasoline and 5660 Electric Vehicles**

Powertrain	CO	NOx	PM <sub>10</sub>	PM <sub>2.5</sub>	VOC	SO <sub>2</sub>
Gasoline	204,742.1	4,448.1	4,992.7	1,048.6	2,0872.3	257.8
EV	0.0	0.0	4487.1	618.9	0.0	0.0

Table 6: 5- and 25-Year Criteria Pollutant Reductions (lbs) from Replacing 5500 Gasoline Vehicles with Electric Vehicles						
Powertrain	CO	NOx	PM <sub>10</sub>	PM <sub>2.5</sub>	VOC	SO <sub>2</sub>
5 year	1,023,710	2,240	2,525	2,145	104,360	1,285
25 year	5,118,550	111,200	12,625	10,725	521,800	6,425

#### Project 2:

- 108 electric buses put into service
- Cumulative GHG emission reductions from 2025-2030: 13,704.72 metric tons of CO<sub>2</sub>e
- Cumulative GHG emission reductions from 2025-2050: 105,610.12 metric tons of CO<sub>2</sub>e

#### Project 3:

- 5,660 EVs on the road, replacing internal combustion engines
- Cumulative GHG emission reductions from 2025-2030: 12,197.77 metric tons of CO<sub>2</sub>e
- Cumulative GHG emission reductions from 2025-2050: 23,177.40 metric tons of CO<sub>2</sub>e
- Criteria pollutant reductions from 5,660 electric vehicles replacing 5,660 gasoline vehicles

**Measure 2 (Project 4):** This measure will result in a reduction in air emissions in heavy traffic corridors and reductions in harmful emissions related to the port/transportation industry. The battery storage project under this measure will improve grid stability and resiliency for the port and local community. The terminal reservation system will reduce truck congestion and traffic around the PPCY facility which is located at an intersection that experiences a high volume of industrial traffic. There will also be reliability and emissions benefits through the implementation of the Mobile Harbor Crane at RMT which will allow the VPA to remove additional trucks from the roads and highways. Finally, the projects under this measure will provide opportunities for new equipment to improve the PPCY operation and technology demonstration.

- Cumulative GHG emission reductions from 2025-2030: 38,318.72 metric tons of CO<sub>2</sub>e
- Cumulative GHG emission reductions from 2025-2050: 143,196.98 metric tons of CO<sub>2</sub>e
- 17 MW of battery installed
- 4 battery electric buses, 17 electric vans, and 13 electric forklifts in use

#### b. Performance Measures and Plan

DEQ will track progress for projects under both measures included in this proposal by working with VDOT, DRPT, VA Energy, and VPA to determine a regular reporting and timekeeping schedule that adheres to EPA CPRG Implementation requirements. VDOT, DRPT, VA Energy, and VPA will be required to report such progress to DEQ. DEQ will provide all necessary details in respect to each performance measure to EPA in the semi-annual reports and final report. Some additional information on how each implementation partner plans to track the information they will share with DEQ is as follows:

#### Measure 1 (Project 1-3):

**Project 1:** Throughout the purchase and use of the electric trucks, VDOT will monitor vehicle miles traveled (VMT) to calculate the reduction in GHG emissions and other co-pollutants. Vehicles will be

equipped with monitoring devices to reduce potential errors in manually capturing VMT, but also to capture other variables such as drive-time, temperature, and hours of total operation. VMT data will be used to calculate CAP and HAP emission reductions will be calculated using the FHWA CMAQ Toolkit’s On-Road EV Purchase Calculator.

**Project 2:** DRPT will ensure that transit agencies that are awarded funds to purchase electric buses are required to report monthly ridership and vehicle miles traveled as a requirement of the grant award. This will allow DRPT to assess actual GHG reductions, as well as other co-pollutants like nitrogen oxides, sulfur dioxide, PM10, PM2.5, and to record ridership effects pre- and post-award.

**Project 3:** VA Energy will keep track of key activity data used to estimate GHG emission reductions such as the number of EV rebates granted (standard and enhanced) and EV miles traveled per year.

**Measure 2 (Project 4):** As this project is implemented, the Port will begin tracking activity metrics and/or conducting emissions reporting. Emissions reporting will be consistent with previously conducted GHG reporting and may include criteria pollutants. Progress reporting will begin upon the commissioning and normal operation of the equipment. The Port will provide scrappage reports for old equipment and report the project emissions reductions in the final report. For the Terminal Reservation System, the Port will report on volume and turn times to provide a reduction of idling hours on the facility (semi-annual) and calculate emission reductions from a fleet emissions standard rate calculation (annual or at final report). For the Mobile Harbor Crane transformation at Richmond Marine Terminal, the Port will utilize data obtained from the barge to update annually the kWh to diesel fuel comparison and calculate emissions based on the difference, such that emissions estimates reflect volume changes to report the benefits associated with implementation. As the battery project is implemented, the Port will utilize software to provide peak shaving data to enable the calculation of an estimate of annual emissions avoided and translate into emissions calculations based on the latest regional grid emissions rate available. Overall, the following implementation tracking metrics will be used: peak shaving energy savings in MWhs, any return to the grid (battery system); usage hours/volume, potentially kWh demand (MHC); turn time and volume (TRS); uptime/usage hours, performance (shuttles); usage hours, performance (ECH); usage hours, performance (UTRs); usage hours (vans and forklifts).

### **c. Authorities, Implementation Timeline, and Milestones**

DEQ, established in the Code of Virginia under § 10.1-11831, will serve as the lead agency with the authority to administer and disburse funds as subawards to project partners for the implementation of Projects 1-4. DEQ will also manage all project reporting to the EPA. VDOT, DRPT, VA Energy, and VPA, which are all state agencies, have the authority to procure and/or implement all tasks under their respective projects. Summaries of key timelines and milestones are included below, but more detail can be found in Section 1.a. All projects will be completed by December of 2029.

### **Measure 1 (Projects 1-3):**

**Project 1:** Title 33.2 of the Code of Virginia establishes VDOT as the agency to VDOT’s fleet management team will be responsible for the procurement of electric trucks and EV chargers, and the training of electric truck operators and maintenance staff. VDOT will contract with qualified electricians to install EV chargers at VDOT facilities. VDOT has the authority to purchase and operate electric trucks and EV chargers and coordinate with electric utility providers for EV charger installation. VDOT expects to purchase vehicles and install charging infrastructure by August 2025, with ongoing monitoring, training, and analysis of the electrified fleet throughout the useful life of the vehicles through 2035. Key milestones include the purchase and delivery of electric trucks, charger installation, and finalizing the

training plan. Other key tasks include monitoring equipment installation, completing staff training and interviews, and identifying and reviewing custom research on fleet conversion; and finalizing data collection and reporting. The procurement of electric trucks and EV chargers will be initiated immediately following the grant award, with electric trucks and EV chargers expected to be in use within 9 months of the finalization of the grant agreement. Then monitoring and maintenance will take place and all award expenditures will be complete by Year 3.

**Project 2:** Title 33.2 of the Code of Virginia establishes DRPT as the agency to provide multimodal transportation system management and enhancement and “ensure that passenger and freight rail and public transportation are full participants in that multimodal system to reduce energy consumption, congestion, and air pollution; to enhance the environment; to support economic development; and to ensure the efficient movement of goods and people.” DRPT will have the full authority to award this funding each year to transit agencies as it would supplement an existing grant program across the 5 years of the grant period. To effectively scale public transit zero-emissions fleet transitions, regional and statewide collaboration will be necessary to retain and recruit transit vehicle drivers and mechanics with the appropriate training to handle high-voltage charging equipment and maintain battery electric, and hydrogen fuel cell electric technologies. Appropriately planning and convening resources across multiple state agencies provides an opportunity to not only reduce GHG emissions and other co-pollutants from the transit industry, but also to provide Virginians new skills training, and opportunities for career growth in a changing energy and transportation sector.

**Project 3:** In 2021, legislation was passed that established the Virginia Electric Vehicle Rebate Program in Code of Virginia Article 8 § 45.2-1727. VA Energy is the key leading authority for implementing the EV Rebate Program with several identified partners. VA Energy has existing authority in law to administer the program and expects all rebates to be complete by Year 2 of the grant period. Virginia Clean Cities at James Madison University is an existing energy office contractor which has worked since 1996 on these issues and is a state agency for easy contracting. The Virginia Motor Vehicle Dealer Board is a state agency through transportation, and their dealer members, will be additional partnerships for implementation. There is a state board supporting this initiative. Virginia DEQ and Virginia DOT and other agencies collaborate in the technology integration and have worked to deploy a community leading network of chargers on corridors in preparation for the technology. Virginia Department of Taxation and Virginia DMV may be engaged for implementation assistance.

**Measure 2 (Project 4):** VPA is the key leading authority for implementing all projects under Measure 2. VPA is a political subdivision of the Commonwealth of Virginia and is the third largest container port on the U.S. East Coast. Title 62 of the Code of Virginia (as amended) authorizes the Virginia Port Authority to engage in the promotion, construction, and operation of the Commonwealth’s harbors and ports and related infrastructure; promulgate rules; establish foreign trade zones; and to enter into financial and commercial transactions to ensure that Virginia’s ports support commerce and trade. The VPA will retain ownership of the equipment purchased with funding from this grant. Virginia International Terminals (VIT), the Port’s private operating subsidiary, will participate in the project as a partner by managing the operation of and maintaining the new equipment. The selected equipment vendor(s) will provide the equipment and technical operating specifications required for the project. Additional entities whose cooperation or participation is necessary for the implementation of Measure 2 projects include Dominion Energy and original equipment manufacturers (OEMs). The Port currently has a partnership Request for Information (RFI) out for all open and secured grants to support standardization of the Port’s desired equipment and ensure timelines are met. The VPA aims to complete the design and procurement for all Projects by April 2025. For Project 4, systems installed by January 2026, will

generate peak shaving benefits immediately at VIG, system’s benefit timeline at PPCY will be assuming utility provider will utilize until PPCY has electrical infrastructure built – but assumed to start as of January 2026 as well. The VPA expects work to be complete by November 2026 and expects emissions reductions through 2050. The ECH receipt and installation is expected to be complete by March 2027; vans by November 2026; forklifts by November 2026; UTRs by December 2026; shuttles by January 2027; and the MHC by January 2026. The VPA expects emissions reductions through the lifespan of each replaced equipment or vehicle.

#### **4. LOW-INCOME AND DISADVANTAGED COMMUNITIES**

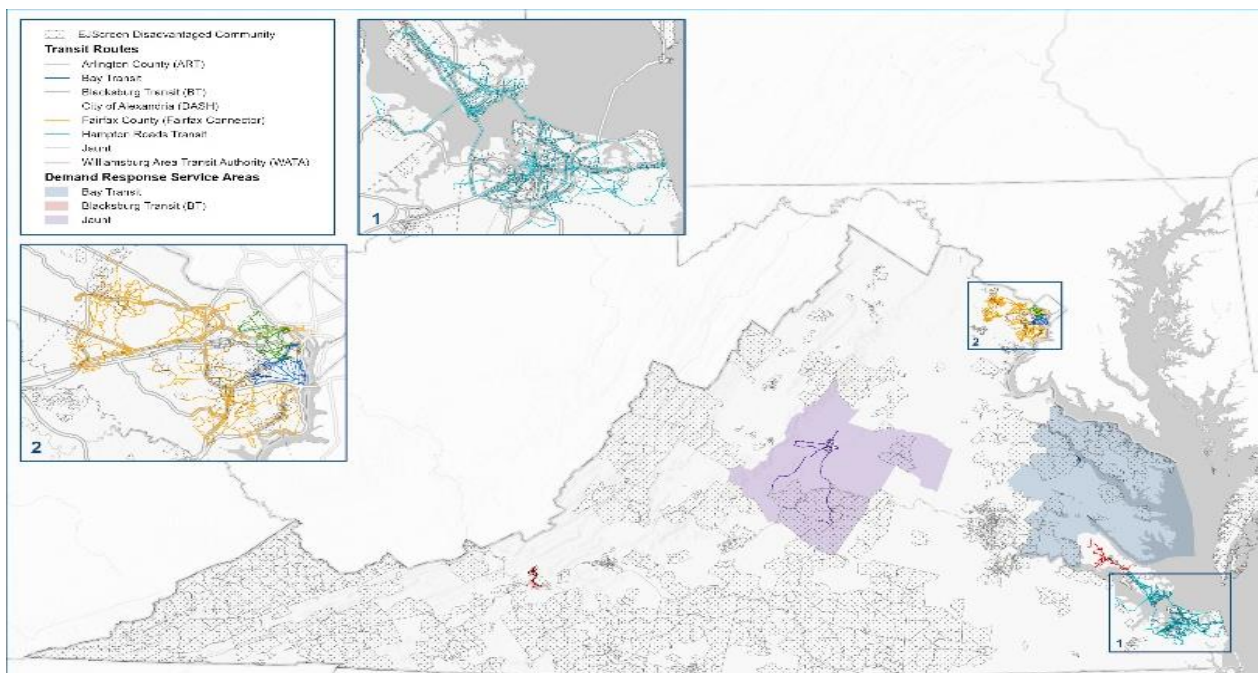
##### **a. Community Benefits**

The implementation of the measures included in this application are anticipated to provide significant benefits to LIDACs. Benefits for disadvantaged communities will include improved air quality, reduced noise pollution, cost savings, and improved public health (and associated costs). Based on partner agency prioritization strategies, it is anticipated that the following 2010 ID LIDAC census tracts within Virginia have a high likelihood of benefitting from the implementation of measures in this application: 51520020300, 51179010406, 51740213101, 51680001900, 51059491704, 51059491705, 51059491705, 51570830200, 51041100506, 51775010300, 51790000200. These census tracts are also listed in attachment *Areas\_VADEQ.xlsx*. The information below showcases how each project will benefit many of these LIDAC communities.

##### **Measure 1 (Projects 1-3)**

**Project 1:** LIDACs are present across Virginia and are in eight of the nine VDOT Districts targeted in this project based on the CEJST mapping tool. While the VDOT Culpeper District office is not in or adjacent LIDAC census tracts within the district boundary, most VDOT District Offices are located adjacent to LIDAC census tracts with the VDOT Lynchburg District Office directly located in a LIDAC census tract. The remaining VDOT District Offices are located within 14 miles from LIDAC census tracts throughout the Commonwealth. The anticipated community benefits include air quality improvement and potential resulting public health benefits, reduced noise pollution for road-adjacent communities, positive optics of the use of electric trucks in a working/service capacity by a state agency and increased cultural acceptance of EVs. The most substantive benefit anticipated is improved air quality from the replacement of 50 internal combustion engine trucks with 50 electric trucks. The internal combustion engine trucks to be replaced are estimated to average 12,000 miles traveled per year and the operators of these trucks work in settings that include idling for periods of time. The elimination of tailpipe emissions removes both the GHG emissions generated with active travel and idling situations. VDOT has conducted preliminary analysis to identify VDOT facilities that are located in or serve low-income and disadvantaged communities to inform the siting of electric trucks across the state. VDOT's Richmond District Office, which is in the 90th percentile for low-income census blocks, and the Lynchburg District Office, which is in the 92nd percentile, will both be prioritized to receive electric trucks. VDOT will conduct additional analysis using CEJST, EJScreen, and Virginia EJ Screen+ to further target the location of trucks at VDOT facilities, including local Area Headquarters offices, that are located in or serve LIDAC communities. There are no anticipated disbenefits associated with this project.

**Project 2:** The agencies identified by DRPT who have begun zero-emissions fleets transitions have LIDAC communities in at least a portion of their service areas, which are primarily in urbanized areas. DRPT is finalizing its Modernizing Transit Fleets (MTF) project, which includes a zero-emissions fleet transition plan template geared toward transition planning for rural and small-urban transit agencies. Through MTF, DRPT is working with Bay Transit to test the toolkits developed to ensure that they are useful and accessible to lower-resourced rural agencies providing transit coverage in underserved areas across the Commonwealth. Figure 1 depicts DRPT Transit Routes overlaid with EJScreen Disadvantaged Community census tracts demonstrating routes that will be prioritized to maximize LIDAC benefit from the deployment of BEBs. DRPT expects numerous benefits to communities, including reduced air pollutants within transit agency service areas, with a preference of funding for vehicles deployed in LIDAC census tracts. Further, zero-emissions transit vehicles have been shown to improve ridership and increase both bus driver and maintenance staff satisfaction due to smoother driving, fewer maintenance issues, cleaner engines, and reduced noise pollution. There are no anticipated disbenefits associated with this project.



**Figure 1: A map of DRPT Transit Routes and Service Areas overlaid with EJScreen Disadvantaged Community census tracts demonstrating routes that will be prioritized to maximize LIDAC benefit from the deployment of BEBs.**

**Project 3:** All of Virginia, especially highway corridors and urban communities with high traffic volumes for light duty vehicles, would benefit from the EV Rebate program. Program implementation includes a focus on disadvantaged communities and an annual evaluation process for review of impacts. Anticipated benefits include improved health outcomes and emissions reductions, fuel savings recirculating in the economy, thousands of gallons of gasoline reduced, increased grid utilization, lower dependence on foreign oil, and enhanced employment if VA can develop as a market hub for EVs. Additionally, the rebate program has proposed to set aside additional funding for enhanced rebates for qualified residents, meaning an additional \$2,000 for residents of the Commonwealth whose annual household income does not exceed 300 percent of the current poverty guidelines. This funding measure is intended to ensure LIDAC communities will be able to take advantage of the benefits created through

this program. The program will also allow for the purchase of used electric vehicles which allows the rebate to be more accessible to lower-income communities. Disbenefits could be caused by real or perceived administrative barriers to receiving rebates, which is why VA Energy is proposing to contract with an entity to provide technical and outreach support to keep barriers as low as possible.

**Measure 2 (Projects 4):** According to the EPA’s EJ Screen tool, the closest LIDAC community surrounding Virginia International Gateway Terminal (VIG) is within two miles of the facility. The Pinners Point Container Yard (PPCY) is surrounded by LIDAC neighborhoods that are mostly historically disadvantaged due to their proximity to environmental hazards. One neighborhood near the Richmond Marine Terminal (RMT) is extremely disadvantaged, ranking >80% in all but a few categories for both socioeconomic and environmental factors. The reduction in tailpipe emissions at port facilities will help improve air quality and health benefits for the area. In addition, LIDAC communities have historically been located within close proximity to aging, “dirtier” power generation and industrial sites. Therefore, it is also likely that the Port’s peak shaving efforts and reductions to peak demands will equate to fewer emissions associated with power generation which will aid in reducing harmful health impacts to neighboring communities. The Terminal Reservation System at the PPCY will alleviate occasional traffic congestion entering that facility thus reducing emission impacts. The port anticipates that benefits including reduction in GHG and criteria pollutants, reduction in traffic and truck idling, reduction in equipment noise, decreased down-time/ability to fully staff PPCY, grid stability and grid resilience, demand levelling reflected in electricity costs, increased respiratory health, increased benefits to barge traffic, increased removal of trucks from I-64 corridor, technology/operational demonstration, operational efficiency gains, cleaner electrical grid, and more engagement with the community will be realized. During the initial construction and installation phases, it is anticipated that there will be some noise and slight operational disruptions. These disturbances are unlikely to affect residential areas given the location of the facilities. To mitigate these issues, the port will employ best practices and undertake thorough planning and permitting activities to mitigate any potential impacts.

#### **b. Community Engagement**

Each lead agency will develop and maintain a plan and processes to continue to assess benefits and avoided disbenefits from their respective programs to LIDACs and continuously engage with communities to share this and other relevant program information. The process included public meetings and distribution of a statewide survey for feedback on the state’s biggest decarbonization priorities.

#### **Measure 1 (Projects 1-3):**

**Project 1:** VDOT plans to use a mix of in-person and virtual events, traditional and social media, and partnerships with organizations like Virginia Clean Cities (VCC) and state agencies to promote the use of electric trucks in its fleet. A dedicated section on the National Electric Vehicle Infrastructure Public Input website will highlight VDOT’s electrification project and solicit public feedback. The statewide Drive Electric Virginia initiative, part of the DOE-sponsored Drive Electric USA, aims to overcome EV adoption barriers, expand EV availability, awareness, and infrastructure, and provide information on available EV rebates. VDOT is dedicated to investing in workforce development for staff by providing a variety of training programs focused on emerging technology and electrification.

**Project 2:** The DRPT, recognizing the transformative impact of stakeholder engagement, has developed a zero-emissions transition planning template for Virginia’s rural and small-urban agencies, following extensive outreach. Committed to providing ongoing technical assistance, DRPT has completed a statewide Transit Equity and Modernization Study, involving over 3,500 interactions with a broad array

of stakeholders. This input has informed data collection and technical analysis efforts, capturing diverse experiences from across the Commonwealth. As part of its commitment to community engagement, DRPT requires transit agencies to update their Transit Strategic Plan every five years, offering support to achieve public participation goals and outreach to underserved communities. DRPT is dedicated to providing staff and external partners with job training opportunities focused on transit best practices.

**Project 3:** The EV Rebate Program will utilize partnership with J40 named programs and use engagement strategies to focus on implementation and engagement with LIDAC populations and in all communities in the Commonwealth. Engagement strategies that will be used to inform the public about the Program will include virtual, in-person, and community tabling events; information-sharing through a website and agency social media; and partnerships with appropriate agencies and integration into regular outreach activities such as transmittals and displays with dealerships, the DMV, and utilities.

**Measure 2 (Project 4):** The VPA Port regularly engages with the community, providing updates to civic leagues, state and congressional leaders, and local communities about ongoing projects and sustainability efforts. To enhance outreach, the Port publishes an annual Sustainability Report and a community newsletter, which includes project updates and a dedicated email for citizen engagement. The Port also identifies and engages with communities adjacent to port facilities where projects will be implemented, providing updates and receiving feedback throughout the project’s lifecycle. These communities also receive the community newsletter, which includes updates and information related to the projects. VPA is dedicated to investing in workforce development for staff by providing a variety of training programs focused on safety, emerging technology and electrification.

## **5. JOB QUALITY**

DEQ and the partner agencies identified in this proposal will work to carry out projects in ways that produce high-quality work, avert disruptive and costly delays, and promote efficiency. In implementing the awarded project, DEQ and partners expect to use strong labor standards, including wages at or above the prevailing rate and include local hire provisions. Access to transportation is a pathway for personal mobility and equitable access to education and training, preparing individuals for career opportunities including high-quality, middle-skill jobs as an alternative to short-term, low-wage jobs. The proposed projects promote job creation and stability in Virginia’s job market and investments in transportation related emission reduction can lead to a number of green jobs and sustainable employment opportunities.

### **Measure 1 (Projects 1-3):**

**Project 1:** VDOT has a diverse workforce and employs an estimated 7,500 people across the Commonwealth. Staff that work for VDOT work and live in or adjacent to LIDAC communities statewide. Workforce development will be a community benefit through its creation of equitable career pathways and training opportunities. Specifically, this includes preparing individuals for high-quality, middle-skill career pathways that enable economic mobility, rather than short-term, low-wage jobs. VDOT has several high-quality training programs, including the VDOT Small Business Enterprise Program (VSBEP) to ensure Disadvantaged Business Enterprises (DBEs) and Small, Women and Minority-owned (SWaM) businesses are afforded the opportunity to participate in federally assisted projects. VDOT is also a Certified V3 (Virginia Values Veterans) Employer. VDOT’s Civil Rights Division partners with the Human Resources Talent Acquisition Team to help recruit veterans who qualify for the Veterans Internship Program (VIP). This 12-month program allows veterans who are transitioning from active duty to the civilian workforce to gain insight and develop skills to work on VDOT projects and support the various positions at VDOT. VDOT has also collaborated with the Virginia Community College System (VCCS),

which oversees 23 community college campuses across the Commonwealth and offers multiple accredited electrical programs as well as continuing education at several campuses. VDOT is working with VCCS to identify how EV charging classes could be incorporated into the existing electrical programs offered by VCCS. In addition, VDOT has coordinated with several private entities in Virginia are interested in expanding training programs to facilitate widespread workforce development opportunities across the Commonwealth. As a direct component of this application, VDOT will provide training to its own staff in the operation and maintenance of electric trucks and EV charging stations. This training will provide professional development opportunities in an emerging technology and ensure that VDOT staff are equipped to work on the transportation technologies of the future. VDOT will hold a transportation electrification convening and training for key staff to successfully and seamlessly transition the fleet and learn cutting edge EV maintenance skills.

**Project 2:** As with any large industrial technology shift, workforce transition considerations are key in ensuring the existing transit workforce can benefit from acquiring new skills and the resulting wage growth, while transit agencies can also better attract the next generation of public transit workers. Historically, there have been large workforce shifts when technology changes in an industry and BEBs are no exception to this rule. DRPT recognizes the importance of establishing talent development pathways for these specific transit agency roles and has supported localities and agencies through its Workforce Development Grant Program. They’ve taken several steps in recognition of the growing need for skilled trade development and coordinated state support. In preparation for Fiscal Year 2025 DRPT’s Transit and Commuter Assistance Grant Application Manual was amended to include specific language and enhanced scoring criteria for apprenticeships. In addition to DRPT’s existing grant programs, the Modernizing Transit Fleets (MTF) project has engaged with internal and external partners to identify opportunities to improve job training opportunities and has provided recommendations including producing an apprenticeship guidebook complete with model job training programs, grant guidance, and recommended agency support. Through the development of these resources DRPT will gain additional competence in how to optimize our grant programs to support our goals as an agency. Through DRPT’s ongoing efforts to better serve the transit agencies in fleet transition planning, the project team has engaged with additional external partners such as the VEDP, Joint Office for Energy and Transportation, National Renewable Energy Laboratory (NREL), and the Michigan Workforce Training and Education Collaborative (METWC). Through these conversations, staff have begun developing best practices to for transit agencies in developing partnerships with community colleges, paid internships, and will be able to support our agencies in developing pre-apprenticeships and registered apprenticeship programs.

**Project 3:** There are thousands of jobs in Virginia that can be created with the rollout of EV charging at scale with EV adoption. Clean transportation vehicle manufacturing and part manufacturing are significant economic development opportunities and can be supported if Virginia can become an EV job hub.

**Measure 2 (Project 4):** The VPA works with Tidewater Community College (TCC) to implement training for port staff in the operations and maintenance divisions. Within the TCC suite of programs is Workforce Solutions (WFS) which provides opportunities across the Hampton Roads region to participate in short-term training which leads to industry recognized credentials and employment. Since July of 2022, TCCWFS has partnered with the VPA to deliver 95 separate classes and train 551 participants in Electrical, Shop Safety, CPR and Fall Protection. TCC’s WFS has several active grant-funded programs that target underrepresented and/or marginalized participants, including TANF recipients, the incarcerated, participants with children, and foster youth. WFS participants have access

to services offered through TCC’s Open Door Project, a U.S. Department of Education TRIO SSS program that supports first-generation and low-income students. TCC has training space designated for the VPA at its current Skilled Trades Academy and space has been identified in the Skilled Trades Academy expansion for a port dedicated classroom and a port training space. The VPA is actively working with TCC to develop a program that supports its workforce development efforts for existing maintenance and operations technicians specifically in the electric vehicle space. In addition, the port is exploring opportunities with the TCCWFS to expand workforce development efforts to create a “pipeline” of future candidates utilizing TCC’s experience in engaging disadvantaged communities and other industry partners. Since 2015, the VPA has hosted an eight-week summer internship program which has provided real-world job experience for college students across the country. Several internships are provided across the organization to include work with our Finance team, Operations, Sales, Sustainability, and Emergency Response providing insights to various occupations within the maritime industry. Through this program’s establishment, the port has provided 81 internships to students in their junior and senior years of college. Lastly, TCC also has an Apprenticeship Institute that partners with employers such as the VPA throughout Hampton Roads to provide a variety of apprenticeship programs in various industries, ranging from cyber security to maritime and skilled trades. At no cost to the employer, companies are guided through the registered apprenticeship development process from initial concept to full recognition by the Department of Labor and Industry on Registered Apprenticeship and U.S. Department of Labor Apprenticeship.gov.

## **6. PROGRAMMATIC CAPABILITY AND PAST PERFORMANCE**

### **a. Past Performance**

The information below demonstrates DEQ’s past performances for a diversity of grants and adherence to reporting requirements.

**Project Title:** State Clean Water Revolving Fund Base Capitalization Grant

**Assistance Agreement Number:** EPA #CS-51000122-0

**Federal or Non-Federal Funding Agency and Assistance Listing Number:** 66.458

**Description:** A capitalization grant which provides funds for DEQ’s Clean Water State Revolving Fund (CWSRF) program. The activities are to provide low interest financing to numerous subrecipients for costs associated with the planning, design, and construction of eligible water quality improvement and protection projects. DEQ has submitted all required financial, programmatic and project reporting for the CWSR. The program has a history of satisfactory Program Evaluation Reports (PER) summarizing EPA’s oversight review of the CWSRF. PERs for the SFY 2021 and SFY 2021 resulted in zero corrective actions needed for Virginia’s CWSRF.

**Organization Contact:** Catherine King

**Project Title:** Chesapeake Bay Program Implementation, Regulatory/Accountability and Monitoring Grants

**Assistance Agreement Number:** EPA #CB-96383501-3

**Federal or Non-Federal Funding Agency and Assistance Listing Number:** 66.964

**Description:** As Virginia’s lead agency for nonpoint source pollution (NPS), DEQ has been working with DCR to use these funds to accomplish objectives of the Virginia Chesapeake Bay TMDL Phase III Watershed Implementation Plan, and Virginia’s Milestones, with an emphasis on nonpoint source pollution reduction programs. DEQ has successfully managed CBIG grants since 2013. Progress reports for projects currently underway follow a semi-annual cycle and have been submitted and reviewed on schedule.

**Organization Contact:** Erin Chapman

**Project Title:** Climate Pollution Reduction Grant Program (CPRG) Planning Grant

**Assistance Agreement Number:** EPA #5D-95316001-0

**Federal or Non-Federal Funding Agency and Assistance Listing Number:** 66.046

**Description:** DEQ successfully received and managed funding under the CPRG Planning Grant to develop a comprehensive, economy-wide climate mitigation plan in collaboration with air pollution control districts, large and small municipalities statewide, and tribal governments that will support actions to reduce greenhouse gases (GHG) and harmful air pollutants and conduct meaningful engagement with low-income and disadvantaged communities. DEQ also assisted local governments in developing or updating their GHG inventories and action plans. DEQ developed and submitted a statewide Priority Climate Action Plan (PCAP) for Virginia on 3/1/24. In addition, the DEQ developed a Quality Assurance Project Plan (QAPP) that was also approved and submitted 2 quarterly reports to EPA on 11/2/23 and 2/2/24. DEQ will maintain compliance throughout the remainder of the grant’s period of performance.

**Organization Contact:** Alison Riley

**Project Title:** CAA Section 105 - Performance Partnership Grant

**Assistance Agreement Number:** EPA #BG-98392507-3: \$9,020,603 (Federal); 8,734,698 (Match)

**Federal or Non-Federal Funding Agency and Assistance Listing Number:** 66.605

**Description:** DEQ received funding to improve and maintain the public's air quality by reducing diesel emissions and promoting cost effective opportunities for consumers, businesses, state and local governments and other organizations to invest in GHG emissions reductions. DEQ has received Clean Air Act Section 105 air quality program support funding since 1993 and has a well-established annual process of reporting and holding meetings on grant status with EPA. This includes the development of grant commitments, a mid-year status meeting, and biennial formal status reports.

**Organization Contact:** Rachel Mirro

#### **b. Reporting Requirements**

With the understanding that data is key to ensuring that communities needs are being addressed and that desired program outcomes are in fact being achieved, DEQ and its partners have historically been providing compliant data and progress reports to local, state, and federal agencies over the last 10 years. Specifically for the past performances listed in the prior section, DEQ and its partners have submitted interim and/or final reports that were accepted and approved by the grantors and provided sufficiently detailed and timely progress reports towards achieving goals, objectives, outputs, and outcomes under the agreements with satisfactory results and no audit findings.

#### **c. Staff Expertise**

Virginia DEQ is the leading environmental agency for the Commonwealth and is responsible for administering laws and regulations for air quality, water quality, water supply, and renewable energy, as well as land protection. DEQ is confident they have the staff expertise and strong administrative and partnership track record necessary for the successful implementation and management of this grant. Staff bios for DEQ’s core CPRG implementation team are provided below.

#### **Michael Dowd**

**Title:** Director, Air & Renewable Energy Division, Department of Environmental Quality.

**Role:** Oversees air quality planning, permitting, compliance, monitoring, and mobile source programs, as well as the Small Renewable Energy Permit by Rule program.

**Education:** Bachelor of Arts, Columbia University, 1979; Juris Doctor (J.D.), Vermont Law School, 1982.

**Experience:** Prior to becoming Air Director, Mr. Dowd served as DEQ’s Enforcement Director. Before joining DEQ, Mr. Dowd was an attorney in private practice with law firms in Richmond, Va., Washington, D.C., and Columbus, Ohio. Mr. Dowd is a recipient of EPA’s Bronze Medal and serves as Co-Chair of the Enforcement Committee of the National Association of Clean Air Agencies, Chair of PJM Environmental-Energy Regulators, on the Board of Directors and Past Chair of the Mid-Atlantic Regional Air Management Association, and Southeast States Air Resource Managers, Inc., and on the Executive Committee of the National Council on Electricity Policy.

#### **Thomas Ballou**

**Title:** Manager, Office of Air Data Analysis and Planning, Department of Environmental Quality.

**Role:** Develops air quality plans, tracks air quality improvement, and develops air pollutant emissions inventories.

**Education:** Bachelor of Science in Environmental Science, Shippensburg University in Pennsylvania, 1983.

**Experience:** Mr. Ballou successfully led the Commonwealth’s Priority Climate Action Plan (PCAP) to completion. He has been with the DEQ air program for over 30 years and has extensive knowledge and experience in the development of air quality plans, programs, and emissions inventories. Mr. Ballou has directed the development of statewide GHG emissions inventories and worked on other state climate initiatives such as planning and implementing a state carbon trading rule and program for the Virginia power sector, including participation in the Regional Greenhouse Gas Initiative (RGGI). He has also directed the development and adoption of Virginia’s advanced clean cars regulation. Before coming to the DEQ, he worked for the Air Division of the US EPA regional office in New York, and the New Jersey DEP.

#### **Angela Conroy**

**Title:** Senior Air Quality Planner, Department of Environmental Quality.

**Role:** Supports climate change planning efforts, including CPRG, greenhouse gas planning efforts (e.g., RGGI and transportation initiatives), and manages Virginia’s \$96.3 million allocation under the Volkswagen Environmental Mitigation Trust on behalf on the Commonwealth of Virginia.

**Education:** Bachelor of Science (B.S.) in Environmental, Ferrum College; Master of Business Administration (M.B.A.), and Master of Science (M.S.) in Environmental Management, University of Maryland, 2009; Graduate Studies in Urban and Regional Planning, Virginia Tech; Certified Sustainable Development Professional, Association of Energy Engineers.

**Experience:** Ms. Conroy has 20 years of experience in environmental program and project management for federal government agencies including but not limited to the U.S EPA, DOE, DOD, Department of Interior, and the Veterans Administration. She has co-authored technical guidance such as *Best Practices for Siting Photovoltaics on Municipal Solid Waste Landfills*, and published articles for the Global Association of Risk Professionals and other non-profit organizations.

#### **Ava Lovain**

**Title:** Greenhouse Gas Inventory Specialist

**Role:** Responsible for updating Virginia’s annual greenhouse gas inventory and aiding in the office’s climate planning efforts as an Air Emissions Coordinator.

**Education:** Bachelor of Science in Environmental Resources Management; Minors in Forestry and National Security, Virginia Tech, 2023.

**Previous Experience:** Ms. Lovain has been supporting DEQ throughout the Climate Pollution Reduction Grant program, most recently throughout the development of the Priority Climate Action Plan. Prior to joining DEQ, she worked in forest analytics and carbon inventories as a Natural Resource Technician.

DEQ’s project partners and subawardees, VDOT, DRPT, VA Energy, and the VPA, all have deep expertise in their agencies to successfully implement measures and manage and report on subaward progress. VDOT has been working with a team of research scientists through their Transportation Research Council. DRPT has 7 full-time planning staff, 2 professional engineers, and contracts with teams of bench consultants for both planning and engineering work that are available for all of Virginia’s transit agencies to use. DRPT staff are prepared to both administer the grant program and to provide technical assistance to agencies planning for zero-emissions fleet transition plans. Virginia Energy has worked on EV deployment issues and operates other similar incentive programs going back to Recovery Act and other technology integration efforts. The VPA has many years of experience implementing decarbonization, optimization, and equipment replacement/transition projects. With assistance from previous DERA funding, over the last eight years, the port has transitioned an entire equipment line of 100 diesel straddle and shuttle carriers to hybrid shuttle carriers and is also managing several electrification pilots and a truck reservation system. The Port has successfully completed a number of power projects on terminals including major substation upgrades ahead of large-scale terminal electrification projects.

## **7. BUDGET**

DEQ requests a total funding award of \$199,999,999 to comprehensively implement two measures and all components of this application with the goal of significantly reducing GHG emissions across the state.

### **a. Budget Detail**

Please see attachments *Budget\_VADEQ.pdf* and *BudgetCalcs\_VADEQ.xlsx* for budget details.

### **b. Expenditure of Awarded Funds**

DEQ has established sound fiscal and accounting policies that govern the expenditure of grant funds. All of the processes, procedures and internal controls outlined in DEQ’s policies are in compliance with the state-wide policies and authoritative guidance issued by the Virginia Department of Accounts through its Commonwealth Accounting Policies and Procedures Manual. DEQ’s fiscal and accounting policies help to ensure that grant funds are expended in a timely and efficient manner. DEQ assigns a Grant Accountant to each awarded grant who reviews, tracks and monitors expenditures relative to the grant budget and project period to ensure accuracy and that funds are expended timely. Grant Accountants prepare monthly grant expenditure reports for Program Managers and upper Financial Management for an additional review for accuracy and to help inform of ongoing grant expenditure decisions. Grant accounting staff and program managers are in regular communication about expenditures. DEQ has also established procurement policies that govern the selection of contractors and vendors. All such policies are in compliance with the Virginia Public Procurement Act. These policies help to ensure that the process for selecting contractors and vendors is fair, impartial and transparent and that all third-party services, including those underwritten by grant funds, are procured at a reasonable price.

### **c. Reasonableness of Costs**

As outlined in the Budget Spreadsheet and Budget Narrative attachments for Budget Detail 7.a, all projected costs are proportionate to the project requirements and are based on current rates or past contracts. The total personnel costs across the four projects, which are based on the rates of three current staff members from various Commonwealth departments without a salary increase, are

expected to be approximately \$158,588. In VA Project 3, fringe benefits for one internal admin staff member with a 0.5 FTE at a 50% fringe rate are estimated to cost around \$24,639. These benefits may include health insurance, retirement, life insurance, and personal time off. The equipment costs for the three projects are estimated to be around \$160,818,212. These costs are derived from information provided by each agency and include the cost of EV trucks based on current vehicle rates, equipment purchases based on recent electrical infrastructure, battery, and charger purchases, purchases for controlled video monitor truck grate house based on current rates, and current rates for mobile harbor crane. VDOT is expected to spend \$30,000 on monitoring supplies, with estimates based on current rates. Contractual costs, based on current rates for the installation of various equipment, are estimated to be around \$18,724,764. These costs will cover the installation of chargers, program management for the rebate program, marketing and technical support, battery installation, and installation of grid power. An additional line item of approximately \$19,770,000 will cover the \$2,500 rebates and \$4,500 enhanced rebates offered to those who made qualifying vehicle purchases. All these costs are deemed reasonable considering the scope and scale of the projects.