

Annual Report 2022



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



Presented to
Governor Lawrence J Hogan, Jr.
and the Maryland General Assembly

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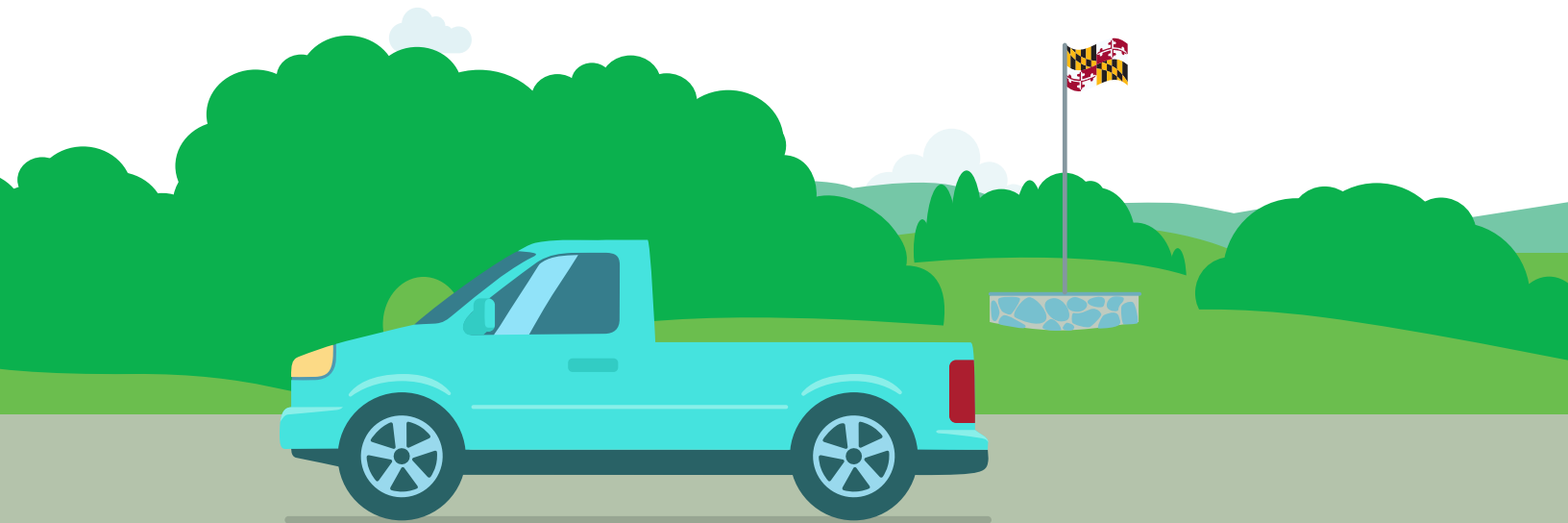
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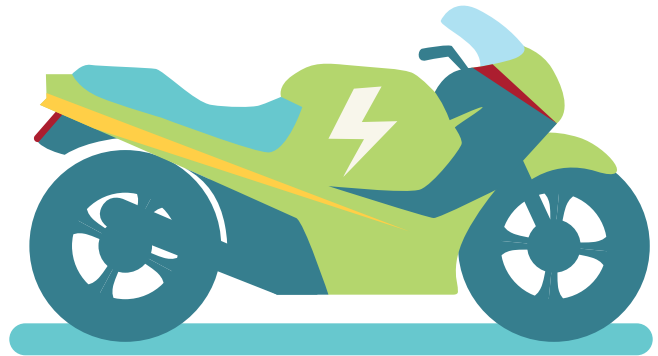
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ACRONYMS

The following acronyms are used in this report:

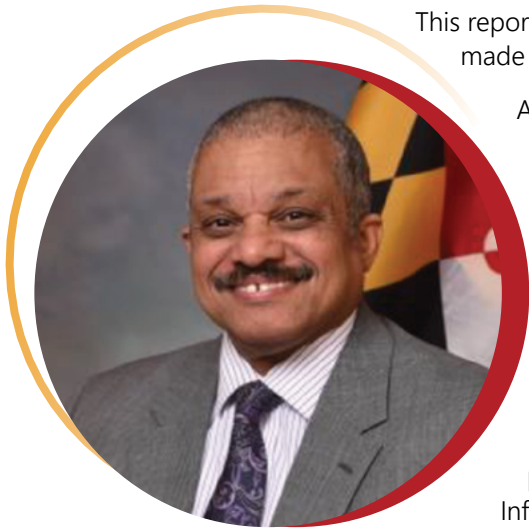
AFC	Alternative Fuel Corridor
AFV	Alternative Fuel Vehicle
BEV	Battery Electric Vehicle
BIL	Bipartisan Infrastructure Law
DC	Direct Current
DGS	Maryland Department of General Services
EV	Electric Vehicle
EVADC	Electric Vehicle Association of Greater Washington DC
EVIC	Electric Vehicle Infrastructure Council (Previous ZEEVIC name)
EVSE	Electric Vehicle Supply Equipment
FCEV	Fuel Cell Electric Vehicle
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
GGRA	Greenhouse Gas Reduction Act
GHG	Greenhouse Gas
ICE	Internal Combustion Engine
IJA	Infrastructure Investment and Jobs Act
kW	Kilowatt
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MDE	Maryland Department of the Environment
MDOT	Maryland Department of Transportation
MDP	Maryland Department of Planning
MEA	Maryland Energy Administration
MHD	Medium- and Heavy-Duty
MOU	Memorandum of Understanding
MUD	Multiunit Dwelling



NESCAUM	Northeast States for Coordinated Air Use Management
NEVI	National Electric Vehicle Infrastructure
OEM	Original Equipment Manufacturer
PHEV	Plug-In Hybrid Electric Vehicle
PSC	Public Service Commission
ROW	Right-of-Way
TOU	Time of Use
ZEEVIC	Zero Emission Electric Vehicle Infrastructure Council (Previously EVIC)
ZEB	Zero Emission Bus
ZEV	Zero Emission Vehicle
ZEVIP	Zero Emission Vehicle Infrastructure Plan

A MESSAGE FROM R. EARL LEWIS, JR.

ZEEVIC Chair



“ As we close out 2022 and I reflect on seven years serving as Chair of the Council, I would like to express my thanks to the Council members and friends who have joined this journey. I appreciate the conversations we’ve had in our meetings, and the insights, perspectives, and updates that each one of you has shared. This report summarizes the array of activity underway in 2022. Together, we’ve made so much progress toward our common ZEV infrastructure goals.

As we worked on the drafting of this report in November, Maryland had over 57,000 registered Electric Vehicles (EVs) on the road and I expect we will reach or surpass 60,000 by the end of 2022. Years ago, Maryland set a goal of 60,000 EVs on the road by 2020, and at that time, the goal was aspirational and very distant. With so many developments boosting our progress, we saw an increase of over 15,000 EVs on the road in 2022 alone.

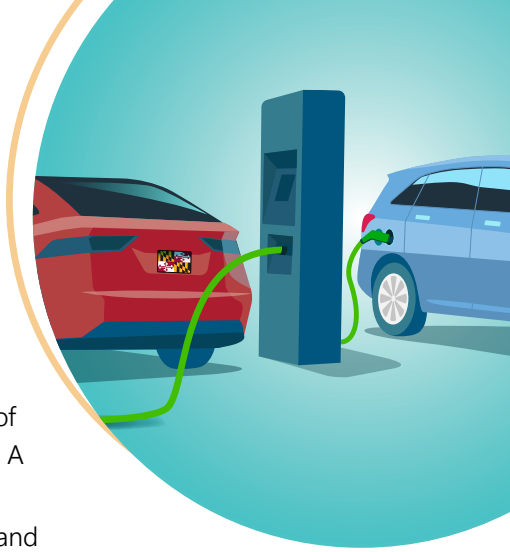
Our work in 2022 was heavily influenced by new federal resources and programs passed in the Bipartisan Infrastructure Law (BIL), Inflation Reduction Act, and other federal bills. I am proud of Maryland’s response to the federal National Electric Vehicle Infrastructure (NEVI) program, with the creation of the Maryland State Plan for NEVI Funding Deployment. Numerous partners participated in the development of the State’s NEVI Plan and I appreciate MDOT’s partnership with the Maryland Energy Administration (MEA) in particular. Maryland’s NEVI Program promises to transform our state’s EV charging infrastructure in 2023 and for years to come.

Finally, our work to expand ZEV infrastructure and transition to light and heavy-duty electric vehicles will continue. These are exciting times, and interesting challenges await us. I look forward to our continued work together.”

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. The Maryland Department of Transportation (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.

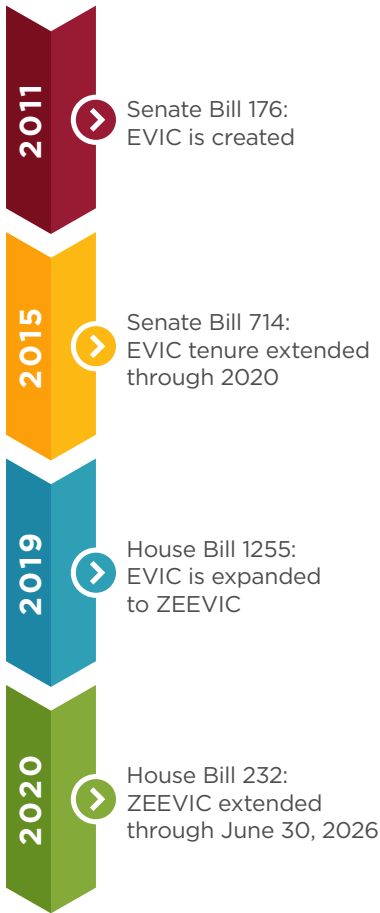


What does ZEEVIC do?

The ZEEVIC is charged with supporting the development of:

- Policies, recommendations, and incentives that increase awareness of Zero Emission Vehicles (ZEVs), support the ownership of ZEVs, and promote investment by the 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 outlined in the Greenhouse Gas Reduction Act (GGRA). The GGRA sets a goal of 40% GHG emission reductions by 2030. The Climate Solution Now Act established a new target of 60% 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

Organizations Representing ZEEVIC	Representative Members
Maryland Department of Transportation	R. Earl Lewis, Jr. , Deputy Secretary (Council Chair)
Academic Community; a Maryland institution of higher education with relevant expertise	Hyeon-Shic Shin , PhD., Morgan State University
Maryland Association of Counties; rural region	Weston Young , Worcester County
Maryland Association of Counties; urban or suburban region	Quiera Harris , Parking Authority of Baltimore City
Maryland Municipal League; rural region	Nina Forsythe , City of Frostburg
Maryland Municipal League; urban or suburban region	David Edmondson , City of Frederick
EV Driver Advocacy Organization	Elvia Thompson , Annapolis Green
Electric Companies (3)	Kristy Fleischmann-Groncki , BGE Robert Stewart , PEPCO Holdings, Inc. Jeff Shaw , SMECO
Electric Vehicle Manufacturer	Jason Tai , Tesla Consultant
Electric Vehicle Charging Station Manufacturer	Kevin Miller , ChargePoint, Inc.
Fuel Cell Electric Vehicle Manufacturer	Robert Wimmer , Toyota
Fuel Cell Electric Vehicle Infrastructure Equipment Manufacturer	Joe Alfred , Ally Power Inc.
Fleet Operators	Steven Koerner , BP Pulse Fleet
Electrical Workers	Michael A. Wall , Clinton Electric Company
Environmental Community (2)	Scott Wilson , Electric Vehicle Association of D.C. (VACANT)
Member of the public, with expertise in energy or transportation policy	Paul Verchinski
New Vehicle Dealer Association	(VACANT)
Maryland State Senate	Senator Clarence K. Lam , M.D., District 12 Baltimore & Howard Counties
Maryland House of Delegates (2)	Delegate Tony Bridges , District 41, Baltimore City Delegate David Fraser-Hidalgo , District 15, Montgomery County
Maryland Department of Planning	Bihui Xu , Transportation Planning
Maryland Department of the Environment	Horacio Tablada , Secretary
Maryland Department of Commerce	(VACANT)
Maryland Public Service Commission	Kevin Mosier , Wholesale Markets Liaison
Office of People’s Council	David Lapp , People’s Counsel
Maryland Energy Administration	Mike Jones , Transportation Program Manager

2022 Highlights and Notable Achievements

2022 was defined by significant federal policy commitments and by global market developments that affected electric vehicles (EVs) and EV charging infrastructure. The Bipartisan Infrastructure Law (BIL), enacted as the Infrastructure Investment and Jobs Act (IIJA) in late 2021, authorized important new programs and funding opportunities to advance the strategic deployment of EV charging infrastructure, such as the National Electric Vehicle Infrastructure (NEVI) Program. IIJA also provided the flexibility to use federal funds for EV charging infrastructure through other established formula and discretionary programs. Automakers announced significant new commitments to bring EVs to market, as part of heightened international focus on threats from climate change. Against this backdrop, the ZEEVIC and its participants continued work on numerous initiatives to advance Zero Emission Vehicles (ZEVs) and associated infrastructure in Maryland. Notable 2022 achievements and highlights include:

- In response to federal funding allocated to states through the federal NEVI Program, MDOT submitted the 2022 Maryland State Plan for NEVI Formula Funding Deployment in July. It was approved on September 14, 2022, along with the plans of 35 other states.
- MDOT launched the Maryland Zero Emission Vehicle Infrastructure Plan (ZEVIP) website to provide information on NEVI plan and formula funding developments, including webinars and program development updates. (<https://evplan.mdot.maryland.gov/>)
- The Federal Highway Administration (FHWA) designated EV and Hydrogen Alternative Fuel Corridors (AFC) in Maryland in response to nominations submitted by MDOT:
 - EV AFC - MD 200, from US 1 to I-370, and
 - Hydrogen AFC - I-95, I-495, and I-695.
- Maryland passed legislation supporting ZEV adoption and infrastructure, providing the following advancements:
 - Reserved parking spaces laws for Plug-In Electric Drive Vehicles
 - Electric School Bus Pilot Program
 - Clean Cars Act of 2022
- Facilitated by Northeast States for Coordinated Air Use Management (NESCAUM), Maryland participated in the development of the Multi-State Medium and Heavy-Duty (MHD) Zero Emission Vehicle (ZEV) Action Plan, which was released July 27th, 2022, and identifies over 80 strategies and recommendations to accelerate the adoption of MHD ZEVs.
- MDOT Maryland Transit Administration continued its multi-year commitment to convert its transit bus fleet to ZEVs by 2030 and upgrade facilities to accommodate charging infrastructure.
- Maryland jurisdictions received major EV funding awards:
 - Prince George's County received \$25 million for Battery Electric Vehicle (BEV) buses and infrastructure. (FTA Low or No Emission Vehicle Program)
 - Montgomery County received \$14.8 million for fuel cell buses. (FTA Low-No)
 - MDOT Maryland Transit Administration (MDOT MTA) on behalf of Anne Arundel County received \$1.9 million for diesel-electric hybrid buses. (FTA Low-No)



- Baltimore City Public Schools received \$9.4 million funding to purchase 25 electric school buses. (EPA Clean School Bus Program)
- In 2022, Maryland did well in rankings:
 - Maryland ranked the 3rd best state to own an electric vehicle by Lendingtreeⁱ, based on vehicle fatalities, electricity costs, state tax credits, public charging infrastructure, and EV registrations.
 - According to a study by SmartAsset, Maryland is one of the top ten states to own an EV.ⁱⁱ
 - According to [Bumper.com](https://www.bumper.com), Maryland was rated as the best state in the country to own an EV.
- Robust utilization of financial incentives available to Maryland residents and businesses continued in 2022:
 - Maryland's Electric Vehicle Supply Equipment (EVSE) Rebate Program is on track to full subscription in FY2023, and reached full subscription in FY2022, which ended June 30, 2022.
 - The Maryland Department of the Environment (MDE) awarded \$3.7M for the installation of EV chargers at 39 sites, through the Electric Corridors Grant Program and Charge Ahead Grant Program.
 - MEA's Clean Fuels Incentive Program supported several significant heavy duty EV deployments: six electric concrete-mixer trucks will be deployed by Chaney Enterprises, and ten Class 8 electric tractors will be deployed by Sysco.
 - Utility companies issued rebates for EV charger installations to over 3,000 residential customers and over 200 multi-family communities.
 - The Federal EV tax credit, renewed through the Inflation Reduction Act, provides incentives to purchase new EVs (up to \$7,500 for new vehicles, and up to \$4,000 for used vehicles) and other provisions.
- The MarylandEV social outreach team returned to in-person outreach after two years of virtual outreach activity. The team conducted a six-event campaign that targeted rural and minority populations across many regions of the state including Western, North Central, Southern, and Eastern Shore Maryland.
- The MarylandEV social media pages experienced more than a 25% audience increase from around 1,600 followers in January 2022 to over 2,000 followers by the end of 2022.
- BGE launched a partnership with Lyft in July to support deployment of EVs for ride-hailing services. Through this partnership, 25 EVs were made available to Lyft drivers in the Baltimore area to rent at a discounted weekly rate in lieu of the driver utilizing a personal vehicle. BGE's installation of fast chargers at BWI Airport's Rideshare Lot further supports EVs for ride-hailing services.



ZEEVIC'S 2022 ACTIVITIES

2022 Priorities Statement

The Council identified a set of three priorities to guide efforts to expand ZEV infrastructure in Maryland in 2022. A Draft Priorities Statement was reviewed at the January meeting, additional comments were solicited from Council members using a survey tool, and the statement was confirmed at the March 16th meeting:

- Install more EVSE and ensure EV readiness through strategic infrastructure planning, particularly focusing on rural communities, equitable EVSE placement in environmental justice communities, corridors, and multi-unit dwellings and apply lessons learned from EVSE deployment to continuously improve EVSE infrastructure.
- Maximize the use of grant and alternative funding opportunities for EV/EVSE in Maryland, particularly funds allocated to Maryland through the IJJA, 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 Schedule and Agendas

ZEEVIC held six bi-monthly meetings in 2022, plus a seventh additional meeting in March for the purpose of legislation review. Meetings were held in a hybrid format via virtual Teams meetings and in person at MDOT headquarters. 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: 2022 ZEEVIC Meeting Topics

Date	Meeting Topics
January 19, 2022	<ul style="list-style-type: none"> • 2022 Maryland Legislative Session • Infrastructure Investment and Jobs Act • 2022 ZEEVIC Priorities • Streetlight and Right-Of-Way Charging • Modifications to Statewide EV Charging Pilot Program
March 3, 2022 (Additional Meeting)	<ul style="list-style-type: none"> • Legislative Working Group Letter of Support for Zero Emission Electric Vehicle Related Legislation • Question & Answer Session for Letter of Support
March 16, 2022	<ul style="list-style-type: none"> • Zero Emission Vehicle Infrastructure Plan (ZEVIP) Update • Medium and Heavy Duty ZEV Action Plan • 2022 Legislative Session Updates • 2022 ZEEVIC Member Survey Results
May 26, 2022	<ul style="list-style-type: none"> • ZEVIP Update • Alternative Fuel Corridor Nomination • Federal Funding Opportunities • 2022 Legislative Session Summary

continued

Date	Meeting Topics
July 19, 2022	<ul style="list-style-type: none"> • Montgomery County EV Purchasing Cooperative • National Capital Hydrogen Center – Hydrogen Green Print • PSC PC 44 EV Workgroup – Recommendations Filed with PSC • Maryland State Plan for NEVI Formula Funding Deployment
September 22, 2022	<ul style="list-style-type: none"> • Transit Bus Electrification – Maryland Transit Administration (MDOT MTA) • Maryland NEVI Plan and Program Update
November 17, 2022	<ul style="list-style-type: none"> • EV Parking Sign Standards • 2022 ZEV Market Data • 2022 ZEEVIC Annual Report • BGE NEVI Make-Ready Proposal
<p>All ZEEVIC meetings, except for the additional meeting in March, began with announcements and public comments, and concluded with state agency and utility company updates, and a summary of outreach efforts.</p>	

Presenters and Discussed Topics

ZEEVIC meetings benefit from multiple member and guest presenters throughout the year, and cover a wide range of ZEV-related activities and efforts. These presentations help 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](#). The following sections highlight the ZEEVIC presentation topics not covered in other sections of the report.

Streetlight and Right-Of-Way (ROW) Charging (January ZEEVIC presentation by Carrie Giles, ICF) - The presentation provided three examples of streetlight charging pilots in Los Angeles, Kansas City, and London. The presenter provided an overview of the challenges and opportunities related to streetlight charging, including ownership models, utility collaboration and involvement, ROW siting issues, and operation and maintenance responsibilities.



Medium- And Heavy-Duty (MHD) ZEV Action Plan (March ZEEVIC presentation by Tim Shepherd, MDE) - Along with 16 other states and DC, Maryland signed a Memorandum of Understanding (MOU) in 2020 to support the deployment of MHD ZEVs through involvement in a Multi-State ZEV Task Forceⁱⁱⁱ. The task force expanded and eventually included seventeen U.S. states, DC, and Quebec. Facilitated by NESCAUM, the Task Force

developed an Action Plan, released in July 2022, to accelerate the transition to zero-emission trucks and buses. The action plan targets the following areas:

- Financial and non-financial vehicle and infrastructure incentives;
- Actions to encourage public transit and public fleet MHD ZEV deployment;
- Effective infrastructure deployment strategies;
- Funding sources and innovative financing models to support incentives and other market enabling programs;
- Leveraging environmental and air quality benefits associated with adoption of the California Advanced Clean Trucks rule under Section 177 of the Clean Air Act;
- Coordinated outreach and education to public and private MHD vehicle fleet managers;
- Utility actions to promote MHD ZEVs, such as electric distribution system planning, beneficial rate design and investment in “make-ready” charging infrastructure;
- Measures to foster electric truck use in densely populated areas;
- Addressing vehicle weight restrictions that are barriers to MHD ZEV deployment; and
- Uniform standards and data collection requirements.



The Action Plan also highlights the economic and job opportunities associated with MHD ZEVs. Investments in ZEV technology can have a deep impact on the economy, creating jobs for assemblers, machinists, electrical technicians, construction workers, and high-skill occupations in design and engineering. The plan recommends partnerships with the trucking industry, community groups, labor groups, educational institutions, and others to develop workforce training and re-training programs, and identifies key labor issues impacting workers.

Montgomery County EV Purchasing Cooperative Update (July ZEEVIC presentation by Brian Booher, Montgomery County) - The Montgomery County Electric Vehicle Purchasing Cooperative program’s purpose is to make it easier for county residents to adopt EVs. The program was born out of 2021 Climate Action Plan Emissions goals, where Montgomery County aggressively targets 80% greenhouse gas (GHG) emission reduction by 2027 and 100% by 2035 compared to 2005 levels*. The program reduces emissions by:

- Reducing vehicle miles traveled by encouraging greater use of transit, cycling and shared mobility options;
- Electrifying public transportation and the County vehicle fleet; and
- Supporting a transition to ZEV for residents and businesses.

The EV Purchasing Co-op offers residents and businesses:

- Negotiated discounts on new and preowned EVs;
- Education and information to help buy an EV, find public charging, install charging, and take advantage of incentives;
- Events where prospective buyers can experience EVs and learn from experts; and
- Electrified Dealership Network of knowledgeable and enthusiastic local dealers.

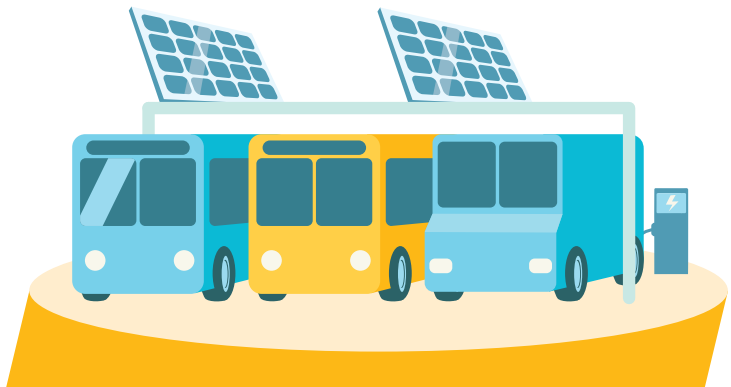
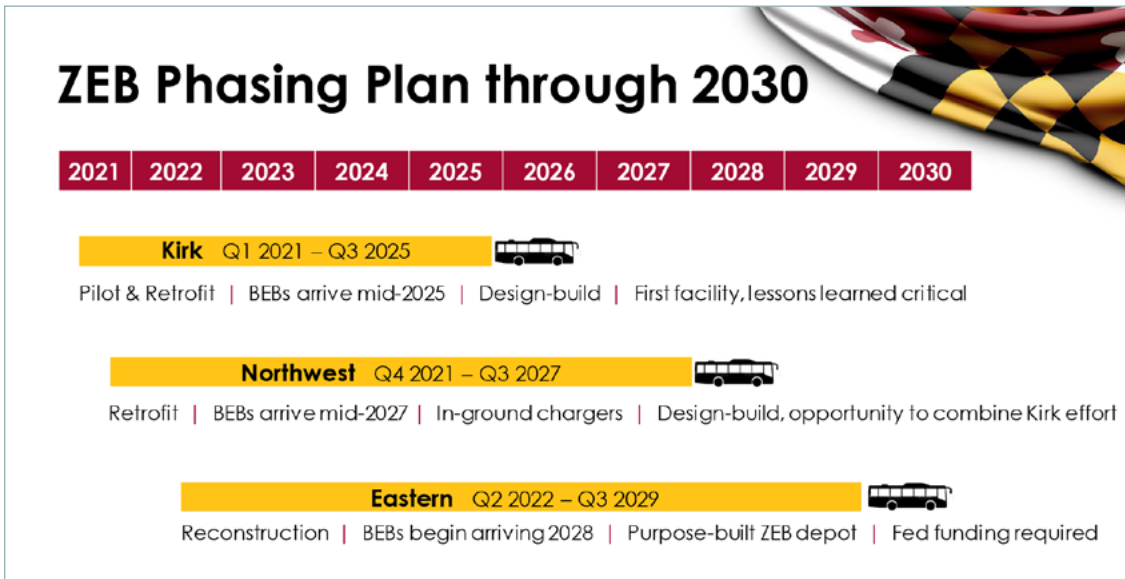


National Capital Hydrogen Center – Hydrogen Green Print

(July ZEEVIC presentation by Richard Moore, Connected DMV) - Connected DMV is a Thinktank/“Do Tank” consisting of representatives from government, academia, industry, and the community with the goal of developing Hydrogen Energy solutions to promote regional economic renewal and social equity. They recently completed the Hydrogen Green Print initiative, which is an assessment of the hydrogen potential for DC, Maryland and Virginia (DMV) region.



Transit Bus Electrification – Maryland Transit Administration (September ZEEVIC presentation by Lauren Molesworth, MDOT MTA) - MDOT MTA continues to advance Transit Bus Electrification efforts and respond to legislation passed in 2021 (SB 137) and 2022 (HB10/SB61). The MDOT MTA aims to meet Greenhouse Gas Reduction Act (GGRA) Plan commitments by converting 50% of the transit bus fleet to Zero Emission Buses (ZEBs) by 2030 (approximately 380 buses) and 95% of the transit bus fleet by 2045. The ZEB plan will target converting bus fleets in Kirk, Northwest, and Eastern bus depots. The Kirk Facility will be the first bus depot in the ZEB pilot plan to incorporate a complete retrofit to accommodate ZEBs by 2030. The retrofit includes four 40-foot and three 60-foot buses, five overhead chargers and the required operating software. The draft FY23-FY28 Consolidated Transportation Program allocates over \$434 million to procure new ZEBs, install charging equipment, and manage the program. Purchasing of ZEBs will leverage grant funding opportunities from the Low or No Emission Vehicle Program and other Federal Transit Administration programs.



ZEV LEGISLATION IN MARYLAND

2022 Passed ZEV Legislation

ZEEVIC reviewed legislative bills affecting EV infrastructure introduced in the Maryland General Assembly's 2022 session. The Legislative Work Group met in February to review and discuss the legislation and held a special ZEEVIC meeting on March 3, 2022, to recommend a letter of support for certain bills to be sent to members of the Maryland General Assembly. A Letter of Support from the Council was sent March 9, 2022. Table 3 summarizes the ZEV related legislative proposals that passed in 2022.



Table 3: Legislative Bills Passed in 2022

Bill #	Bill Title	ZEEVIC Supported
SB0146/HB0157	Vehicle Laws – Plug-In Electric Drive Vehicles-Reserved Parking Spaces Beginning October 1, 2022, individuals may not stop, stand, or park a vehicle in a designated EV charging space unless it is an EV that is actively charging. Violators may be subject to a fine of \$100.	✓
HB0696	Public Utilities – Electric School Bus Pilot Program The Maryland Public Service Commission (PSC) must develop and administer an electric school bus pilot program that investor-owned utilities (IOUs) may apply to implement in their service territories.	✓
HB1391	Clean Cars Act of 2022 Beginning in fiscal year 2024, Maryland Energy Administration is authorized to administer a Medium- and Heavy-Duty (MHD) ZEV grant program. Grants must cover up to 20% of the cost to purchase MHD ZEVs, electric vehicle charging stations, or MHD non-road equipment. Eligible vehicles must have a gross vehicle weight rating above 8,500 pounds and be powered exclusively by electricity or hydrogen.	✓
HB0010/SB0061	Zero Emission Bus Acquisition Requirement Beginning in 2023, the Maryland Transit Administration (MDOT MTA) may only purchase zero emission buses for the state transit bus fleet. The MDOT MTA must develop charging infrastructure to support zero emission buses throughout the state, provide safety and workforce development training for operations and maintenance workforces, and ensure no state government jobs are transferred to a contracting entity as a result of the transition to zero emission transit buses.	
SB0528	Climate Solutions Now Act Established ZEV purchase requirements for the State vehicle fleet and local school buses. Established an electric school bus pilot program and required the PSC to implement and administer the pilot program.	



2022 Failed Legislative Proposals

Various legislative proposals were introduced in the 2022 session and did not pass. Table 4 provides a summary of ZEV-related legislative proposals that were introduced but were withdrawn or did not pass.

Table 4: 2022 Failed or Withdrawn ZEV Related Legislative Proposals

Bill #	Bill Title	ZEEVIC Supported
HB0829/SB0687	MDE - Zero-Emission Medium-and Heavy-Duty Vehicles (MHDVs) - Regulations (Zero-Emission Truck Act of 2022)	✓
HB0894	Transportation Electrification and Modernization (TEAM) Act	✓
HB1146	Residential Construction- EV Charging	✓
HB0046/SB0104	Vehicle Emissions Inspection Program Not Subject to Inspection Fee	
HB0060/SB0126	Environment New Motor Vehicles Pollution Fee	
HB0094	State Vehicle Fleet Conversion to Zero Emission Passenger Cars and Other Light Duty Vehicles	
HB0507/SB0924	Environment Electric Vehicle Charging Infrastructure Environmental Justice Considerations	
HB0782	Vehicle Laws Plug-in Electric Drive Vehicles Reserved Parking Spaces	
HB0831	Reducing Greenhouse Gas Emissions Commercial and Residential Buildings	
HB0835	Retail Service Stations New Construction Setbacks and Electric Charging Stations	
HB1079/SB0922	Vehicle Emissions Inspection Program Standards Requirements and Application	
HB1314	Vehicle Laws Pilot Program to Evaluate Alternative Registration Plates and Cards	
SB0627	State Building Code Electric Vehicles	



Level One
120V
Electrical source from a regular home outlet.

Charge Time
2-5 miles of range per 1 hour of charging.



Level Two
220V
Electrical source from a regular home dryer outlet, home hardwire, or public station.

Charge Time
10-20 miles of range per 1 hour of charging.



DC Fast Charge
208 or 480V 3-Phase AC
Electrical source from a public station.

Charge Time
60-80 miles of range per 20 minutes of charging.

NATIONAL ELECTRIC VEHICLE INFRASTRUCTURE (NEVI) PLAN



The Bipartisan Infrastructure Law (BIL) was enacted on November 15, 2021, as the Infrastructure Investment and Jobs Act (IIJA). The \$5 billion National Electric Vehicle Infrastructure (NEVI) Formula Program was authorized under the Highway Infrastructure Program heading of the IIJA and provides dedicated funding to states to strategically deploy EV charging infrastructure and establish an interconnected network to facilitate data collection, access, and reliability.

Under the NEVI Formula Program, Maryland has been apportioned approximately \$63 million between federal fiscal years (FFY) 2022-2026, before any set-asides. The funds must first be used to “build-out” and certify all existing EV AFCs. Only once all AFCs have been certified can funds be used to build-out charging infrastructure within communities.

NEVI Requirements for Certification of AFCs:

- \leq 50 miles between one station/site and the next on the corridor (minimum two stations).
- \leq One mile from Interstate exits or highway intersections along the corridor.
- Include four Combined Charging System (CCS) connectors - Type 1 ports (simultaneously charging four EVs).
- Maximum charge power per DC port should not be below 150 kW.
- Site power capability should be no less than 600 kW (support at least 150 kW per port simultaneously across four ports).

To access funds, states were required to submit an EV Infrastructure Development Plan describing how each state intends to use its apportioned NEVI Formula Program funds. The MDOT and MEA, in collaboration with partners and stakeholders, developed the *2022 Maryland State Plan for NEVI Formula Funding Deployment* and submitted the plan to the Joint Office of Energy and Transportation on July 15, 2022. On September 14, 2022, the Joint Office announced the approval of Maryland’s NEVI Plan, unlocking funds that Maryland will allocate during State fiscal year 2023.

The MDOT and MEA are currently working on the development of the NEVI Program, which is expected to be released late fall 2022/early winter 2023. More information on Maryland’s NEVI Plan can be found on its [website](#).

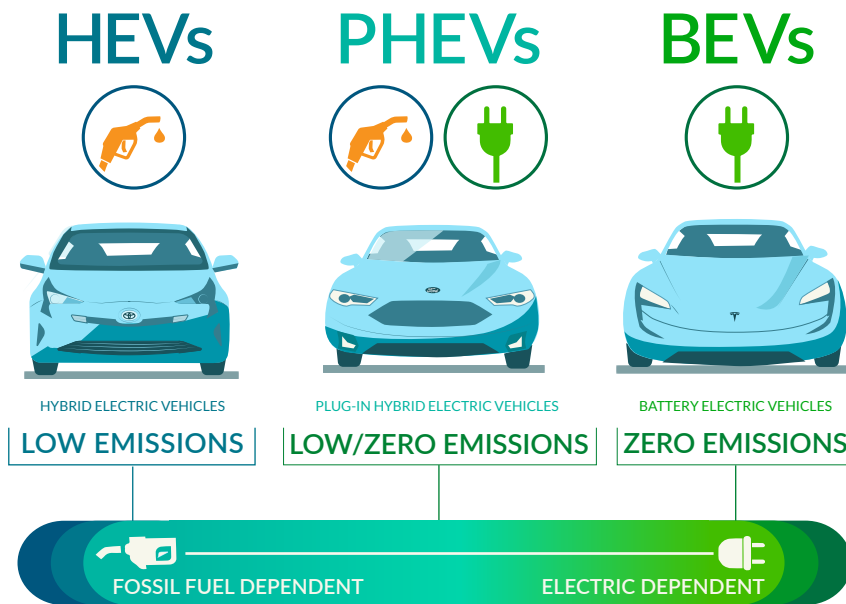


ELECTRIC VEHICLES AND INFRASTRUCTURE

EV Registration Status and Trends

Throughout 2022, Maryland continued to experience significant EV ownership growth. 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 three main types of EVs, excluding FCEVs which are discussed separately, as shown in Figure 1.

Figure 1: Types of EVs



Consumers are finding greater satisfaction with the benefits of EVs and are being helped by shared user experience. Nasdaq quoted the automotive part supplier Invesco, saying “By 2035, some of the largest auto markets... are expected to be fully electric, a reflection of the ongoing shift to decarbonize transportation worldwide.”^{vi}

Currently, over 60 battery electric vehicle (BEV) models are available for purchase in Maryland. This represents 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 EVs currently available for purchase in Maryland.

The Motor Vehicle Administration (MDOT MVA) tracks the total number, make, model, and model year (MY) of all EVs registered in Maryland. As illustrated in Figure 2, the total number of EVs registered in Maryland increased from 609 in FY 2012 to 57,347 in October 2022. The percentage of BEVs has been increasing steadily as more EV models have become available and charging infrastructure has been deployed. In 2012, BEVs made up less than 30% of the EV market share, with the majority of EVs being PHEVs as illustrated in Figure 3. In FY 2019, BEVs overtook PHEVs as having the largest EV market share, with 53%. As of October 31, 2022, 65% (37,214) of EVs registered were BEVs and 35% (20,133) were PHEVs.

Figure 2: Total EVs registered in Maryland (FY 2012-2023)

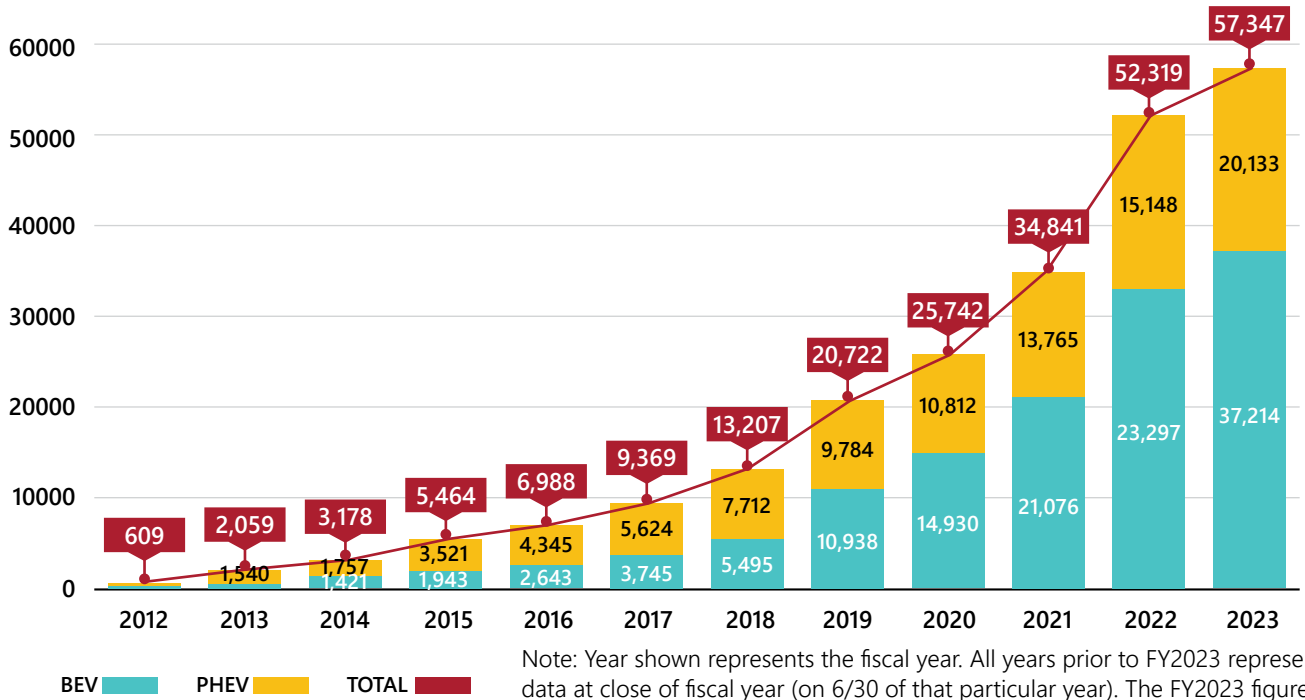
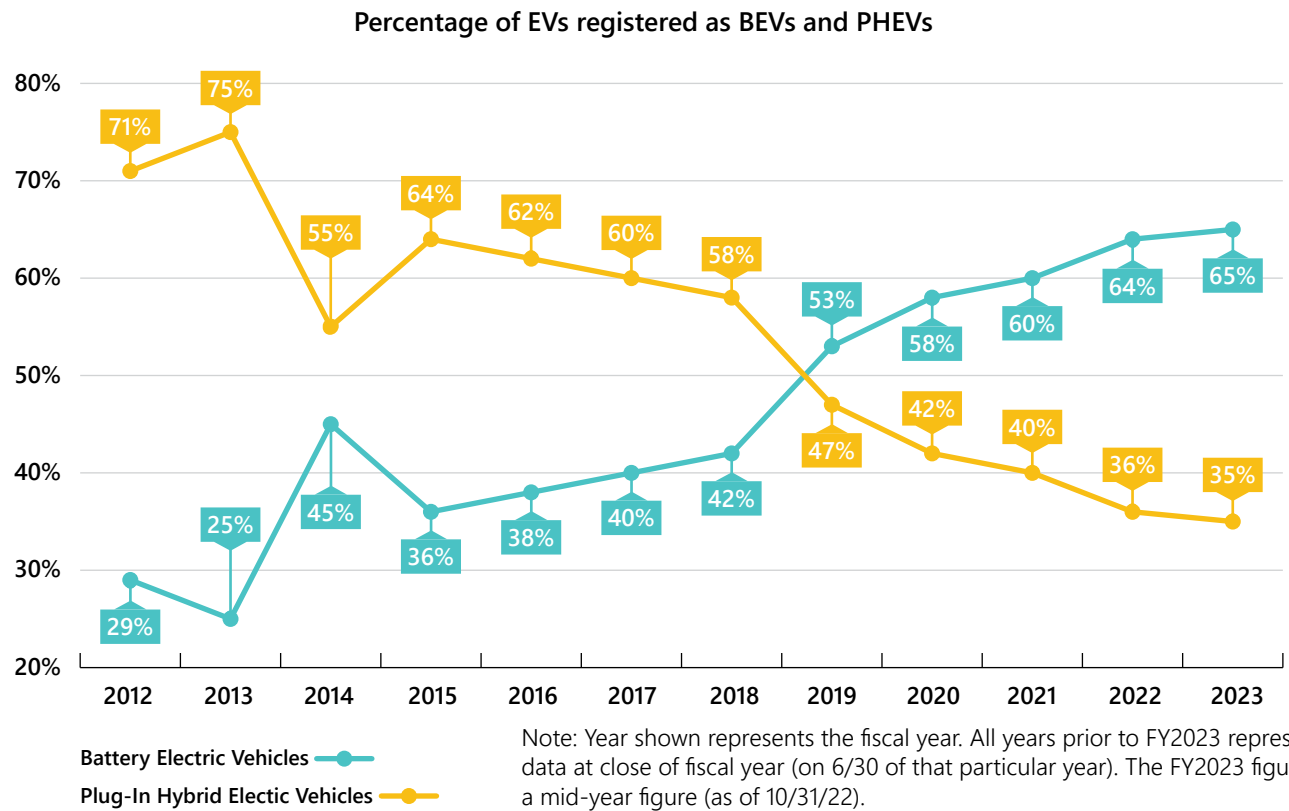


Figure 3: BEV and PHEV Market Distribution



There are currently 45 makes and more than 100 EV models registered in Maryland. Twelve original equipment manufacturers (OEMs) account for almost 92% of all EVs registered in Maryland and have at least 1,000 registered EVs, as shown in Figure 4. The remaining 8% is comprised of 33 vehicle OEMs. Tesla has the largest share of Maryland's EV market, making up 43% of all makes registered in Maryland. Toyota has the next largest share with 10% followed by Chevrolet with nearly 8% of the EV market. There are currently thirteen models with more than 1,000 EVs registered. These models account for 73% of all models registered, as shown in Figure 5. Tesla's Model 3 is the most registered EV in Maryland, accounting for approximately 21% of all registered EV models.

Figure 4: EV Market Share by Make (Oct 31, 2022)

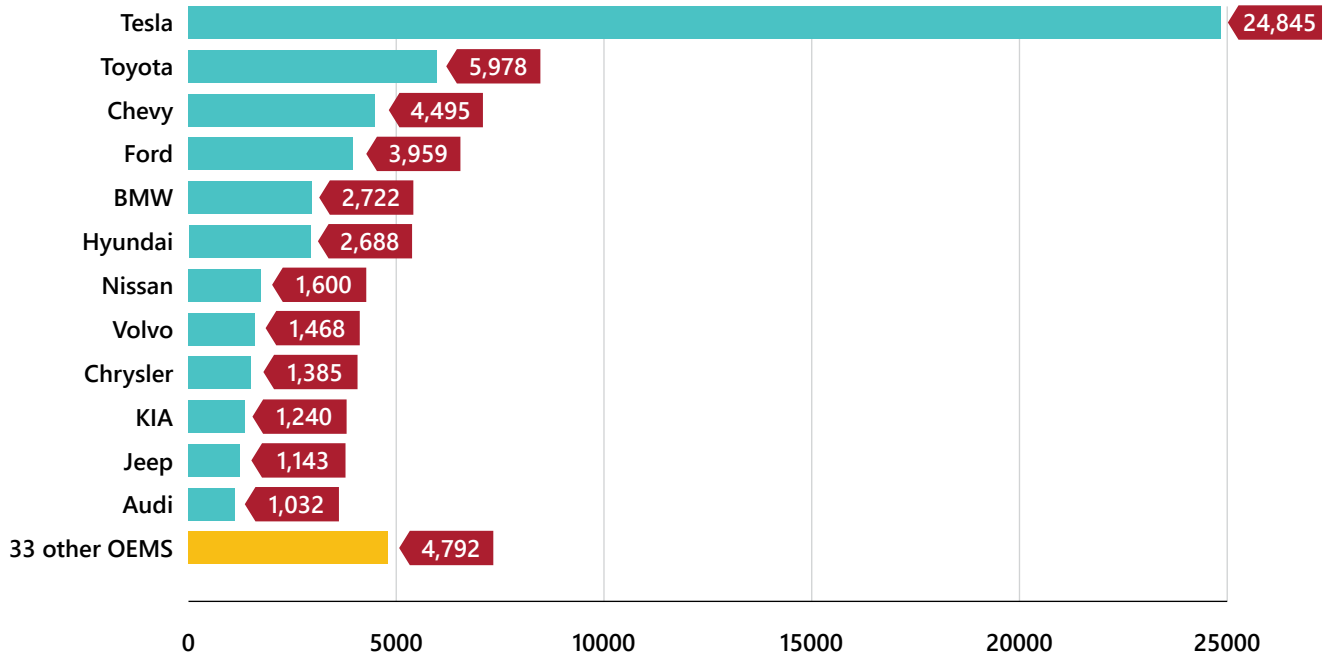
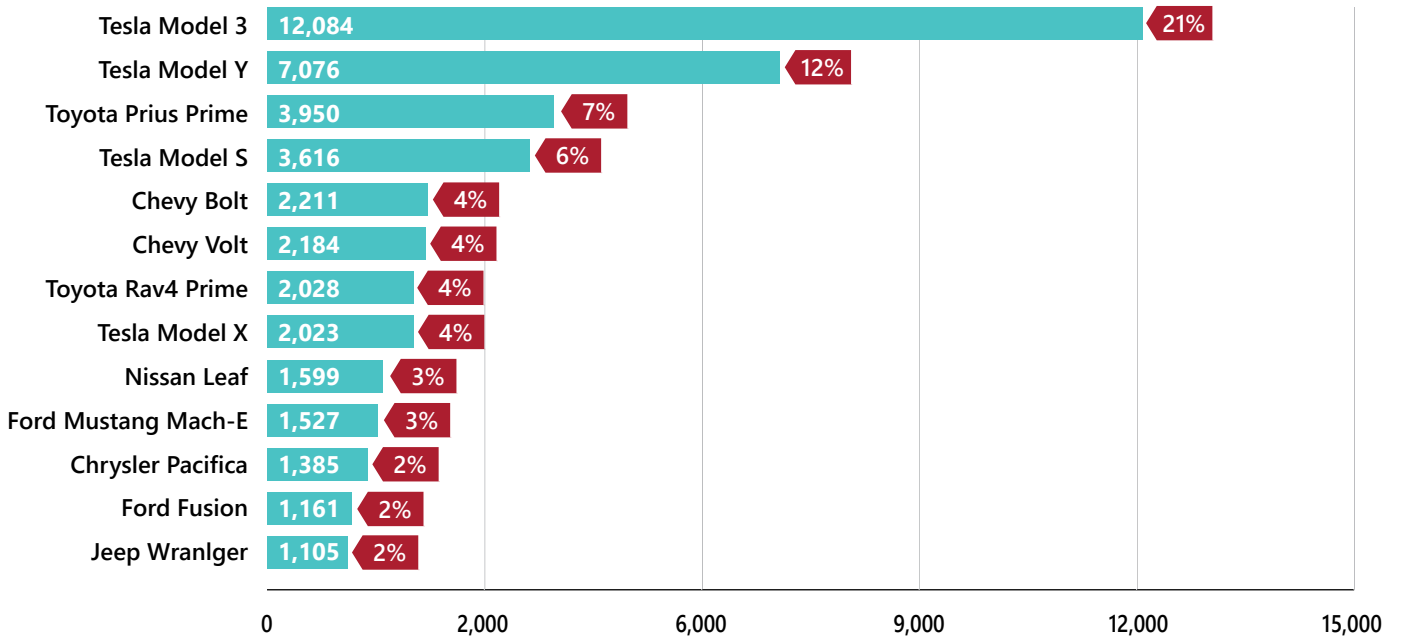


Figure 5: EV Models with more than 1,000 Registered in Maryland (Oct 31, 2022)



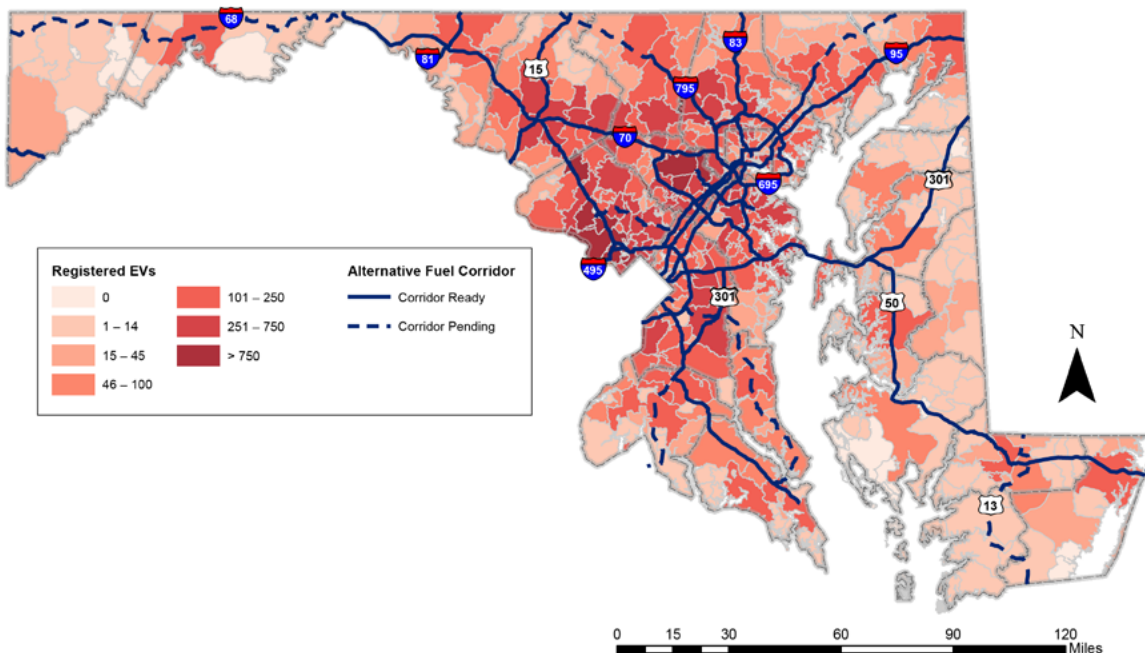
Automakers EV Goal Highlights^{vii}:

- BMW: 50% of global sales to be electric by 2030.
- Ford: 50% of global sales to be electric by 2030.
- GM: Sell only zero-emission cars and trucks by 2035.
- Honda: Entire lineup zero-emissions in major markets by 2040.
- Hyundai: Plans to sell 1.9 million BEVs annually by 2030 (and 1.2 million for Kia).
- Mazda: 25% of vehicles will be electrified by 2030.
- Nissan: 40% of US sales to be EV by 2030.
- Stellantis: 50% of US sales to be electric by 2030.
- Subaru: EVs to make 40% of its sales by 2030.
- Toyota: All EV sales to reach 3.5 million by 2030.
- Volkswagen: 50% of US sales to be electric by 2030.
- Volvo: 50% of all car sales to be electric by 2025, and fully electric by 2030.

The MDOT 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 AFCs in Southern Maryland, Western Maryland, and the Eastern Shore regions.

As of October 31, 2022, Maryland has 83 zip codes with more than 210 EVs registered and five zip codes with more than 1,000 registered EVs. Figure 6 illustrates the number of EV registered by ZIP code at the end of October 2022.

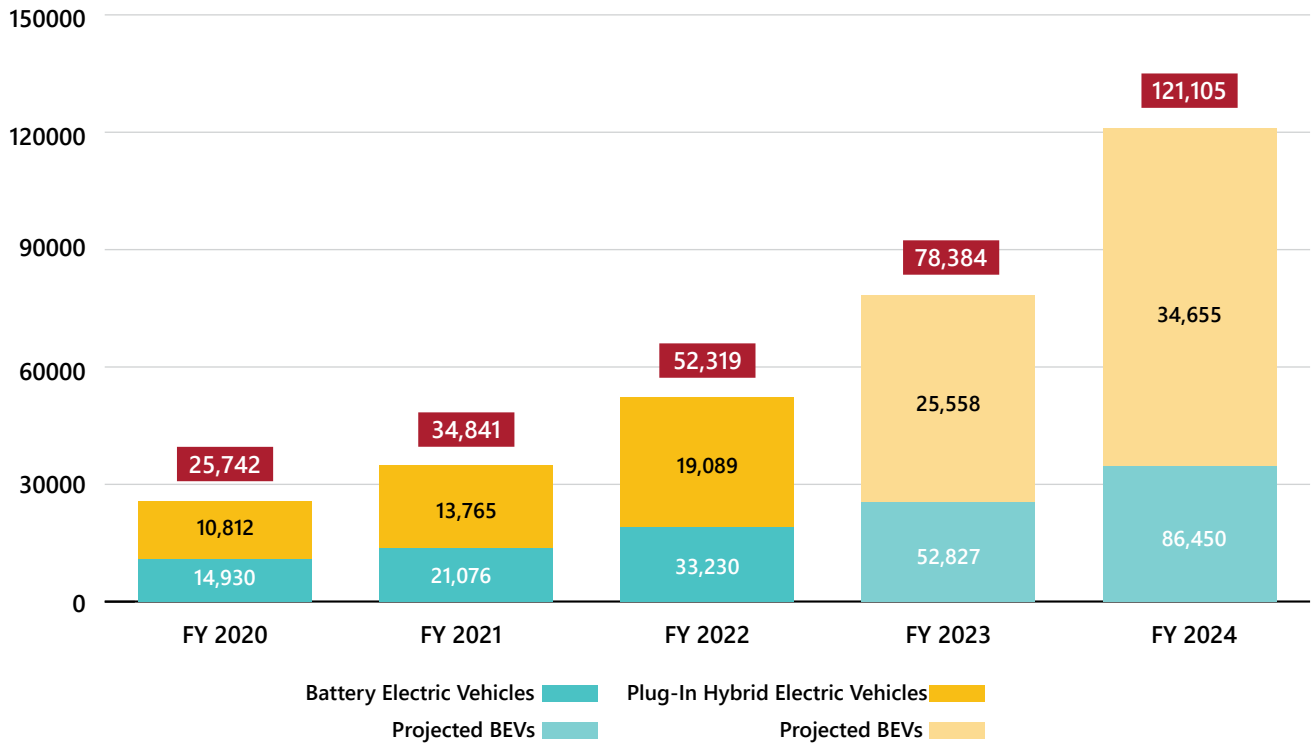
Figure 6: Maryland EV Registration by ZIP Code, October 2022



Through the Maryland Commission on Climate Change (MCCC) and the adoption of the Maryland Greenhouse Reduction Act (GGRA) Plan, Maryland established a goal of 300,000 ZEVs registered by 2025 and 600,000 ZEVs registered by 2030. Based on projections developed as part of the Managing for Results/Attainment Report (MFR/AR), Maryland is expected to have over 121,000 registered EVs by the end of FY 2024—more than double the number of EVs registered at the end of FY 2022. While it appears that the number of registered EVs in Maryland will fall short, Maryland has made significant progress towards its goals. There are several factors that could either positively or negatively influence the projected growth and overall adoption of EVs in the State. These factors include

the cost of gasoline, the cost to purchase an EV, supply chain issues, range of the EVs, models available to purchase, and the availability, convenience, and reliability of charging infrastructure.

Figure 7: EV Projection



Charging Infrastructure

On November 1, 2022, Maryland had 1,188 publicly accessible EV charging stations, totaling 3,404 EVSE ports^{viii}. Out of the EVSE ports, 19 are Level 1, 2,712 are Level 2, and 673 are DC Fast Charge. Publicly available Level 2 and DC Fast EVSE are shown in Figure 9. Newly available IIJA and NEVI funding are anticipated to further accelerate the development of Maryland’s EV charging infrastructure network.



Figure 8: EV Alternative Fuel Corridors

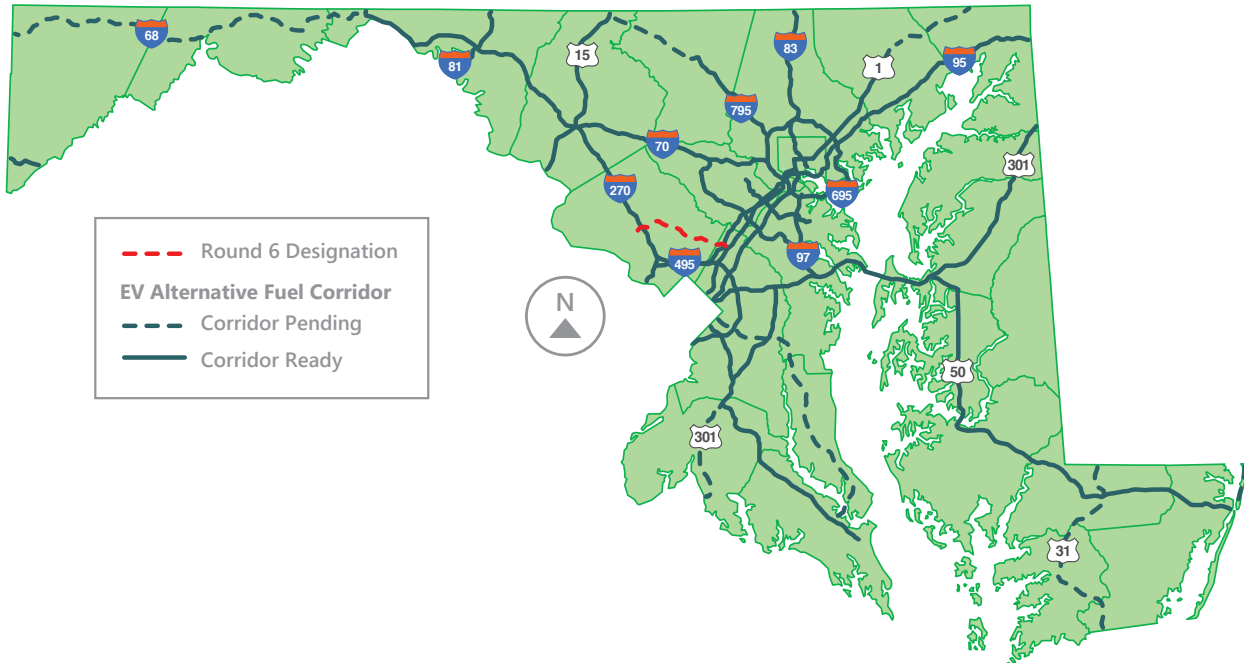
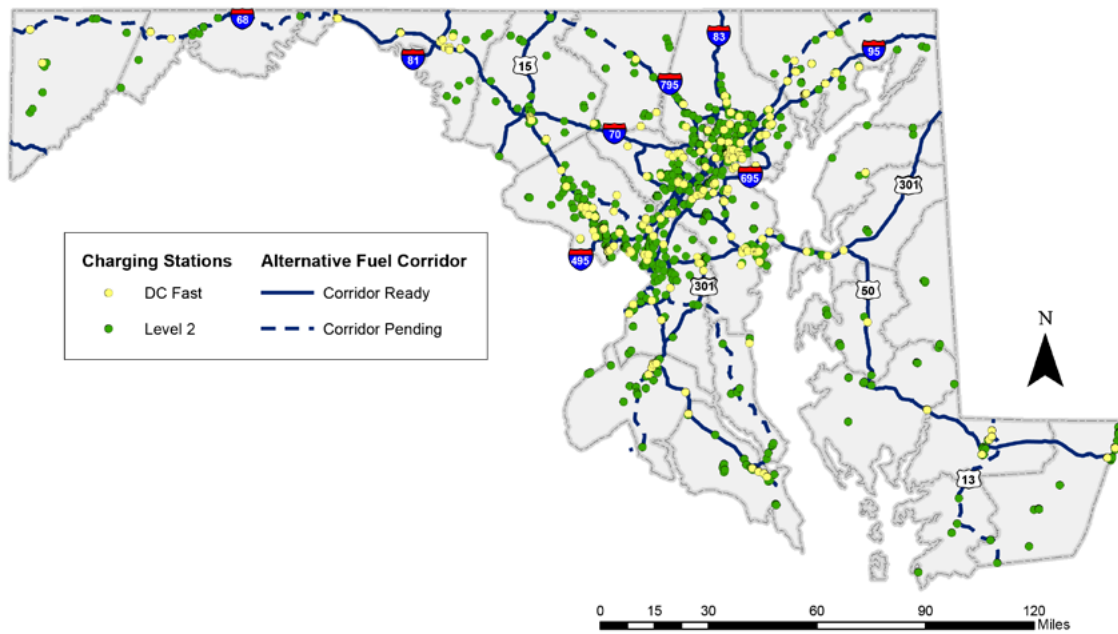


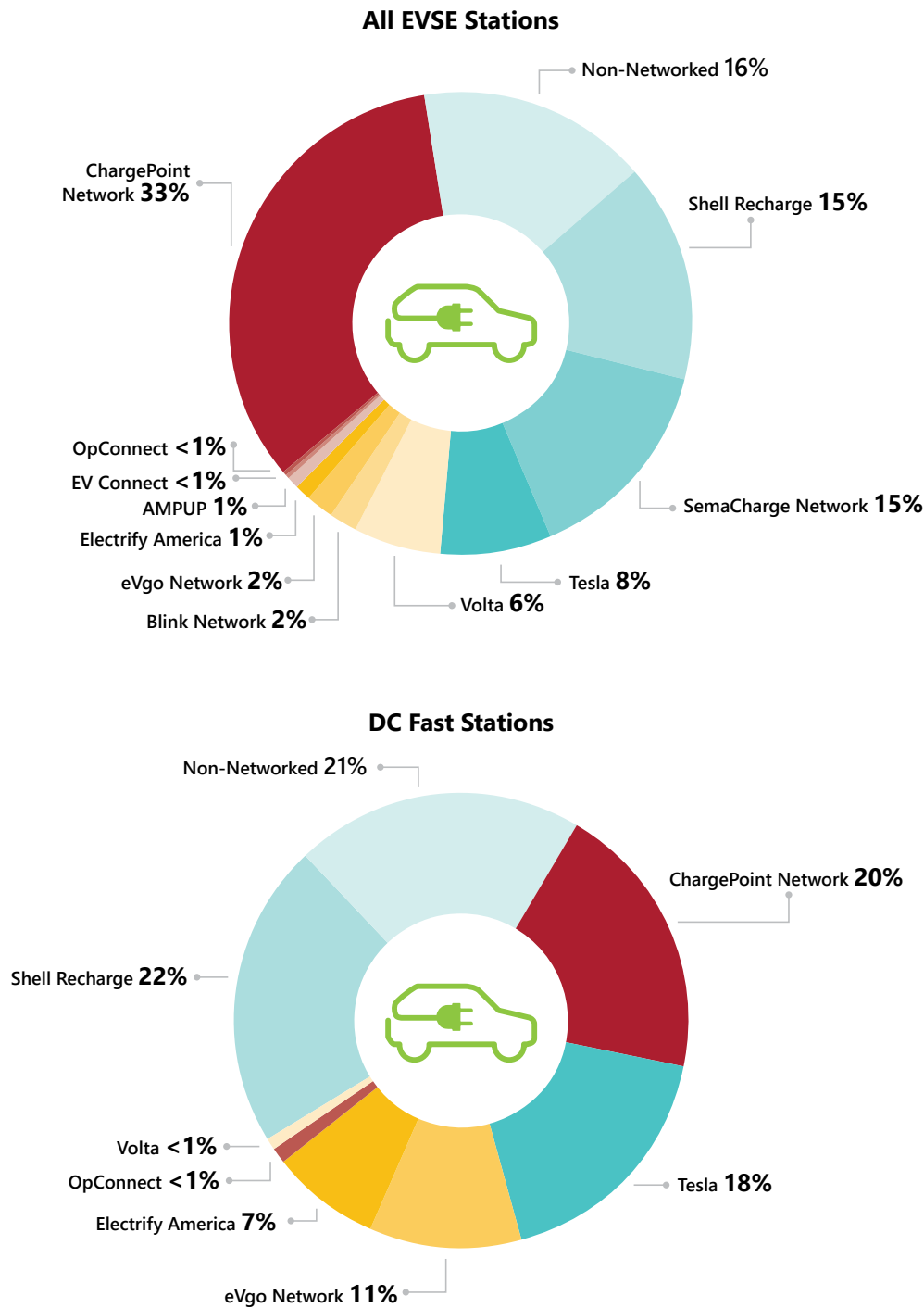
Figure 9: DC Fast and Level 2 Charging Station Locations in Maryland



Charging Networks

There are now 11 charging networks operating in Maryland that are responsible for 84% 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, Shell Recharge, and SemaConnect. These three companies are responsible for approximately 64% of the available chargers statewide, as shown in Figure 10. Non-networked chargers comprise 16% of public EVSE. When considering only public DC Fast charging, and excluding Level 2 charging, Shell Recharge and ChargePoint are the largest network providers, responsible for 44% of the available DC Fast charging stations.

Figure 10: Maryland's Charging Networks



HYDROGEN FUEL CELL ELECTRIC VEHICLES AND INFRASTRUCTURE



About the Technology

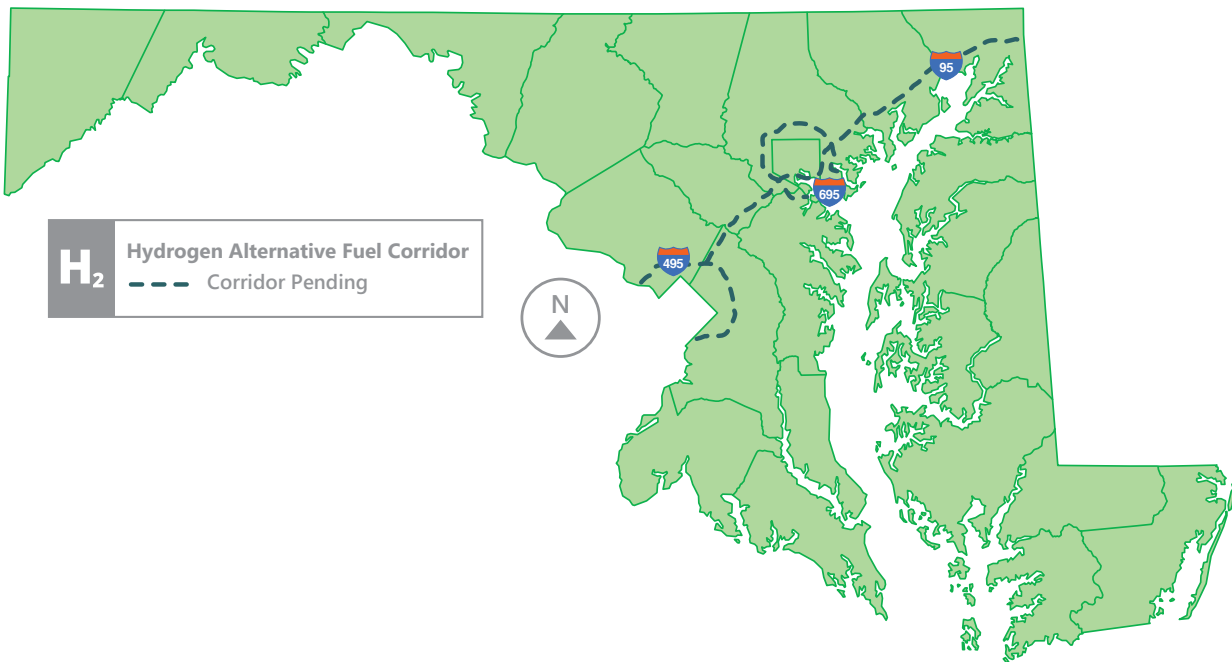
Fuel Cell Electric Vehicles (FCEVs) are gaining popularity in the U.S., and these vehicles may soon be available for purchase in Maryland. FCEVs use fuel cells to convert hydrogen into electricity to power electric motors. Unlike other types of EVs, FCEVs are not charged by plugging into a power outlet or charger—the tank is filled with hydrogen at fueling stations. This technology is thought to be particularly suitable to early applications in the heavy-duty trucking and freight sectors.

A fuel cell uses hydrogen (or hydrogen-rich fuel) and oxygen to create electricity. Fuel cells are more energy efficient than combustion engines and the hydrogen used to power them can come from a variety of sources. If pure hydrogen is used as a fuel, fuel cells emit only heat and water, eliminating concerns about tailpipe air pollutants or greenhouse gases^{ix}.

Fuel Cell Electric Vehicle (FCEV) AFCs

In 2022, Maryland nominated the first hydrogen AFCs, which include I-95, I-495, and I-695. All three corridors were designated as 'Corridor-Pending' and currently have no hydrogen infrastructure. These corridors provide key connection to intermodal freight facilities and have significantly high truck volumes. These corridors traverse census tracts identified as rural or disadvantaged, further aligning with environmental justice initiatives.

Figure 11: Hydrogen Alternative Fuel Corridors



Hydrogen Market

Based on 2021 data, there are 67 open retail and non-retail hydrogen stations in the United States. Additionally, there were at least 60 stations in various stages of planning or construction^x. Most of the existing retail and non-retail stations were in California, with one in Hawaii and one in Michigan. States with existing hydrogen fueling stations are shown in

Table 5. Currently, there are no registered FCEVs or hydrogen fueling stations in Maryland. As the market expands, hydrogen fueling stations will be matched with vehicle rollout as both grow together. Customers are expected to have similar experiences at hydrogen fueling stations as at gasoline stations, with most hydrogen dispensers being added at existing gasoline stations.

Table 5: Hydrogen Fueling Station by State (2021)

State	Retail	Non-Retail	Total
Arizona		1	1
California	47	5	52
Colorado		1	1
Connecticut		1	1
Delaware		1	1
Hawaii	1	1	2
Massachusetts		2	2
Michigan	1	1	2
New York		1	1
Ohio		2	2
Virginia		1	1
Washington		1	1
Total	49	18	67

ZEEVIC monitors and supports promotion and collaboration on FCEV research and development in Maryland. Interstate highways I-95, I-495, and I-695 were designated as hydrogen AFCs in 2022. Other northeastern states, including New Jersey, Pennsylvania, New York, and Connecticut have also recently nominated hydrogen corridors. Regional hydrogen AFCs are shown in Figure 12 and show the beginnings of a regional hydrogen AFC network. These efforts are just beginning and have the potential to contribute to reduction of nitrogen oxide emissions associated with heavy-duty vehicles and trucking.

Figure 12: Regional Hydrogen Alternative Fuel Corridors^{xi}



MARYLAND ZEV POLICIES IN ACTION

Public policy plays a role in shaping the ZEV market and ZEV infrastructure deployment. The following section summarizes efforts underway by State agencies and utility companies. Maryland’s ZEV policies continue to encourage higher rates of EV ownership through incentives (financial and non-financial), consumer education and outreach, and inter-agency coordination and collaboration. An up-to-date list of federal, state, and utility incentives is available at MarylandEV.org.



State Agencies

Maryland state agencies actively participate and provide updates at every ZEEVIC meeting. While much of the work state agencies do is complementary to the work of ZEEVIC, their work is not done under ZEEVIC. Their activities, programs, and outreach have been integral to the development of EVSE infrastructure in Maryland and EV adoption. Maryland’s financial incentives have been extremely popular, with the MDE and the MEA’s programs regularly reaching full subscription.

MARYLAND ENERGY ADMINISTRATION (MEA)

In 2022, the MEA administered and supported several programs that work to accelerate and encourage EVSE development and transportation electrification efforts, including the EVSE Rebate program, Clean Fuels Incentive Program (CFIP), Clean Fuels Technical Assistance (CFTA) Program, and the Maryland Smart Energy Communities (MSEC) Program. Additionally, MEA is the lead agency in Maryland for participating in the Mid-Atlantic Electrification Partnership (MAEP) and the Mid-Atlantic Electric School Experience Project (MEEP). In total, the MEA has awarded over \$6.1 million dollars in FY 2022 and FY 2023.

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. In FY 2022 and FY 2023, the MEA awarded the following amounts:

Table 6: MEA EVSE Rebate Award Totals

FY	Award Total	Number of EVSE Installed
2022	\$1,800,000	2,120
2023*	\$1,219,468	1,242

* Note: FY 2023 rebate award amount as of October 31, 2022. (FY 2023 Program budget is \$1,800,000).



Baltimore County and Greenland Technologies announced plans to construct an approximately 50,000 square-foot EV manufacturing facility to be located in White Marsh.

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 (AFVs). Specifically, the program provides funding to support the incremental cost to purchase alternative fuel fleet vehicles or convert new fleet vehicles to utilize alternative fuel. In FY 2022, the MEA made the following EV-related awards:

Table 7: MEA CFIP FY 2022 Awards

Awardee	Amount Awarded	Project
BGE	\$60,000	1 electric Class 7 box truck
Highlight Electric Transportation (Baltimore City)	\$320,000	4 Baltimore City electric school buses
Montgomery County	\$80,000	1 electric Class 6 box truck
K Neal	\$90,000	2 electric Class 2 vans, 1 electric Class 6 box truck
Swann Transportation	\$80,000	1 electric school bus
Sysco	\$1,500,000	10 electric Class 8 tractors (First of its kind)
Chaney Enterprises	\$900,000	6 electric concrete mixer trucks (First of its kind)

Two CFIP awards in FY22 were notable as significant “firsts” in Maryland. Chaney Enterprises was awarded \$900,000 to purchase and deploy six electric concrete-mixer trucks at locations in Anne Arundel and Prince George’s counties. The vehicles are expected to represent the first such deployment in the state and one of the first in the country. Sysco was awarded \$1,500,000 to purchase and deploy ten Class 8 electric tractors in Jessup (in Howard County). The vehicles will be Sysco’s first such deployment on the East Coast and are expected to represent the first and largest Class 8 electric vehicle deployment in the state^{xviii}.

Clean Fuels Technical Assistance (CFTA) Program

The MEA’s CFTA Program provides technical assistance to local governments looking to transition fleets to AFVs. In FY 2023, the MEA is working with Prince George’s County and the City of Gaithersburg to perform EV infrastructure analyses. Through FY 2022, the CFTA conducted analyses for five jurisdictions including Cumberland, Laurel, Rockville, Baltimore City, and Anne Arundel County. The program application period re-opened on October 3, 2022 and was extended through December 31, 2022.

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 ICE vehicles to EVs, and installing EVSE. In FY 2022, the MEA made the following awards for EV projects, totaling \$48,750. Applications for the FY23 MSEC Program were accepted until November 15, 2022.



Table 8: MEA MSEC FY 2022 Awards

Community	Project	Award Amount
Edmonton	EV for administration department	\$3,750
Howard County	5 EVs for admin fleet	\$37,500
Sykesville	EV for police department	\$7,500

MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE)

In 2022, MDE continued to administer and support programs and grants that work to accelerate and encourage EVSE development and transportation electrification efforts. These included the Clean Cars Program, the Electric Corridor Grant Program, and the Charge Ahead Grant Program.

Clean Cars Program

In 2007, Maryland adopted regulations implementing the California Clean Car emissions standards for new vehicles, commonly known as the Maryland Clean Car Program. MDE is responsible for managing and implementing Maryland’s Clean Cars Program. As the Clean Cars Program has developed over the years, MDE has taken an active role in helping ensure the program continues to be successful across the country and in Maryland. In 2021, MDE, along with the other 14 states who’ve adopted California’s light-duty vehicle emission standards, began working with California to develop the Advanced Clean Cars II Program (ACC II). The California Air Resources Board adopted the ACC II regulations on August 24, 2022. The new program will start in FY 2026 and, like the current Clean Cars program, will require a growing percentage of light-duty vehicles to be ZEVs. MDE is working to help develop this program in a way that ensures a robust ZEV market and achievable program goals based on Maryland’s vehicle market.



In 2022, the Clean Cars Act was updated to extend excise tax credit eligibility requirements to electric vehicles whose minimum purchase price is \$50,000. It also further adds a new Medium-Duty and Heavy-Duty Zero-Emission Vehicle Grant Program for certain vehicles and equipment to be administered by the MEA.

Volkswagen (VW) Environmental Mitigation Trust (EMT)

MDE was designated as the lead agency to administer VW EMT funds in Maryland. Maryland has been allocated approximately \$75 million under the EMT and allocated 15% (\$11.3 million) for the installation of light-duty EVSE infrastructure. MDE, with MEA’s assistance, developed the framework for two grant programs to assist with deployment of EV infrastructure; the Electric Corridor Grant Program (ECGP) and the Charge Ahead Grant Program (CAGP). These grants programs are being administered as three rounds of funding, with approximately \$3.7 million available for each round. The first round of awards was announced in August of 2021, and the second round application period opened in December of 2021 and closed April 15, 2022. MDE anticipates opening the third round of funding in early 2023.

The ECGP is for DCFC EVSE along corridors or at charging hubs to facilitate interstate and intrastate travel with ZEVs. Specifically, funds will be used to deploy DCFC along Maryland’s EV AFCs, within five miles of the corridor. Proposed stations must be within a short walking distance, not to exceed a quarter mile, to restrooms and retail or service establishments such as restaurants, coffee shops, convenience stores or tourism destinations. They must be publicly accessible twenty-four hours a day, seven days a week, without restrictions^{xiv}. ECGP amounts 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	TBD

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 employee vehicles, they can also be used for charging fleet or public vehicles^{xv}. CAGP award amounts 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	TBD

MARYLAND DEPARTMENT OF PLANNING (MDP)

The MDP works closely with Maryland’s counties and municipalities to promote sustainable growth, including ZEV adoption. Through the local comprehensive plan review process, the MDP regularly provides written comments to local jurisdictions, 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 2022, the MDP included suggestions on electric vehicle infrastructure preparedness planning in the Queen Anne’s County, Bryans Road Sub-Area (Charles County), Thurmont, Galena, Myersville, Bel Air, and West Hyattsville-Queens Chapel (Prince George’s County) comprehensive plan reviews.

The MDP provides Geographic Information System (GIS) based statewide land use and growth management maps to support various planning analyses, including EV charge location identification and evaluation. The MDP also partners with the MDOT to communicate ZEV programs, information, and initiatives in its Planning Practice Monthly newsletter, which has a subscriber list of 22,000 individuals.

MARYLAND DEPARTMENT OF GENERAL SERVICES (DGS)

The DGS administers the state’s Electric Vehicle Infrastructure Program. This program ensures the installation of charging infrastructure to support the electrification of the state’s light duty fleet. To date, DGS has installed 76 charging ports across 17 sites. An additional 18 projects are currently in design or construction and will add 115 ports across the state in 2023.

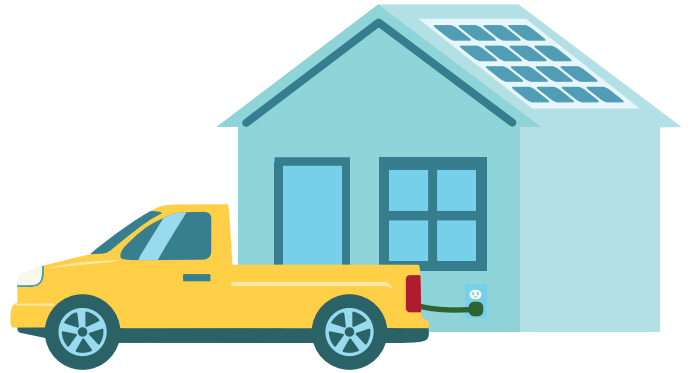
DGS also leads the Maryland EV Ambassadors, a community of E-mobility users, champions, and enthusiasts across all levels at state agencies. The purpose of the group is to enable knowledge sharing, improve the charging experience, and promote the benefits of transportation electrification. The Ambassadors hosted two outreach and ride-and-drive events over the past year.



PUBLIC SERVICE COMMISSION (PSC)

With a goal of ensuring that Maryland’s electric grid is customer-centered, affordable, reliable, and environmentally sustainable, the PSC initiated a proceeding in September 2016, titled Public Conference 44 (PC44) to launch a targeted review of electric distribution systems in Maryland. PC44 and subsequent notice from January 2017 assigned workgroups, led by a Commission advisor, to address six major topics^{xvi}. These include:

1. Rate Design
2. Electric Vehicles
3. Competitive Markets and Customer Choice
4. Interconnection Process
5. Energy Storage
6. Distribution System Planning



PSC Order 90036 formed the EV Workgroup to address matters specific to Electric Vehicles, and subgroups were formed for Fleet, Reliability, EV Metering, Rate Design, and Make-Ready, Carshare, Charging and Other Technologies. The subgroups of the EV Workgroup worked on eight initiatives throughout 2022:

Table 11: PC44 EV Workgroup - Subgroup Initiatives

Initiative	Subgroup Summary
1. EVSE metering regulations	The PSC granted several sub-metering and meter testing regulation waivers as part of the PC44 EV pilot. These waivers expire with the end of the pilot. Proposed regulations on EVSE metering are due by the end of 2023.
2. EVSE reliability standards and reporting metrics	The EV pilot program utilities were directed to work with the PC44 EV WG to develop consensus public charger reliability standards or metrics for pilot semi-annual reporting prior to August 1, 2022, and to address the impact, if any, that public charger uptime has on the quality and quantity of charger data reported for the EV Pilot in their reports. The PC44 EV WG filed an interim report on July 20, 2022, requesting to delay finalizing reliability standards until the federal rules for the NEVI Formula Program are finalized. A subsequent report is due December 1, 2022.
3. Fleet pilot proposals	The PSC directed the leader of the PC44 EV WG to convene a fleet-specific subgroup to discuss utility and non-utility fleet options, potential make-ready applications for fleet charging, and potential revisions to the utility fleet proposals not approved in Order No. 90036 and file a report by June 30, 2022. The Fleet Subgroup Summary Report was filed on June 30, 2022, with pilot proposals for BGE, Pepco, and Delmarva. The PSC approved the pilot proposals on September 14, 2022.

continued

Initiative	Subgroup Summary
4-7. Make-ready incentives; Carshare programs; EVSE charging paired with other technologies; and Pilot education and outreach	<p>The PSC included directives in Order No. 90036 for the PC44 EV WG on several issues which the work group discussed collectively. The topics the work group were directed to discuss included:</p> <ul style="list-style-type: none"> • How multifamily make-ready incentives could position the private sector to offer additional EVSE, multifamily and other applications, and how make-ready could provide a cost-effective alternative to utility investment for fleet applications; • Information on carshare programs; • Incorporating other energy source technologies into EV charging; and • Educational efforts for off-peak charging and submitting any updates to the PSC as appropriate on the utilities’ education and outreach budgets. <p>The PC44 EV Work Group filed a summary report on July 29, 2022. While no pilot proposals were submitted as part of the summary report, the Work Group plans to continue discussions of these topics as part of its meetings on next steps for the utilities’ EV programs in 2023.</p>
8. Commercial rate design	Commercial rate design discussions continued into 2022. The PC44 EV WG selected a rate for the EV pilot program utilities and EVSE charging companies to collaborate on and bring final proposals back to the Work Group for review.

On December 1, 2021, the leader of the PC44 EV Work Group filed a consensus benefit-cost analysis (BCA) framework for the EV pilot in compliance with Order No. 89678. The Maryland EV-BCA Framework was approved by the Commission via a January 12, 2022 letter order.

The EV pilot program utilities^{xvii} included proposals for the PSC’s consideration in their semi-annual reports filed on September 15, 2021,^{xviii} which were considered by the PSC at the Mid-Course EV Pilot hearing on October 13, 2021. On January 11, 2022, the PSC issued Order No. 90036 approving, in part, and denying, in part, the residential, multifamily, utility-owned, fleet and workplace, and other modifications proposed by the utilities. The PSC also included several directives for the PC44 EV Work Group with various deadlines and deliverables.

Summary of the Order No. 90036 from Case No. 9478

- Approving 60 additional Level 2 multifamily EVSE for BGE, an increase in multifamily make-ready incentives for PHI, the installation of seven utility-owned Level 2 multifamily EVSE for Potomac Edison, the conversion of 20 public Level 2 EVSE to ten public DC Fast EVSE for BGE, the installation of public EVSE up to 150kW for BGE and SMECO, the installation of EVSE in gated government parks on a case-by-case basis, and the development of a fleet calculator tool for BGE and PHI.
- Denying additional residential rebates for BGE, an increase in the limited-income rebate amount for BGE and PHI, an EV car-share program for BGE, rebates for non-utility owned public direct current (DC) fast EVSE and discounted rates for public DC fast EVSE, a fleet electrification assessment program for BGE, and the education and outreach budget requests.

Utility Companies

Discussion of utility activities as directed by PSC Order No. 88997 has been on the agenda during all regular 2022 ZEEVIC meetings. The utilities have been actively engaging ZEEVIC to collect feedback and recommendations on their EV Pilot Program efforts and

to coordinate event and outreach efforts. Maryland utilities and the PSC have spurred the expansion of EVSE infrastructure throughout the state, with thousands of EVSE installations resulting from the pilot program. Maryland continues to support MUD-focused incentives to provide equitable access to EV charging infrastructure to underserved areas. These areas lack the 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 November 17, 2022.

Table 12: Utility EVSE Program Metrics

	Residential Rebates	Multifamily Rebates	Public Charging	EV Time of Use (TOU) Rate Program
BGE	2,319 applicants	181 ports rebated; 100 Level 2 BGE-owned	245 EVSE Energized (455 EVSE Installed or Planned)	1,304 Participants
PHI	844 rebates issued	15 ports rebated	201 Level 2 EVSE eight DC Fast EVSE (209 EVSE Total)	375 Participants
Potomac Edison	384 rebates issued	Six ports rebated	23 Level 2 EVSE; Eight DC Fast EVSE	500 Participants
SMECO	Pending: Filed 9/2022	Pending: Filed 9/2022	26 Level 2 EVSE (50 Level 2 EVSE total) Three DC Fast EVSE (Six DC Fast EVSE total)	Pending: Filed 9/2022
As of November 2022				

BALTIMORE GAS & ELECTRIC (BGE)

In July 2019, BGE launched its pilot program incentives, accepting applications for residential and MUD EVSE. As of November 2022, BGE has received a total of 2,319 residential applications and rebated 181 EVSE ports at MUD properties. BGE has also installed 245 public EVSE, with a total of 455 installed or planned stations. BGE is also in-progress of installing 100 BGE-owned Level 2 charging stations at MUD properties. BGE launched a new Fleet calculator tool on BGE.com and began offering rebates for fleet and workplace EVSE installations.

BGE continues to promote its EVsmart programs and provide education to its customers. BGE has attended multiple events in 2022, including the Maryland Auto Show, Drive Electric Week and Maryland Zoo’s ZooBoo.

In July 2022, BGE partnered with Lyft to deploy 25 electric vehicles in the Baltimore area for ride-hailing services. This partnership is designed to help Maryland achieve its goal of reaching 300,000 ZEVs by 2025. Since a ride-hail vehicle driver likely drives three to five times more miles annually than a someone in a personal vehicle, this switch results in additional clean, emissions-free electric miles. BGE includes educational materials in these vehicles highlighting the impact on the environment, EV charger accessibility, and cost-savings compared to a gas vehicle.

PEPCO HOLDINGS, INC (PHI)

In July 2019, PHI, both the Potomac Electric Power Company (Pepco) and Delmarva Power & Light Company (Delmarva), launched their EVsmart EV incentive and public charging offerings.

In January 2022, Pepco and Delmarva modified their offerings to include an annual credit of \$50 to those customers who currently participate in the residential EV program and communicate charging data to the utility platform, as well as an increase in the EVSE equipment rebate coverage and existing make-ready incentive amount in the Multifamily Rebate Incentive.

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. In September 2022, Pepco increased the maximum number of eligible enrollees from 750 to 1,500 for the residential annual \$50 rebate program.

As of November 2022, PHI has issued rebates for a total of 844 residential EVSE and 15 EVSE charging stations for MUDs. PHI has enrolled 304 customers into its Off Peak/Off Bill program and 375 customers into its Time of Use (TOU) rate. Additionally, PHI has installed 201 public Level 2 EVSE and eight public DC Fast EVSE for a total of 209 public EVSE.

POTOMAC EDISON

In December 2019, Potomac Edison launched its EV Driven pilot program which includes residential and MUD EV charger rebates, Off-Bill Credit EV TOU rates for residential customers, and 59 public EV charger installations in Western Maryland. As of November 2022, Potomac Edison has issued 384 rebates, totaling \$111,900 and installed 23 Level 2 and eight DC Fast EVSE.

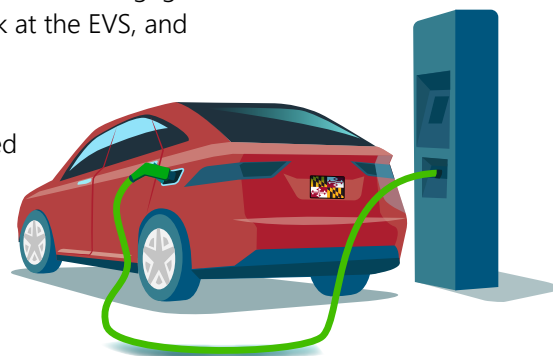
In 2022, Potomac Edison utilized social media channels to share public EVSE developments and EV-related news. Potomac Edison attended multiple ribbon cuttings, sponsored the Poolesville National Drive Electric Event, and presented two EV Charging Webinars with the Electric Vehicle Association and Maryland Multi-Housing Association (MMHA) in September and November. Potomac Edison also engaged with Maryland customers at the MMHA Industry Development Day & Expo in August 2022 and has sent direct mailers promoting the residential EV Rebate and Off-Bill Credit programs.

SOUTHERN MARYLAND ELECTRIC COOPERATIVE (SMECO)

As of November 2022, SMECO has installed 26 Level 2 chargers and three Level 3 DC Fast Chargers for 29 chargers in total. There are currently an additional six DCFC, either in the planning phase, in construction, or waiting to be energized.

SMECO held an in-person EV Meet and Greet with an EV car club in May 2022 to engage customer-members about EVs, answer questions, allow attendees to look at the EVs, and clarify misconceptions related to EVs.

In September 2022, SMECO filed with the Public Service Commission to offer residential rebates, multi-family charger installations, and a managed charging option. SMECO filed an EV Time of Use (TOU) in September as well.



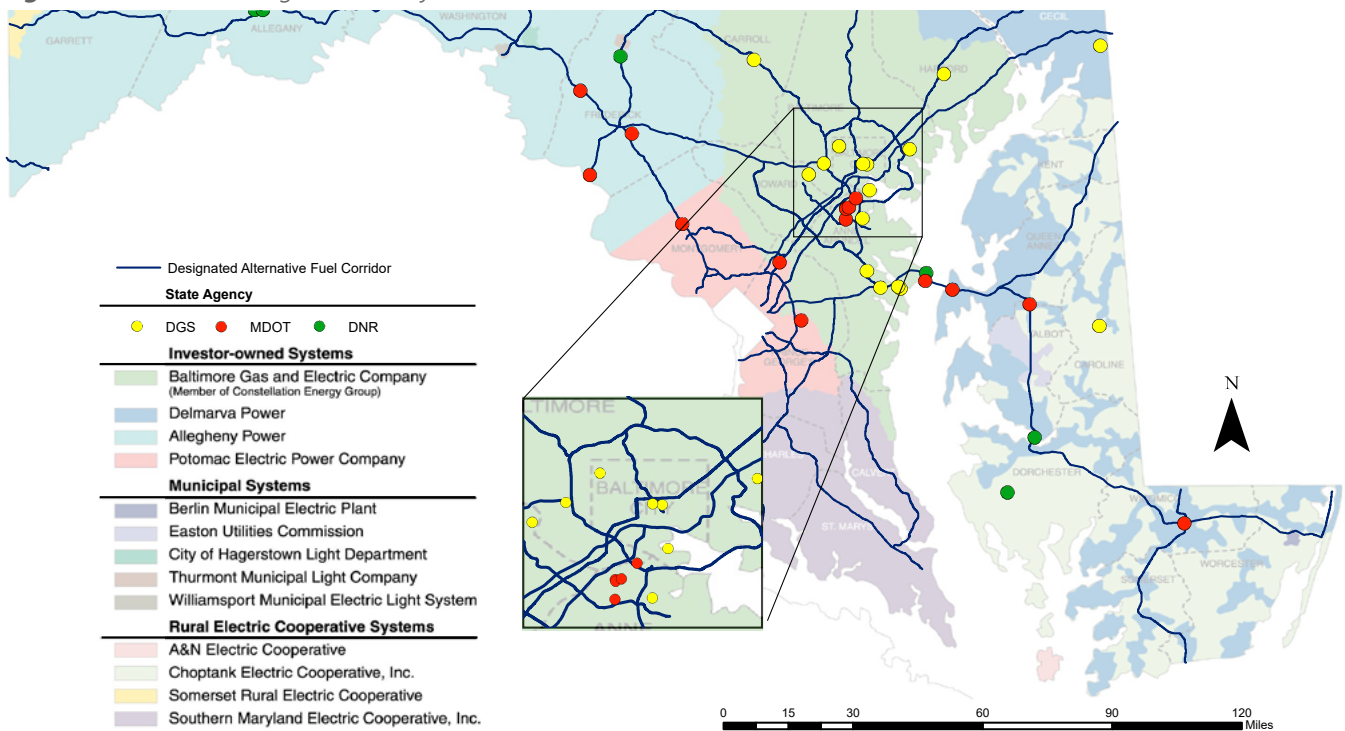
Public Charging – PSC Pilot Program

Under the PSC Pilot Program launched in 2019, and as directed by PSC Order No. 88997, the utility companies are installing publicly accessible EVSE under the Public Charger Program. Under the terms of the order, the utility companies are directed to install approximately 900 publicly accessible chargers, primarily on sites owned or controlled by units of government. For the duration of the program, the chargers are owned and operated by the utilities. Charging rates are set by the PSC.

Sites owned by the State of Maryland are eligible for this program. The Department of General Services (DGS), Department of Natural Resources (DNR), and Department of Transportation (MDOT) have worked with the utility companies to allow publicly accessible EVSE installations to go forward on state owned sites. To date, chargers have been installed or planned on 37 state-owned sites.

Further details about pilot program activity by the utility companies are listed in Table 12.

Figure 13: PSC Pilot Program – Utility EVSE Installations on State Sites

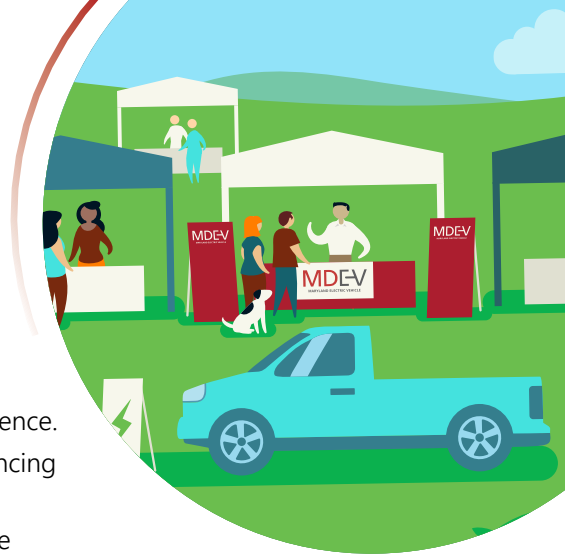


Agency	Location Name	Agency	Location Name
DGS	100 Community Place, Catonsville Courthouse, DBM street parking @ Northwest Street, Denton DC/MSC, Edward F. Borgerding (Wabash Courthouse), Elkton DC/MSC, Ellicott City DC/MSC, Essex-Rosedale DC/ MSC, Glen Burnie-George M. Taylor DC-MSC, John R. Hargrove DC/MSC, Mary Risteau, Bel Air DC/MSC, MDA Agriculture HQ, Saint Frances Academy, State Center Fueling Station, Tawes Office Building (daycare lot), Westminster DC-MSC	MDOT	SHA Hanover Complex, OOM, Connelley Drive, BWI - Express Parking Lot, BWI - Cellphone Parking Lot, BWI - Rideshare Staging Lot, Bay Bridge E-Z Pass Stop-In Center, North Linthicum Light Rail Station, Park & Ride Lot B (US 50 @ MD 404), US 50 @ MD 8 Park and Ride, Salisbury FSO Parking Lot, Myersville Park & Ride Lot, Beltsville FSO, Largo MVA, Gaithersburg FSO Parking Lot, Point of Rocks MARC- Brunswick Line, Monocacy Station MARC-Brunswick Line
			DNR

OUTREACH EFFORTS

To support growing public interest in EVs, outreach activities included digital and in-person outreach. ZEEVIC Member Organizations coordinated outreach activity, when possible, to amplify messaging. Key highlights from 2022 outreach efforts include:

- Returned to in-person outreach throughout Maryland with new event materials.
- Continued improvement on the MarylandEV.org website and user experience.
- Increased digital outreach efforts, including paid social media and geofencing at events.
- Coordinated with other ZEEVIC organizations and supporters to integrate outreach campaigns.



MarylandEV Outreach by the Numbers

- MarylandEV.org received over 41,000 page views in 2022, as of October 31, 2022.
- Paid social media advertising campaigns ran from August – October making 287,000 impressions on Marylanders.
- Geofencing campaigns at all in-person outreach events digitally retargeted audiences with EV ads for a combined reach of 271,000 people.
- MarylandEV Facebook page followers increased by 435 people in 2022.
- Social media content posted to the MarylandEV Facebook and Instagram accounts reached over 27,000 Marylanders with over 175 total posts.
- The combined effort of in-person outreach, digital advertising, and website improvements led to an overall message exposure increase of 74%.

Postcard Handout

Get Energized About Driving!
Make the Switch to Electric

There's never been a better time to choose an EV that's right for your lifestyle. Take the EV Journey to learn about the benefits of EVs in Maryland by scanning the code below.




Scan the code or visit:
MarylandEV.org/Maryland-EV-Journey










Front

EVs offer great incentives for Marylanders

CHEAPER Federal, state, and electric utility incentives mean that you save money when you purchase an EV and/or install charging equipment.	CONVENIENT Save time by charging at home and wake up every day to a full tank! A growing network of over 1,200 Maryland charging stations takes range anxiety out of your travels.	CLEANER EVs produce little to no tailpipe emissions compared to gas-only vehicles. Your charge will also benefit the environment as Maryland electricity continues to get cleaner by shifting to renewable sources.
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 MarylandEV.org

Gas		3.9 gallons x \$5 per gallon		\$19.5 
VS Cost to drive 100 miles*				
Electric		34.7 kWh x \$.14 per kWh		\$4.86 

*Based on Maryland averages 6/22.

Back

Events

The MarylandEV outreach team returned to in-person outreach in 2022 by attending six festival events and reaching key audiences, as seen in Figure 14. Rural and minority Maryland residents were identified as having lower-than-average EV adoption rates. MarylandEV event staff included people fluent in Spanish, French, and American Sign Language (ASL). Events were also geofenced to integrate digital with in-person outreach (discussed later). ZEEVIC Member Organizations also conducted outreach events.

Figure 14: MarylandEV In-Person Outreach Events



Baltimore One Carnival (Baltimore, MD)



People Engaged: 1,200 | Spanish Engagements: 275 | French Engagements: 10

This annual celebration of Caribbean culture is a weekend-long festival of food, music, dancing, and parades. Held within Clifton Park, many visitors from Baltimore and the surrounding counties stopped by to ask questions about EVs. The MarylandEV Outreach team was located along the main entrance to the event allowing us to interact with many interested people. Newly developed postcard handouts, in both English and Spanish, contained a QR code and EV information and were used to reinforce and quickly distribute messaging during interactions with visitors.

Washington County Agricultural Fair and Expo (Boonsboro, MD)



People Engaged: **455**

To ensure maximum visibility, the MarylandEV display booth was updated with a new tent, banners, backdrop, and borders to draw attention and amplify messaging. This event combined the rides and entertainment typical of a carnival, with an exposition of local farming, artists, and food vendors. The MarylandEV Outreach team had a Rivian truck on display that attracted interest from visitors. Visitors commented on the increased number of EVs now available and shared how they felt their needs could now be met with some of the newer models available.

Wicomico County Fair (Salisbury, MD)



People Engaged: **905** | Spanish Engagements: **25**

The Wicomico County Fair is a venue for locals to showcase their animal raising, farming, and cooking skills. Local rodeo competitors had a chance to exhibit their riding and roping skills. The MarylandEV Outreach team had a Mustang Mach E on hand during this event. Delmarva Power provided the EV and collaborated in presenting at the event. Useful branded giveaways were developed to attract visitors to the outreach booth, encourage discussion, and provide something visitors will value that also has the MarylandEV website listed.

Cumberland Historic Heritage Days (Cumberland, MD)



People Engaged: **775** | Spanish Engagements: **50**

The Town of Cumberland hosts this annual event that features historic reenactments of American history. The MarylandEV Outreach team had a Tesla Model Y on display for this event. A Chevy Volt owner and Benjamin Franklin reenactor helped the MarylandEV Outreach team with EV-positive messaging. Visitors commented how much room the EV's had and the technology of the infotainment center.

Maryland Wine Festival (Westminster, MD)



People Engaged: **520** | Spanish Engagements: **35** | ASL Engagements: **1**

The Maryland Wine Festival was a weekend-long event that drew groups of wine enthusiasts to sample the product of local vintners. People arrived ready to picnic, relax, and spend the entire day at the event. Due to this leisurely atmosphere, the outreach staff were able to engage in longer in-depth conversations about EVs. Additionally, one of the staff members provided her Tesla Model Y for display and was able to speak firsthand about the affordability and benefits of EV ownership.

St. Mary's County Fair (Leonardtown, MD)



People Engaged: 305

Concluding MarylandEV's outreach touring for the year, the outreach team attended the St. Mary's County Fair in Southern Maryland, engaging residents within the tri-county area about their unique set of needs. The MarylandEV Outreach team had a staff-owned 2013 PHEV model available for display, impressing many people as the owner attested to the vehicle's low maintenance despite being almost ten years old.

Electric Vehicle Association of Greater DC



The Electric Vehicle Association of Greater Washington DC (EVADC) helped promote EVs to many different audiences at multiple events in the greater Washington region. Events included the Washington DC Auto Show; the state-wide FeBREWary event, a month-long celebration of craft beer brewed in Maryland, along with the Montgomery County Dept of Environmental Protection; several events for Drive Electric Earth Day in April; and various events for National Drive Electric Week in September/October. In partnership with Annapolis Green and Poolesville Green, EVADC displayed member-owned EVs and provided important EV education and consumer information by presenting talks on EVs and climate change; organizing testimony on EV-related legislation; serving on the policy committee for the national Electric Vehicle Association; and by growing the Ask-An-EV-Owner online meeting every week.

Annapolis Green



Annapolis Green, an organization that brings together citizens, businesses, government agencies, and nonprofits to create a healthy, environmentally responsible and thriving community, organized two major EV showcases in 2022 under the “Kick Gas! in Annapolis” brand to educate consumers about the benefits of driving electric. This outreach included large events during Plug in America’s nationwide Drive Electric Earth Day in April and National Drive Electric Week in October. Other outreach events included volunteering to address EV questions at the Washington Auto Show; participating in other organizations’ EV showcases such as Montgomery County, Poolesville, and the State of Maryland’s General Services Administration; and giving talks for One Montgomery, Ignite Annapolis, and the Anne Arundel Public Library system.

Online Presence

MarylandEV maintains an integrated web and social media presence designed to work in coordination with in-person outreach. The MarylandEV.org website serves as a central consumer-facing hub for all things ZEV within the state. All marketing materials, both digital and print, prominently feature this URL to push people to the website to access the latest information and resources.

MARYLANDEV.ORG

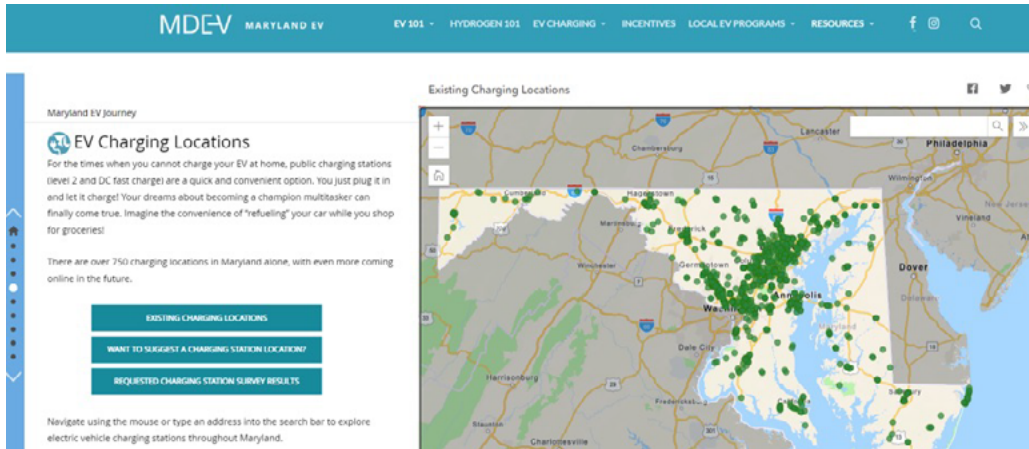
From January 1, 2022 through October 31, 2022, MarylandEV.org received over 41,000 page views, a 33% increase from the 30,000 total views received during the same period in 2021. Through the team’s experience conducting in-person outreach, it became clear that current EV owners make very persuasive arguments about the benefits of owning and driving an EV. To leverage this kind of first-person, personal promotion, a new testimonial collection tool was added to the MarylandEV.org home page to allow Maryland residents to share their EV experience and potentially help influence those that are considering an EV purchase.

These updates along with the continued fine tuning of website language helped improve the search engine optimization, ensuring that MarylandEV.org remained at the top of keyword searches for EVs.



THE MARYLAND EV JOURNEY

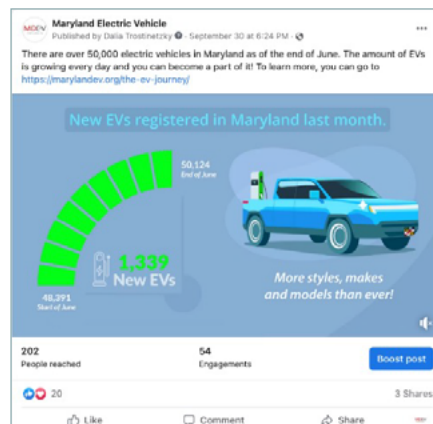
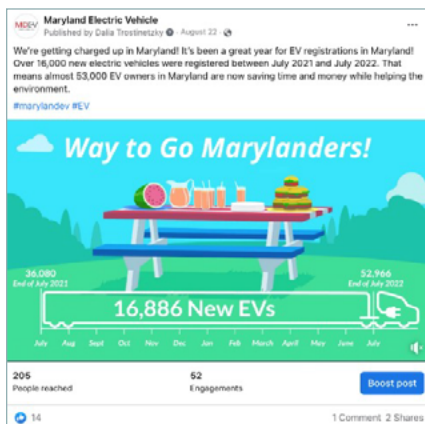
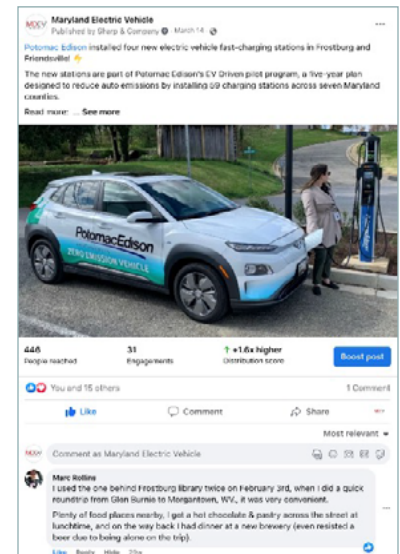
Developed and implemented when the pandemic suspended in-person outreach, this interactive web-based tool takes Marylanders on a journey through EV knowledge and understanding. The team continued to promote the EV Journey tool in 2022 during in-person interactions, on postcards with QR codes that directed users to the MarylandEV Journey site, and through social media channels. This promotion resulted in 2,369 views as of October 31, 2022. Touchscreen tablets will be used at future events to allow staff to scroll through this digital outreach tool as they talk with visitors.



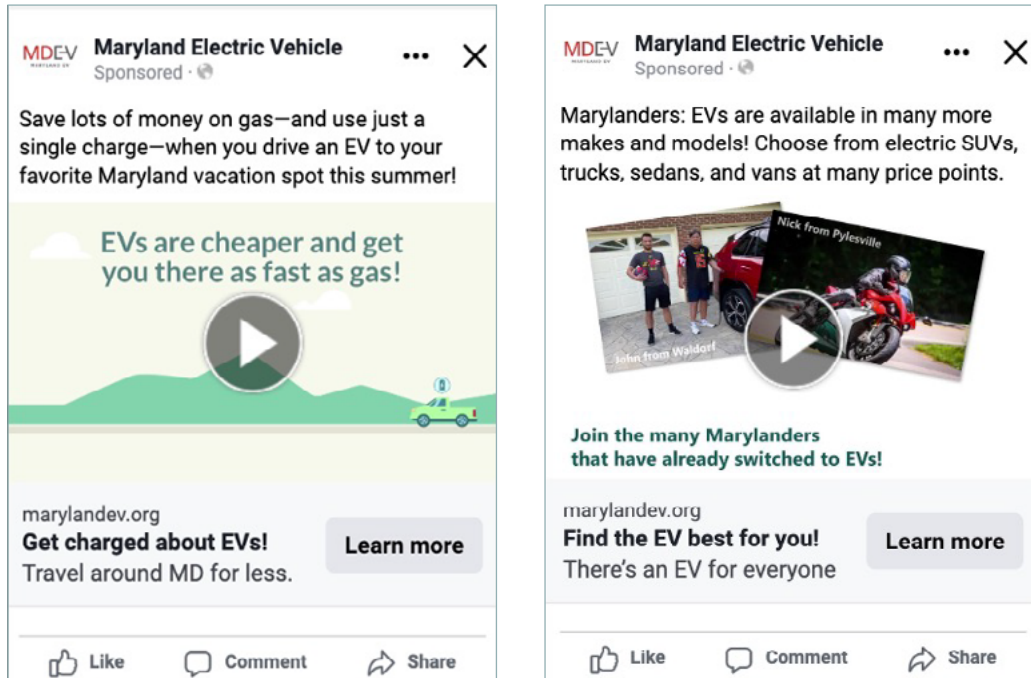
DIGITAL OUTREACH

An important part of digital outreach occurs through digital activity such as social media postings on Facebook and Instagram. The MarylandEV Outreach team posts regular content designed to educate, inform, and interact dynamically with the audience. Posts contain content such as EV news, announcements about upcoming outreach events, Q&A forums, and poll responses. The team's posts, often reaching hundreds of Marylanders, cross-promote events and initiatives from ZEEVIC Member organizations and other partners. This year, the team's efforts resulted in 175 total posts reaching 27,000 people with over 2,000 interactions.

In an ongoing effort to build excitement for the growing number of Maryland EV owners, the MarylandEV Outreach team posts a monthly update of new EV registrations in the state. August of 2022 marked the completion of a full year of providing these monthly updates. We will continue to report on Maryland's progress with a new series of graphics highlighting the number of EV registrations while showing the wide variety of EV makes and models available.



To reach new and larger audiences with messaging, paid social media advertising is a cost-effective method. In the summer and fall of 2022, the MarylandEV Outreach team implemented multiple paid social campaigns on Facebook and Instagram. Leveraging the increased publicity of EVs and the rising cost of gas, the team developed two ads titled “EVs are for Everyone” and “Gas vs. EV” that addressed these topics and combined to reach over 287,000 Marylanders.



After the general awareness outreach campaigns began, a second campaign was launched to build MarylandEV’s Facebook audience. During that campaign, the team saw MarylandEV’s accounts receive 387 new followers. That number continues to grow with increased exposure, and 2,088 people now follow the account as of October 31. This new audience will continue to receive regular weekly content posts and engage with us at no advertising cost.

MarylandEV used geofencing at all six in-person outreach events, successfully reaching over 271,000 people. This location-based digital advertising technique draws digital borders around physical locations, and then tags visitors that enter the digitally defined areas to receive advertisements promoting the MarylandEV.org website.

In an effort to continue using fresh and innovative marketing tactics to ensure that the Maryland EV messaging reaches broad and diverse Maryland audiences, this year the team ran the first YouTube pre-roll ad campaign—the ads that run before the video is played—directing viewers to the MarylandEV website, resulting in 57,000 views and over 55% of viewers watching the ad in its entirety.



Digital Ad Campaign Insights

- Paid social ads on Facebook and Instagram had an extremely high engagement rate of 34% suggesting that the content, graphics, and topics were of interest to people watching. Engagements are the number of times a like, comment, or share is gained on a particular ad. Engagement rate is the rate at which an impression generated an engagement. This campaign quadrupled the industry standard engagement rate of approximately 8%.
- Comparing data year-over-year, campaigns in 2022 were better able to reach users on Instagram compared to 2021. In addition to the platform volume improvements, 14% more women were reached in 2022, specifically within the 30-50 year range.



APPENDIX A - ZEEVIC BACKGROUND

ZEEVIC Composition and Support

ZEEVIC includes a diverse representation of interests, perspectives, and responsibilities, including utilities, state agencies, private enterprise, non-profit ZEV advocates, and public representation. All ZEEVIC meetings are open to the public and time is allotted at every meeting for the ZEEVIC to hear public comments. ZEEVIC has three working groups that provide analysis and recommendations to ZEEVIC for consideration. The working groups are: Communications, Legislative, and State Agency.



ZEEVIC Formation and Requirements

ZEEVIC was originally established as EVIC in 2011. In 2015 the Maryland General Assembly extended EVIC through 2020 and established requirements for the EVIC. The Clean Cars Act of 2019 expanded the scope of EVIC again to include FCEVs, powered by hydrogen. FCEVs were incorporated into all the EVIC requirements, and the EVIC name was changed to the ZEEVIC. In March 2020 the Maryland General Assembly extended ZEEVIC through 2026. The tenure of ZEEVIC is currently authorized through June 2026.

Status of ZEEVIC's 2012 Recommendations

ZEEVIC was responsible for developing an initial report in 2012, resulting in a Statewide Charging Infrastructure Plan, an Action Plan, and 32 recommendations intended to promote widespread PEV adoption. In March 2016, based on advice from the State Agency WG, each recommendation from the Council's 2012 report was assigned to a working group for further investigation and comment. The working groups meet in intervening months to address the matters assigned to them.

Legislative Mandate for ZEEVIC

In 2011, Governor O'Malley signed into law Maryland Senate Bill 176, Chapter 400 Acts of 2011, which established the Electric Vehicle Infrastructure Council (EVIC).

In July 2019, Maryland House Bill 1246 expanded the membership and responsibilities of EVIC to include ZEVs and fuel cell electric vehicles. To reflect the expanded responsibilities of EVIC, it was renamed the Maryland ZEEVIC. In March 2020, Maryland House Bill 232 altered the membership of ZEEVIC and reporting requirements. The following checklist outlines activities ZEEVIC has been legislatively mandated to accomplish.

Legislative Mandate	Legislative Reference
Develop an action plan to facilitate the successful integration of zero emission electric vehicles into the state's transportation network.	HB1246 Ch213 (MD 2019) (g) 1
Assist in developing and coordinating statewide standards for streamlined permitting and installation of residential and commercial [EV] electric vehicle charging and hydrogen refueling stations and supply equipment.	HB1246 Ch213 (MD 2019) (g) 2
Develop a recommendation for a statewide electric vehicle charging and hydrogen refueling infrastructure plan, including placement opportunities for public charging and hydrogen refueling stations.	HB1246 Ch213 (MD 2019) (g) 3
Increase consumer awareness and demand for zero emission electric vehicles through public outreach.	HB1246 Ch213 (MD 2019) (g) 4
Make recommendations regarding monetary and nonmonetary incentives to support zero emission electric vehicle ownership and maximize private sector investment in zero emission electric vehicles.	HB1246 Ch213 (MD 2019) (g) 5
Develop targeted policies to support fleet purchases of zero emission electric vehicles.	HB1246 Ch213 (MD 2019) (g) 6
Develop charging solutions for existing and future multi-dwelling units (MDU)s.	HB1246 Ch213 (MD 2019) (g) 7
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.	HB1246 Ch213 (MD 2019) (g) 8
Encourage local and regional efforts to promote the use of electric vehicles and attract federal funding for State and local [EV] zero emission electric vehicle programs.	HB1246 Ch213 (MD 2019) (g) 9
Recommend policies that support [EV] zero emission electric vehicle charging and hydrogen refueling from clean energy sources.	HB1246 Ch213 (MD 2019) (g) 10
Recommend a method of displaying pricing information at public charging and hydrogen refueling stations.	HB1246 Ch213 (MD 2019) (g) 11
Establish performance measures for meeting [EV-related] zero emission electric vehicle-related employment, infrastructure, and regulatory goals.	HB1246 Ch213 (MD 2019) (g) 12
Pursue other goals and objectives that promote the utilization of zero emission electric vehicles in the state.	HB1246 Ch213 (MD 2019) (g) 13
<p>On or before December 1, [2013] 2020, December 1, [2014] 2021, December 1, [2015] 2022, December 1, [2016] 2023, December 1, [2017] 2024, AND December 1, [2018, and December 1, 2019] 2025, the Council shall submit interim reports of its work and recommendations to the Governor and, in accordance with § [2-1246] 2-1257 of the State Government Article, the General Assembly.</p> <p>On or before June 30, [2020] 2026, the Council shall submit a final report of its work and recommendations to the Governor and, in accordance with § [2-1246] 2-1257 of the State Government Article, the General Assembly.</p> <p>Submit reports by certain dates regarding the progress on the above items.</p>	HB0232 Ch118 (MD 2020) (h) 1-2

APPENDIX B – BEVS AVAILABLE IN MARYLAND IN 2022

































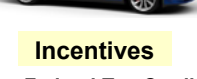
**The Electric Vehicle Association
of Greater Washington DC**
evadc.org/EVInfo

2022



**Electric Vehicle
Information Sheet**
10th Anniversary Edition!



	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	
											
	Chevy Bolt EV	\$25,600	\$25,600 ⁵	259	66	201	6.5	55	120	\$46	
	Chevy Bolt EUV	\$27,200	\$27,200 ⁵	247	66	201	7.0	50	115	\$46	
	Fisker Ocean #	\$37,499	\$37,499	250-350	80*	275-550	3.6-6.9	250*	---	---	
	Ford Mustang Mach-E#	\$46,895	\$39,395 ⁵	224-247	70	266	5.2-5.8	115	93-103	\$54	
	Ext. Range, GT #	\$54,975	\$47,475 ⁵	260-314	91	290-480	3.5-6.1	150	82-101	\$58	
	Hyundai Ioniq Elec.	\$33,245	\$33,245	170	38	134	9.5	75	133	\$42	
	Hyundai Ioniq 5	\$39,950	\$39,950	220	58	167	7.4	230	98-	\$50	
	Long RWD-AWD	\$44,000	\$44,000	256-303	77	225-320	5.2	230	114	\$50	
	Hyundai Kona Elec.	\$34,000	\$34,000	258	64	201	7.9	75*	120	\$46	
	Kia EV6 Light	\$41,400	\$41,400	232	58	167	8.0	230	117	\$46	
	Wind, GT #	\$47,500	\$47,500	274-310	77	225-320	3.5-7.2	230	105-117	\$46	
	Kia Niro EV	\$39,990	\$39,990	239	64	201	7.5	77	112	\$50	
	Mazda MX-30	\$33,470	\$33,470	100	36	143	8.7	50	98	\$58	
	MINI Electric	\$34,225	\$34,225	114	33	181	6.9	50	110	\$50	
	Nissan Ariya #	\$45,950	\$45,950	285-300*	91	238-389	4.8-7.2	130	---	---	
	Nissan LEAF s	\$27,800	\$20,300 ⁵	149	40	147	7.4	50	111	\$50	
	SV Plus	\$35,800	\$28,300 ⁵	226	62	214	6.5	100	108	\$50	
	Subaru Solterra	\$44,995	\$44,995	222*	73	215	6.5	150	102	\$50	
	Toyota bZ4X #	\$42,000	\$42,000	222-252	71-73	201-214	6.7*	150	119	\$46	
	VW ID.4 Std	\$37,495	\$37,495	208*	62	201	7.6	125	112	\$50	
	VW ID.4 Pro#	\$42,495	\$42,495	245-275*	82	201-295	5.4	170	95-101	\$54	
	Average U.S. Gasoline Car		\$48,000						25	\$200	
	Audi Q4 e-tron #	\$53,300	\$53,300	241	82	201	7.9	135	95	\$58	
	Audi e-tron	\$70,800	\$70,800	226	95	300	5.5	150	78	\$71	
	BMW i4 #	\$55,900	\$55,900	300*	84	335-536	<4-5.7	200	96-109	\$50	
	Cadillac Lyriq #	\$62,990	\$62,990 ⁵	312	100	340	< 4	190	89	\$63	
	Genesis GV60	\$58,890	\$58,890	248	77	225-429	---	350	94*	---	
	Genesis Elec. GV70	\$65,000*	\$65,000*	248*	77	429	4.5*	350	---	---	
	Genesis Elec. G80	\$79,825	\$79,825	282	87	365	4.1	350	95*	---	
	Jaguar I-Pace	\$71,300	\$71,300	234	90	394	4.5	50	76	\$71	
	Lexus RZ 450e	\$55,000*	\$55,000*	225*	71	308	5.6	150	---	---	
	Mercedes EQE350#	\$70,000	\$70,000	300*	91	288-402	5.6*	170	97*	\$58*	
	Polestar 2 Single	\$48,400	\$48,400	270	78	228	7.0	150	107	\$50	
	Polestar 2 Dual	\$51,900	\$51,900	249	78	402	4.5	150	89	\$62	
	Tesla Model 3 RWD	\$46,990	\$46,990 ⁵	272	60	283	5.8	170	132	\$42	
	Tesla Model 3 AWD	\$55,990	\$55,990 ⁵	315-358	82	449	3.1-4.2	250	113-131	\$46	
	Tesla Model Y Long	\$65,990	\$65,990 ⁵	314-330	75	283	4.8	250	122	\$46	
	Tesla Model Y Performance	\$69,990	\$69,990 ⁵	303	75	449	3.5	250	111	\$50	
	VinFast VF8 AWD +	\$57,000	\$57,000	250*	83-87	348-402	5.3-5.8	---	---	---	
	Volvo C40 Recharge	\$55,300	\$55,300	226	78	402	4.7	250	87	\$63	
	Volvo XC40 Recharge	\$53,550	\$53,550	223	78	402	4.7	250	87	\$63	

Incentives
Federal Tax Credits
Vehicle: up to \$7500
EVSE: up to \$1000

Federal: New tax credit rules starting 1/1/2023, see Inflation Reduction Act
DC: EV Supply Equipment (EVSE) Tax Credit - 50% of cost up to \$1000
Excise tax exemption. Reduced vehicle registration fee of \$36
Maryland: 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

EVA/DC is providing the following for informational purposes only. We do not endorse or recommend any specific vehicle manufacturer or distributor. Information subject to change.
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Version 20220906

1. Base price before tax incentives, destination.
2. Net price after federal tax credit. State credits may still apply. Consult 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, 12¢ / kWh
* Estimate
+ Multiple battery options available
Multiple drive options, AWD or other
β Future availability announced
\$ Projected to qualify for 2023 fed tax credit



		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	All Electric										
	Audi RS e-tron	\$143,900	\$143,900	232	93	637	3.1	270	81	\$67	Audi
	BMW i7 xDrive60	\$119,300	\$119,300	300*	102	536	4.5	---	---	---	Lucid
	Lucid Air RWD	\$87,400	\$79,990	406	88	480	4.2	300	131	\$42	
	AWD ⁺	\$92,900	\$85,400	471-516	93-118	620-1K	2.5-3.4	300	116	\$42	
	Mercedes EQS sedan	\$102,310	\$102,310	350*	108	329	5.9	200	97	\$58	
	Porsche Taycan	\$86,700	\$86,700	200	79	402	5.1	270	79	\$67	
	4S, Turbo, GT	\$106,500	\$106,500	199-227	93	402-750	2.6-5.1	270	79	\$79	
	Tesla Model S	\$104,990	\$104,990	375-405	100	670	3.1	250	120	\$46	Model S
	Tri-Motor	\$135,990	\$135,990	348-396	100	1020	1.99	250	116	\$46	Model X
Tesla Model X	\$120,990	\$120,990	330-348	100	670	3.8	250	102	\$54		
Tri-Motor	\$138,990	\$138,990	311-333	100	1020	2.5	250	98	\$54		
Tesla Roadster ^{β*}	\$200,000	\$200,000	620	200	---	1.9	350	---	---		
Trucks & Large Vehicles	BMW iX	\$84,100	\$84,100	280-324	112	516-610	3.6-4.4	200	86	63	
	Canoo Lifestyle Van ^β	\$34,750	\$34,750	250*	80	350	---	---	---	---	Canoo
	Ford E-Transit	\$46,295	\$38,795 ⁵	108-126	68	266	---	115	---	---	
	Ford F-150 Pro	\$39,974	\$32,474 ⁵	230	98	426	5.0	150	68-70	\$79	
	XLT ⁺	\$52,974	\$45,474 ⁵	230-320	98-131	563	4.5	150	66-70	\$79	
	GMC Hummer pickup ^β	\$94,650	\$94,650	300*	200	625-830	3.0	350	---	---	Hummer
	GMC Hummer SUV ^β	\$94,650	\$94,650	300*	200	625-830	3.5	350	---	---	
	Mercedes EQS SUV ^{β#}	\$110,000*	\$102,500*	275-300*	108	355-536	---	200	---	---	
	Rivian R1S ⁺⁺	\$78,000	\$70,500 ⁵	260-400*	135	600*	3.0	220*	69	\$79	R1S
	Rivian R1T ⁺⁺	\$73,000	\$65,500 ⁵	260-400*	135	753*	3.0	220*	70	\$79	R1T
Tesla Cybertruck ^{β+Λ}	---	---	250-500	100/200	330-600	2.9-6.5	250	---	---		
Tesla Semi ^{β+Λ}	\$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	25-100	250-1000	134-201	3.5	---	337	\$15*	
	CSC City Slicker	\$2,795	\$2,795	30	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	Harley
	Kollter ES1-S Pro	\$6,995	\$6,995	70	5	16	---	72	mph	max	
	Lightning LS-218 ⁺	\$38,888	\$38,888	100-180	12-20	200	2.2	218	mph	max	
	Vespa Elettrica	\$7,949	\$7,949	62	4	5.4	---	45	mph	max	
	Zero SR/S ⁺	\$20,595	\$20,595	118-172	14-21	110	3.3	124	mph	max	

Coming Soon !

Cars: BMW i5; Chevy Blazer, Equinox; DeLorean; Ford Explorer; Hyundai Ioniq 6; Jeep Wrangler; Kia EV9; Lotus Eletre; Polestar 3; Porsche Macan
Trucks: Atlas XT; Canoo Pickup; Chevy Silverado; GMC Sierra; Lordstown Endurance; 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

240V Home Charging Station

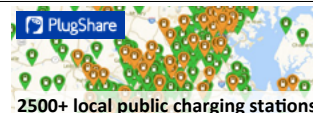


Public Charging

Cost varies, free - 49 ¢ / kWh



240V Public Charging Station



480V DC Fast Charger



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

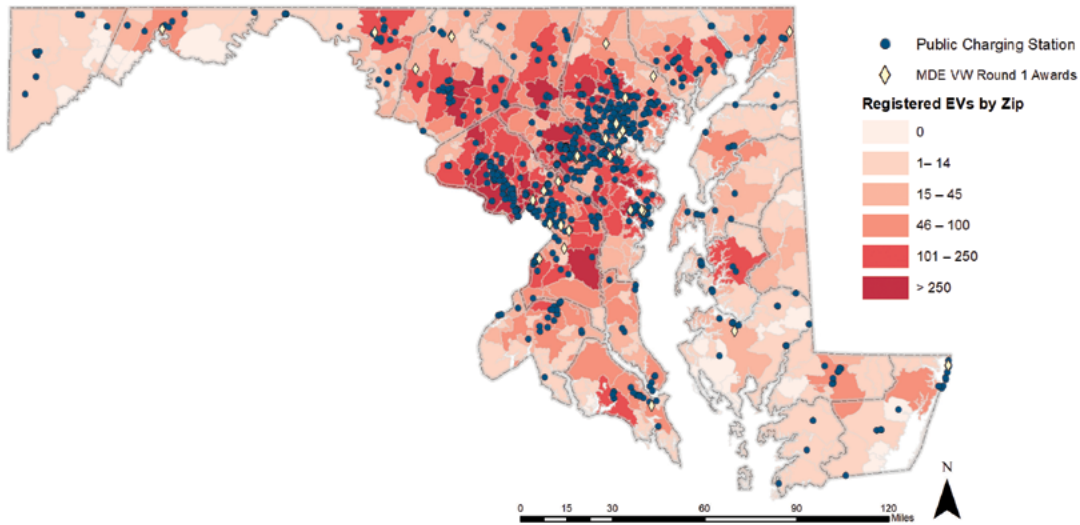
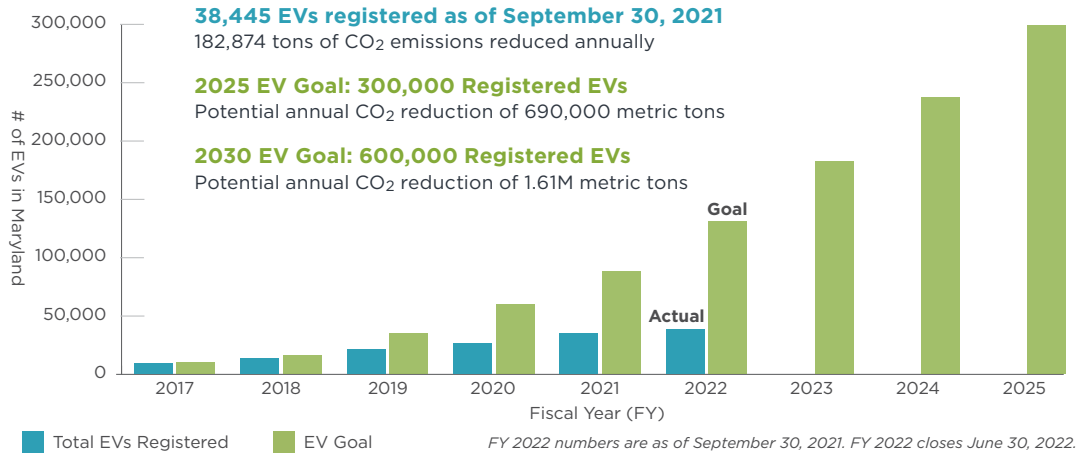
Fast Charge: 480V DC
Reclaim 50-200 miles in 30 minutes

APPENDIX C – LEGISLATIVE HANDOUT (PRESENTED MARCH 2022)

Zero Emission Vehicles (ZEVs) in Maryland



The Maryland Greenhouse Gas Emissions Reduction Act sets a goal of 40% greenhouse gas (GHG) emissions reductions by 2030. Transportation is the single largest GHG emissions generator in Maryland, representing 36% of total GHG emissions. ZEVs play an integral role in helping Maryland meet its emission reduction goal.





Maryland ZEV Policy Scorecard

The ZEV market is rapidly advancing in part due to supportive state policy. Maryland has the opportunity to continue being a leader in ZEV market development but does not have the necessary policies in place. This scorecard outlines policy options that have been adopted across the United States to promote ZEV adoption and ZEV recharging and refueling infrastructure.

State Policies to Support Electric Vehicle (EV) Deployment	Active in Maryland?	States with Active Policy	
Financial Incentives			
Point-Of-Sale Rebates	No	CA, PA	
Rebates for New EVs	No	CA, CO, CT, ME, MN, NJ, NY, OR, VT	
Rebates for Used EVs	No	CA, CT, ME, MN, OR	
Rebates or Grants for EV Infrastructure	Yes	42 States (including DC, DE, PA, and VA)	
Grants for Emissions Reductions Technologies	No	CA, CT, DE , IL, IN, IA, LA, MA, ME, MI, MN, NC, NM, NV, OH, OR, SD, TX, UT, VA , VT, WI, WY	
Tax Credit - EV Purchase	No	* Tax credits expired in 2021 CO, DC , LA, MT	
Tax Credit - EV Infrastructure	No	DC , GA, LA, NY, OK, UT, WA	
Tax Exemption for ZEVs and Infrastructure	No	AZ, CA, DC , MI, NJ, NC, OK, RI, UT, WA	
ZEV Registration Fee Exemption	No	AZ, CT, OR	
Goals			
State ZEV Adoption Goal	Yes	* 300,000 EVs registered by 2025 * 600,000 EVs registered by 2030 CA, CO, CT, MA, MN, NJ, NY, NC, OR, RI, VT, WA	
Greenhouse Gas (GHG) Emission Reduction Target	Yes	* By 2030, 40% emissions reduction from 2006 levels * Greenhouse Gas Reduction Act CA, CO, CT, HI, MA, ME, MN, NV, NJ, NY, OR, RI, VT, VA , WA	
State Fleet Procurement Goal	Yes	* Maryland Green Purchasing CA, CT, IL, MN, NC, NH, OR, TN	
State Infrastructure Deployment Goal	Yes	* DGS is establishing a Statewide EV infrastructure Strategy CA, CO, CT, ME, MA, NJ, NY, OR, RI, VT	
Non-Financial Incentives and Supporting Legislation			
HOV Lane Access	Yes	AZ, CA, GA, HI, NJ, NY, NC, UT, VA	
Reserved Parking on Public Property	Varies	CA, MA, OR, WA	
ZEV Infrastructure Multi-State Collaboration	Yes	* Medium- and Heavy-Duty ZEV MOU * Light-Duty Vehicle 2014 Multi-State Action Plan * Light-Duty Vehicle 2018-2021 Multi-State ZEV Action Plan 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	
ZEV Infrastructure Planning and Coordination	Yes	* Zero Emission Electric Vehicle Infrastructure Council CO, DC , NH, RI	
ZEV Sales Requirements	Light-Duty Vehicles	Yes	* Adopted Title 13 of the California Code of Regulations CA, CO, CT, DC, DE , ME, MA, MN, NJ, NV, NY, OR, PA , RI, VT, VA , WA
	Medium- and Heavy-Duty Vehicles	No	CA
EVSE or EVSE-Wiring Building Code Requirements	Partially	* House Bill 784, 2021, requires builders to provide the option for Level 2 EVSE prewiring CA, MA, NJ, OR, VA , WA	
Direct-to-Public EV Sales	Yes	AK, AZ, CA, CO, DE , FL, HI, ID, IL, MA, ME, MN, MO, MS, NH, OR, RI, TN, UT, VT, WY	
EVSE Electricity Sales Deregulated	Yes	AL, AZ, AK, CA, CO, CT, DE, DC , FL, HI, IA, IL, ID, KS, KY, ME, MA, MN, MO, MT, NV, NH, NJ, NM, NY, NC, ND, OH, OK, OR, PA , RI, SC, TX, UT, VT, WA, WV	
Utility EVSE Programs	Yes	* PC44 EV Pilot Program 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	
Charging Signage Standardization	No	CA, NH, NY, ND, OH, SD, VA , WA	
Right-Of-Way Charging	No	* Testing in Montgomery County	
Streamline ZEV Infrastructure Permitting	No	CA	
Define EVSE Zoning Requirements	No		
Right-To-Charge Requirements	Yes	CA, FL, HI, NJ, NY, VA	



ZEEVIC Purpose and Role



What is ZEEVIC?

ZEEVIC is the Zero Emission Electric Vehicle Infrastructure Council.

Who created ZEEVIC?

The Maryland Legislature created the Electric Vehicle Infrastructure Council (EVIC) in 2011 to address and remove barriers related to plug-in electric vehicle (PEV) adoption in Maryland. In 2019, the membership, responsibilities, and reporting requirements of EVIC were expanded to include zero emission vehicles (ZEVs) and fuel cell electric vehicles (FCEVs). To reflect the expanded responsibilities of the council, EVIC was renamed the Maryland Zero Emission Electric Vehicle Infrastructure Council (ZEEVIC).¹ In 2020, the membership of ZEEVIC was expanded further and the Council's termination date was extended to 2026.²

What does ZEEVIC do?

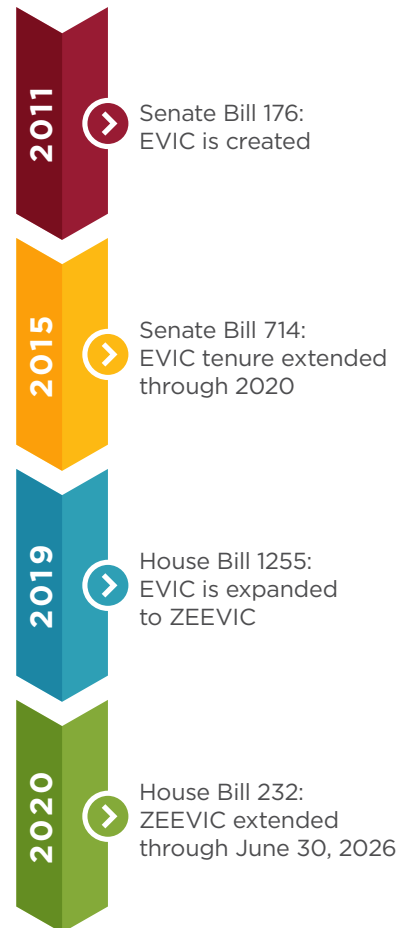
The ZEEVIC is charged with the supporting the development of:

- Policies, recommendations, and incentives that increase awareness of ZEVs, support the ownership of ZEVs, and promote investment by the 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) emissions reductions goals outlined in the Greenhouse Gas Emissions Reduction Act (GGRA). The GGRA sets a goal of

40% GHG emissions reductions by 2030.

Because transportation is the single largest GHG emissions generator in Maryland, representing 36% of total GHG emissions, ZEVs play an integral role in helping Maryland meet the GGRA emissions reduction goal.



¹ Chapter 213, Acts of 2019

² House Bill 232, 2020



END NOTES

- i. [Best, Worst States to Own an Electric Vehicle | LendingTree](#)
- ii. [Where Are Electric Vehicles Most Cost-Effective? \(smartasset.com\)](#)
- iii. [mhdv-zev-mou-20220329.pdf \(nescaum.org\)](#)
- iv. [Multi-State Medium- and Heavy-Duty Zero-Emission Vehicle Action Plan — NESCAUM](#)
- v. <https://montgomerycountymd.gov/climate/Resources/Files/climate/climate-action-plan.pdf>
- vi. <https://www.nasdaq.com/articles/rising-gas-prices-drives-demand-for-electric-vehicles>
- vii. <https://www.protocol.com/climate/electric-vehicle-automaker-goals?rebelltitem=1#rebelltitem1>
- viii. <https://afdc.energy.gov/stations/states>
- ix. <https://www.energy.gov/eere/fuelcells/fuel-cell-animation-text-version>
- x. https://afdc.energy.gov/vehicles/fuel_cell_availability.html
- xi. [https://hepgis.fhwa.dot.gov/fhwagis/ViewMap.aspx?map=Highway+Information|Hydrogen+\(HY-Round+1,2,3,4,5+and+6\)#](https://hepgis.fhwa.dot.gov/fhwagis/ViewMap.aspx?map=Highway+Information|Hydrogen+(HY-Round+1,2,3,4,5+and+6)#)
- xii. <https://www.consumerreports.org/hybrids-evs/interest-in-electric-vehicles-and-low-carbon-fuels-survey-a8457332578/>
- xiii. <https://news.maryland.gov/mea/2022/06/15/mea-awards-nearly-4-million-in-clean-fuels-incentive-program-grants/>
- xiv. <https://mde.maryland.gov/programs/air/MobileSources/SiteAssets/Pages/MarylandVolkswagenMitigation-Plan/Electric%20Corridors%20Grant%20Program%20Framework%20Round%202.pdf>
- xv. <https://mde.maryland.gov/programs/air/MobileSources/SiteAssets/Pages/MarylandVolkswagenMitigation-Plan/Charge%20Ahead%20Grant%20Program%20Framework%20Round%202.pdf>
- xvi. <https://www.psc.state.md.us/transforming-marylands-electric-grid-pc44/>
- xvii. The pilot utilities include Potomac Edison, BGE, PHI, and SMECO.
- xviii. All filings for the PC44 EV Pilot can be found under Case Number 9478. <https://www.psc.state.md.us/search-results/?q=9478&x>