Maryland Zero Emission Vehicle Infrastructure

2023 Annual Report

MARYLAND ZERO EMISSION
Electric Vehicle Infrastructure Council

MDOT
MARYLAND DEPARTMENT OF TRANSPORTATION

Presented by the
Zero Emission Electric Vehicle Infrastructure Council
(SB 714, Chapter 378, Acts of 2015)

Presented to
Governor Wes Moore
and the Maryland General Assembly

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Acronyms

The following acronyms are used in this report:

ACC II	Advanced Clean Cars II
ACT	Advanced Clean Trucks
AFC	Alternative Fuel Corridor
BEV	Battery Electric Vehicle
BGE	Baltimore Gas and Electric
BIL	Bipartisan Infrastructure Law
CAGP	Charge Ahead Grant Program
CFI	Charging and Fueling Infrastructure
CFIP	Clean Fuels Incentive Program
CRP	Carbon Reduction Program
CSNA	Climate Solutions Now Act
DCFC	Direct Current Fast Charging
DGS	Maryland Department of General Services
ECGP	Electric Corridor Grant Program
EPA	Environmental Protection Agency
ESB	Electric School Bus
EV	Electric Vehicle
EVADC	Electric Vehicle Association of Greater Washington
EVIC	Electric Vehicle Infrastructure Council (Previous ZEEVIC name)
EVIP	Electric Vehicle Infrastructure Program
EVSE	Electric Vehicle Supply Equipment
FCEV	Fuel Cell Electric Vehicle
FHWA	Federal Highway Administration
FY	Fiscal Year (July 1 – June 30)
GHG	Greenhouse Gas
HB	House Bill
HOA	Homeowners Association
HOV	High Occupancy Vehicle
ICCT	International Council on Clean Transportation
IIJA	Infrastructure Investment and Jobs Act
kWh	Kilowatt-Hour
MAEP	Mid-Atlantic Electrification Partnership
MAHH	Mid-Atlantic Hydrogen Hub
MCCC	Maryland Commission on Climate Change
MCEC	Maryland Clean Energy Center
MDE	Maryland Department of Environment
MEEP	Mid-Atlantic Electric School Bus Experience Project
MDOT	Maryland Department of Transportation
MDP	Maryland Department of Planning
MEA	Maryland Energy Administration
MHD	Medium- and Heavy-Duty
MHDV	Medium- and Heavy-Duty Vehicles
MPO	Metropolitan Planning Organizations
MSEC	Maryland Smart Energy Communities

MUD	Multiunit Dwelling
MVA	Motor Vehicle Administration
NDEW	National Drive Electric Week
NEVI	National Electric Vehicle Infrastructure
OEM	Original Equipment Manufacturer
PC44	Public Conference 44
Pepco	Potomac Electric Power Company
PHEV	Plug-In Hybrid Electric Vehicle
PHI	Pepco Holdings, Inc.
PSC	Public Service Commission
RFI	Request for Information
SMECO	Southern Maryland Electric Cooperative
TOU	Time of Use Charging Rate
US DOE	United States Department of Energy
US DOT	United States Department of Transportation
V2G	Vehicle-to-Grid
VW	Volkswagen
WG	Working Group
ZEEVIC	Zero Emission Electric Vehicle Infrastructure Council (Previously EVIC)
ZEV	Zero Emission Vehicle

A Message from Deron Lovaas, ZEEVIC Chair

As I scan the road ahead, I see a zero-emission future for transportation. Small wonder. More than 87,000 plug-in and battery-electric light-duty vehicles now ply our roads and highways. We are on track to hit the 100,000 mark this fiscal year, a stunning achievement and double the number in 2022. This transformation of Maryland's vehicle fleet wouldn't have been possible without years of great work by ZEEVIC under the leadership of my predecessor in the Chair position, former Maryland Department of Transportation (MDOT) Deputy Secretary R. Earl Lewis. The good news is that we are poised to speed up that progress.

One of the first actions Governor Wes Moore took this year is directing the Maryland Department of Environment (MDE) to move forward with new regulations advancing clean cars, moving us toward 100 percent zero-emission passenger and light-duty vehicle sales by model year 2035. This will help us to achieve the most ambitious state climate goals in the nation, which became law last year with the Climate Solutions Now Act.

Those are just two of an array of state policies driving us to clean energy and transportation. These policies supplement vehicle electrification provisions in landmark federal laws enacted in the last two years – the Bipartisan Infrastructure Law and the Inflation Reduction Act – delivering unprecedented investments in charging infrastructure and electric-vehicle tax incentives.

MDOT has a major role to play in implementing these provisions alongside fellow agencies including MDE and the Maryland Energy Administration (MEA). Specifically, we're charged with implementing new initiatives including the National Electric Vehicle Infrastructure (NEVI) and Carbon Reduction (CRP) programs. My team here at MDOT is leading the way with the development of plans, strategies, and projects to leverage such new federal and state investments as effectively as possible.

I am excited to chair this important and unique council, fully aware that the thought leadership generated by ZEEVIC has contributed immensely to getting us this far. In the fall we established ZEEVIC working groups to build on our collaborative efforts towards transportation electrification. I am excited and appreciative of the ZEEVIC members who joined a working group and participated.

Moving forward, we will further accelerate and intensify our work together. Effective implementation of new state and federal laws is a top priority. In addition, we must develop new strategies for decarbonizing medium- and heavy-duty vehicles and addressing the funding of transportation needs as we electrify the sector. Emerging challenges and opportunities will continue to require our attention and focus.

As Governor Moore says, this is Maryland's decade. ZEEVIC is a key driver of the conversations and creative ideas that will make it so.

Thank you for all we've accomplished so far. Let's keep working together to deliver a zero-emission future for transportation.

Introduction

The Maryland Zero Emission Electric Vehicle Infrastructure Council (ZEEVIC) was originally established as the Electric Vehicle Infrastructure Council (EVIC) in 2011. In 2015, the Maryland General Assembly extended EVIC through 2020 and established requirements for EVIC. The Clean Cars Act of 2019 expanded the scope of EVIC again to include fuel cell electric vehicles (FCEVs) powered by hydrogen, and the EVIC name was changed to ZEEVIC. In 2020, ZEEVIC's term was extended to June 2026. MDOT serves as Chair of the Council. The current members of ZEEVIC are presented in Table 1. See Appendix A for more information on ZEEVIC's legislative mandates.

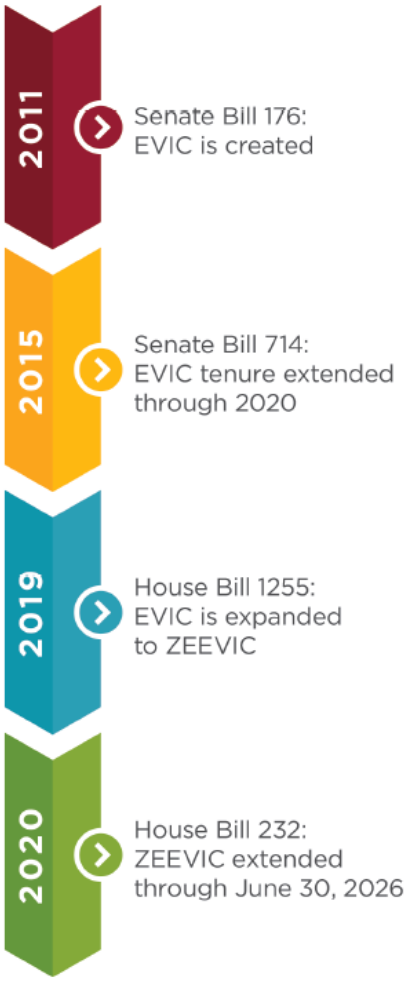
This document fulfills the requirement to submit an annual report of ZEEVIC's work and recommendations to the Governor and General Assembly under the Maryland Electric Vehicle Infrastructure Council Act.

What does ZEEVIC Do?

ZEEVIC is charged with the supporting development of:

- Policies, recommendations, and incentives that increase awareness of zero emission vehicles (ZEVs), support the ownership of ZEVs, and promote investment by private sector in ZEVs;
- Recommendations for a statewide EV charging and hydrogen refueling infrastructure plan; and,
- Other potential policies to promote and facilitate the successful integration of ZEVs into Maryland's transportation network.

ZEEVIC's responsibilities are directly related to helping Maryland meet the greenhouse gas (GHG) emission reductions goals. The Climate Solution Now Act (CSNA) established a new target of 60 percent reduction by 2031. Because transportation is the single largest GHG generator in Maryland, ZEVs play an integral role in helping meet Maryland's emissions reduction goal.



ZEEVIC Members

Table 1 - ZEEVIC Members

Representative Members	Organizations Representing ZEEVIC
Deron Lovaas, Chief of Environment and Sustainable Transportation (Council Chair)	Maryland Department of Transportation
Hyeon-Shic Shin, PhD., Morgan State University	Member from a Maryland institution of higher education
Weston Young, Worcester County	Maryland Association of Counties - rural region
Council Member Jolene Ivey, Prince George's County Council District 5	Maryland Association of Counties - urban or suburban region
Nina Forsythe, City of Frostburg	Maryland Municipal League - rural region
David Edmondson, City of Frederick	Maryland Municipal League - urban or suburban region
Elvia Thompson, Annapolis Green	EV Driver Advocacy Organization
Kristy Fleischmann Groncki, BGE	Electric Companies
Vincent Wynne, Pepco	
Jeff Shaw, SMECO	
Jason Tai, Tesla Consultant	Electric Vehicle Manufacturer
Joshua Cohen, SWTCH Energy	Electric Vehicle Charging Station Manufacturer
Robert Wimmer, Toyota	Fuel Cell Electric Vehicle Manufacturer
Joe Alfred, Ally Power Inc.	Fuel Cell Electric Vehicle Infrastructure Equipment Manufacturer
Steven Koerner, BP Pulse Fleet	Fleet Operator
Michael Wall, Clinton Electric Company	Electrical Workers
Scott Wilson, Electric Vehicle Association of Washington D.C.	Environmental Community
Sari Amiel, Sierra Club	
Paul Verchinski	Public with expertise in energy or transportation policy
John Bowis, Chevy Chase Automotive	New vehicle dealer association
Senator Clarence K. Lam, M.D., District 12 Anne Arundel and Howard Counties	State Senate
Delegate Sara Love, District 16 Montgomery County	House of Delegates
Delegate David Fraser-Hidalgo, District 15 Montgomery County	
Bihui Xu, Secretary's Designee	Maryland Department of Planning
Tim Shepherd, Secretary's Designee	Maryland Department of the Environment
Heather Gramm, Secretary's Designee	Maryland Department of Commerce
Kevin Mosier, Assistant Director – Energy Analysis & Planning	Maryland Public Service Commission
Paul Pinsky, Director	Maryland Energy Administration
David Lapp, People's Counsel	Office of People's Counsel

Section 1 - 2023 Annual Report Highlights

At mid-year, ZEEVIC Chair R. Earl Lewis Jr. stepped down, after serving as Chair for seven years. He was replaced by the new Chair Deron Lovaas, MDOT's Chief of Environment and Sustainable Transportation.

Highlights of the year included new federal funding opportunities, passage of the Advanced Clean Cars II (ACC II) and Clean Trucks Acts, and advancement of Maryland's NEVI Program. Medium- and heavy-duty vehicles (MHDVs) and infrastructure were increasingly an area of focus, with a focus on the electrification of school bus fleets and associated charging infrastructure. (More information is presented in the ZEEVIC 2023 Activities section.)

Maryland continues to work on the development of the NEVI Program. The 2023 Plan Update of the Maryland State Plan for NEVI Formula Funding Deployment was approved by the Federal Highway Administration (FHWA) on September 29, 2023. As part of this effort, MDOT created and launched an interactive Electric Vehicle Charger Siting Tool to assist potential applicants in responding to funding opportunities. MDOT also released two Requests for Information (RFI) aimed to solicit feedback and recommendations for Maryland's NEVI Program. (More information is presented in the NEVI section.)

Maryland continued to experience significant growth in the number of electric vehicles (EVs) registered to Maryland drivers. The total number of EVs registered in Maryland reached 87,087 at the end of October 2023. (More information is presented in the EV and Infrastructure section.)

ZEEVIC's EV education and outreach activities in 2023 combined in-person events and digital outreach strategies to amplify messaging and re-target audiences, which increased overall message exposure by more than 47 percent compared to 2022 outreach metrics. (More information is presented in the Education and Outreach section.)

Section 2 - ZEEVIC Activity in 2023

ZEEVIC Priority Statement

The Council supports a set of three priorities to guide efforts to expand zero emission vehicle (ZEV) infrastructure in Maryland:

- Install more EV charging infrastructure and ensure EV readiness through strategic infrastructure planning, particularly focusing on rural communities, equitable charger placement in environmental justice communities, corridors, and multiunit dwellings (MUDs), and apply lessons learned from deployments to continuously improve charging infrastructure.
- Maximize the use of grant and alternative funding opportunities for EVs and charging infrastructure in Maryland, particularly funds allocated to Maryland through the 2021 Bipartisan Infrastructure Investment (BIL) and Jobs Act (IIJA) by collaborating across local and state agencies, to strategically target funds for optimal infrastructure expansion.
- Continue ZEV education and outreach coordination, with a focus on diversity and equity to increase ZEV deployment.

ZEEVIC Meeting Schedules and Agendas

ZEEVIC held five meetings in 2023. Starting with the July meeting, as leadership of the Council shifted to a new Chair, the ZEEVIC meeting schedule was adjusted from bi-monthly to quarterly. Meetings were held in a hybrid format via virtual Microsoft Teams meetings and in person at MDOT headquarters in Hanover. All ZEEVIC meetings are open to the public and the agendas are posted on the ZEEVIC website in advance. The ZEEVIC meeting dates and topics are presented in Table 2.

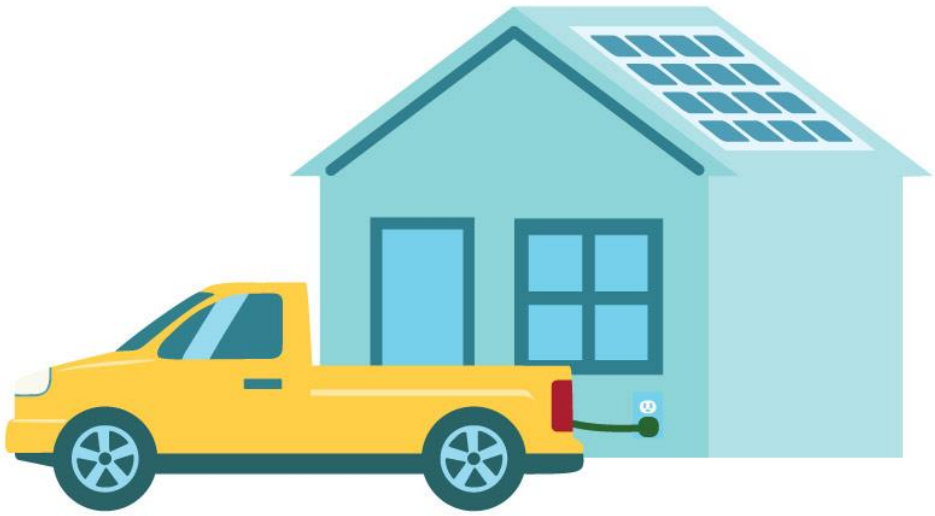


Table 2 - ZEEVIC Meetings and Agendas

Date	Meeting Topic

January 12, 2023	• 2023 Legislative Session of Maryland General Assembly
	• Mid-Atlantic Hydrogen Hub
	• School Bus Electrification
	  ▫ Electric School Bus Pilot Program – Baltimore Gas and Electric (BGE) Proposal
	  ▫ Perspectives on Funding – MDE
	• Maryland NEVI Program

February 23, 2023	• ZEEVIC Letter of Support for Zero Emission Electric Vehicle Related Legislation • ZEEVIC Letter to Public Service Commission (PSC)
March 8, 2023	• Federal NEVI Standards and Build/Buy America Requirements • Federal Program Updates • 2023 Legislative Session Update and ZEEVIC Letter of Support for Legislation
July 12, 2023	• ZEEVIC Organizational Updates • Maryland ZEV Tax Credit Explained • ACC II and Clean Trucks Acts • MEA Medium- and Heavy-Duty ZEV Grant Program • PSC PC44 EV Working Group Update • "What We Heard at the MarylandEV Booth"; Outreach Season Highlights
October 25, 2023	• ZEV Policy Scorecard - 2023 Update • MHDV Infrastructure • EV Adoption Scenarios – MDOT CSNA Plan • Maryland NEVI Program
All ZEEVIC meetings, except for the additional meeting in February, began with announcements and public comments. At the January and March meetings, routine updates were given about outreach efforts, along with routine updates by state agencies and utility companies.	

ZEEVIC Working Groups

At the discretion of the Chair, the Council may form working groups (WGs) for members to discuss topics of interest. The WGs are open to ZEEVIC members or alternates from the member's organization, and to invited speakers, at the discretion of the WG chair. The purpose of the ZEEVIC WGs is to share information and discuss ideas in a small group format. WG discussions are not decisional but are for the purpose of developing recommendations for the full Council to consider. Three WGs were formed in 2023. A brief description of the WGs, meeting dates, and outcomes are presented below. Further information on the WG topics is included in Section 5, Appendix C, and Appendix D of this report.

1. Legislative WG met weekly via virtual meetings in late January and February to review and discuss pending legislation. Chaired by Kevin Miller of ChargePoint, the WG drafted letters of support regarding certain legislative proposals. The WG presented draft letters to the full Council at the February and March ZEEVIC meetings (see Section 5).

2. MHDV WG was devoted to trucking and MHDV infrastructure. Chaired by Tim Shepherd of MDE, the WG met virtually on September 22, September 29, and October 13. The WG heard from four invited speakers, explored barriers and opportunities for electrification of the trucking sector, and discussed strategies and policies ZEEVIC could support. Draft recommendations from the WG were presented to the full Council at the October meeting and documented in a report (see Appendix D).

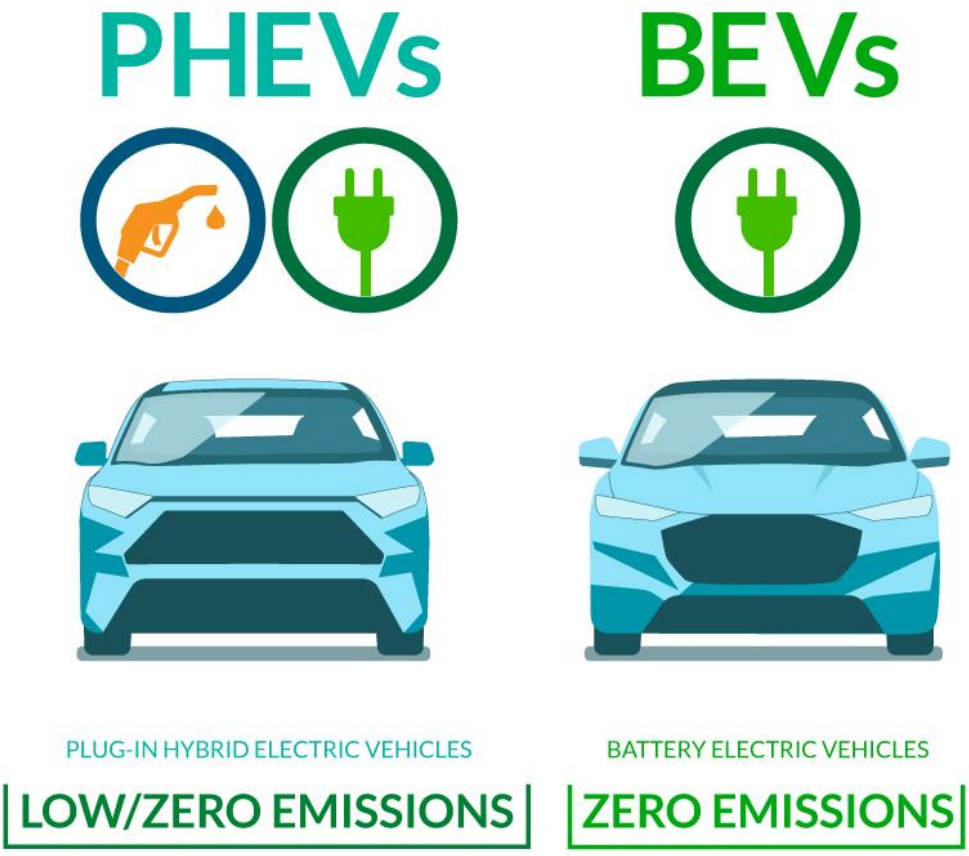
3. ZEV Policy Scorecard WG reviewed the 2023 Update of the Maryland ZEV Policy Scorecard. This scorecard assesses the status of ZEV-supportive policies and incentives active in Maryland, and highlights possible legislative concepts ZEEVIC may wish to support in the 2024 Legislative Session. The WG met virtually on October 6, 2023. A draft version of the updated ZEV Policy Scorecard was presented to the full Council at the October meeting. The draft scorecard is presented in Appendix C.

Section 3 - Electric Vehicles and Infrastructure

EV Registration Status and Trends

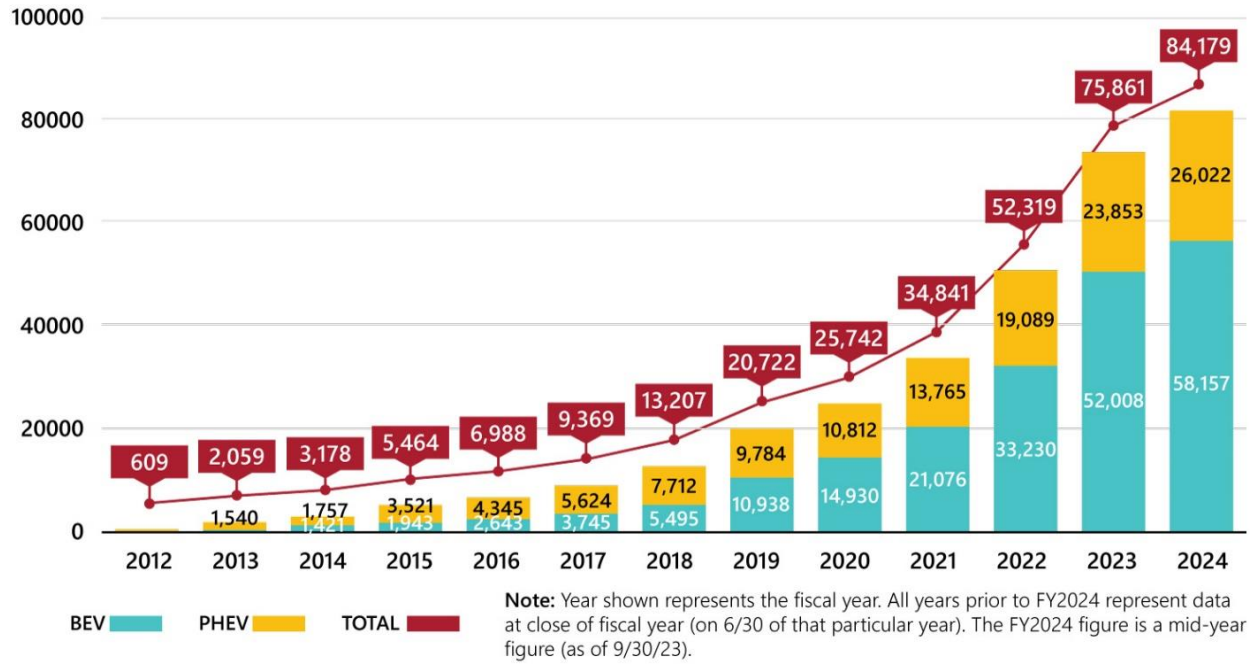
Maryland continued to experience significant EV ownership growth over the past year. Lower vehicle costs, state and federal incentives, and increasing availability of vehicles and charging infrastructure has supported and accelerated EV registrations across the state. There are two main types of EVs (excluding hydrogen FCEVs), as shown in Figure 1.

Figure 1 - Types of EVs



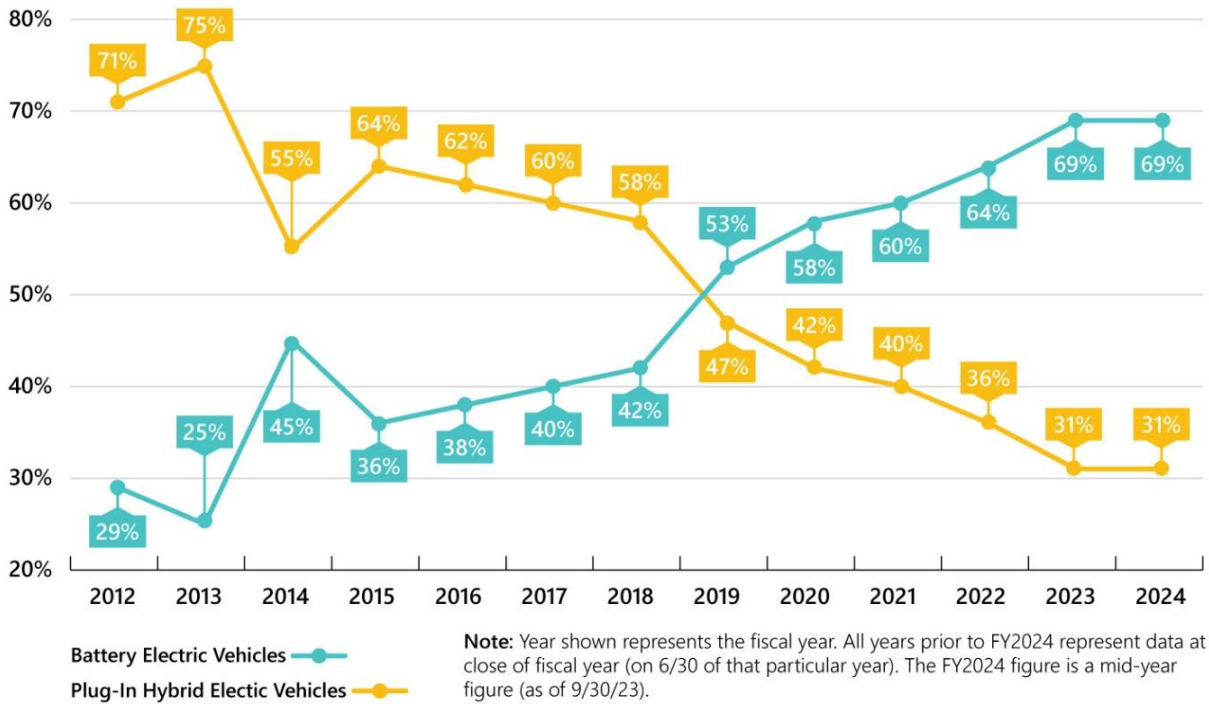
The Motor Vehicle Administration (MVA) tracks the total number, make, model, and model year of all EVs registered in Maryland. This data includes both battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs). As illustrated in Figure 2, the total number of EVs registered in Maryland increased from 609 in Fiscal Year (FY) 2012 to 84,179 at the end of September 2023. The percentage of BEVs has been increasing steadily as more EV models have become available and charging infrastructure has been deployed. Between 2012 and 2019, BEVs were a smaller market share of EVs on the road compared to PHEVs. In 2019 BEVs overtook PHEVs as being the larger share of EVs on road, as illustrated in Figure 3. As of September 30, 2023, 69 percent (58,157) of EVs registered were BEVs and 31 percent (26,022) were PHEVs.

Figure 2 - Total Number of EVs Registered in Maryland



Note: Year shown represents the fiscal year. All years prior to FY2024 represent data at close of fiscal year (on 6/30 of that particular year). The FY2024 figure is a mid-year figure (as of 9/30/23).

Figure 3 - Comparison of BEVs and PHEVs



Note: Year shown represents the fiscal year. All years prior to FY2024 represent data at close of fiscal year (on 6/30 of that particular year). The FY2024 figure is a mid-year figure (as of 9/30/23).

There are currently 53 makes and more than 100 EV models registered in Maryland. These numbers represent significant growth since 2012. In 2012, there were two BEV models available in Maryland, the Nissan Leaf and Chevrolet Volt. Appendix B includes a list of all BEVs available for purchase in Maryland as of April 2023.

Thirteen original equipment manufacturers (OEMs) account for over 92 percent of all EVs registered in Maryland and each of these 13 OEMs have at least 1,000 registered EVs, as shown in Figure 4. The remaining eight percent of EVs is comprised of 40 vehicle OEMs. Tesla has the largest share of Maryland's EV market, making up 44 percent of all makes registered in Maryland. Toyota has the next largest share with eight percent followed by Chevrolet with nearly seven percent of the EV market. There are currently 19 models with more than 1,000 EVs registered. These models account for 76 percent of all models registered, as shown in Figure 5. Tesla's Model 3 is the most registered EV in Maryland, accounting for approximately 19 percent of all registered EV models.

Figure 4 - Number of EVs Registered in Maryland by Manufacturer

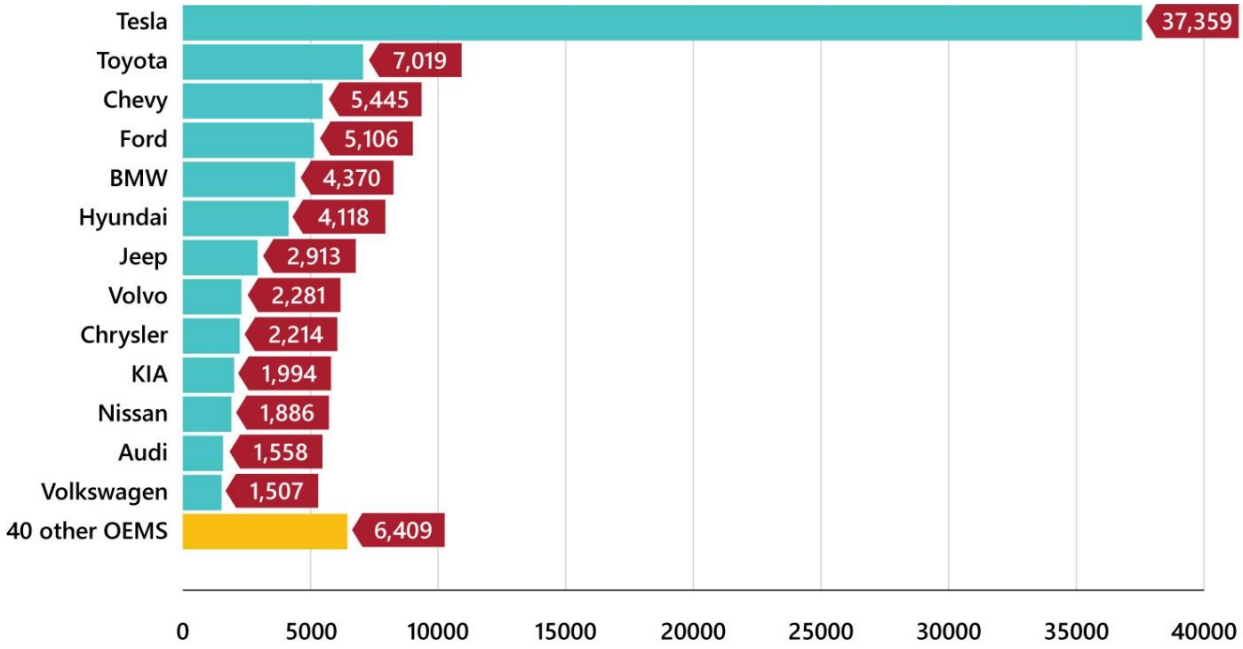
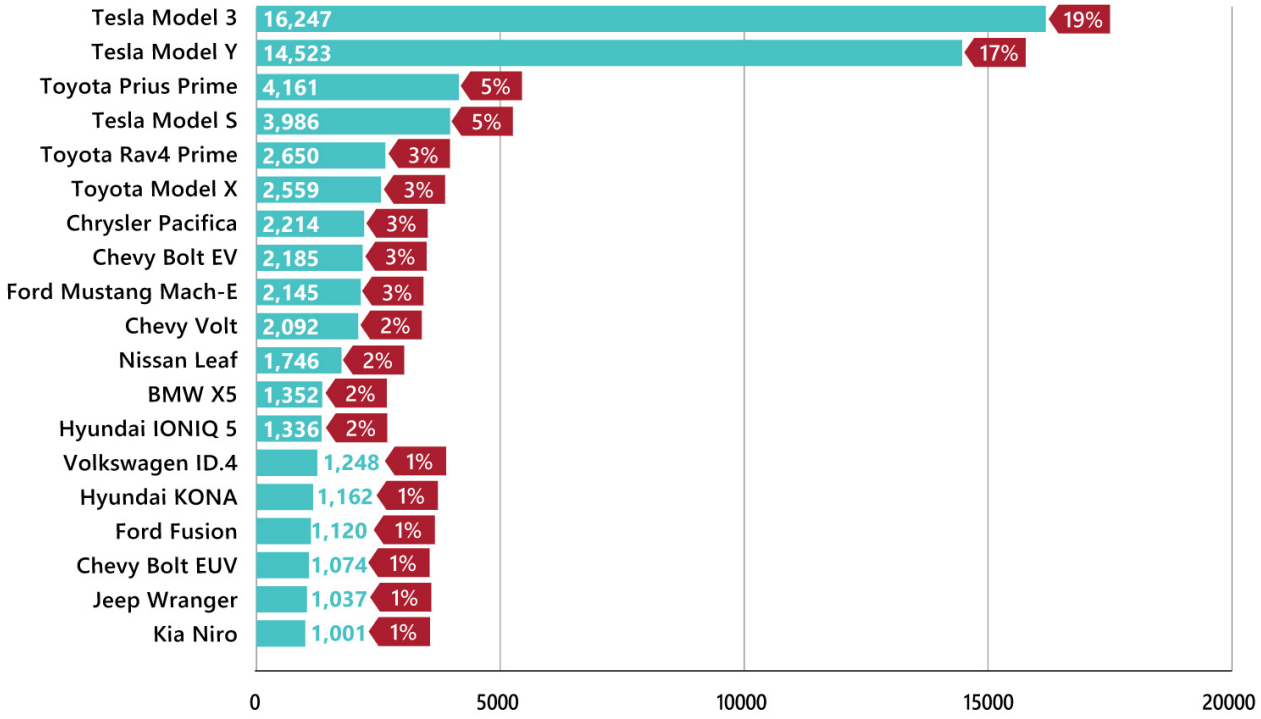
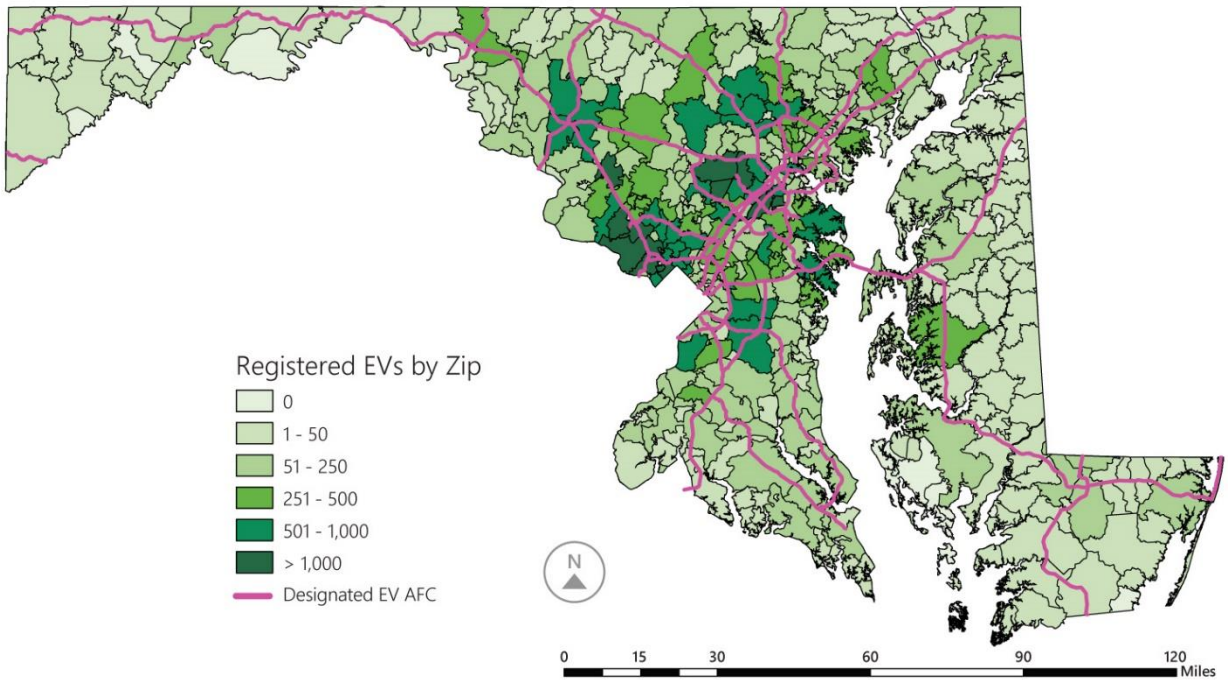


Figure 5 - Number of EVs Registered in Maryland by Model



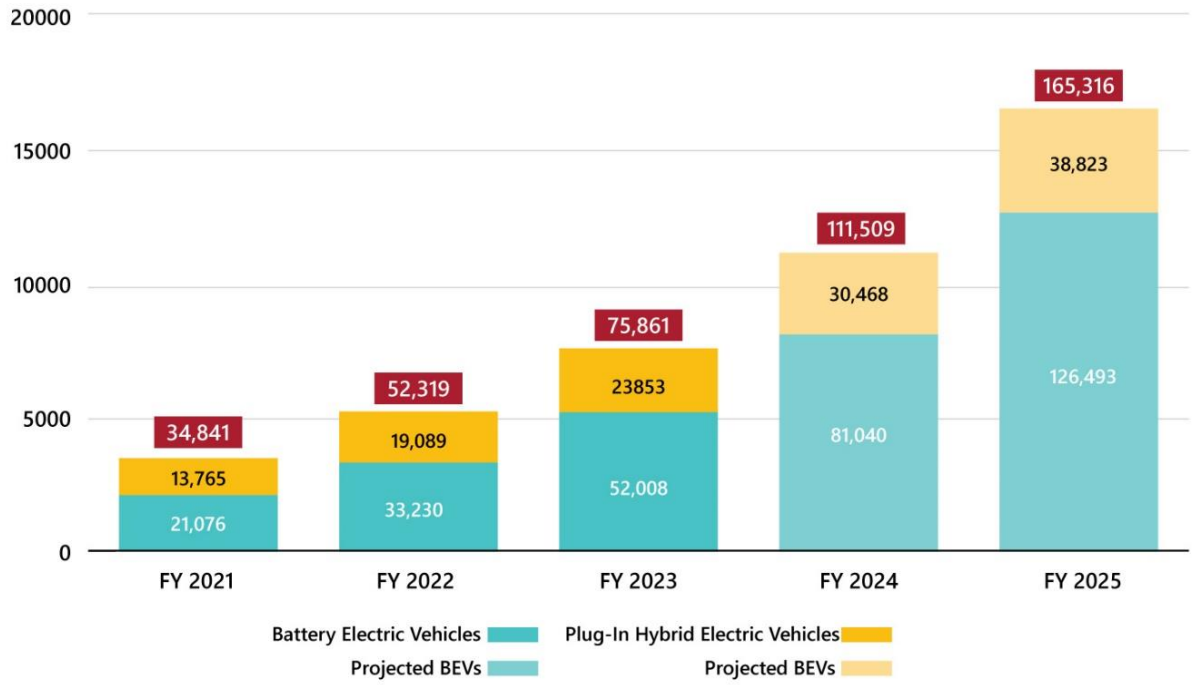
The MVA also tracks the total number of EVs registered in each of Maryland's ZIP codes. While most of Maryland's EV ownership is concentrated in the Baltimore Metro and Washington Metro regions, there has been growth in EV ownership along the EV Alternative Fuel Corridors (AFCs) in Southern Maryland, Western Maryland, and the Eastern Shore regions. As of September 30, 2023, Maryland has 97 ZIP codes with more than 250 EVs registered and 13 ZIP codes with more than 1,000 registered EVs. Figure 6 illustrates the number of EVs registered by ZIP code at the end of September 2023.

Figure 6 - Number of EVs Registered by ZIP Code



If growth rates from the first half of 2023 continue into 2025, Maryland will have over 165,000 registered EVs by the end of FY 2025 — more than double the number of EVs registered at the end of FY 2023. With significant incentives now available to car buyers, significant investments in EV charging infrastructure underway, and significant commitments from automakers, growth rates are poised to accelerate in the coming years.

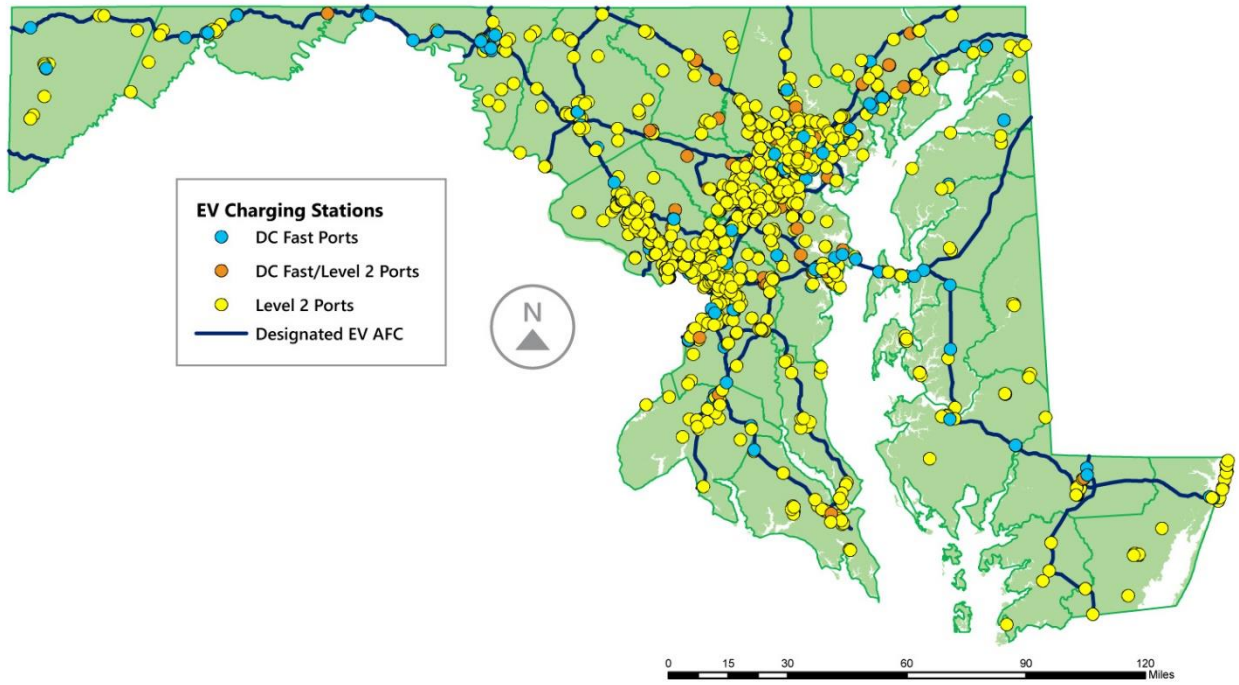
Figure 7 - Number of EVs Registered in Maryland



Charging Infrastructure

As of September 30, 2023, Maryland had 1,540 publicly accessible EV charging stations, totaling 4,357 electric vehicle supply equipment (EVSE) ports. Out of the EVSE ports, 3,507 are Level 2 and 850 are direct current (DC) Fast[i]. Publicly available Level 2 and DCFC stations are shown in Figure 8. An interactive map and dashboard with the EV charging stations is available on MDOT's new ZEV Maps and Dashboard. Newly available IIJA and NEVI funding are anticipated to further accelerate the development of Maryland's EV charging infrastructure network.

Figure 8 - EV Charging Stations



Charging Networks

There are now 14 charging networks operating in Maryland that are responsible for 88 percent of EVSE. While offerings for networked stations vary among EVSE providers, charging networks may include advanced functionalities for site hosts such as pricing and access controls, data reporting, and charger availability notifications. The three largest networks in the state are ChargePoint, Blink, and Shell Recharge. These three companies are responsible for approximately 71 percent of the available public chargers statewide, as shown in Figure 9. Non-networked chargers comprise 12 percent of public EVSE. When considering only public DCFC, and excluding Level 2 charging, Shell Recharge, ChargePoint, and Tesla are the largest network providers, responsible for 64 percent of the available DCFC stations, as shown in Figure 10.

Figure 9 - All Public EVSE Stations

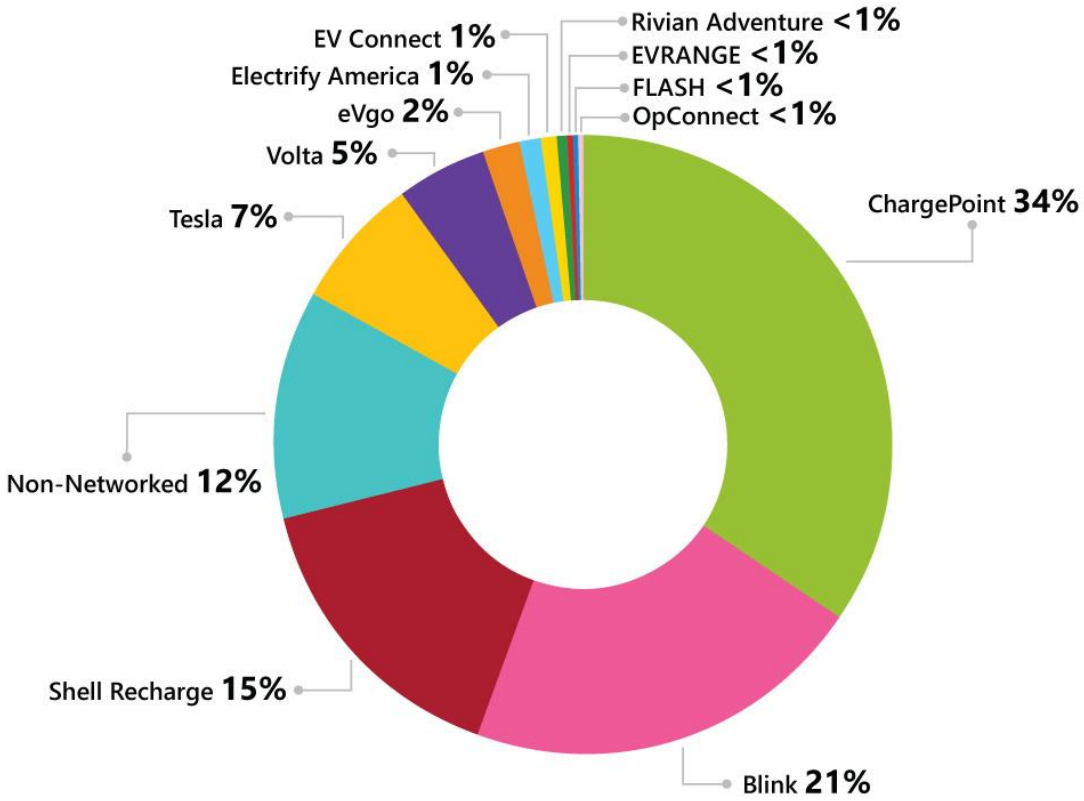
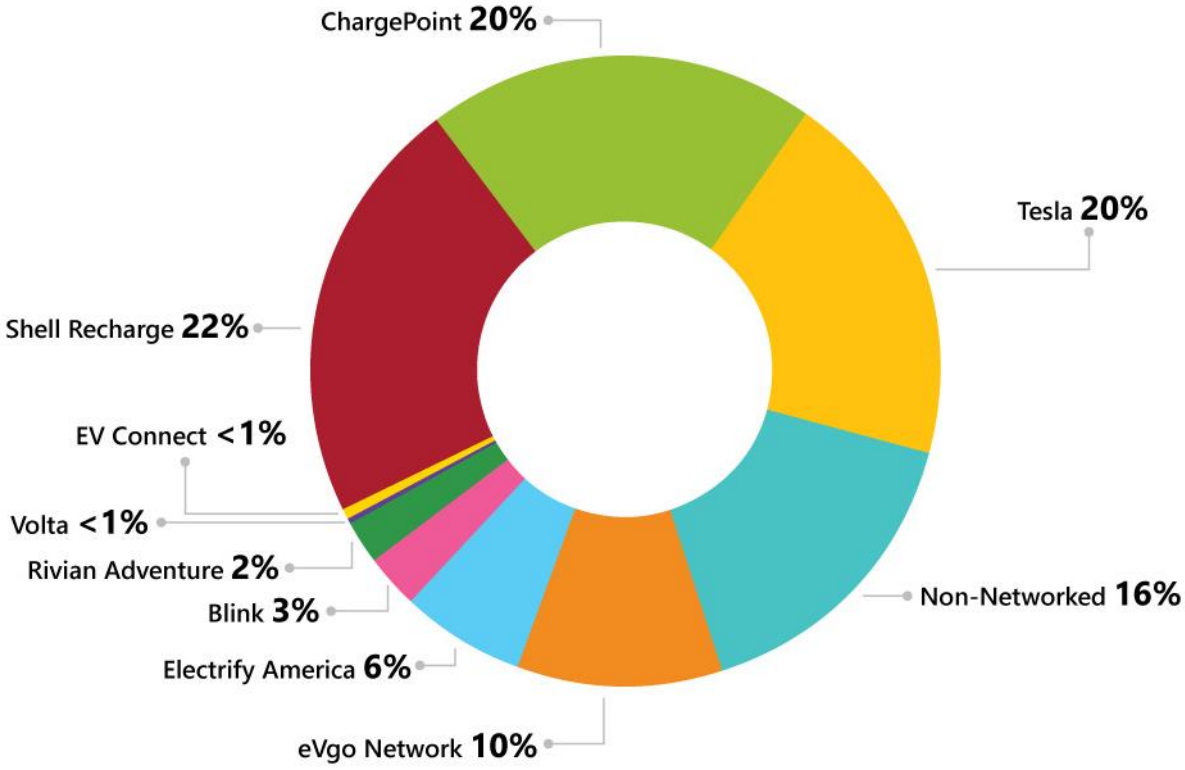


Figure 10 - Public DC Fast Stations



Section 4 - ZEEVIC Presentation Topics in 2023

ZEEVIC meetings benefited from multiple member and guest presenters throughout the year and covered a wide range of ZEV-related activities and efforts. These presentations helped ZEEVIC stay current on emerging technologies and practices, regional and national EV efforts, and on what is happening in Maryland. The presentation slides and meeting notes are available on the ZEEVIC website. Highlights of the topics covered during ZEEVIC meetings in 2023 are presented below.

Mid-Atlantic Hydrogen Hub

The Mid-Atlantic Hydrogen Hub (MAHH) submitted its concept paper to the US Department of Energy (US DOE) in November 2022, pursuing federal funds from the IIJA to support the region's clean energy transition[ii]. The US DOE Regional Clean Hydrogen Hubs program–or H2Hubs–included up to $7 billion to establish six to ten regional clean hydrogen hubs. Proposed by Connected DMV, the MAHH assembled support from a cross-sector coalition of more than 40 partners representing Washington, D.C., Maryland, and Virginia. Of the 79 concept papers submitted, MAHH was among 33 invited to advance a Regional Hydrogen Hub application by May 2023. However, the application was not ultimately selected for funding.

School Bus Electrification - Proposed Pilot Program

Baltimore Gas and Electric (BGE) proposed a pilot program to the Public Service Commission (PSC) to create and deploy an electrified school bus fleet. BGE's proposed pilot was based on 2022 Maryland authorizing legislation—a provision of the Climate Solutions Now Act (CSNA) and House Bill (HB) 696 (2022 Regular Legislative Session)—requiring all new school bus purchases to be zero-emission beginning in FY 2025. The purpose of the pilot is to ensure buses can begin service upon delivery while maintaining reliability on the power grid. Strategic deployment considerations include flexibility in the program to account for applicants in different stages of technology adoption, recognition of supply chain constraints, and the evolution of the technology and options over time. BGE has a target goal of 20 percent of funding to go towards underserved areas and to recover costs within five years with full return. Their proposed pilot program would provide the following:

- $50 million in BGE-funded rebates to cover the incremental cost of an electric school bus versus a fossil-powered unit.
- Rebates for make-ready and charging infrastructure.
- A foundation for a Vehicle-to-Grid (V2G) construct by requiring new electric buses and chargers to have bidirectional power flow capability. When V2G infrastructure is implemented, BGE will be able to share in the latent battery capacity of these electric buses during time periods when buses are not required for student transport.

School Bus Electrification - Perspectives on Funding

Maryland has between 8,000 and 10,000 public and private school buses operating in the state. Several incentive programs are in place to support the transition to zero-emission school buses. These include the Environmental Protection Agency (EPA) Clean School Bus Program, MDE's Volkswagen (VW) Settlement Program, the CSNA of 2022, and the PSC/Utilities School Bus Program.

EPA's Clean School Bus Program, funded under the IIJA, provides $5 billion over five years (federal fiscal years 2022-26) for the replacement of existing school buses with clean school buses and zero-emission school buses. Eligible technologies include battery electric, compressed natural gas, and propane. The program is eligible to state and local governmental entities responsible for providing bus service, nonprofit school transportation associations, eligible contractors, Indian tribes, tribal organizations or tribally controlled schools, and private school districts. EPA opened a round of competitive funding in spring of 2023 and opened the 2023 rebate program in fall of 2023.

MDE has also utilized funding from the VW Settlement Program to support the transition to zero-emission school buses. To date, MDE has funded the purchase of six electric school buses located in four counties (Frederick, Howard, Montgomery, and Prince George's). MDE is documenting lessons learned from participants' experiences, which will include recommendations for future rounds or other programs.

The CSNA of 2022 set requirements and limitations on future purchases of school buses. Beginning in FY 2025, a county Board of Education may not enter a new contract for the purchase or use of any school bus that is not a zero-emission vehicle. The requirements do not apply if MDE determines that no available ZEV meets the performance requirements, or if the county board is unable to obtain federal, state, or private funding sufficient to cover the incremental costs associated with the contracting, purchase, or use of zero-emission school buses.

Lastly, the PSC enabled a process for the utility companies to seek approval of their Electric School Bus Pilot Programs. The utility must file a plan for review and approval by the PSC that includes plans for rebate program as laid out in the CSNA; charging and interconnection infrastructure; and training for bus operators and other stakeholders, including schools and equitable solutions and outcomes. The program must commence by October 1, 2024, and run for three to five years.

New Federal Resources

Charging and Fueling Infrastructure (CFI)

The federal government is providing $2.5 billion in aid for the Charging and Fueling Infrastructure (CFI) Discretionary Grant Program. Eligible activities under the CFI program include planning, installation, and operations of EV charging infrastructure. Eligible applicants include states, local governments, metropolitan

planning organizations (MPOs), Indian Tribes, U.S. territories, and public authorities. Additional information about applications to the CFI Grant Program from Maryland entities is presented in Section 7.

Ride and Drive Electric

The Ride and Drive Electric initiative announced funding availability in 2023. The initiative aims to accelerate and enhance the development of the nation's EV charging network through focused investment in EV charging reliability, resiliency, equity, and workforce development.

ZEV Freight Corridors

In FY 2023, US DOE and DOT made $7 million available for 'New Projects to Accelerate Decarbonization of Medium- and Heavy-Duty (MHD) Freight Transportation'. Funding was awarded to seven projects, each of which will develop an MHD EV charging and hydrogen corridor infrastructure plan. CALSTART was awarded funding for a strategic planning effort to spur the deployment of commercial MHD ZEV infrastructure for the East Coast along the I-95 freight corridor from Georgia to New Jersey. CALSTART is partnered with the National Renewable Energy Laboratory, Momentum, the Eastern Transportation Coalition, Georgetown Climate Center, Dominion Energy, Exelon, and Clean Cities partners along the I-95 corridor.

Maryland ZEV Tax Credit

The Maryland ZEV excise tax credit was enacted during the 2023 Legislative Session of the Maryland General Assembly, and is in effect from July 1, 2023, through June 30, 2027. The credit is limited to one vehicle per individual and ten vehicles per business entity. To take advantage of the tax credit, a qualifying EV or FCEV must meet the following criteria:

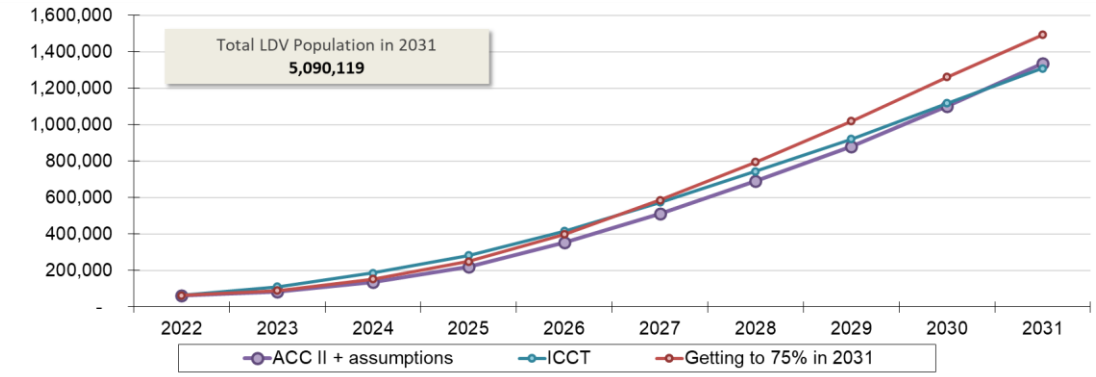
- Made by a manufacturer primarily for use on public streets, roads, and highways.
- Cannot be modified from the manufacturer's specifications.
- Must be a new vehicle and purchased and titled for the first time on or after July 1, 2023, but before July 1, 2027.
- Must be acquired for use or lease by the taxpayer, and not for resale.
- Has a battery capacity of at least 5 kilowatt-hours (kWhs), or if a motorcycle or auto cycle, has a battery capacity of at least 4 kWhs (applies only to EVs)
- Has a base purchase price not exceeding $50,000. The base purchase price for a vehicle is displayed on the window sticker and determines if it qualifies for the tax credit by not exceeding $50,000. This price does not include optional upgrades, shipping charges, taxes, fees, or calculation of a trade-in allowance.

EV Adoption Scenarios - MDOT Climate Solutions Now Act Plan

The CSNA of 2022 established new requirements for greenhouse gas (GHG) emission reduction in Maryland. MDE is required to develop a CSNA plan to meet the statewide goal of 60 percent reduction in GHG emissions by 2031. MDOT is supporting MDE in the development of the statewide plan and is developing MDOT's component of the CSNA Plan. MDOT's plan focuses on reducing GHG emissions from on-road vehicles. EV growth forecasts included three EV adoption scenarios:

- Advanced Clean Cars II (ACC II) – Follows ACC II's requirements for continuously increasing the share of ZEV sales starting with MY 2027 and includes assumptions about the makeup of EVs of new vehicle sales in the years prior to 2027.
- Getting to 75% in 2031 - Maryland Commission on Climate Change's (MCCC) aspirational target for 75 percent of newly registered light-duty vehicles in the state to be ZEV and plug-in hybrids by 2030.
- International Council on Clean Transportation (ICCT) - Utilizes ICCT's high Inflation Reduction Act (IRA) Uptake scenario with increased state adoption of ACC II and applies national percentages for light-duty vehicles to Maryland's projected numbers of light-duty vehicles.

Figure 11 - Projected Light-Duty BEV/ PHEV Registrations



Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
ACC II + assumptions	62,744	84,246	137,494	221,425	352,010	513,051	691,687	879,693	1,099,904	1,334,415
ICCT	62,744	110,317	186,743	282,942	415,391	573,437	744,717	921,570	1,117,817	1,309,128
Getting to 75% in 2031	62,744	89,621	152,266	249,110	398,349	585,607	795,767	1,018,824	1,261,704	1,493,129

The MDOT CSNA Plan forecasts 1.33 million EVs must be registered in Maryland in 2031 to help meet the State's GHG reduction goal. This would represent 26 percent of all light-duty vehicles in the state and would achieve an emission reduction of 2.46 million metric tons of carbon dioxide equivalent.

Section 5 - ZEV Legislation in Maryland

2023 Passed ZEV Legislation

ZEEVIC reviewed legislative bills affecting ZEV infrastructure introduced in the Maryland General Assembly's 2023 Session. Table 3 summarizes the ZEV related legislative proposals that passed in 2023.

Table 3 - ZEV Related Legislative Bills Passed in 2023

Bill #	Bill Title and Synopsis	ZEEVIC Supported
HB0230/ CH0097 SB0224/ CH0096	**Department of the Environment - Zero-Emission Medium- and Heavy-Duty Vehicles - Regulations (Clean Trucks Act of 2023)** Requires MDE to adopt regulations establishing requirements for the sale of new zero–emission medium (8,501 – 14,000 pounds) – and heavy (greater than 14,001 pounds) –duty vehicles in the State. The department is required to coordinate with units of State government, to prepare and submit a certain needs assessment and deployment plan.	✓
HB0550/ CH0098	**Maryland Energy Administration (MEA) – Energy Programs – Modifications (Clean Transportation and Energy Act)** Altering the Electric Vehicle Recharging Equipment Program by extending the duration of the Program through fiscal year 2026, repealing the rebates that may be issued to retail service station dealers, and increasing the limitation on the total amount of rebates that the MEA may issue in each fiscal year. Alters the Medium-Duty and Heavy-Duty Zero-Emission Vehicle Grant Program by altering the definition of "grant".	✓
HB0830	**Residential Construction or Significant Renovation – Electric Vehicle Charging** Establishing and altering certain requirements related to the installation of EV charging equipment during the construction of certain housing units. A county or municipal corporation may require a greater number of electric vehicle parking spaces; requiring the MEA to study certain issues related to the installation of electric vehicle parking spaces at multifamily residential buildings and submit a report to the Governor and the General Assembly by December 1, 2023.	✓
HB0123	**Vehicle Laws – High Occupancy Vehicle (HOV) Lanes – Plug–In Electric Drive Vehicles** Authorizing certain plug-in electric drive vehicles for which a permit has been issued by the Motor Vehicle Administration to use HOV lanes regardless of the number of passengers in the vehicles through September 30, 2035.	
HB0834	**Electric Vehicle Charging Infrastructure - Requirements (Electric Vehicle Charging Reliability Act)** Requiring the Public Service Commission to expand the EV Pilot Program to allow participating electric companies to install EV charging stations in multifamily dwellings in underserved communities; requiring the Commission to terminate the expansion of the EV Pilot Program on December 31, 2025; requiring an electric company operating an EV charging network to ensure the EV charging stations in the EV charging network maintain certain uptime standards, subject to certain exceptions.	

2023 Failed Legislative Proposals

Various legislative proposals were introduced into the 2023 session that did not pass. Table 4 provides a summary of ZEV relevant legislative proposals that were introduced but were withdrawn or did not pass.

Table 4 - 2023 Failed or Withdrawn ZEV Related Legislative Proposals

Bill #	Bill Title	ZEEVIC Supported
HB0007	Electric Vehicle Recharging Equipment Rebate Program – Renewal	✓
HB0101 SB0593	Condominiums - Common Elements - Clean Energy Equipment	✓
HB0312	Vehicle Emissions Inspection Program - Not Subject to Inspection - Fee	✓
SB0548	Maryland Energy Administration – Energy Programs – Modifications (Clean Transportation and Energy Act)	✓
SB0477	Residential Construction or Significant Renovation - Electric Vehicle Charging	✓
HB0889	Retail Service Stations - Electric Vehicle Charging Stations and Property Tax Credit for Service Station Conversions	✓
HB0147 SB0250	Environment – Climate Crisis Plan – Requirement	
HB1291 SB0950	Maryland Zero Emission Electric Vehicle Infrastructure Council - Membership	

Two letters of support from the Council were sent to lawmakers and uploaded to relevant committees as written testimony, along with a handout depicting ZEEVIC's purpose, role, and membership in brief. The first letter was sent on February 24, 2023, supporting six bills, and the second was sent on March 9, 2023, in support of the Clean Trucks Act of 2023. The "ZEEVIC Supported" column in Table 3 and Table 4 above shows a full list of bills that were included in the Letters of Support from the Council for the 2023 Session.

> *ZEEVIC supports the goals of the following bill, which is generally consistent with ZEEVIC's mission and priorities...*
>
> — Kevin Miller, Chair, Legislative Workgroup, ZEEVIC

2023 Letter to the PSC Supporting Reliability Reporting for EV Charging

In addition to submitting Letters of Support to lawmakers, ZEEVIC also sent a letter to the PSC commenting on Case Number 9478. Comments were provided in reference to the Semi-Annual Progress Reports filed by BGE, Delmarva Power and Light Company (Delmarva), and Potomac Electric Power Company (Pepco) regarding Implementation of Approved Electric Vehicle Charging Program Offerings. This letter, drafted in response to the proposal of HB 834 - Electric Vehicle Charging Reliability Act, encouraged the Public Service Commission to adopt robust reliability requirements for EV charging stations under its jurisdiction.

> *We support the evaluation and adoption of consistent, transparent, and actionable reliability reporting for EV charging stations under the Commission's jurisdiction, such as those deployed through the utilities' Approved Electric Vehicle Charging Programs. We concur with the PC 44 Work Group recommendation to develop reliability reporting requirements after reviewing utility semi-annual reports filed on February 1, 2023, as well as any final reliability reporting requirements set by the Federal Highway Administration (FHWA) for the NEVI program. These comments represent a consensus position of ZEEVIC...*
>
> — R. Earl Lewis, Jr., Former ZEEVIC Chair

Section 6 - Maryland ZEV Policies in Action

In 2023, ZEEVIC updated Maryland's ZEV Policy Scorecard. The Scorecard serves as a quick reference guide for policies that have been adopted in Maryland and across the United States to promote ZEV adoption and ZEV infrastructure. The Scorecard can be found in Appendix C.

Active ZEV Policies in Maryland

Maryland had a long-standing goal of 300,000 EVs on Maryland roads by 2025, and 600,000 EVs by 2030. With the State adopting aggressive climate change goals under the CSNA of 2022, a new goal for EV growth is over 1 million EVs registered in Maryland by 2030. The CSNA also enacted goals for light-duty State fleet vehicles, with passenger vehicles required to be ZEVs by 2031, and all light-duty vehicles required to be ZEVs by 2036. The goal of Maryland's NEVI Plan and Program is build-out of EV infrastructure along the State's 23 Alternative Fuel Corridors in accordance with NEVI standards and requirements. With the NEVI Program, Maryland is committed to the federal Justice40 mandate that 40 percent of benefits accrue to disadvantaged communities.

Advanced Clean Cars II (ACC II), adopted in 2023 in Maryland, enacts ZEV requirements for passenger car and light truck sales. This regulation requires manufacturers to continuously increase the share of new vehicles they sell that are zero-emission. ACC II regulations become enforceable beginning with vehicle model year 2027, and apply to vehicle model years 2027 through 2035. The regulation includes increasingly stringent emissions standards for ICE vehicles, and 100 percent of model year 2035 passenger car and light truck sales must be ZEVs.

The Clean Cars Act of 2022 reauthorized an excise tax credit of up to $3,000 for the purchase of qualifying light-duty ZEVs that have a base purchase price of less than $50,000. The excise tax credit is eligible for vehicles purchased and titled on or after July 1, 2023. As enacted with the Clean Cars Act of 2022, a tax credit is also available for up to 20 percent of the cost for MHD vehicles, vehicle supply equipment, and heavy equipment. The Clean Cars Act of 2022 also added a new Medium- and Heavy-Duty Zero Emission Vehicle Grant Program for certain vehicles and equipment to be administered by the MEA.

In 2023, Maryland adopted the Clean Trucks Act of 2023, requiring MDE to adopt California's Advanced Clean Trucks (ACT) Program by December of 2023. In 2021, California adopted the ACT Program requiring truck manufacturers to transition from diesel trucks and vans to zero-emission, beginning in 2024. The program covers vehicles with a gross vehicle weight rating over 8,500 pounds and requires manufacturers to deliver an increasing percentage of ZEVs to California. MDE has passed the regulations necessary to adopt this program. The ACT program will become enforceable in Maryland beginning with model year 2027, although the State may delay implementing the regulation pending the results of a needs

assessment study and deployment plan due to the Maryland General Assembly by December 2024.

Maryland has enacted building code requirements for townhouses and single unit homes (HB784, 2021) requiring builders to provide the option for Level 2 EVSE prewiring. Maryland has Right-To-Charge protections enacted by Electric Vehicle Recharging Equipment for Multifamily Units Act (HB0110, 2021). This bill establishes standards relating to the installation of and use of EV recharging equipment in condominiums and Homeowners Associations (HOAs). This law also prevents HOAs within the state from unnecessarily restricting homeowners from installing EV chargers at their homes. Maryland also passed the Residential Construction – Electric Vehicle Charging bill (HB830, 2023), which requires construction of new housing units to include one dedicated parking space with EV supply equipment that is fully installed or one EV-ready parking space.

EVs registered in Maryland can also use HOV lanes regardless of the number of vehicle occupants through the passage of Vehicle Laws: HOV Lanes (HB123, 2023). Qualifying EVs that are registered in Maryland can obtain a permit for the use of HOV lanes. The permit will be valid through September 30, 2025.

State Agencies

State programs have been integral to the development of EV charging infrastructure and EV adoption in Maryland. Maryland's financial incentives have been well-utilized, with MDE and MEA programs regularly reaching full subscription.

Maryland Energy Administration (MEA)

In 2023, MEA administered and supported several programs that work to accelerate and encourage EVSE deployment and transportation electrification efforts across the state, including the EVSE Rebate program, Clean Fuels Incentive Program (CFIP), the Maryland Smart Energy Communities (MSEC) program, and the OPEN Energy Grant program. MEA is currently developing the MHD Zero Emission Vehicle program. Additionally, MEA is the lead agency in Maryland for participating in the Mid-Atlantic Electrification Partnership (MAEP) and the Mid-Atlantic Electric School Bus Experience Project (MEEP).

EVSE Rebate Program

The Maryland EVSE Rebate Program offers a rebate to individuals, businesses, multiunit dwellings (MUDs), non-profits, workplaces, or state or local government entities for the costs of acquiring and installing EVSE. This popular rebate program has been in place since FY 2015. The program routinely reaches full subscription before the end of the fiscal year. As of October 24, 2023, based on the applications received that are still under review, FY 2024 EVSE Rebate Program funding for both commercial and residential applicants is anticipated to be fully exhausted. Table 5 shows FY 2023 and FY 2024 totals:

Table 5 - Maryland EVSE Rebate Program Awards

Fiscal Year (FY)	Total	Number of EVSE Ports Installed
2023	$1,800,000 awarded	1,897
2024	$2,500,000 budgeted	TBD

Clean Fuels Incentive Program (CFIP)

The MEA's CFIP provides grants to school districts, nonprofits, commercial entities, corporations, and local and municipal governments for the purchase of alternative fuel vehicles. Specifically, the program provides funding to support the incremental cost to purchase new alternative fuel fleet vehicles or convert new fleet vehicles to utilize alternative fuel. In FY 2023, the MEA made the following EV-related awards:

Table 6 - Clean Fuels Incentives Program Awards

Awardee	Project	Amount Awarded
11V Logistics	6 Class 8 BEVs	$900,000
D.M. Bowman	1 Class 8 BEV	$150,000
Highland - Anne Arundel	3 Electric School Buses (ESBs)	$240,000
Highland - Baltimore County	5 ESBs	$400,000
Highland - Washington County	3 ESBs	$240,000
Sysco	8 Class 8 BEVs	$1,200,000
WSSC	6 Class 2 BEVs	$30,000

Maryland Smart Energy Communities (MSEC) Program

The MEA's MSEC Program supports local governments in adopting sustainable long-term energy policies that lead to reduced energy usage, cost savings, and renewable energy deployment. This includes grants for reducing petroleum consumption by local fleets by converting internal combustion engine vehicles to EVs and installing EVSE. MEA is currently developing its suite of programs for FY 2024.

Table 7 - MSEC FY 2023 Awards

Community	Project	Award Amount
Baltimore City #1	10 EV charging stations for admin fleet	$60,000
Greenbelt #1 - Prince George's	2 EVs for admin purposes, 2 EV charging stations	$27,000
Hyattsville - Prince George's	3 EVs for its Police Department	$22,500

OPEN Energy Grant Program

MEA's OPEN Energy Program allows the agency to consider energy projects and initiatives outside of the agency's suite of established technology and sector-specific energy programs offered in a given FY. The program considers proposals that help advance the State's energy goals, GHG reduction goals, and agency mission, in innovative ways while also being responsive to evolving energy and

environmental issues, as well as engaging a broad range of stakeholders. In 2023, two EV-related projects were selected.

Table 8 - MEA OPEN Energy Program Awards

Awardee	Project	Amount Awarded
Howard County	Defray costs of acquiring 2 new ambulances that support plug-in and hybrid-power idling technology and retrofitting 2 ambulances and 13 dump trucks	$153,000
Kerb-e Inc.	Install 3 public curbside charging stations and 10 residential curbside charging stations in Montgomery County	$250,000

Maryland Department of the Environment (MDE)

In 2023, MDE continued to administer programs that accelerate EVSE deployment and encourage transportation electrification efforts. These included the Electric Corridor Grant Program, and the Charge Ahead Grant Program.

Electric Corridor Grant Program (ECGP)

The ECGP is one of two programs created from the VW ZEV infrastructure investment allotment of the Environmental Mitigation Trust. The ECGP is being administered through three competitive rounds of funding. The first round of awards was announced in August of 2021, and the second round of awards was announced in October of 2022. MDE anticipates opening the third round of funding in 2024.

The ECGP is for DCFC EVSE along corridors or at charging hubs to facilitate interstate and intrastate travel. Specifically, funds will be used to deploy DCFC within five miles of Maryland AFCs[iii]. Proposed stations must be within a short walking distance, not to exceed a quarter mile, of restrooms and retail or service establishments such as restaurants, coffee shops, convenience stores, or tourism destinations. They must be publicly accessible twenty-four hours per day, seven days per week, without restrictions. ECGP award amounts for the first two rounds are as follows:

Table 9 - Electric Corridor Grant Program Awards

Program	EVSE Plugs Energized	EVSE Type	# Locations	Award Amount
2021/Round 1	36	DCFC	13	$3,037,160
2022/Round 2	35	DCFC	13	$2,953,103

Charge Ahead Grant Program (CAGP)

The CAGP is one of two programs created from the VW ZEV infrastructure investment allotment of the Environmental Mitigation Trust, along with the ECGP. The CAGP is being administered through three competitive rounds of funding. The first round of awards was announced in August of 2021, and the second round of

awards was announced in October of 2022. MDE anticipates opening the third round of funding in 2024.

The CAGP is for Level 2 EVSE located at either workplaces or open to the public at State-owned properties. Employee access to charging infrastructure at workplaces is critical to meeting EV adoption goals; besides at home, the workplace is the next most likely location an EV driver will charge. With proper workplace charging implementation, employers can help increase the convenience and affordability of driving electric for their employees. While the priority use of these chargers is to be for employee vehicles, they can also be used for charging fleet or public vehicles. CAGP award amounts for the first two rounds are as follows:

Table 10 - Charge Ahead Grant Program Awards

Program	EVSE Plugs Energized	EVSE Type	# Locations	Award Amount
2021/Round 1	145	Level 2	24	$642,942
2022/Round 2	170	Level 2	26	$770,558

Maryland Department of Planning (MDP)

The MDP works closely with Maryland's counties and municipalities to provide sustainable growth, including ZEV adoption. Through the local comprehensive plan review process, the MDP regularly provides written comments to local governments, as appropriate, to encourage the inclusion of planning policies and strategies in their plans to promote environmentally responsible and equitable ZEV deployment and infrastructure building. In FY 2023, the MDP reviewed 23 draft comprehensive plans and provided suggestions on EV infrastructure preparedness planning in 14 of those comprehensive plan reviews, including Galena, West Hyattsville-Queens Chapel Sector Plan, Washington Grove, Bryans Road Sub-Area, Centreville, Howard County, Gaithersburg, Denton, Walkersville, Millington, Washington County, Rock Hall, Church Hill, and Aberdeen. The MDP also reviewed state EV programs and plans and provided comments on equity and applicability to local planning policies and land use regulations and building codes.

The MDP provides Geographic Information System (GIS) base statewide land use and growth management maps to support various planning analyses, including EV charger location identification and evaluation. The MDP also partners with MDOT to communicate ZEV programs, information, and initiatives in its Planning Practice Monthly newsletter, which has a distribution list of 28,700 individuals.

Maryland Department of General Services (DGS)

DGS, through its Office of Energy and Sustainability, has centralized the fleet electrification process related to charging infrastructure throughout the state. The Electric Vehicle Infrastructure Program (EVIP) provides project identification, design, and construction project management for fleet charging. To date, DGS has installed 151 charging ports across 29 sites. An additional 104 projects are currently

in planning or design and 106 are in construction. EVIP maintains the data portals on charging infrastructure at State facilities, administers the Radio Frequency Identification (RFID) card program for usage, and supports agencies with live and online training and the development of educational resources related to EV charging.

DGS also leads the Maryland EV Ambassadors, a community of e-mobility users, champions, and enthusiasts across all levels at state agencies. The purpose of the group is to enable knowledge sharing, improve the charging experience, and promote the benefits of transportation electrification. This past year, the Ambassadors hosted a Drive Electric Earth Day event at State Center featuring electric passenger vehicles as well as micro-mobility solutions such as e-bikes and scooters, participated in the Kick Gas! event in Annapolis, and hosted an EV 'Lunch & Learn' in Annapolis.

Public Service Commission (PSC)

To address barriers to deployment of EVs, in 2018 the PSC approved the implementation of a 'Statewide EV Portfolio' and launched the 5-year Utility Pilot Program. Under Public Conference 44 (PC44), PSC Order 90036 formed the EV Working Group to address matters relevant to implementation of the Statewide EV Portfolio. Subgroups were formed for fleet, reliability, EV metering, rate design, and other topics. Table 11 presents the EV Workgroup's subgroup initiatives throughout 2023.

The PSC PC44 EV Working Group submitted an updated report to the PSC in July 2023. Topics included proposed uptime charging standards, adjustments to comply with recently passed HB834, and future charging standards. Utilities file Semi-annual reports with the PSC, and report progress on their EV portfolio offerings and implementation statistics for all components of the Utility Pilot Program. These are summarized in the Utility Companies subsection below.

Table 11 - PC44 EV Workgroup - Subgroup Initiatives

Initiative	Subgroup Summary
1. EVSE Metering	The EV WG will provide updates to the Commission every six months regarding EVSE sub-metering. There have been no new developments in 2023.
2. EVSE reliability standards and reporting metrics	The Maryland Legislature passed HB834 in 2023 which required the Commission to establish reliability and reporting standards for utility-owned chargers. The EV WG developed proposed reliability and reporting standards that were filed with the Commission on July 28, 2023. Currently, the Commission is reviewing the proposal and will issue an order regarding the standards in the near future.
3. Commercial Rate Design	Exelon utilities filed a proposed demand charge relief rider with the Commission. The Commission is reviewing the proposal and will issue an order regarding the tariff in the near future.

Utility Companies

Maryland utilities and the PSC have spurred the expansion of EV charging infrastructure throughout the state, with thousands of EVSE installations resulting from the Utility Pilot Program. Maryland continues to support MUD-focused incentives to provide equitable access to EV charging infrastructure to underserved areas. These areas lack permanent, resident-owned off-street parking opportunities, and the competitive market participants have been unsuccessful in meeting the demand in the low-income and MUD segments, resulting in a market gap. Table 12 provides a summary of pilot program outcomes as of October 31, 2023.

Table 12 - PSC Utility Pilot Program Summary

Utility Company	Residential Rebates	Multifamily Rebates	Public Charging	EV Time of Use (TOU) Rate Program
BGE	3,852 applicants	265 ports rebated	316 EVSE installed (418 EVSE installed or planned)	2,369 participants
PHI	1,194 enrolled customers	61 ports rebated	284 EVSE energized	946 participants
Potomac Edison	892 rebates issued	10 ports rebated	34 Level 2 EVSE; 18 DCFC EVSE	596 participants
SMECO	Filing Q4 2023	3	35 Level 2 EVSE; 3 DCFC EVSE	Filing Q4 2023
As of October 31, 2023.				

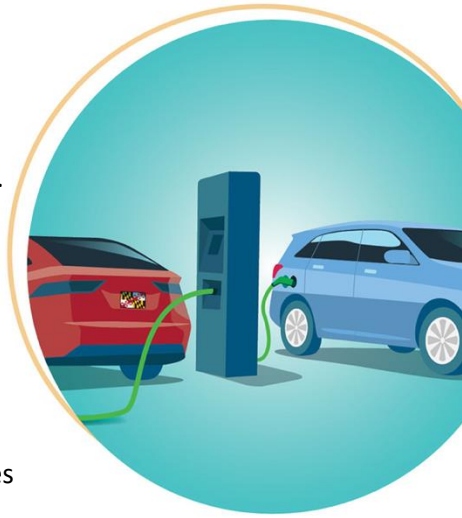
Baltimore Gas and Electric (BGE)

In July 2019, BGE launched its pilot program incentives, accepting applications for residential and MUD EVSE. As of September 2023, BGE has received a total of 3,852 residential applications and rebated 265 EVSE ports at MUD properties. BGE has also installed 316 public charging stations, with 102 in-progress of being installed. BGE has also installed 35 BGE-owned MUD charging stations, with 19 in-progress of being installed. BGE rebated 20 EVSE ports for Maryland non-profit's workplace charging. BGE launched a new fleet offering to provide technical assessments, make-ready incentives, and EVSE rebates.

Pepco Holdings, Inc (PHI)

In July 2019, PHI, comprised of both Pepco and Delmarva Power, launched their EVsmart EV incentive and public charging offerings. In July 2022, Pepco and Delmarva launched the Workplace Charger Rebate Program to offer fleet and workplace rebates, and the Fleet Calculator Tool, to help educate fleet customers on the types of EVs that are available for purchase, what charging equipment to buy, and available EV rates. As of September 2023, PHI has issued rebates for a total of 1,194 residential charging ports and 61 charging stations for MUDs. Additionally, PHI has installed 284 public charging stations. In August 2023, Pepco

and Delmarva launched their Fleet Program. The Fleet Program offering includes fleet assessments, make-ready incentives and EVSE incentives.



Potomac Edison

In December 2019, Potomac Edison launched its EV Driven pilot program which includes residential and MUD EV charger rebates, the Off-Bill Credit program for residential customers, and 59 public EV charger installations in Western Maryland. However, on May 15, 2023, Potomac Edison implemented an EV-only time of use (TOU) Rate program to replace the Residential Off-Bill Credit program. As of October 2023, Potomac Edison has issued 892 rebates, totaling $267,600 and installed 34 Level 2 charging stations and 18 DCFC.

Southern Maryland Electric Cooperative (SMECO)

As of October 2023, SMECO has installed a total of 38 public chargers, of which 35 are Level 2 chargers and three are DCFC. There are currently an additional five sites either in the planning phase, in construction, or waiting to be energized. SMECO's residential programs were approved in March of 2023 and SMECO is working on implementing the Managed Charging and a Data Share incentive program by Q4 2023. SMECO also received approval from the PSC for Q1 2023 to install up to 30 Level 2 charging stations and is currently working with three property management companies looking to install Level 2 chargers at eight potential sites. SMECO is planning to file for the TOU program in Q4 of 2023.

Section 7 - National Electric Vehicle Infrastructure (NEVI)

BIL, enacted on November 15, 2021, established the NEVI Formula Program. On June 2, 2023, the FHWA provided updates to the initial NEVI guidance, superseding the guidance that was issued on February 10, 2022. The updated guidance provides information on expectations for updated NEVI Plans, funding eligibilities, and program administration guidance for the historic investments in EV charging infrastructure made in the BIL.

Maryland NEVI Plan and Program

Following the requirements of the NEVI Formula Program, MDOT submitted the 2023 Update of the 'Maryland State Plan for NEVI Formula Funding Deployment' to FHWA in August 2023. The 2023 Plan Update, approved by FHWA on September 29, 2023, describes Maryland's activities that support the successful deployment of charging infrastructure since the previous plan submittal in July 2022[iv]. The 2023 Plan Update adheres to the revised and updated template provided by FHWA.

To inform Maryland's NEVI Program, MDOT released two RFI for NEVI Formula Program Funding, which received a total of 53 responses. The RFI aimed to solicit feedback and recommendations for a future Request for Proposal (RFP) for the development of EV charging networks within Maryland. The initial RFI was released on September 20, 2022, and closed after one month on October 20, 2022. In total, 29 respondents provided information on their organization; funding and costs; and barriers, challenges, and opportunities. This included anticipated costs, 20 percent matching requirements, as well as experience installing and operating charging stations in Maryland. The second RFI, focused on end-to-end data collection and data reporting, was released on January 11, 2023, and closed on February 13, 2023. It received 24 responses providing information on EV infrastructure deployment data, data reporting, software, network, communication, and cybersecurity needs.

MDOT continues to work on the development of the NEVI Program and anticipates releasing Round 1 in winter of 2023/2024. More information on Maryland's NEVI Plan, including updates and how to stay involved, can be found on the Maryland's NEVI website.

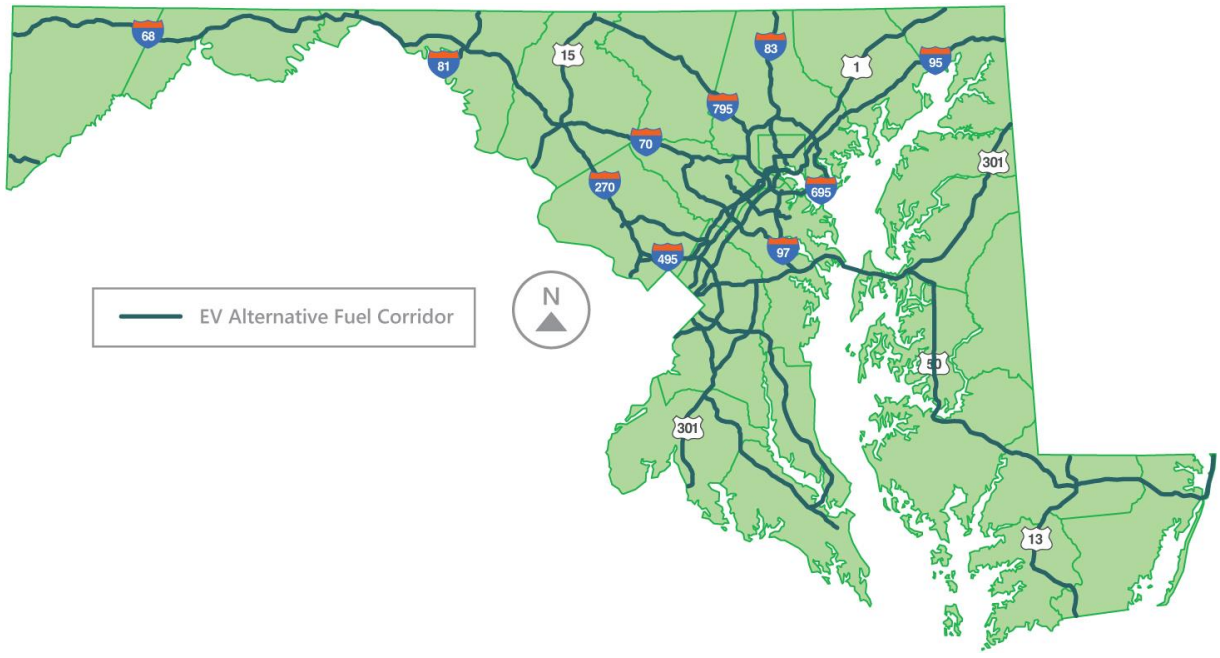
Charging and Fueling Infrastructure Discretionary Grant Program

The Charging and Fueling Infrastructure (CFI) Discretionary Grant Program, created under the BIL, was announced on March 14, 2023. The CFI Grant Program will provide $2.5 billion over five years to accelerate the deployment of publicly accessible EV charging and alternative fueling infrastructure along designated AFCs and in communities. The BIL established two funding categories within the CFI Discretionary Grant Program:

- Alternative Fuel Corridor Grant (Corridor Program) – This is focused on deploying publicly accessible alternative fueling infrastructure along designated AFCs.
- Community Charging and Fueling Grants (Community Program) - This is focused on strategically deploying publicly accessible alternative fueling infrastructure in communities to fill in gaps in access to charging or alternative fueling infrastructure.

In Maryland, 29 sites were proposed under the Corridor Program, and over 175 sites were proposed under the Community Program. The Maryland Clean Energy Center (MCEC) coordinated and submitted a CFI application for Corridor Program funds on behalf of multiple Maryland jurisdictions. MDOT coordinated with the MCEC on this application to ensure the proposed sites would support corridor build-out. The Metropolitan Washington Council of Governments submitted a CFI application for Community Program funds on behalf of its member jurisdictions, including Frederick and Prince George's counties. Montgomery County and Howard County also submitted applications for Community Program funds.

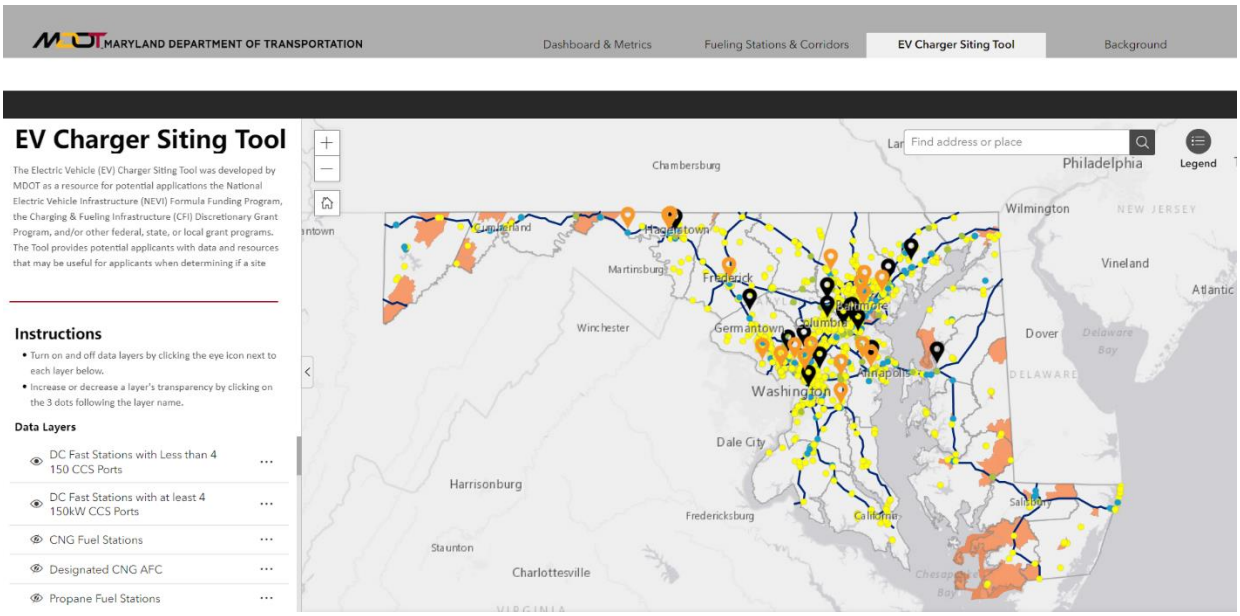
Figure 12 - EV Alternative Fuel Corridors



EV Charger Siting Tool

MDOT created and launched an interactive Electric Vehicle Charger Siting Tool to serve as a resource for agencies engaged in decisions about EV charger siting. The interactive tool consolidates data from a variety of state and federal agencies. Its purpose is to serve as a resource for potential applicants when applying to the NEVI Formula Funding Program, CFI Discretionary Grant Program, and other state/local grant programs to determine whether a site may be a good candidate for a grant program.

Figure 13 - Electric Vehicle Charger Siting Tool



Electric Vehicle Charger Reliability and Accessibility Accelerator Grant

The Electric Vehicle Charger Reliability and Accessibility Accelerator Discretionary Grant Program, created under the BIL, opened applications on September 13, 2023. This program provides federal funding to repair and replace existing but non-operational EV charging stations. MDOT submitted an application in November, seeking funding for EV charging stations to complement NEVI deployment in Maryland. MDOT, in collaboration with local governments and private vendors, identified inoperable charging stations throughout the State that would be eligible for this program. The application proposed replacement of 25 charging stations spanning six counties. If awarded, this funding would contribute toward maintaining a functional, reliable, NEVI-compliant network of EVSE across the State.

Section 8 - Education and Outreach

To promote EV adoption throughout the state of Maryland, the team's outreach efforts focused on reaching and engaging a broad, diverse spectrum of population groups. By combining in-person events with digital outreach strategies, the team amplified messaging, re-targeted audiences, and effectively championed EV adoption to a wide range of Maryland residents.

MarylandEV Outreach by the Numbers:

- Attended five events across Maryland with refreshed event collateral.
- Implemented geofencing campaigns at all in-person outreach events, digitally retargeting audiences with EV ads for a combined reach of 623,470 people.
- Dramatically increased MarylandEV.org website traffic to over 106,893 page views as of October 31, 2023, a 160 percent increase from the 41,000 total views received during the same period in 2022.
- Implemented multiple paid social media advertising campaigns in 2023 from April 21 – July 31, resulting in 552,634 impressions in English and Spanish.
- Reached 40,454 Marylanders (160,499 impressions) with the Spanish version of the ads.
- As of October 2023, over 3,300 people have visited the Maryland EV Journey StoryMap site.
- Posted new social media content to MarylandEV Facebook and Instagram platforms, reaching over 16,817 Marylanders via 169 total posts.
- The combined effort of in-person outreach, digital advertising, and website optimization led to an increased overall message exposure of more than 47 percent. Total message exposure of 1,291,445 was 603,000 more views than 2022's total message exposure of 687,000.
- Engaged over 1,110 Marylanders across the state in conversations about the benefits of EVs.

Events

The MarylandEV outreach team focused in-person outreach on population groups with lower-than-average EV adoption rates such as rural residents and racial minority groups. The team planned and attended five pop-up events throughout Maryland, reaching out to low adoption audiences. To ensure interaction with all visitors at these events, MarylandEV event staff included fluent Spanish, French, and American Sign Language speakers. Events were digitally geofenced and promoted through social media to integrate digital messaging with in-person interaction.

Figure 14 - MarylandEV In-Person Outreach Events

Taste of Southern Maryland (Newburg, MD) | April 23, 2023

People Engaged: 275

The Taste of Southern Maryland, held on a sunny spring day, celebrated Southern Maryland's robust business community with food, live music, and local artisans. The MarylandEV outreach staff drew interested festival goers to their booth with a Kia Nero EV on display and appealing giveaways such as children's balloon animals, cellphone wallets, and cellphone fans. Staff were able to convey messaging by distributing postcards and flyers, and answered questions on a wide range of topics, including availability of EV charging stations, battery life, and federal and local incentives offered towards EV purchases. Outreach staff were also able to dispel some common EV misconceptions related to range anxiety and lack of charging infrastructure. Overall, visitors were intrigued by the EV on display and engaged in our conversations—even those that remain loyal to gas-powered vehicles.

Bladensburg Waterfront Arts Festival (Bladensburg, MD) | May 20, 2023

People Engaged: 150 | Spanish Engagements: 12

This free arts festival attracted many visitors to Bladensburg's urban waterfront park with an outdoor gallery featuring local artists and a creative zone for children. The MarylandEV booth tied into the festival's arts theme with a children's art activity, which then allowed outreach staff to engage kids' parents on the benefits of owning an EV. Booth collateral, particularly the "Gas vs. EV" postcard, helped reinforce messaging to visitors who frequently asked about the costs of EVs compared to gas-powered vehicles. Other discussions focused on pricing and availability of different EV makes and models, available state and federal incentives, and costs around charging infrastructure.

Eastern Shore Juneteenth Festival (Salisbury, MD) | June 17, 2023

People Engaged: 325 | Spanish Engagements: 5

Salisbury's annual Juneteenth celebration is an annual live music festival that celebrates Black culture and achievement and educates the community on Black history and the struggle for civil rights. The outreach team's booth near the festival's performance stage, enticing giveaways, and the Chevy Bolt EV on display ensured a steady stream of visitors, many of whom then engaged in extended conversations on EV affordability, charging infrastructure, and tax and other financial incentives in purchasing EVs and charging equipment. This event was an excellent opportunity to engage Marylanders who have not previously considered EVs.

Potomac Jazz and Seafood Festival (Colton's Point, MD) | July 8, 2023

People Engaged: 190

The 23rd Annual Potomac Seafood and Wine Festival was held at the St. Clements Island Museum. Festival attendees that came out on a hot and humid day for the live music, fresh seafood, and a Jazz Cruise to visit the island also were very interested in the EV on display—and appreciated the weather-appropriate cellphone fan giveaways. Many booth visitors were high-income African Americans who were interested in discussing EV issues, including the latest EV luxury makes and models. Recurring talking points focused on what vehicles qualify for state and federal credits, battery mileage, and concerns around lack of charging infrastructure in the state.

Howard County Pow Wow (West Friendship, MD) | July 15, 2023

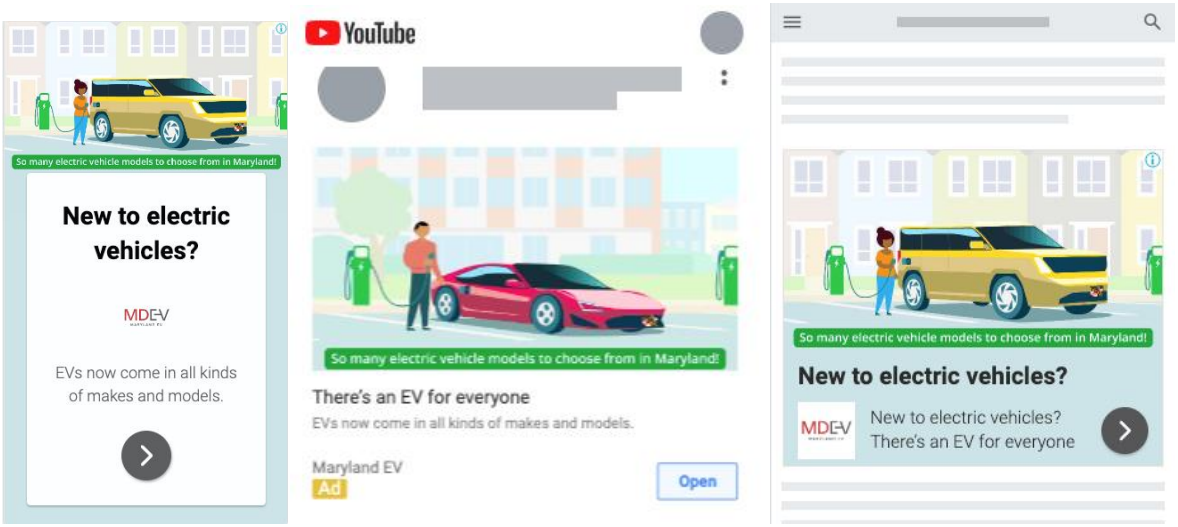
People Engaged: 142 | Spanish Engagements: 15

Held in the Howard County Fairgrounds, the 30th annual Howard County Whispering Winds Pow-Wow//American Indian Show and Festival gives the public the opportunity to interact with American Indian dancers, singers, drummers, artists, and crafts artisans. The outreach team's booth was located near the main entrance to the indoor event, attracting many diverse attendees. Outreach staff's conversations with visitors were detailed and extensive, covering all issues related to making a switch to electric vehicles. As with other events, there was some hesitation around cost, charging availability, battery safety, and reliability, but attendees appreciated the team's outreach efforts and willingness to share the real-life experiences of EV owners. To help connect with a wider audience, several attendees expressed an interest in having more translated materials and presentations available to accommodate non-English speakers, and others requested easy-to-understand materials to clearly explain more complex EV information such as charging infrastructure expansion plans and battery recycling and disposal methods.

MarylandEV combined digital and in-person outreach with Google geofencing, receiving thousands of impressions for a relatively small budget. At each of the five in-person outreach events, MarylandEV outreach staff successfully served 623,470 impressions to people who made 1,413 link clicks to the website through this method of digital retargeting. This location-based digital advertising technique draws digital borders around physical locations, such as outreach events, and then tags visitors that enter the digitally defined areas to receive

advertisements promoting the MarylandEV.org website. Those advertisements appeared while browsing the internet and visiting websites and apps for the next 30 days.

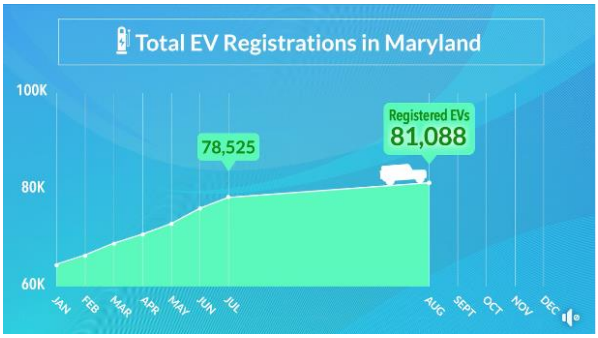
Figure 15 - Geofencing ad examples on different platforms

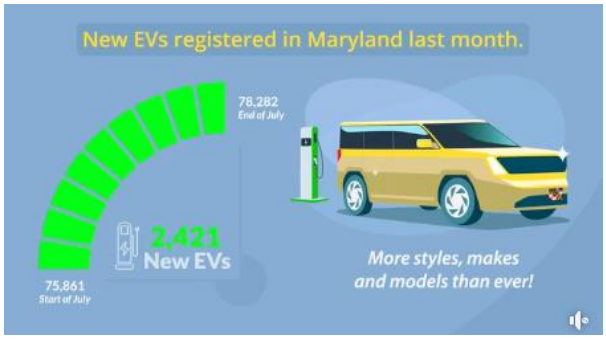


Online Presence

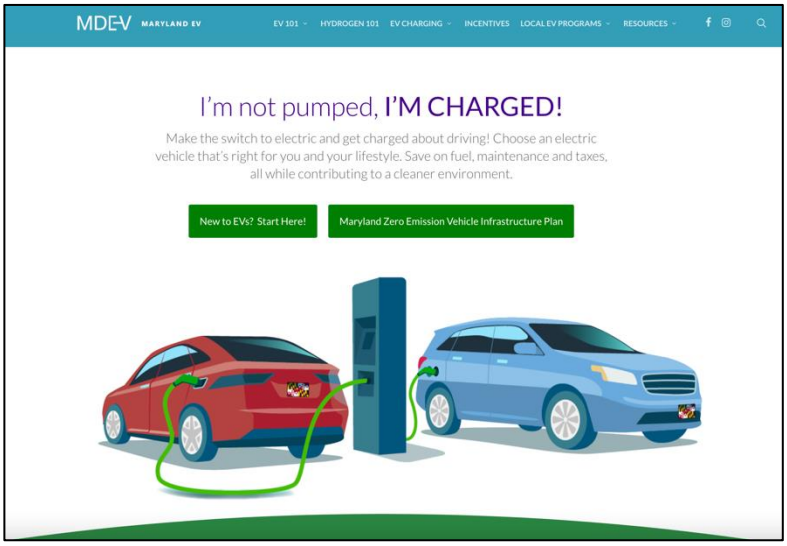
Maryland EV

MarylandEV maintains a seamless web and social media presence integrated with in-person outreach. The MarylandEV.org website continues to aggregate consumer-facing EV resources and information, providing valuable and accurate information to help Maryland consumers make informed decisions regarding EVs. The MarylandEV.org website URL is prominently displayed in all collateral material, both digital and print, to assist Marylanders with finding information maintained on the site.

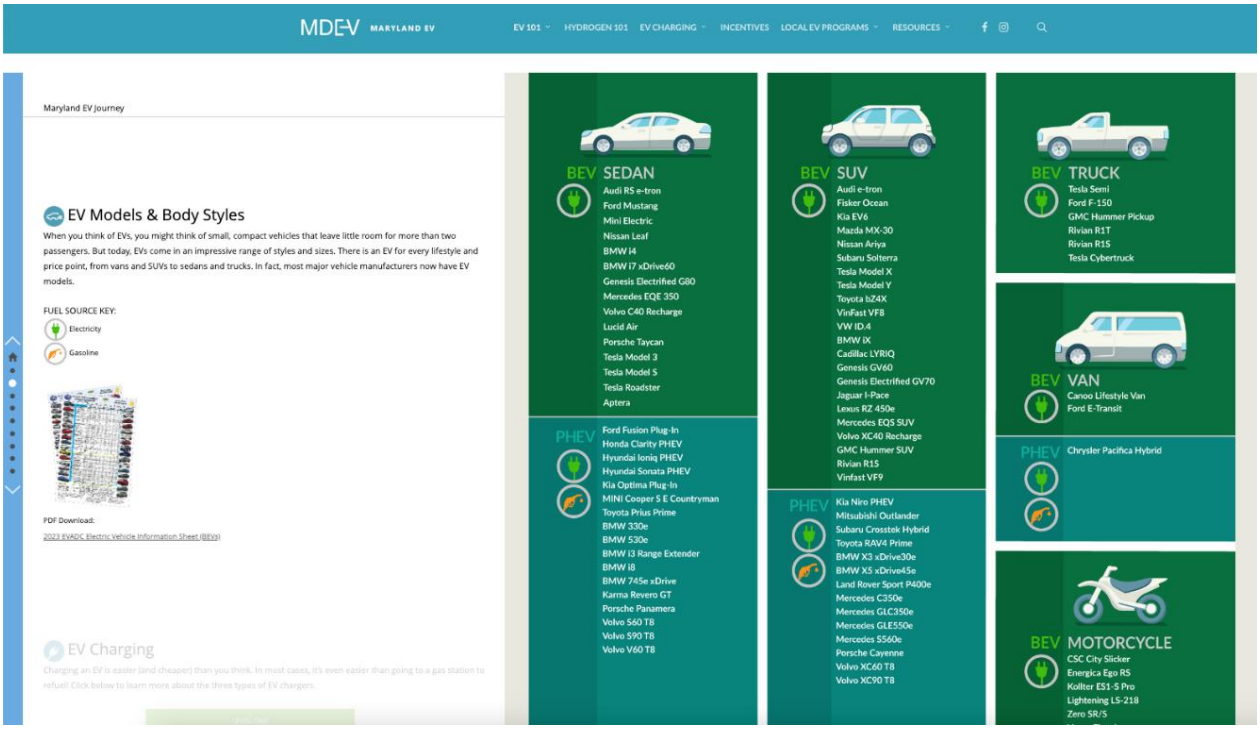




MarylandEV.org

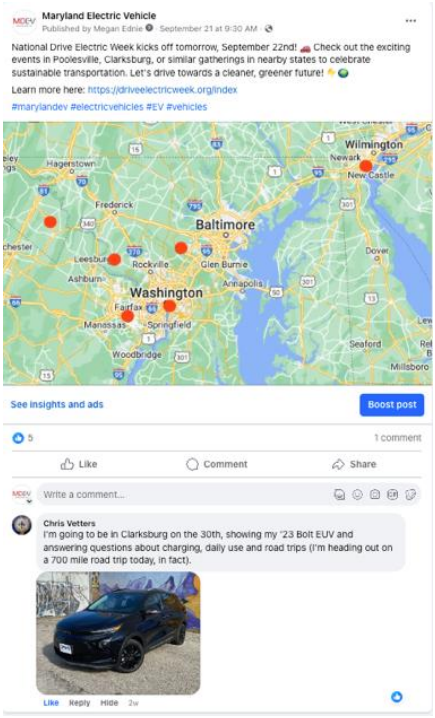


The Maryland EV Journey StoryMap, an interactive web-based consumer information tool that educates visitors with a comprehensive menu of important, timely, and relevant EV topics and issues, continues to be useful and engaging for both in-person and digital engagement. The site allows users to provide input via surveys, provide charging station location suggestions, and relay their own personal testimonials about their Maryland EV experience. The team consistently refreshes this online tool with updated information, such as the latest EV makes and models and financial incentives towards purchasing electric vehicles and charging equipment and will promote the Maryland EV Journey in all future outreach campaigns.



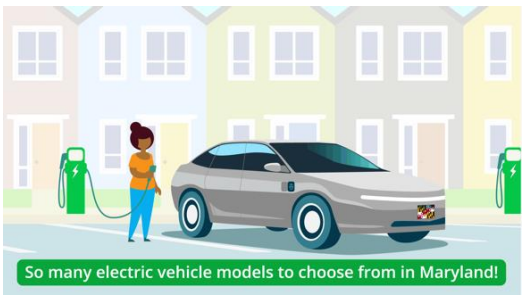
Social Media

An important part of digital outreach occurs through social media postings on Facebook and Instagram. The MarylandEV outreach team has cultivated an audience of predominantly Maryland residents that follow MarylandEV social media accounts. Social media content is designed to educate, inform, and elicit responses from the audience. Engagement is attracted with twice-weekly posts focused on the latest EV developments—news, events, and education—within Maryland. The team's posts, often reaching thousands of Marylanders, cross-promote events and initiatives, request testimonials from Maryland EV owners, and promote ZEEVIC member organizations and other partner efforts.



As the number of Maryland EV owners continues to grow, the outreach team posts monthly registration motion graphics showing increasing EV registrations. This year, the graphics series has been updated with a new look as Maryland EV registrations topped 84,000 in October of 2023.

Paid social media advertising was used to target Maryland's diverse audiences and to build excitement around the return of a state tax incentive for EV purchases. Used to reach both niche and large audiences in a cost-effective way, the MarylandEV outreach team implemented multiple paid social campaigns on Facebook and Instagram in the spring and summer of 2023. The spring ad, distributed on Facebook and Instagram in both English and Spanish, focused on the many EV makes and models that fit the lifestyles of diverse Marylanders.



To capitalize on the new Maryland EV tax credit enacted on July 1, 2023, a second campaign ran throughout July to announce the upcoming incentive and provide awareness of its availability. The team implemented a two-part Facebook ad campaign that consisted of a week-long ad that ran prior to July 1. During the campaign, MarylandEV's Facebook account received 45 new followers. That number continues to grow with increased exposure; as of October 31, 2023, the Maryland EV Facebook account has 2,133 followers who will continue to receive regular weekly content posts and engage at no advertising cost.

ZEEVIC Member Organization Outreach

Electric Vehicle Association of Greater Washington (EVADC)

The EVADC helped promote EVs to many different audiences at multiple events in the greater Washington region. There were several events for Drive Electric Earth Day in April 2023, including Rockville Science Day and Montgomery County GreenFest. National Drive Electric Week (NDEW) in September included events in Clarksville, Greenbelt, and Baltimore. EVADC members helped organize testimony on EV-related legislation and served on the national Electric Vehicle Association Policy Committee. EVADC members also continued hosting weekly Ask-an-EV-Owner meetings consisting of both in-person and virtual components.

Photo Credit Athel Rogers

Poolesville Green

Poolesville Green is a nonprofit organization that educates the community about sustainable living practices that families and businesses can implement to reduce their carbon footprint. The organization focuses on three main areas: renewable energy transition, transportation electrification, and energy efficiency. In 2023, as in years past, Poolesville Green organized major EV shows for the Montgomery County GreenFest in April and the Poolesville Day festival and parade in September, both efforts part of the nationwide Drive Electric Earth Day and NDEW, respectively. The Poolesville Day EV showcase, the unofficial kickoff for similar regional events, was once again the largest NDEW event nationally, attracting EV

owners and the EV-curious from the multi-state mid-Atlantic area. Other outreach included "go electric" discussions with the Town of Poolesville; participation in bi-weekly Cars & Coffee events; EV shows in Annapolis and Clarksville; Supercharger ribbon cuttings in Bowie and Gaithersburg; and outreach partnerships with Capital Area Solar Switch, Gaithersburg Green Drinks, and One Montgomery Green.

Utility Outreach

Maryland's public utility companies—BGE, Pepco and Delmarva, SMECO, and Potomac Edison—conducted outreach to promote electric vehicle adoption, EVSE installation, and time of use (TOU) rates.

BGE Events and Outreach

The EVsmart team supported three Corporate Community Impact events targeted toward youth. These events, known as Youth Energy Days, offered an opportunity for middle school and high school students along with BGE college interns and STEM Academy attendees to learn more about careers at BGE. Corporate Community Impact events were held at BGE's White Marsh Training Center on July 10, July 14, and August 2, 2023.

BGE also conducted outreach at community events, including:

- Maryland Auto Show – March 10-12, 2023
- Through WMAR's 'Steering Change' series[v]
- Department of General Services' annual Earth Day event – April 25, 2023
- Maryland Zoo - Annual Trucks for Tots – October 1, 2023

bge℠
AN EXELON COMPANY

PHI Events and Outreach

In August 2023, Pepco and Delmarva Power (collectively PHI) launched the Electric Vehicle Fleet Program to offer fleet assessments, make-ready incentives, and EVSE purchase and installation incentives.

PHI also continued their education and outreach efforts to promote the EVsmart programs through email, social media, and engagement with customers in the community through in-person attendance at multiple events in 2023, including:

- Power2Go Summit EV Symposium: Mapping Rural Maryland's EV Future, at the Chesapeake Environmental Center in Grasonville, MD – February 13, 2023
- Cardinal Shehan School Youth Workforce Development Day in Baltimore, MD – February 21, 2023
- Montgomery County Energy Summit in Silver Springs, MD – March 28-29, 2023
- Montgomery County GreenFest in Wheaton, MD – April 23, 2023
- Power in the Park in Silver Spring, MD – June 1, 2023
- Wicomico County Fair in Salisbury, MD – August 18-20, 2023

pepco℠
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delmarva power℠
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Potomac Edison Events and Outreach

In 2023, Potomac Edison used social media channels to share public EVSE developments and EV-related news. They advertised on PlugShare and Facebook to promote their rebate and off-bill credit programs. A six-month social media advertising campaign developed by the MOWER Advertising Agency to promote rebates was launched on October 28, 2022, and ran through March 31, 2023, targeting current EV owners and single-family homeowners considering an EV purchase. Potomac Edison also sponsored the Poolesville National Drive Electric event on September 23, 2023. Other outreach included:

- EV-Only TOU Rate promotional campaign via websites, blog posts, emails, and updated online rate calculator

SMECO Events and Outreach

SMECO participated in the Calvert Green Day event at Annmarie Garden so customers could view EVs and ask questions. SMECO had one company-owned and one employee-owned EV on site. SMECO also participated in Summerseats' Earth Day event handing out literature and answering questions regarding SMECO's EV programs.

Appendix A - ZEEVIC Enabling Legislation and Requirements

ZEEVIC Legislative Basis and Requirements

The 2011 session of the Maryland General Assembly adopted, and Governor O'Malley signed into law, Senate Bill 176, Chapter 400 Acts of 2011, which established the Electric Vehicle Infrastructure Council (EVIC or 'Council').

In 2013, Maryland House Bill 836 extended the authorization of the Council through 2017 and required additional reports.

In 2015, Maryland Senate Bill 714 extended the tenure of the Council until 2020 and set out annual reporting requirements.

In 2019, Maryland House Bill 1246 expanded the membership and responsibilities of the Council to include zero emission vehicles (ZEVs) and fuel cell electric vehicles. To reflect the expanded responsibilities of the Council, it was renamed the Maryland Zero Emission Electric Vehicle Infrastructure Council (ZEEVIC or 'Council').

In 2020, Maryland House Bill 232 altered the membership of the Council and reporting requirements. This bill also extended authorization of the Council through June 30, 2026.

In 2021, Maryland House Bill 30 altered the membership of the Council again.

Membership

The membership of ZEEVIC, as outlined in its originating legislation and subsequently amended, serves to represent a diverse set of interests, perspectives, and responsibilities, including utilities, State agencies, private enterprise, and non-profit EV advocates. ZEEVIC Membership is comprised of the following twenty-nine representatives:

1. One member of the Senate of Maryland, appointed by the President of the Senate
2. Two members of the House of Delegates, appointed by the Speaker of the House
3. The Secretary of Transportation or the Secretary's designee
4. The Secretary of Planning or the Secretary's designee
5. The Secretary of the Environment or the Secretary's designee
6. The Secretary of Commerce or the Secretary's designee
7. The Executive Director of the Technical Staff of the Maryland Public Service Commission or the Executive Director's designee
8. The Director of the Maryland Energy Administration or the Director's designee
9. The People's Counsel, or the People's Counsel's Designee

The following members are appointed by the Governor:

10. One representative of an institution of higher education in the State with expertise in energy, transportation, or the environment

11. Two representatives of the Maryland Association of Counties, including:
    a. A representative who resides in a rural region of the State; and
    b. A representative who resides in an urban or suburban region of the State
12. Two representatives of the Maryland Municipal League, including:
    a. A representative who resides in a rural region of the State; and
    b. A representative who resides in an urban or suburban region of the State
13. One representative of an electric vehicle driver advocacy organization
14. Three representatives of electric companies in the State
15. One representative of a plug-in electric drive vehicle manufacturer
16. One representative of a manufacturer of plug-in electric drive vehicle charging stations
17. One representative of manufacturers of fuel cell electric vehicles
18. One representative of manufacturers of fuel cell electric vehicle infrastructure equipment
19. One representative of fleet vehicle operators
20. One representative of electrical workers
21. Two representatives of the environmental community
22. One public member with expertise in energy or transportation policy
23. One representative of a new vehicle dealer association in the State

Requirements

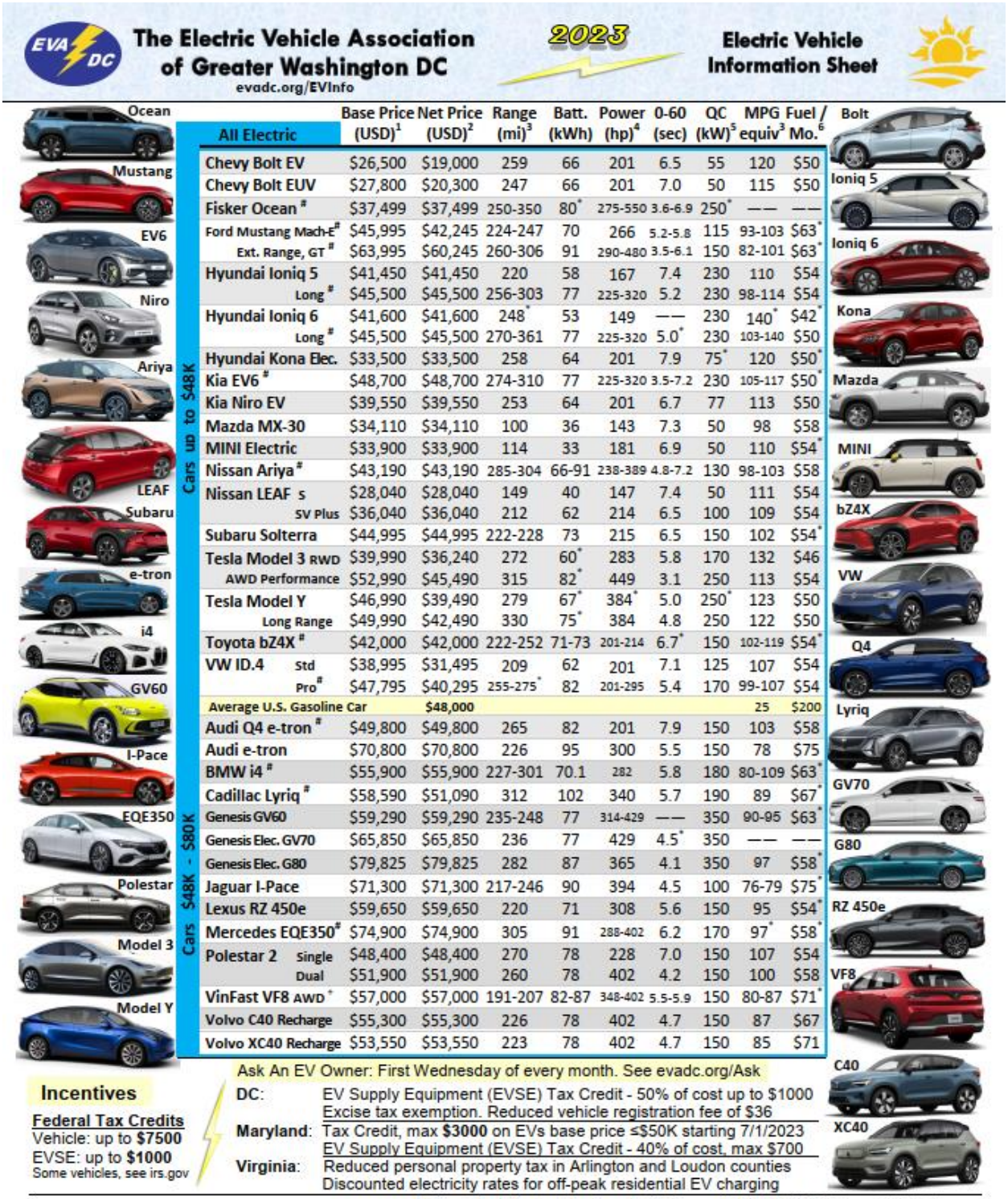
The 2011 legislation that established the Council included an initial list of directives. The Council responded to these directives by completing an Electric Vehicle Infrastructure Plan in 2012. The Action Plan included 32 recommendations. The recommendations were grouped by the following themes: Coordinated Action, Policy Changes, Outreach and Education, Promotion of Infrastructure, and Charging Solutions. Progress under each theme has continued to be tracked in the Council's Annual Reports filed with the Department of Legislative Services (DLS) each year.

2011 directives established by Senate Bill 176, Chapter 400 Acts of 2011, and amended in subsequent bills, required the Council to:

1. Develop an action plan to facilitate the successful integration of zero-emission electric vehicles into the State's transportation network.
2. Assist in developing and coordinating Statewide standards for streamlined permitting and installation of residential and commercial electric vehicle charging and hydrogen refueling stations and supply equipment.
3. Develop a recommendation for a Statewide electric vehicle charging and hydrogen refueling infrastructure plan, including placement opportunities for public charging and hydrogen refueling stations.
4. Increase consumer awareness and demand for zero-emission electric vehicles through public outreach.

5. Make recommendations regarding monetary and nonmonetary incentives to support zero-emission electric vehicle ownership and maximize private sector investment in zero-emission electric vehicles.
6. Develop targeted policies to support fleet purchases of zero-emission electric vehicles.
7. Develop charging solutions for existing and future multi-dwelling units.
8. Develop model procurement practices for light-duty vehicles that include an evaluation of the vehicle lifecycle costs inclusive of estimated fuel cost over the anticipated life of the vehicle.
9. Encourage local and regional efforts to promote the use of electric vehicles and attract federal funding for State and local zero-emission electric vehicle programs.
10. Recommend policies that support zero-emission electric vehicle charging and hydrogen refueling from clean energy sources.
11. Recommend a method of displaying pricing information at public charging and hydrogen refueling stations.
12. Establish performance measures for meeting zero-emission electric vehicle–related employment, infrastructure, and regulatory goals.
13. Pursue other goals and objectives that promote the utilization of zero-emission electric vehicles in the State.
14. Submit reports by certain dates regarding the progress on the above items.

Appendix B - EVADC EV Information Sheet (As of April 2023[vi])



The Electric Vehicle Association of Greater Washington DC
evadc.org/EVInfo

2023 Electric Vehicle Information Sheet

	All Electric	Base Price (USD)[1]	Net Price (USD)[2]	Range (mi)[3]	Batt. (kWh)	Power (hp)[4]	0-60 (sec)	QC (kW)[5]	MPG equiv[3]	Fuel / Mo.[6]
Cars up to $48K	Chevy Bolt EV	$26,500	$19,000	259	66	201	6.5	55	120	$50
	Chevy Bolt EUV	$27,800	$20,300	247	66	201	7.0	50	115	$50
	Fisker Ocean #	$37,499	$37,499	250-350	80*	275-550	3.6-6.9	250*	——	——
	Ford Mustang Mach-E#	$45,995	$42,245	224-247	70	266	5.2-5.8	115	93-103	$63*
	Ext. Range, GT #	$63,995	$60,245	260-306	91	290-480	3.5-6.1	150	82-101	$63*
	Hyundai Ioniq 5	$41,450	$41,450	220	58	167	7.4	230	110	$54
	Long #	$45,500	$45,500	256-303	77	225-320	5.2	230	98-114	$54
	Hyundai Ioniq 6	$41,600	$41,600	248*	53	149	——	230	140*	$42*
	Long #	$45,500	$45,500	270-361	77	225-320	5.0*	230	103-140	$50
	Hyundai Kona Elec.	$33,500	$33,500	258	64	201	7.9	75*	120	$50*
	Kia EV6 #	$48,700	$48,700	274-310	77	225-320	3.5-7.2	230	105-117	$50*
	Kia Niro EV	$39,550	$39,550	253	64	201	6.7	77	113	$50
	Mazda MX-30	$34,110	$34,110	100	36	143	7.3	50	98	$58
	MINI Electric	$33,900	$33,900	114	33	181	6.9	50	110	$54*
	Nissan Ariya #	$43,190	$43,190	285-304	66-91	238-389	4.8-7.2	130	98-103	$58
	Nissan LEAF S	$28,040	$28,040	149	40	147	7.4	50	111	$54
	SV Plus	$36,040	$36,040	212	62	214	6.5	100	109	$54
	Subaru Solterra	$44,995	$44,995	222-228	73	215	6.5	150	102	$54*
	Tesla Model 3 RWD	$39,990	$36,240	272	60*	283	5.8	170	132	$46
	AWD Performance	$52,990	$45,490	315	82*	449	3.1	250	113	$54
	Tesla Model Y	$46,990	$39,490	279	67*	384*	5.0	250*	123	$50
	Long Range	$49,990	$42,490	330	75*	384	4.8	250	122	$50
	Toyota bZ4X #	$42,000	$42,000	222-252	71-73	201-214	6.7*	150	102-119	$54*
	VW ID.4 Std	$38,995	$31,495	209	62	201	7.1	125	107	$54
	Pro#	$47,795	$40,295	255-275*	82	201-295	5.4	170	99-107	$54
	Average U.S. Gasoline Car		$48,000						25	$200
Cars $48K - $80K	Audi Q4 e-tron #	$49,800	$49,800	265	82	201	7.9	150	103	$58
	Audi e-tron	$70,800	$70,800	226	95	300	5.5	150	78	$75
	BMW i4 #	$55,900	$55,900	227-301	70.1	282	5.8	180	80-109	$63*
	Cadillac Lyriq #	$58,590	$51,090	312	102	340	5.7	190	89	$67*
	Genesis GV60	$59,290	$59,290	235-248	77	314-429	——	350	90-95	$63*
	Genesis Elec. GV70	$65,850	$65,850	236	77	429	4.5*	350	——	——
	Genesis Elec. G80	$79,825	$79,825	282	87	365	4.1	350	97	$58*
	Jaguar I-Pace	$71,300	$71,300	217-246	90	394	4.5	100	76-79	$75*
	Lexus RZ 450e	$59,650	$59,650	220	71	308	5.6	150	95	$54*
	Mercedes EQE350#	$74,900	$74,900	305	91	288-402	6.2	170	97*	$58*
	Polestar 2 Single	$48,400	$48,400	270	78	228	7.0	150	107	$54
	Dual	$51,900	$51,900	260	78	402	4.2	150	100	$58
	VinFast VF8 AWD +	$57,000	$57,000	191-207	82-87	348-402	5.5-5.9	150	80-87	$71*
	Volvo C40 Recharge	$55,300	$55,300	226	78	402	4.7	150	87	$67
	Volvo XC40 Recharge	$53,550	$53,550	223	78	402	4.7	150	85	$71

Ocean, Mustang, EV6, Niro, Ariya, LEAF, Subaru, e-tron, i4, GV60, I-Pace, EQE350, Polestar, Model 3, Model Y

Bolt, Ioniq 5, Ioniq 6, Kona, Mazda, MINI, bZ4X, VW, Q4, Lyriq, GV70, G80, RZ 450e, VF8, C40, XC40

Ask An EV Owner: First Wednesday of every month. See evadc.org/Ask

Incentives

Federal Tax Credits
Vehicle: up to **$7500**
EVSE: up to **$1000**
Some vehicles, see irs.gov

DC: EV Supply Equipment (EVSE) Tax Credit - 50% of cost up to $1000
Excise tax exemption. Reduced vehicle registration fee of $36

Maryland: Tax Credit, max **$3000** on EVs base price ≤$50K starting 7/1/2023
EV Supply Equipment (EVSE) Tax Credit - 40% of cost, max $700

Virginia: Reduced personal property tax in Arlington and Loudon counties
Discounted electricity rates for off-peak residential EV charging

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Version 20230426

1. Base price before tax incentives, destination.
2. Net price after federal tax credit. State credits may still apply. Consult irs.gov & tax advisor.
3. EPA combined city/highway, except as noted
4. Total motor power. 1 kW = 1.34 hp
5. DC Quick / Fast Charge max rate
6. EPA, 15000 miles/year, 14¢ / kWh

* Estimate
\+ Multiple battery options available
\# Multiple drive options, AWD or other
β Future availability announced

The Electric Vehicle Association of Greater Washington DC

evadc.org/EVInfo

2023 Electric Vehicle Information Sheet

	All Electric	Base Price (USD)[1]	Net Price (USD)[2]	Range (mi)[3]	Batt. (kWh)	Power (hp)[4]	0-60 (sec)	QC (kW)[5]	MPG equiv[3]	Fuel / Mo.[6]
Cars over $80K	Audi RS e-tron	$143,900	$143,900	232	93	637	3.1	270	81	$67
	BMW i7 xDrive60	$119,300	$119,300	308-318	105	536	4.5	195	89	$67*
	Lucid Air RWD	$87,400	$87,400	406	88	480	4.2	300	140	$50*
	Lucid Air AWD +	$92,900	$92,900	471-516	93-118	620-1K	2.5-3.4	300	116	$50*
	Mercedes EQS sedan	$102,310	$102,310	340	120	329	5.9	200	103	$54*
	Porsche Taycan	$90,900	$90,900	200	79	402	5.1	270	79	$75*
	Porsche Taycan 4S, Turbo, GT	$111,700	$111,700	199-227	93	402-750	2.6-5.1	270	79	$75*
	Tesla Model S	$84,990	$84,990	405	100*	670	3.1	250	120	$50
	Tesla Model S Tri-Motor	$104,990	$104,990	348-396	100*	1020	1.99	250	116	$50*
	Tesla Model X	$94,990	$94,990	330-348	100*	670	3.8	250	102	$58
	Tesla Model X Tri-Motor	$104,990	$104,990	311-333	100*	1020	2.5	250	91-98	$63*
	Tesla Roadster β*	$200,000	$200,000	620	200*	——	1.9	350	——	——
Large Vehicles & Trucks	BMW iX	$87,100	$87,100	274-324	112	516-610	3.6-4.4	200	86	$71*
	Canoo Lifestyle Van β	$34,750	$34,750	250*	80	350	——	——	——	——
	Ford E-Transit	$53,790	$50,040	108-126	68	266	8.0-9.0	115	77	$65*
	Ford F-150 Pro	$59,974	$52,474	230	98	426	5.0	150	68-70	$88*
	Ford F-150 XLT *	$63,474	$55,974	230-320	98-131	563	4.5	150	66-70	$88*
	GMC Hummer pickup β	$94,650	$94,650	300*	200	625-830	3.0	350	——	——
	GMC Hummer SUV β	$94,650	$94,650	300*	200	625-830	3.5	350	——	——
	Mercedes EQS SUV β#	$104,400	$104,400	305	108	355-536	4.5-6.5	200	77	$75*
	Rivian R1S +#	$78,000	$74,250	321-390	135	600*	3.0	220*	64-71	$88*
	Rivian R1T +#	$73,000	$69,250	328-400	135	753*	3.0-4.5	220*	64-73	$88*
	Tesla Cybertruck β+^	$39,900*	$39,900*	250-500	100/200	330-600	2.9-6.5	250	——	——
	Tesla Semi β + ^	$150,000	$150,000	300-500	500/850	1000	20	>1000	——	——
	VinFast VF9 AWD *	$76,000*	$76,000*	250*	83-87	402	6.3	——	——	——
Motorcycles	Aptera	$25,900	$25,900	250-1000	25-100	134-201	3.5	——	337	$15*
	CSC Whiz Scooter	$2,495	$2,495	20-50	2	4	——	46	mph	max
	Energica Ego RS *	$26,650	$26,650	261	13-22	171	2.6	150	mph	max
	Harley LiveWire One	$22,799	$22,799	95	15.5	100	3.0	110	mph	max
	Kollter ES1-S Pro	$6,995	$6,995	100	5	16	——	72	mph	max
	Lightning LS-218 *	$38,988	$38,988	188-335	15-28	244	2.2	218	mph	max
	Vespa Elettrica	$7,999	$7,999	62	4	5.4	——	45	mph	max
	Zero SR/S *	$23,995	$23,995	118-187	14-21	110	3.3	124	mph	max



Coming Soon !

Cars: BMW i5; Chevy Blazer, Equinox; DeLorean; Ford Explorer; Hyundai Ioniq 7, Jeep Wrangler; Kia EV9; Lotus Eletre; Polestar 3; Porsche Macan
Trucks: Atlis XT; Canoo Pickup; Chevy Silverado; GMC Sierra; Lordstown Enduance; Ram 1500

EVA/DC meets the 3rd Wednesday of every month. See evadc.org/meeting.

Home Charging

Typically costs **4 ¢ / mile**. (3 mi / kWh, 12 ¢ / kWh)

Charge using an **ordinary 120V outlet**.
Dedicated circuit recommended.

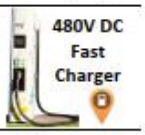
Install a home 240V charging station for faster charging at home. $400-$1000 + installation

Public Charging

Cost varies, free - 49 ¢ / kWh

SemaConnect, chargepoint, blink, eVgo, electrify america

240V Public Charging Station



Level 1: 120V AC (regular outlet)
Reclaim 5 miles per hour charging

Level 2: 240V AC (J1772 / dryer plug)
Reclaim 15-60 miles per hour charging

Fast Charge: 480V DC
Reclaim 50-200 miles in 30 minutes

Appendix C - ZEV Policy Scorecard (Draft 10/31/2023)

MARYLAND ZERO EMISSION
Electric Vehicle Infrastructure Council

In 2023, ZEEVIC updated Maryland's ZEV Policy Scorecard. This Scorecard outlines policy options that have been considered or enacted across the United States to promote ZEV adoption and accelerate ZEV recharging and refueling infrastructure. The footnotes indicate the status of the policies/incentives in other States. The purpose of the Scorecard is to inform public policy decisions about how to advance EV infrastructure. The Scorecard focuses on policies and programs currently active in Maryland, and it is not intended to capture Federal policies and incentives.

State Policies to Support Zero Emission Vehicle (ZEV) Deployment[1]		Active in Maryland?	Description
Goals			
State ZEV Adoption Goal[2]		Yes	• 300,000 EVs registered by 2025 • 600,000 EVs registered by 2030
State Light-Duty Fleet Procurement Goal[3]		Yes	• Climate Solutions Now Act (2022) • 100% State Fleet of passenger vehicles must be ZEV by 2031 • 100% State Fleet of LDVs must be ZEV by 2036
State Infrastructure Deployment Goal[4]		Yes	• MD National Electric Vehicle Infrastructure (NEVI) Plan • Build out 23 Alternative Fuel Corridors
Greenhouse Gas (GHG) Emission Reduction Target[5]		Yes	• Climate Solutions Now Act (2022) • 60% emission reduction by 2031, net-zero by 2045
ZEV Funding for EJ Communities[6]		Yes	• MD NEVI Plan • Justice40 mandates 40% of federal investments go to disadvantaged communities
Financial Incentives			
Point of Sale Rebates[7]		No	
Rebates for New EVs[8]		No	
Rebates for Used EVs[9]		No	
Rebates or Grants for EV Infrastructure[10]		Yes	• MEA Electric Vehicle Supply Equipment (EVSE) Rebate Program • MDE Electric Corridors Grant Program (ECGP)
Grants for Alternative Fuel Technologies[11]		Yes	• MEA grant & loan program, Clean Fuels Incentive Program (CFIP) • MEA Maryland Smart Energy Communities (MSEC) Program
Grants for Workplace Charging [12]		Yes	• MDE Charge Ahead Grant Program, • BGE and PHI Commercial Customer Charging Rebate
Tax Credit – EV Purchase	Light-duty Vehicles[13]	Yes	• MD Transportation Statute (§13–815)
	Medium- and Heavy-Duty Vehicles[14]	Yes	• Clean Cars Act of 2022 (HB1391, CH0234)
Tax Credit – EV Infrastructure[15]		No	

[1] Footnotes indicate States where the policy is active. Bolded states border MD and make up part of the southern Mid-Atlantic Region.
[2] CA, CO, CT, MA, MN, NJ, NY, NY, NC, OR, RI, VT, WA
[3] CA, CT, IL, MN, NC, NH, OR, TN
[4] CA, CO, CT, ME, MA, NJ, NY, OR, RI, VT
[5] CA, CO, CT, HI, MA, ME, MN, NV, NJ, NY, OR, RI, VT, **VA**, WA
[6] All 50 states (including **DC**)
[7] CA, CO, CT, **DE**, MA, NY, OR, **PA**
[8] AK, AZ, CA, CO, CT, FL, IL, MA, ME, MI, MN, MS, NE, NJ, NV, NY, OK, OR, **PA**, TX, VT, WA
[9] AK, AZ, CA, CT, FL, IL, MA, ME, MI, MN, MS, OR, NJ, NV, NY, OK, OR, **PA**, TX, VT, WA
[10] 42 States (including **DC**, **DE**, **PA**, and **VA**)
[11] CA, CT, **DE**, IL, IN, IA, LA, MA, ME, MI, MN, NC, NM, NV, OH, OR, SD, TX, UT, **VA**, VT, WI, WY
[12] WA
[13] CO, **DC**, LA, MT
[14] CA, CT, MA, UT
[15] **DC**, GA, LA, NY, OK, UT, WA

State Policies to Support Zero Emission Vehicle (ZEV) Deployment		Active in Maryland?	Description
Financial Incentives *(continued)*			
Tax Exemption for ZEVs and Infrastructure[16]		No	
ZEV Registration Fee Exemption[17]		No	
Off-Peak Charging Credit[18]		Yes	• Incentive offered in territory of the following utilities: BGE, Delmarva, Pepco, Potomac Edison
Non-Financial Incentives			
Reserved Parking on Public Property[19]		Varies	• Jurisdictions include Montgomery County, Howard County, Baltimore County, and Emmittsburg.
ZEV Infrastructure Multi-State Collaboration[20]		Yes	• Multi- State Medium- and Heavy-Duty ZEV Action Plan (2022) • Light-Duty Vehicle 2018-2021 Multi-State ZEV Action Plan
ZEV Infrastructure Planning and Coordination[21]		Yes	• Zero Emission Electric Vehicle Infrastructure Council (ZEEVIC)
ZEV Sale Requirements	Light-duty Vehicles[22]	Yes	• Advanced Clean Cars II (ACC II)
	Medium- and Heavy-Duty Vehicles[23]	No	• Clean Trucks Act of 2023 (HB0230)
Utility EVSE Programs[24]		Yes	• PC44 EV Pilot Program
Right-To-Charge Requirements[25]		Yes	• House Bill 0110, 2021
Consumer Education on EV Charging[26]		Yes	• PC44 EV Pilot Program • MarylandEV
Data Disclosure to Utilities[27]		Yes	• PC44 EV Pilot Program
Charging Signage Standardization[28]		Yes	• Senate Bill 146, 2022
HOV Lane Access[29]		Yes	• House Bill 123, 2023
Zero-Emission School Bus Pilot Program[30]		Yes	• Climate Solutions Now Act (2022) • BGE proposed a pilot to the PSC.
Innovative Policies			
Define EVSE Zoning Requirements[31]		No	
Streamline ZEV Infrastructure Permitting[32]		No	
Right-Of-Way Charging		No	
PSC Mandated EV Plan by Utilities		No	
Alternative to Motor Fuel Tax	Annual EV Fee[33]	No	
	Other Policy	No	

[16] AZ, CA, **DC**, MI, NJ, NC, OK, RI, UT, WA
[17] AZ, CT, OR
[18] AL, AZ, CA, CO, **DC**, **DE** FL, GA, IL, IN, KY, LA, MA, MN, NC, NH, NJ, NY, OH, **PA**, SC, TX, UT, **VA**, WA, WI, **WV**
[19] AZ, CA, CO, **DC**, FL, HI, IL, MA, ND, NV, OR, RI, WA
[20] AZ, CA, CO, CT, **DC**, **DE**, HI, ID, ME, MA, MT, NH, NJ, NM, NC, NV, NY, OK, OR, **PA**, RI, UT, **VA**, VT, WA, WY
[21] CO, **DC**, NH, RI
[22] CA, CO, CT, **DC**, **DE**, ME, MA, MN, NJ, NV, NY, OR, **PA**, RI, VT, **VA**, WA
[23] CA, CO, CT, ME, MA, NC, NJ, NY, OR, **PA**, RI, VT, WA
[24] AL, AK, AZ, CA, CO, CT, **DC**, **DE**, FL, GA, HI, ID, IN, IA, KS, LA, MA, ME, MI, MN, MS, MO, NE, NV, NH, NJ, NM, NY, NC, OH, OK, OR, RI, TN, TX, UT, VT, **VA**, WA, WI, **WV**, WY
[25] CA, CO, **DE**, FL, HI, NJ, NY, OR, **VA**
[26] AZ, CA, CO, HI
[27] AZ, CA, CO, FL, KT, MO, MS, NC, NM, NV, VT
[28] CA, NH, NY, ND, OH, SD, **VA**, WA
[29] AZ, CA, GA, HI, NJ, NY, NC, UT, **VA**
[30] All 50 states (including **DC**)
[31] WA
[32] CA
[33] AL, AK, CA, CO, GA, HI, ID, IL, IN, IW, KA, MI, MN, MS, MO, NE, NC, SC, ND, SD, OH, OK, OR, TN, UT, VA, WA, WV, WI, WY

MARYLAND ZERO EMISSION
Electric Vehicle Infrastructure Council

ZEV Policy Scorecard: Definitions

Policy Type		Policy Description
Goals		
State ZEV Adoption Goal		A state aims to have a certain number of ZEVs registered by a certain year.
State Light-Duty Fleet Procurement Goal		Requires the state fleet to procure a certain number of ZEVs when purchasing and/or replacing vehicles.
State Infrastructure Deployment Goal		A state aims to have a certain number of EVSE or hydrogen refueling stations installed by a certain year.
Greenhouse Gas (GHG) Emission Reduction Target		A state aims to reduce GHG emissions by a certain amount by a certain year compared to a baseline year level.
ZEV Funding for EJ Communities		A state sets funding targets for prioritized ZEV funding to EJ communities.
Financial Incentives		
Point-Of-Sale Rebates		Applies the rebate amount directly to the sale price of a ZEV, allowing consumers to realize savings immediately.
Rebates for New EVs		Rebates for the purchase of a new EV.
Rebates for Used EVs		Rebates for the purchase of a used EV.
Rebates or Grants for EV Infrastructure		Financial award for the cost of equipment, installation, construction, and/or operation costs of EVSE.
Grants for Alternative Fuel Technologies		Financial award for technology that reduces the GHG emissions from ICE vehicles (e.g., idle reduction technology).
Grants for Workplace Charging		Financial award for the cost of equipment, installation, construction, and/or operation costs of EVSE for workplace charging.
Tax Credit – EV Purchase	Light-Duty Vehicles	Provides the buyer of an EV with a tax credit for the vehicle purchase.
	Medium- and Heavy-Duty Vehicles	
Tax Credit – EV Infrastructure		Provides the buyer of EVSE or hydrogen refueling infrastructure with a tax credit.
Tax Exemption for ZEVs and Infrastructure		Costs associated with ZEVs, EVSE, and hydrogen refueling infrastructure are exempt from state taxes.
ZEV Registration Fee Exemption		ZEVs do not pay state motor vehicle registration fees.
Off-Peak Charging Credit		Incentives offered by utility companies to promote usage of electricity during times of low demand.

MARYLAND ZERO EMISSION
Electric Vehicle Infrastructure Council

ZEV Policy Scorecard: Definition (continued)

Policy Type		Policy Description
Non-Financial Incentives		
Reserved Parking on Public Property		Parking spaces are reserved for ZEV use only. This can be particularly useful for EVSE installed in parking lots or garages, preventing ICE vehicles from using spaces designated for charging.
ZEV Infrastructure Multi-State Collaboration		Plans, councils, task forces, commitments, or agreements between states that promote the deployment of ZEV infrastructure.
ZEV Infrastructure Planning and Coordination		State-wide approaches to promoting ZEVs and Infrastructure.
ZEV Sales Requirements	Light-Duty Vehicles	The adoption of Title 13 of the California Code of Regulations in whole or in part.
	Medium- and Heavy-Duty Vehicles	The adoption of the Advanced Clean Trucks rule in whole or in part.
Utility EVSE Programs		Utility company actions in support of EVSE deployment. Legislation may be directed at the utility or at the state's public utility commission.
Right-To-Charge Requirements		Prevents HOAs, condominiums, MUDs, and other community-style residences from prohibiting the installation of EVSE.
Consumer Education on EV Charging		Conducts outreach activities to the public and private entities to educate the public on EV technologies and charging infrastructure.
Data Disclosure to Utilities		State, local jurisdictions, and utility regulators provide information to enable strategic planning to ensure adequate electric demand.
Charging Signage Standardization		Creates uniform design, placement, and content for signage indicating EVSE availability or access.
HOV Lane Access		Allows ZEVs to access HOV lanes at any time or specific times for a reduced or no price regardless of the number of vehicle occupants.
Zero-Emission School Bus Pilot Program		Pilot program to purchase zero emission school buses, install charging infrastructure, and transition to zero emission school bus fleets.
Innovative Policies		
Define ZEV Zoning Requirements		Clear Zoning Code language related to permissions and siting of ZEV Charging equipment.
Streamline ZEV Infrastructure Permitting		Removes barriers for permitting the development of EVSE and hydrogen refueling infrastructure. Ideally, this would provide for a unique, easier permitting process for this type of infrastructure and construction.
Right-Of-Way Charging		Allows EVSE to be installed along streets (e.g., curbside, light posts)
PSC Mandated EV Plan by Utilities		A State's Public Utility Commission mandates utility companies to develop strategic plan to accommodate transportation electrification needs.
Alternative to Motor Fuel Tax		In response to diminishing revenue from the Motor Fuel Tax, States may enact alternatives sources of funding. Alternative sources of revenue could be a registration fee on EVs, a mileage-based user fee (MBUF) or a roadway user charger (RUC).

Appendix D - Medium- and Heavy-Duty Vehicle Working Group Report (Draft 10/31/2023)

Background

The Zero Emission Electric Vehicle Infrastructure Council (ZEEVIC) convened the Medium- and Heavy-Duty Vehicles (MHDV) working group (WG) to explore barriers and opportunities for the trucking and freight sectors to adopt EV technologies. The WG's goal was to identify recommendations for promoting the transition of MHDVs to clean technologies. This WG invited four speakers to address key questions around MHDV electrification and facilitate discussions through a series of meetings and presentations. This report summarizes the WG activities and recommendations.

Workgroup Format

MDOT identified Tim Shepherd as the Chair for the WG and ZEEVIC members or alternates form the Member's organization were invited to participate. The MHDV WG participants are listed at the end of this report.

The WG met three times over a period of a month. The first two meetings included discussions and presentations on barriers and opportunities directly from industry representatives, as well as group discussion and question and answers. The third meeting focused on reviewing what was discussed in the prior meetings and developing the WG's recommendations to ZEEVIC. A summary of the WG meetings and topics discussed is summarized below:

1. ZEEVIC Meeting # 1 – 9/22/23, 10:00-11:00 AM
   - Topic: What is the industry's largest hurdle to adopt EVs? / What can the State of Maryland do to support MHDV EV adoption?
   - Speaker # 1 – Luis Campion, Maryland Motor Truck Association
   - Speaker # 2 – Tim French, Truck and Engine Manufacturers Association

2. ZEEVIC Meeting # 2 – 9/29/23, 10:00-11:00 AM
   - Topic: What are the infrastructure deployment constraints for MHDV EV?
     - Speaker # 1 – Sam duPont, BGE
     - Speaker # 2 – Jim Nemec, Blink

3. ZEEVIC Meeting # 3 – 10/13/2023, 10:00-11:00 AM
   - Topic: What should ZEEVIC advocate to promote MHDV EV transition? / What policies or strategies can ZEEVIC support to accelerate MHDV EV adoption in Maryland?
   - Review of past meetings
   - Discuss recommendations to ZEEVIC

Meeting Summaries

Workgroup Meeting # 1 – Overview

The WG began with a brief overview of Multi-State Medium- and Heavy-Duty Zero-Emission Vehicle Action Plan, highlighting some of the barriers identified in the report. These included:

- Higher Upfront Cost of MHD ZEVs
- Barriers for Small Fleets
- Need for Fleet Outreach and Education Programs
- Critical Need to Deploy Charging Infrastructure
- Production Issues
- Electricity Rates
- Lack of Financing Options
- Different Charging Standards
- Lithium-ion Battery Production and Recycling
- Other Challenges for Hydrogen Truck and Bus Deployment

Workgroup Meeting # 1 – Speaker Perspectives

Louis Campion: Charging Infrastructure is the largest current barrier. Currently, efforts in charging infrastructure should be focused on short/local hauls, particularly in cases where the trucks come back to the same facility every day. Technology is currently not feasible for long-haul charging infrastructure. ZEEVIC should support incentives for on-site charging permitting and efforts to ensure the transmission lines can support charging infrastructure at depots.

He conveyed that California is having some instances of trouble on short-haul routes and Maryland should focus resources here. Maryland should think about additional truck traffic. 2,000 pounds limit is not applicable on local and state routes. Pavement, traffic impacts, and overnight charging parking need to be considered by MDOT. Capacity is already a concern for parking conventionally fueled vehicles (for instance: rest areas on I-95), eventually charging infrastructure will need to be implemented in these parking areas.

Timothy French: Agrees there are more practical things that need to be build-out, and the focus should be on chargers for depots. The practical problem is Maryland is going to opt-in to ACT mandates, which establishes targets of approximately 700 busses and trucks, 8000 short-haul and regional trucks in 2027. Long-Haul infrastructure (hydrogen) are still ways away from being feasible, maybe around 2030. Rough estimates indicate Maryland would need to be installing 195 MHD charging stations per month starting the beginning of next year to meet demand resulting from the ACT requirements and goals. This will be a large effort and coordination between the state, companies, and utilities. We are in a very compressed timeframe.

BEV trucks are currently two to three times more expensive than normal trucks. Current trends show that 2030 will match traditional fossil-fuel trucks, due to economies of scale. Current tax credits needed from the Federal government with BIL help, but state needs to match more of CA's amount of incentives to help close the gaps in the cost of ZEV compared to their fossil-fuel counterparts.

ACT requires 42-60 percent of ZEV sales in MD by 2032. Utilities need to evaluate what is needed in the electricity grid to meet demands if this is implemented. OEM's will comply with ACT in all states, but if they cannot sell the mandated percentage based requirement manufactures will scale back on ZEV's and all other vehicles to meet the percentage requirement. Maryland should think about opt-in a pooled credit program between states, to meet a goal volume of (X) amount. Since each state's industries vary from state to state. Overall, goal is to reduce GHG emissions and other air pollutants in the United States. This would provide flexibility between states in implementing ZEVs.

Workgroup Meeting # 1 – Discussion and Questions and Answers

Tim Shepherd asked for clarification when defining "depots," as referred to by the speakers. The speakers clarified they referred to private, not public, depots with ten or more vehicles. Public charging stations are going to be utilized more along highway corridors and less at ports and harbors. Depending on the operations and dwell times for trucks, ports could be a prime opportunity for electrification. California is a good example for ports too, but Maryland should evaluate if practical for the Port of Baltimore.

Drew McAuliffe explained that the permitting process for utilities to add capacity and substation is lengthy. Rather, utilities should focus on implementing level 2 chargers when applicable and specific needs for depots and ports. Efficiency in the grid and power use will be key to manage demand and reduce costs by overbuilding capacity. Both speakers agreed but explained that educational outreach is necessary through the industry. The speakers described instances where depots are building or expanding for electrification but later fail to obtain permits because of unforeseen requirements or limitations from the utilities.

Virginia Burke asked the speakers if they can help identify pilot projects that Maryland/ ZEEVIC can influence. It would be beneficial to have a local case study to run numbers, investigate the permitting process, identify partnering opportunities, etc. The speakers responded that there are a variety of big players interested in electrification (Amazon, FedEx) interested in accessing depots with EV charging infrastructure.

Workgroup Meeting # 2 – Overview

The WG began with a brief overview of Multi-State Medium- and Heavy-Duty Zero-Emission Vehicle Action Plan, highlighting some of the strategies identified for utility companies and in the report. These included:

- Higher Upfront Cost of MHD ZEVs
- Barriers for Small Fleets
- Need for Fleet Outreach and Education Programs
- Critical Need to Deploy Charging Infrastructure
- Production Issues
- Electricity Rates
- Lack of Financing Options
- Different Charging Standards
- Lithium-ion Battery Production and Recycling
- Other Challenges for Hydrogen Truck and Bus Deployment

Workgroup Meeting # 2 – Speaker Perspectives

Samuel duPont: The presentation gave an overview of BGE and its service area, as well as service area of sister companies throughout the Mid-Atlantic. The speaker presented BGE Transportation Electrification Roadmap, a tool to help plan out the electrification process from initiation, identify charging needs and use patterns, establish timeline and phasing of installing chargers for electrification, and help identify

partners and permitting requirements. The speaker noted the charging requirements vary significantly from MHD vehicles (School Busses vs. Long Haul Trucking).

Sam also explained the eligible activities under the Make-Ready Incentives Program. These included to-the-meter infrastructure (utility distribution network and utility pad-mounted transformer) and behind-the-meter infrastructure (meter and panel). One key consideration from the utility side that can impact schedule and timeline is if the BGE Capacity Planning Group needs to get involved. If a project is over 1MW, additional review and standards will be taken into engineering and design, which could extend timelines. Another key impact to schedule is the lead time for critical switchgear is 52 weeks, supply chain issues still from the pandemic years ago.

Jim Nemec: The presenter gave an overview of Blink. The range of electrification projects Blink sees can range from $750,000 – $4.5 million in capital on the adoption of MHD EVs. Roughly 90 percent of chargers are expected to be level 2 chargers and 10 percent DCFC, particularly for facilities that would charge vehicles overnight. The costs of 480 Volt chargers are very high and many companies have sticker shock (price a deterrence from adoption). Another cost factor for many companies is the unpredictability in demand charging. Currently, even with grants and government match, timelines are still around 10 years out to obtain payback on charging equipment for MHD vehicle.

Discussions

Steve Koerner asked about lead time regarding switchbacks and back logs, and whether there are opportunities to pre-order parts or do some type of early procurement. The speakers explained that the switchbacks are site-specific and could not be ordered until design and location are finalized. BGE's planning team utilizes metrics and data provided to them to better prepare for future demands, but there are limitations without knowing site specific needs. The utilities cannot overbuild capacity, or build proactively, unless an application is submitted first. The speaker explained that other states have this same issue.

The PSC would need to revise their current regulatory structure to allow utilities to build proactively. Drew McAuliffe explained the concern of passing on the capital costs to the utilities, and then to rate payers, when there is risk that the demand does not follow the capital investment. Drew also mentioned the resiliency considerations for upgrades in preparation for solar farms and their plans to upgrade facilities and capacity planning for EVs that might be informative for the MHDV electrification discussion.

A question was also asked about the kind of outreach the utilities are doing for this industry sector and if there are recommendations ZEEVIC should consider proposing to Maryland PSC. The speaker explained there is a robust governmental and public affairs outreach department which is very proactive, but admitted there is always room to improve and do more.

Workgroup Meeting # 3 – Overview

The last WG meeting was devoted to discussing strategies and recommendations from the Multi-State Medium- and Heavy-Duty Zero-Emission Vehicle Action Plan and the topics discussed by the WG speakers. After the meeting, the discussions and suggestions were organized as recommendations and shared with the entire ZEEVIC at the October meeting. Based on initial feedback from ZEEVIC, the WG recommendations include:

Recommendations for ZEEVIC/ State of Maryland:

1. Develop a map of depot locations for the State of Maryland. Based on feedback this should target fleets with at least ten MHD vehicles.
2. Develop a website that identifies the steps a business would have to take to electrify its facilities. This site should act as a clearinghouse of information and contacts. Information to be included would be at least a brief description of the action, the appropriate agency (private or public), the specific agency program and a contact person.
3. Depot Electrification Pilot – Work with MEA in developing their MHD Grant Program that would incorporate the feedback and information received in this working group to fund several MHD electric vehicles programs.
4. Incentives- Based on industry feedback and reviewing programs offered in other states, determine the recommended funding levels for a MHD electrification incentive program. Maryland currently has allocated $10 million per year through 2027.
5. Ensure that feedback received during these workgroups is included, where appropriate, in the Needs Assessment Study that will be conducted as part of Maryland's adoption of the Advanced Clean Truck regulation.
6. Data sharing for utility planning – State, or agency with oversight, to gather forecast data and provide to PSC/ utilities to improve planning.

Recommendations for PSC and Utility companies:

7. Outreach to industry – Provide directed outreach to fleet operators and depot owners on electrification process and emerging technologies, such as Adaptive Load Management
8. Improve Energization Process – Reduce uncertainty by allowing utilities to engage with developers early in the service request to better plan timelines and costs.
9. Commercial Rates – Identify opportunities for PSC/ Utilities to help evaluate different cost scenarios to better understand potential fluctuations in operational cost.

Other General Recommendations:

10. Considerations for Incentive Programs (state or utilities)
    - Incentive programs should encourage off-peak charging and use of load management equipment
    - Incentive programs should be flexible in the features required to lower investment needs while considering the impact to ratepayers and the investment to the utility infrastructure.
    - Utility Make-Ready programs should not hinder the ability of customers to install third-party owned and operated load management equipment.
11. Zoning and Permitting – EVSE projects should receive special attention from a zoning/ permitting perspective, with clear guidance and a single point of contact for applications.
12. Highway Planning – Transitioning the MHDV EV will increase truck traffic, increasing the need of capacity and truck parking, which are challenges today.

13. Weight Restrictions –MHDV EVs will be heavier than current vehicles. Support policies to lift vehicle weight restriction for MHDV EV. MDOT consideration of adjusting infrastructure planning and maintenance projects to accommodate heavier trucks.

Plans for 2024

As part of Maryland's adoption of the ACT Program, MDE is required to oversee a Needs Assessment and Deployment Plan Study that must be completed by December 2024. The WG activities helped educate the WG and ZEEVIC members on the topic to be better positioned to review and provide comments on the Study. The MHVD WG will be positioned to assist as a stakeholder reviewer to assist MDE in 2024 when the plan is being developed.

Table 13 - MHDV WG Participants

Participant	ZEEVIC Membership	Organization/ Affiliation
Alena Martinez-Hart	Member Alternate	BGE
Amanda Hinh	Member Alternate	MEA
Amanda Janaskie	Member Alternate	BGE
Carissa Ralbovsky	Member Alternate	OPC
Deron Lovaas	ZEEVIC Chair	MDOT
Drew McAuliffe	Member Alternate	PSC
Jeff Shaw	Member	SMECO
Jill Lemke	Member Alternate	MDP
Jim Nemec	Invited Speaker	Blink
Kevin Mosier	Member	PSC
Kristy Fleischmann Groncki	Member	BGE
Louis Campion	Invited Speaker	MD Motor Truck Association
Natalie Buscemi	Member Alternate	MEA
Samuel duPont	Invited Speaker	BGE
Sari Amiel	Member	Sierra Club
Steve Koerner	Member	BP Pulse Fleet
Tim Shepherd	Member and WG Chair	MDE
Timothy French	Invited Speaker	Truck and Engine Manufacturers Association
Walt Alfred	Member	Ally Power
Weston Young	Member	Worcester County
Virginia Burke		MDOT
Sophia Cortazzo		MDOT
John Thomas		MDOT
Dan Janousek		MDOT
Leo Sawada		MDOT/ consultant
Scott Halerz		MDOT/ consultant
Andrew Newsome		MDOT/ consultant

Endnotes

[i] https://afdc.energy.gov/stations/states
[ii] Mid-Atlantic Hydrogen Hub (midatlantichydrogenhub.com)
[iii] https://www.mdot.maryland.gov/tso/pages/Index.aspx?PageId=167
[iv] https://evplan.mdot.maryland.gov/
[v] https://www.wmar2news.com/steeringchange
[vi] https://evadc.wildapricot.org/resources/Documents/EVInfo/EVInfoSheet.pdf