BEFORE THE
MARYLAND PUBLIC SERVICE COMMISSION

In The Matter of the Petition of the Electric Vehicle Work Group for Implementation of a Statewide Electric Vehicle Portfolio	* * * * *	Case No. 9478

COMMENTS OF THE MARYLAND OFFICE OF PEOPLE'S COUNSEL ON THE SEMI-ANNUAL AND FINAL EV PILOT REPORTS

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1. Introduction

The Office of People's Counsel submits these comments on the semi-annual progress reports and Final Electric Vehicle (EV) Pilot reports regarding the implementation of the utilities' approved electric vehicle (EV) charging program offerings ("pilots") in accordance with Commission Order No. 88997.[1] These comments have been prepared with the assistance of Synapse Energy Economics, Inc.

The purpose of these comments is to provide an evaluation of Phase I EV pilot programs, including program design and cost recovery, and to provide recommendations on the utilities' appropriate role within the EV sector going forward. Our comments provide an overview of the original objectives of the Phase I EV pilot programs, key procedural history, and market trends and policy developments since the pilots were approved. We then analyze the pilot results and share our primary findings and recommendations.

Based on an analysis of market trends and utility Phase I pilot programs, OPC presents the following findings and recommendations for the Commission's consideration:

- The EV market has advanced considerably in Maryland and nationwide since the pilots were approved in 2019. EV adoption, public charging access, the number of EV models, and battery range have significantly increased. Given these developments and the availability of federal and state subsidies, utility customer subsidies are no longer needed or appropriate for some sectors—such as single-family homes.

- Utilities have sole responsibility for several transportation electrification areas that are critical for cost-effective EV adoption, most notably interconnection (including utility-side make-ready) and load management. As monopolies, utilities should prioritize these areas where they have sole responsibility, rather than activities that interfere in competitive markets. Currently, enrollment in time-of use (TOU) rates is low, and OPC is unaware of any holistic assessment of how to properly manage the load of thousands or millions of EVs in Maryland.

- With respect to utility customer costs, the utility pilots are not operating in customers' interests: Costs are too high relative to EV charging station utilization and revenues are too low. Any future role for utility support of the EV charging market must minimize costs and maximize benefits of utility programs to a much greater extent than has been achieved in the utility's pilots.

[1] The utilities with EV charging programs include Potomac Edison Company (PE), Baltimore Gas and Electric Company (BGE), Delmarva Power & Light Company (DPL), Potomac Electric Power Company (Pepco), and Southern Maryland Electric Cooperative, Inc. (SMECO).

- Current cost recovery mechanisms that allow for the capitalization of non-traditional capital expenditures through regulatory asset treatment are not in the interest of utility customers. Such mechanisms serve to further widen the gulf between costs and benefits over time. Costs that are not traditional capital expenditures—including utility program administration costs and financial incentives to support customer-side of the meter investments—should be expensed.

- Notwithstanding the concerns stated above, it is likely that residents at multi-unit dwellings (MUD) will continue to be underserved by building owner efforts to install EV charging infrastructure, and therefore would benefit from continuing utility involvement in the development of such infrastructure. But the utilities' current programs for residents of multi-unit dwellings (MUD) require new or modified program structures to be in customers' interests. OPC recommends, for example, that the Commission:

    - require utilities to implement cost-minimization solutions that limit necessary customer-side and utility-side upgrades through the deployment of power-sharing software and lower-level charging options, including widespread Level 1 charging that can be used overnight;

    - survey MUD site residents before providing customer subsidies to gather additional information concerning potential EV adoption at specific sites that should help maximize the benefits of these programs; and

    - provide load management options for MUDs and other utility programs, including but not limited to TOU rates.

- Going forward, the Commission should require data collection and analysis of utility EV programs that includes additional elements, including an assessment of realized incremental EV adoption due to program implementation and the resulting incremental load, cost to serve incremental load, emissions benefits of programs, and peak charging behavior.

2. Phase I EV Pilot background and objectives

In September, 2016, the Commission initiated a public conference (PC44) to commence "a targeted review to ensure that electric distribution systems in Maryland are customer-centered, affordable, reliable and environmentally sustainable."[2] Following a comment period and a public hearing, the Commission established a PC 44 Electric Vehicle Work Group (EV Work Group) to address EV adoption-related issues, acknowledging both expectations that EV adoption would grow over the next decade and that Maryland had a

2 Maillog #199669, Notice of Public Conference, at 1 (Sept. 26, 2016)

goal for greater EV adoption.[3] The Commission tasked the EV Work Group to consider the following actions:

- Expansion of EV tariffs across utility territories;
- Providing for retail choice for customers with EVs in all utility territories;
- Additional rate structures for customers with EVs, including EV-only time-varying rates;
- Planning a limited utility infrastructure investment in EV supply equipment (EVSE), including working with private industry and identifying locations where it is difficult to attract private capital for EVSE investment;
- Developing for the Commission, in partnership with other state agencies and in consultation with the electric utilities, a strategy to address grid-related costs associated with vehicle fleet electrification;
- Considering unique tariffs for corporate fleets and workplace & commercial EVSE; and
- Partnering with Maryland Department of Transportation and the auto industry to promote the cost savings and other benefits of EV rate structures.[4]

On January 2, 2018, the leader of the PC44 EV Work Group, along with BGE, DPL, Pepco, Potomac Edison, and non-utility signatories,[5] filed a *Petition for Implementation of a Statewide Electric Vehicle Portfolio* (petition).[6] The petition proposed a suite of EV programs across five sub-portfolio levels: residential, non-residential, public, innovation, and technology. The stated goals of the petition were to (1) alleviate EV range anxiety, (2) help customers understand and manage their charging load, (3) increase interest and investment in smart charging at multifamily properties, as well as workplace and fleet charging, (4) provide information regarding EV charging behavior to facilitate the development of future TOU rates, managed charging, and other EV programs, and (5) evaluate grid impacts to

[3] Maillog #212176, PC44 Notice at 7 (Jan. 31, 2017). At the time, Maryland had a goal of 60,000 zero-emission vehicles (ZEVs) on the road by 2020 and 300,000 by 2025.

[4] ML#212176: Public Service Commission of Maryland Public Conference 44 Notice (Jan. 31, 2017) at 9.

[5] ChargePoint, Greenlots, Natural Resources Defense Council, Sierra Club, Chesapeake Climate Action Network (CCAN), Institute for Energy and Environmental Research, Marylanders for Energy Democracy and Affordability, Pace Energy and Climate Center, Solar United Neighbors of Maryland, and Nuclear Information and Resource Service.

[6] Petition for Implementation of a Statewide Electric Vehicle Portfolio ("Petition"), ML# 218613 (CN 9478, Jan 2, 2018)

determine opportunities for integrating additional technology, as well as to maximize economic and technical benefits of EV charging infrastructure.[7]

On January 14, 2019, the Commission approved the EV pilot programs in part and articulated three specific objectives for the pilot: (1) to address barriers to deployment of EVs, (2) to increase the efficiency and reliability of the electric distribution system, and (3) to lower electricity use at times of high demand. As approved, the pilots included incentives and rates to support residential and commercial EV charging infrastructure, utility-owned-and-operated public charging stations, and evaluation requirements for the utilities' pilots. The Commission directed the utilities to file semi-annual reports on their pilot programs, to be reviewed at administrative meetings, along with a mid-course pilot evaluation report by September 15, 2021, and a final program evaluation report by March 1, 2024. The Commission directed a mid-course program review to be held in October or November, 2021, and a final program review at a legislative-style hearing in May, 2024.[8] The Commission stated that the pilot will "provide valuable insight into Maryland's trajectory toward achieving its zero emission vehicle (ZEV) and climate goals as well as 'lessons learned' to help the Commission and stakeholders evaluate grid impacts, technology capabilities, and load management strategies to determine the appropriate next steps for implementing an efficient and reliable charging network in Maryland."[9]

Pursuant to the Commission's evaluation requirements for the pilots, the utilities contracted with Guidehouse to help aggregate and analyze pilot data and prepare mid-course and final evaluation reports. On September 15, 2021, the pilot utilities filed Guidehouse's mid-course report.[10] On March 1, the pilot utilities filed Guidehouse's final report ("Guidehouse Report") with presentation of aggregated charging profiles, revenues, utilization, and other statistics for utility pilots through the end of 2023.[11]

3. Overview of Phase I EV Pilot Programs

The utilities'[12] approved Phase I EV pilot programs, as implemented between July 1, 2019 and December 31, 2023, can be grouped into the following five categories:

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[7] Petition at 28-29.

[8] Case No. 9478, Order No. 88997, ML# 223588 (Jan. 14, 2019).

[9] Order No. 88997 at 80-81.

[10] Guidehouse Inc., *Maryland Statewide Electric Vehicle Portfolio Evaluation: Mid-Course Evaluation Report*, September 15, 2021 ("Guidehouse Report"), ML# 237041.

[11] Guidehouse Inc., *Maryland Statewide Electric Vehicle Portfolio Evaluation: Final Evaluation Report,* February 16, 2024 ("Guidehouse Report"), ML#307936

[12] *See* BGE, Electric Vehicle Charging Program Semi-Annual Progress Report of Baltimore Gas and Electric Company, Case No. 9478, March 1, 2024, PHI, Final Program and Semi-Annual Progress Report of Delmarva Power & Light Company and Potomac Electric Power Company Regarding

- **Residential Charger Rebates:** All utilities offered rebates or incentives for residential charging equipment; BGE, PHI, and PE offered customers $300 per charger for "smart" Level 2 (L2) chargers that could provide metrology functions—and so avoid the need for customers to have second meters to record charging data and allow charging managed by third parties. Upon exhausting approved charger rebate funds, BGE and PHI offered customers a $50 annual incentive to share charging data. SMECO offered a $50 incentive for customers to share charging data.

- **Multifamily Dwelling Charger (MUD) Rebates:** All utilities offered EV charging programs for customers in multifamily dwellings. Customers of BGE, PHI, and PE were eligible to receive a rebate for purchasing and installing their own EVSE. BGE and PE additionally offered multifamily customers the option for utility-owned and -installed charging stations. SMECO did not provide rebates for customer-owned EVSE, but like BGE and PE, SMECO offered utility-owned and operated charging stations for multifamily customers.

- **Time-Varying Rates:** All utilities offered some form of residential EV time-varying rate. PHI offered three voluntary TOU rates for customers with EVs: an EV-only TOU rate, a whole-house TOU rate, and off-peak credit program for customers who charged their vehicles during off-peak hours. PHI offered a whole house EV TOU rate, an EV-only TOU rate, and an off peak off bill credit program. PE offered an off peak off bill credit program, which was replaced by EV Only TOU in May 2023. BGE and SMECO offered voluntary EV-only TOU rates. In addition, BGE, PHI, and SMECO offered managed charging programs.

- **Workplace and Fleets:** BGE and PHI offered EVSE incentives for workplaces and commercial fleets. Both utilities offered rebates for EVSE purchase and installation up to $5,000 per L2 port and up to $15,000 per Direct Current Fast Charging (DCFC) port. BGE and PHI formerly offered a demand charge credit program to commercial customers, which ended in 2023. SMECO and PE had no workplace or fleet offerings.

- **Public Charging Stations:** All four utilities were authorized to own and operate public L2 and DCFC charging stations, installed on government-owned or leased property. When the pilot program was approved in 2019, the utilities were expected to complete construction of their public chargers by the end of 2023. The buildout was delayed due to the COVID-19 pandemic and supply chain issues, however, and the Commission extended the deadline for

Implementation of Approved Electric Vehicle Charging Program Offerings, Case No. 9478, March 1, 2024; PE, Replacement and Additional Attachments to the Potomac Edison Company Third and Fourth Quarter Semi-Annual Progress Report, Case no. 9478, March 12, 2024; SMECO, Southern Maryland Electric Cooperative, Inc. Combined Semi-Annual Progress and Final Electric Vehicle Program Report, Case No. 9478, March 1, 2024.

the buildout through the end of 2024 for PE,[13] the end of 2025 for PHI, BGE, and SMECO.[14]

As summarized in Table 1 below, from January 2019 to December 2023, the pilot utilities spent $51 million on Phase I pilot programs, about 72 percent of the pilot's $77.7 million total budget approved in 2019.

Table 1. Budget and incurred program costs through December 31, 2023

Utility	Budget	Incurred through 2023 ($)	Incurred through 2023 (%)	Remaining ($)	Remaining (%)
BGE	$33,666,074	$25,405,789	75%	$8,260,286	25%
PE	$8,356,325	$6,554,586	78%	$1,801,739	22%
PHI	$30,027,722	$17,443,033	58%	$12,584,689	42%
SMECO	$5,620,197	$1,671,687	30%	$3,948,510	70%
Total	**$77,670,318**	**$51,075,094**	**66%**	**$26,595,224**	**34%**

Notes: Delmarva Power and Potomac Electric Power Co are collectively referred to as PHI. Source: CN9478_OPCDR10-01_Attachment 1; PE Final Report Attachment A; SMECO Appendix B to Final Report; PHI Appendix A to Final Report, MD 9478 OPC DR 2-1 Attachment. There is a discrepancy for the incurred costs through 2023 amounts for BGE between the utility's filing (Appendix B) compared with its data request response (shown in the table). For PE there is a discrepancy between the utility's filing and a data request response (OPC 8-6, Attachment A) for the budget amounts (the filing amount is shown in the table).

Phase I program participation rates

Participation rates have varied across each program and utility but certain trends are evident. As shown in For readability, PE's "off-bill credit" program and PHI's "off peak off bill" program are referred to collectively as "off peak credit." Source: Guidehouse Report Table ES-2 and Table A-25, provided in response to OPC Discovery Request 01-01, Attachment 1.

and Figure 1, Guidehouse summarized the enrollment rates for the pilot by investor-owned utility.[15]

[13] Case No. 9478, Letter Order, ML #305534 (October 11, 2023)

[14] Case No. 9478, Letter Order, ML #301131 (March 15, 2023) for PHI and Letter Order, ML # 241730 (September 14, 2022) for BGE, and Letter Order, ML # 301119 (March 15, 2023) for SMECO.

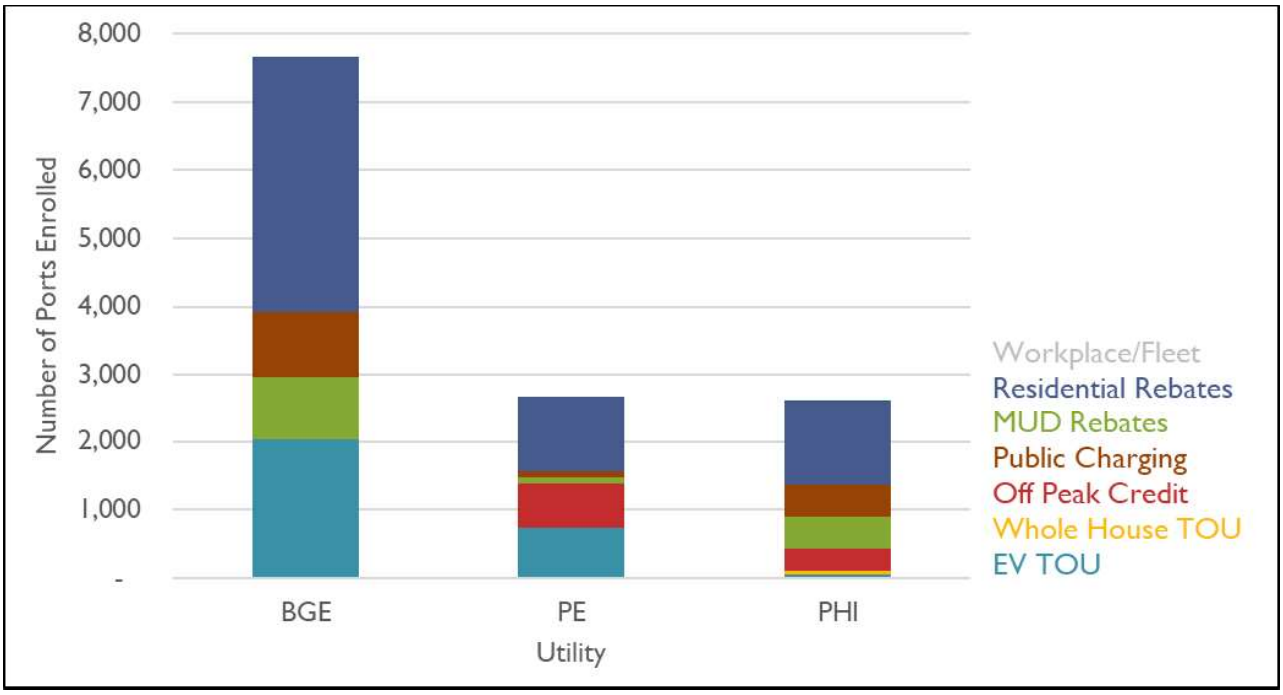
[15] *See* Guidehouse Report at Table 2-1. Guidehouse evaluated all EVSE ports that participated in or were supported by utility programs; ports that participated in more than one program were counted in each program. E.g., if a BGE residential customer both received a rebate for an L2 charger and enrolled in BGE's TOU rate, the customer's charger port was counted in both the company's residential rebate program and its EV TOU program. MD Utilities Response to Staff DR 1-1.

Table 2. Number of ports in each utility's Phase I EV pilot programs

	BGE	PE	PHI	SMECO
Workplace/Fleet Rebates	*No data*	*Not offered*	5	*Not offered*
Residential Charger Rebates	3,753	1,122	1,242	*No data*
MUD Charger Rebates	207	11	86	*No data*
Public Charging	942	93	462	91
Off-Peak Credit	*Not offered*	647	337	*Not offered*
Whole House TOU	*Not offered*	*Not offered*	55	*Not offered*
EV-only TOU	2,037	731	41	*No data*

Source: Guidehouse Report Table ES-2 and Table A-25 provided in response to OPC Discovery Request 01-01, Attachment 1.

Figure 1. Enrollment for Phase I EV pilot programs, by investor-owned utility, by number of ports enrolled



For readability, PE's "off-bill credit" program and PHI's "off peak off bill" program are referred to collectively as "off peak credit". BGE offered a workplace/fleet program but no program data was analyzed by Guidehouse.. Source: Guidehouse Report Table ES-2 and Table A-25 provided in response to OPC Discovery Request 01-01, Attachment 1.

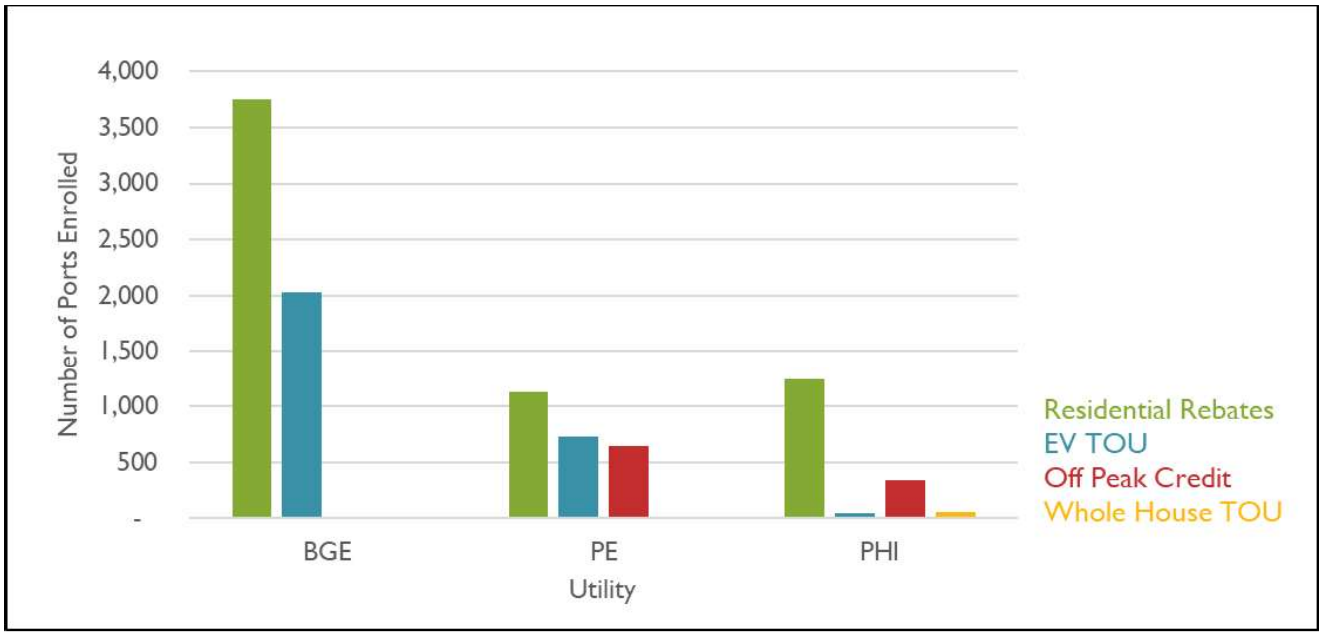
There was limited participation in workplace charging programs. PHI's workplace charging program launched in July 2022[16] and as of December, 2023, port enrollment was less than 1 percent of total PHI ports included in the Guidehouse evaluation. While BGE offered a workplace/fleet program during Phase I, Guidehouse indicated data was not available for this program.[17] Due to the fact that SMECO's residential rebate, EV Only TOU rate, and MUD programs were either still in the ramp-up phase, had no participants, or did not have charging data in time for the evaluation, Guidehouse did not include these offerings in its report. Only SMECO's public charging station data is included.[18]

Figure 2 illustrates the number of ports enrolled for residential programs only (i.e., it excludes public chargers and rebates for MUDs, workplaces and fleets, and public charging). Customer adoption of time-varying rates—including EV-only and whole-house TOU rates and off-peak bill credits—is noticeably lower than the number of customers who received

[18] Guidehouse Report at Table ES-2.
[18] Guidehouse Report at Table ES-2.
[18] Guidehouse Report at Table ES-2.

residential rebates. For example, as shown in Figure 2 for BGE, approximately half the number of customers that received residential charger rebates enrolled in the company's TOU rate. PHI offers more programs than BGE and PE to encourage off-peak charging, but participation in these three programs is only a third of the participation rate of PHI's residential charger rebate).[19] Of the utilities, PE has the highest participation rate of time-varying rates relative to residential charger rebates.

Figure 2. Number of ports enrolled by utility for all residential programs (residential charger rebates, TOU rates and off-peak credit programs)



For readability, PE's "off-bill credit" program and PHI's "off peak off bill" program are referred to collectively as "off peak credit." Source: Guidehouse Report Table ES-2 and Table A-25, provided in response to OPC Discovery Request 01-01, Attachment 1.

4. Evaluation of EV Pilot Programs

The Commission intended the Phase I EV pilot programs to support Maryland's EV and climate goals through greater EV adoption. The pilot had three specific objectives: to address barriers to deployment of EVs, increase the efficiency and reliability of the electric distribution system, and lower electricity use at times of high demand.[20] To the extent that EV programs achieve those objectives there are two primary benefits for ratepayers.

[19] PHI's EV Only program and its Off Peak Off Bill program both have enrollment limits, but neither was fully subscribed by the end of 2023; the Whole House TOU rate does not have an enrollment limit, but it still has very low subscription levels throughout Phase I.
[20] Order No. 88997 at 7; *Guidehouse Final Evaluation* report at 1.

1. *Financial benefits*. If the additional revenues from EV charging are greater than the cost to serve EV load and fund the utility programs, EV load can create "downward pressure on rates,"[21] benefitting all ratepayers by spreading the fixed costs of electricity service over a greater volume of sales. Costs to serve EV load can be minimized by ensuring that charging is shifted off-peak when the cost to generate and deliver energy is generally lower.

2. *Societal benefits.* EV adoption decreases greenhouse gas (GHG) emissions and local air pollutants by displacing emissions from internal combustion engine (ICE) vehicles. EVs have zero tailpipe emissions.

The Guidehouse Report provides a useful summary and compilation of data for the Commission's consideration, but it does not provide insight into whether utilities have deployed EV charging equipment "in a manner that will help the State meet its EV adoption and GHG reduction goals."[22] We highlight four key areas where analysis has not been performed that would give a more comprehensive and more accurate understanding of the benefits, costs, and overall impact of the utility EV programs consistent with the goals of these pilot programs.

OPC recommends that the Commission consider the four areas highlighted below to supplement third-party evaluation should utility EV programs continue.

First, it is not known—and it has not been assessed—whether customers participating in the pilots would have invested in EVSE or purchased an EV absent the utility EV pilots. This is commonly referred to as "free ridership." Free ridership refers to situations whereby participants in a program would have adopted an EV or invested in charging infrastructure even without the existence of the program or incentive.[23] An evaluation of free ridership was

[21] This is true for both supply and distribution rate components. "Downward pressure on rates" does not mean that rates would necessarily decrease in absolute terms, but that they would be lower than they otherwise would be, controlling for all of the other factors that influence rates. See Synapse Energy Economics, *EVs Are Driving Rates Down,* https://www.synapse-energy.com/evs-are-driving-rates-down#:~:text=The%20results%20of%20our%20analysis,the%20Natural%20Resources%20Defense%20Council.

[22] Order No. 88997, p. 13.

[23] The impact of free ridership is a standard part of energy efficiency evaluations. Utility energy efficiency programs undergo independent third-party evaluations to determine a net-to-gross ratio that measures the portion of participation that would not have occurred but for the program. Evaluators apply this ratio to energy savings to determine what portion of those savings can be directly attributable to the utility program, often referred to as net savings.

outside the scope of the Phase I evaluation and therefore The Guidehouse Report treats *all* load recorded as load that was caused by the programs. [24]

However, given the fact that other jurisdictions have found high levels of free ridership, it is unlikely that 100 percent of the incremental EV adoption or load induced by utility programs is directly attributable to the utility pilot incentives..[25] Consumers adopt EVs for a number of reasons which may or may not be related to utility programs.[26] Therefore, certain benefits like additional revenues from utility programs presented in the Guidehouse Report and these comments should be seen as a maximum or estimate.

Second, the cost to serve this incremental load (energy, capacity, transmission and distribution, etc.) has not been assessed by Guidehouse, giving an incomplete picture of the total cost to ratepayers. Guidehouse's analysis primarily consists of a summary of program expenditures on utility programs.

Third, the emissions benefits of programs have not been calculated. These were included in utility benefit-cost analyses, in part, to justify program expenditures, but they have been excluded in the programs' evaluation.

Fourth, while some data was analyzed to evaluate load-shifting behavior throughout the year, grid impacts from EV charging were not assessed holistically; distribution infrastructure upgrade costs due to EV load was not assessed, nor was the amount of charging that occurred on the utilities' respective system peaks, a major driver of ratepayer costs particularly as this can affect capacity requirements. More broadly, avoided costs from load shifting behavior were not calculated and compared with program implementation costs.

See Maryland Statewide Electric Vehicle Portfolio Evaluation: Final Evaluation Report ("Guidehouse Report" or "Guidehouse"), February 16, 2024, p. 30. Guidehouse states: "For Residential Rebate Programs, Guidehouse used charging data from the EVSE, or from Weavegrid for Tesla, Toyota, Lexus, Kia and Hyundai EVs, to calculate energy and demand impacts directly."

A study examining the cost-effectiveness of the Massachusetts Offers Rebates for Electric Vehicles ("MOR-EV") program found high free ridership levels for customers receiving the MOR-EV rebate. The study determined an average free ridership rate of 57 percent for program years 2014 to 2020. See: *Massachusetts Offers Rebates for Electric Vehicles (MOR-EV) Cost-Effectiveness Study. 2022.* Prepared for the Massachusetts Department of Energy Resources. At 16. Available at: https://www.synapse-energy.com/sites/default/files/MOR-EV%20Cost%20Effectiveness%20Study%20FINAL%2002-25-2022.pdf.

[26] National Renewable Energy Laboratory (NREL), January 2016, *Consumer Views on Plug-in Electric Vehicles,* https://www.nrel.gov/docs/fy16osti/65279.pdf, pp. 15-16. Consumers cite environmental benefits of EVs, saving money on fuel costs, national energy security, and performance and technology aspects of EVs, as reasons for considering an EV purchase.

Noting these limitations in data availability, OPC has utilized the data and analysis provided and summarized by Guidehouse, discovery responses, and external sources to provide relevant context for evaluation of Phase I EV pilot programs.

a. Utilization of charging stations and ports

Utilization is the assessment of how much or how little charging stations or ports supported by utility programs are used to charge EVs. This is an important metric because it is likely to be the most correlated with direct benefits to ratepayers (financial and societal). The more a station is used, reflecting higher amounts of EV charging, the higher the amount of EV miles that are driven as a result of the utility program (at least in part). A higher utilization rate indicates that a site or port is used more often and provides more revenues, all else equal.

The Guidehouse Report calculates two types of utilization: charging time at each port,[27] and energy consumed at each port.[28] While both metrics can provide useful information, the most straightforward and applicable metric for assessing the success of utility programs is energy utilization. Time metrics may be affected by various sites' operational hours – making comparisons of utilization among ports potentially misleading across sites and utilities. Further, time-based utilization metrics are agnostic as to the actual *amount* of charging that occurs, which is more important than the number of minutes a port is in use.[29] Specifically, energy delivered is critical from an evaluation standpoint, since kilowatt hours (kWhs) directly translate into utility impacts (revenues, as well as incremental costs to serve the energy and demand).

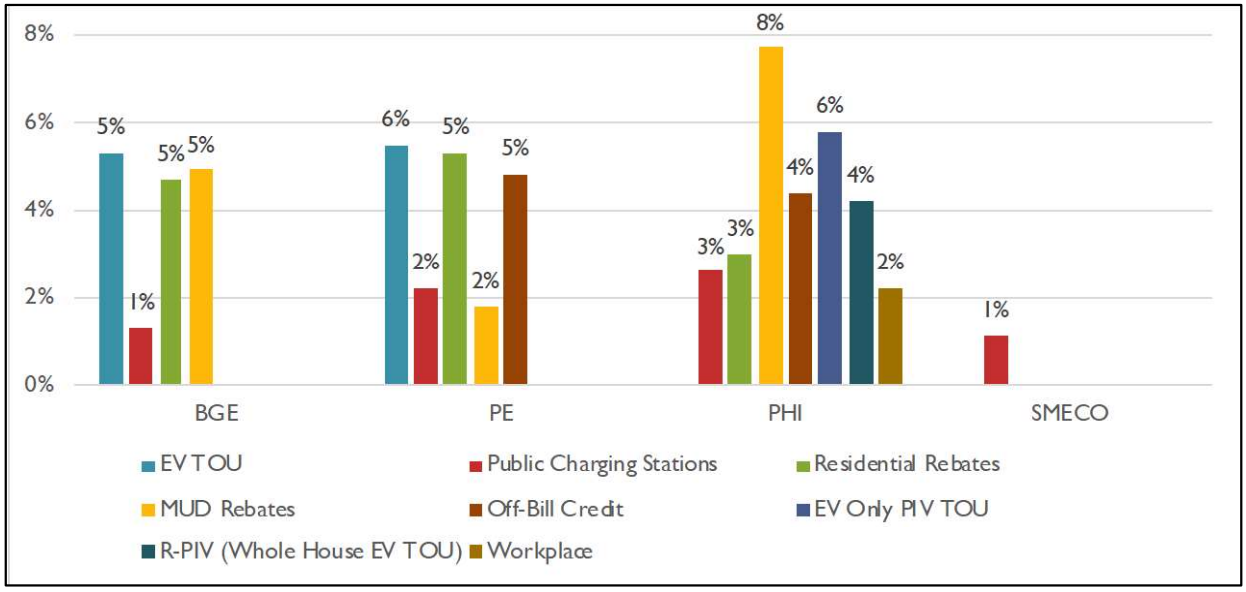
Utilization by utility and program are summarized below, in Figure 3. Several residential programs supporting MUDs and TOU rates have relatively high utilization. However, utility-owned public charging stations achieved very low utilization levels across all utilities: BGE and SMECO achieved just 1 percent utilization, PE just 2 percent, and PHI 3 percent for public charging station programs. Low utilization is of particular concern, given that public chargers have the highest levels of expenditure (as described in the following section).

[27] Guidehouse Report, p. 18, states "This metric is computed by summing the total time spent charging across all ports and dividing by the total number of port-hours active during that same time period."

[28] Guidehouse Report, p. 18, states "this KPI represents the percentage of total possible energy delivered. This metric is computed by summing the total energy delivered divided by the maximum possible energy delivered during that same time period. Maximum possible energy delivered is defined as the product of the charger's rated capacity and the number of hours the port was active. Because rated capacity was not readily available, the 90% percentile of session's max charging rates for a given port was used as its charging capacity".

[29] For example, a vehicle that charges at a 100 kW charger for half an hour receives 50kWh, while a vehicle that charges at a 10kW charger for an hour receives 10kWh. In this example, the 10kW charger would have higher utilization by time, but would have deliver significantly less electricity (and thus e-miles).

Figure 3. Utilization rates of charging infrastructure



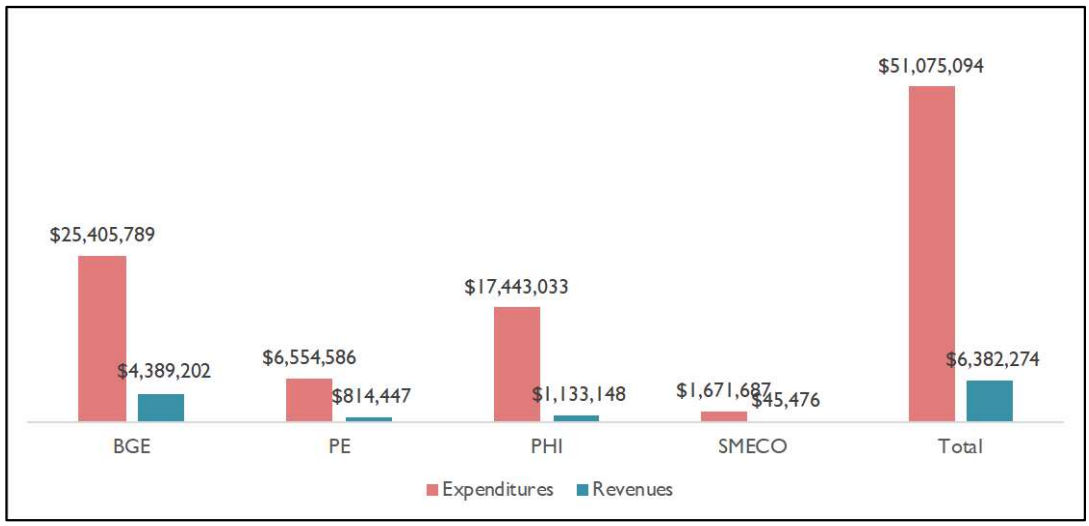
Source: Guidehouse Report, Table A-35; underlying data provided in Joint Utilities' response to OPC DR 01-01, Attachment 1.

b. Revenues and expenditures

As summarized in Figure 4, through the end of year 2023, utilities have spent just over $51 million on EV charging and infrastructure programs. By comparison, the programs have brought in just over $6.4 million in revenues from EV charging over the same period, *not* accounting for the incremental cost of energy and capacity to provide the electricity to serve this load. Guidehouse estimates revenues of utility programs by multiplying hourly load data by the rates in the utility's applicable tariff.[30]

[30] Guidehouse Report at 73.

Figure 4. Program expenditures and revenues through 2023 ($)



Source: Revenue data is from Guidehouse Report, provided in Response of Joint Utilities to OPC DR01-01, Attachment 1, tab "Total Revenue." Cost data is from final report filings and related discovery responses: BGE Appendix B of Final Report, CN9478_OPCDR10-01_Attachment 1; PE Final Report Attachment A, OPC 8-6 Attachment A; SMECO Appendix B to Final Report; PHI Appendix A to Final Report, MD 9478 OPC DR 2-1 Attachment.

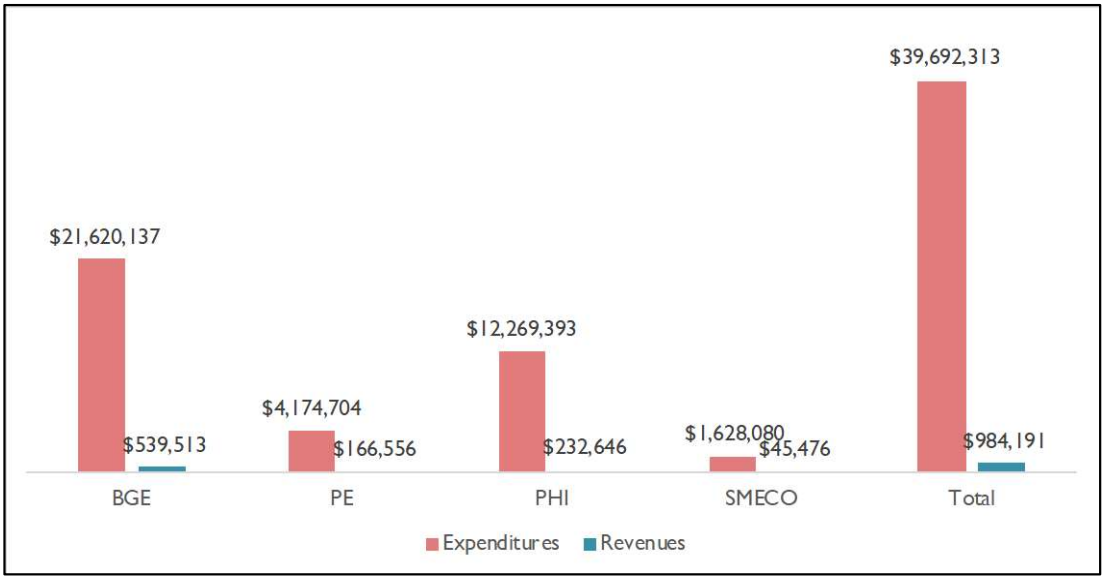
Guidehouse notes that results pertaining to charging station usage and charging behavior may not be reflective of what would have occurred in the absence of the COVID-19 pandemic.[31] Therefore, some programs may have been slow to implement or affected by the pandemic, resulting in relatively low utilization and revenues. However, if 2023 levels of utilization (and therefore revenues) remain constant, the expenditures made by the utilities from 2019 to 2023 would require about 14 years to recover, again not taking into account the additional purchase of electricity, generating capacity, or grid upgrades required to serve EV load, which could add considerable costs during these years. Nor does this estimate of expenditures take into account depreciation expenses for the utility-owned charging stations, which are being depreciated over 15 years, or amortization expenses associated with the utilities' non-capital expenditures, which are being recorded to regulatory assets that are amortized over five years. Other costs may also be required for the continuation of these programs.

These overall statistics mask some important underlying sectoral trends regarding utility-owned public charging stations, MUD chargers, and residential chargers.

[31] Guidehouse Report, p. 8.

First, public charging programs represent 78 percent of pilot expenditures to-date and are a key driver of the gulf seen above between expenditures and revenues.

Figure 5. Expenditures and revenues for public charging station programs ($)



Source: Revenue data from Guidehouse Report, provided in Joint Utilities' response to OPC Data Request01-01, Attachment 1, tab "Total Revenue;" Cost data from final report filings and related data request responses: BGE Appendix B of Final Report, CN9478_OPCDR10-01_Attachment 1; PE Final Report Attachment A, OPC 8-6 Attachment A; SMEC Appendix B to Final Report; PHI Appendix A to Final Report, MD 9478 OPC DR 2-1 Attachment. For BGE, overhead costs have been allocated to total program costs based on percentage of expenditures.

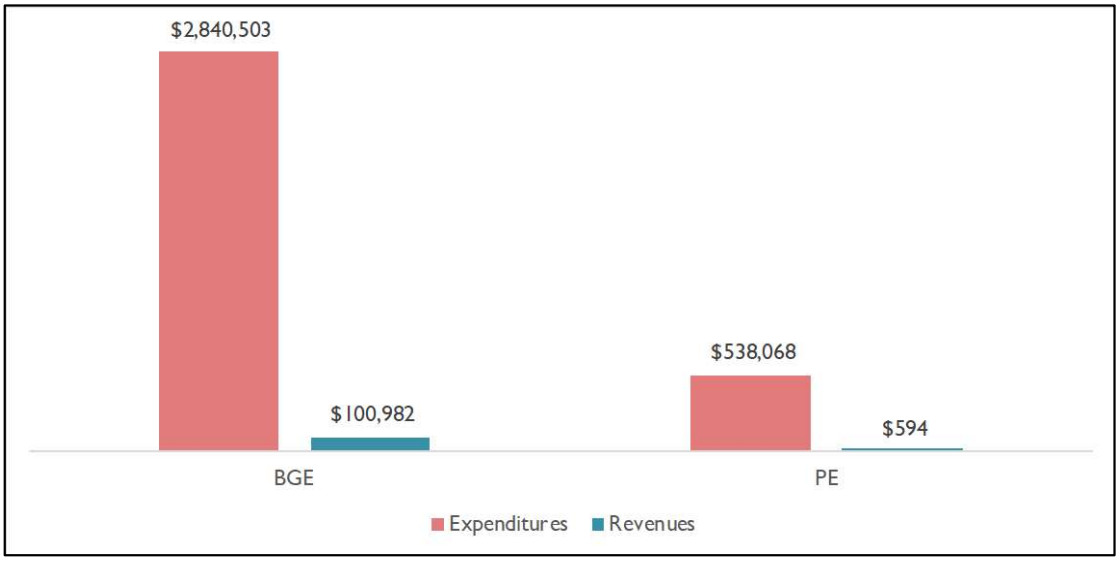
Based on costs and revenues of the programs incurred to-date and holding 2023 utilization and revenues constant, these programs will take about 66 years to break even (e.g. when revenues and costs are equal).[32] Assuming no further costs are incurred after 2023, these programs must achieve at least a 40 percent annual average utilization/revenue *increase every year* to break even within ten years; this is highly unrealistic.

Second, MUD programs are of particular interest since there is a general understanding that this sector lacks adequate charging infrastructure and there appears to be a gap in market support for residents of MUDs. Figure 6 shows the revenues and costs associated with BGE and PE's MUD programs (excluding the incremental costs to serve EV load). Unfortunately,

[32] Calculated by subtracting pre-2023 revenues from total costs and dividing by 2023 revenues. This assumes 2023 revenues remain constant. All calculations in nominal dollars for simplicity.

PHI, which had high utilization for its MUD program (see Figure 3 above) did not break out costs for this program so these MUD program costs cannot be compared with revenues. While SMECO currently offers a MUD EV charging program, it was only recently approved and therefore data was not available for inclusion in the Guidehouse Report.[33]

Figure 6. Expenditures and revenues of MUD rebate programs ($)



Source: Revenue data from Guidehouse Report, provided in Joint Utilities' response to OPC Data Request 01-01, Attachment 1, tab "Total Revenue;" Cost data from final report filings and related discovery responses: BGE Appendix B of Final Report, CN9478_OPCDR10-01_Attachment 1; PE Final Report Attachment A, OPC 8-6 Attachment A; SMECO Appendix B to Final Report; PHI Appendix A to Final Report, MD 9478 OPC DR 2-1 Attachment. For BGE, overhead costs have been allocated to total program costs based on percentage of expenditures.

At revenue and utilization levels achieved in 2023, the BGE and PE MUD programs will require 50 years to break even.[34] Again, this does not include the incremental cost to serve this load. It is therefore unlikely these programs are structured to be in the ratepayer interest from a financial perspective, though utilization and revenues may be low due to delayed program implementation. For example, BGE noted delays in MUD programs due to the pandemic.[35]

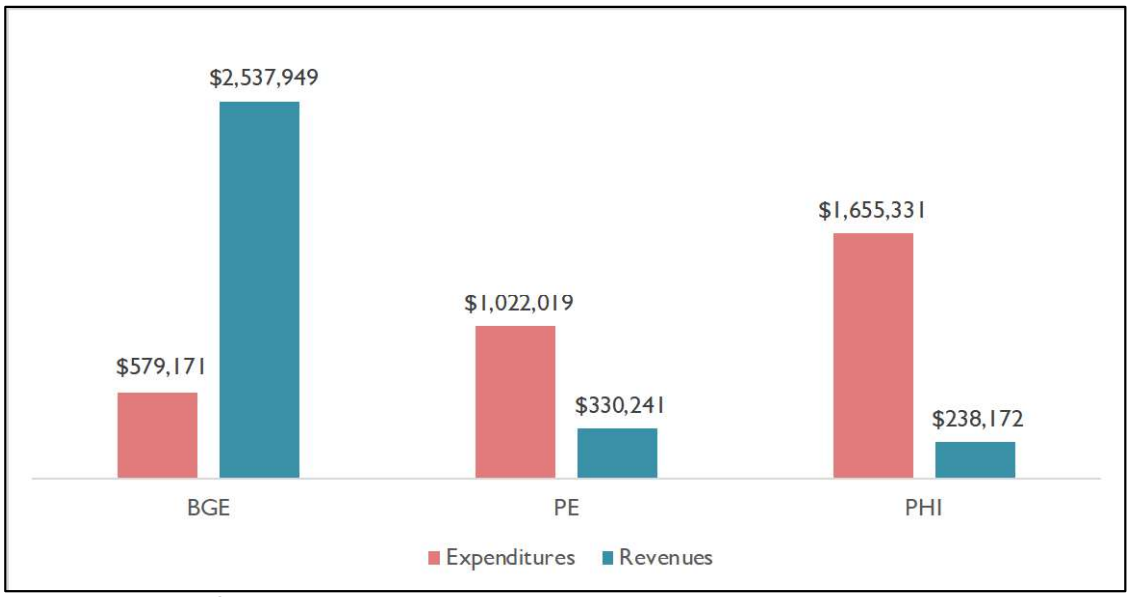
[33] SMECO, Southern Maryland Electric Cooperative, Inc. Combined Semi-Annual Progress and Final Electric Vehicle Program Report, Case No. 9478, March 1, 2024, pg. 1.

[34] Calculated by subtracting pre-2023 revenues from total costs and dividing by 2023 revenues. This assumes 2023 revenues remain constant. All calculations in nominal dollars for simplicity.

[35] Guidehouse Report, p. 8.

The *third* sector is residential customers. Unlike public charging and MUD programs, where it is not known at the time of installation how many EV drivers will utilize the station, the majority of participants in residential charger rebate programs are enrolling in the program with the sole purpose of charging their EV, which they have likely already purchased. We therefore expect that residential chargers—particularly if installed at a single family home—will have higher utilization from the moment of charger installation as opposed to public chargers and MUDs. We suspect that participants residing in single-family homes that receive these incentives may be predominately "free riders" (see discussion above) given the relative lack of complexity in installing home charging outside of MUDs. This is evident in Figure 7 below, which details the higher revenues compared to costs for the residential charger rebate programs.

Figure 7. Expenditures and revenues of residential rebate programs ($)



Source: Revenue data from Guidehouse Report, provided in response to Joint Utilities' response to OPC DR 01-01, Attachment 1, tab "Total Revenue;" Cost data from final report filings and related discovery responses: BGE Appendix B of Final Report, CN9478_OPCDR 10-01_Attachment 1; PE Final Report Attachment A, OPC 8-6 Attachment A; SMEC Appendix B to Final Report; PHI Appendix A to Final Report, MD 9478 OPC DR 2-1 Attachment. Includes residential rebate and discount incentives. For BGE and PHI, overhead costs have been allocated to total program costs based on percentage of expenditures.

These programs have a payback period of less than a year if 2023 revenue levels remain constant.[36] While it is encouraging to see higher utilization and therefore revenues from

[36] To calculate this, we subtract pre-2023 revenues from total costs and divide this by 2023 revenues. This assumes 2023 revenues remain constant for the life of the program. All calculations in nominal dollars for simplicity.

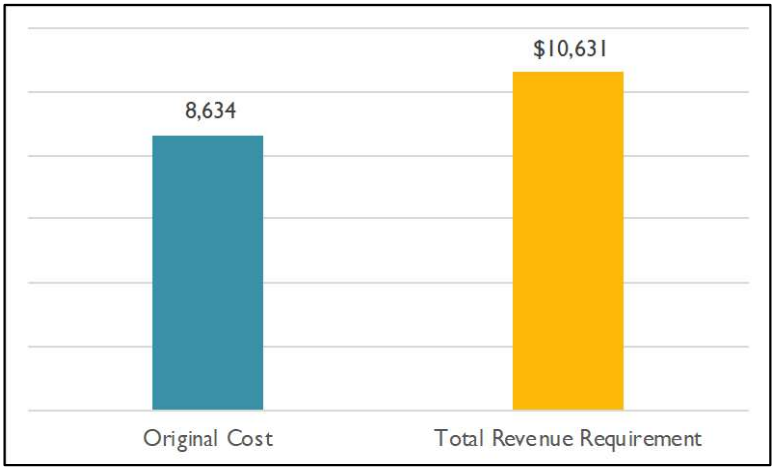
residential charger rebates, higher utilization does not indicate that such incentives are required. Residential charging is already the most convenient and inexpensive avenue to charge a vehicle. As explained in more detail in the next section, the EV marketplace has changed significantly since 2019 and no longer warrants utility intervention to support residential EV chargers at single-family homes, in contrast with MUDs where access to charging overnight remains a barrier to EV adoption.

5. Cost recovery

The expenditures shown above are the pilot utilities' total expenditures from 2019 through 2023, not the annual revenue requirements that customers pay for the programs in their rates. Both the utilities' capital expenditures on utility-owned charging stations and the regulatory assets covering other program expenditures are paid back over time based on depreciation and amortization schedules. Due to the return utility customers pay on undepreciated capital spending and sometimes on the balance of regulatory assets, over the time period of depreciation and amortization customers pay in their rates much more than the initial expenditures.

As an example, provided in Figure 8, Pepco expects to incur $8.6 million in costs from 2022-2026 for its EV Smart Program, as reported in Case No. 9702. But ratepayers will ultimately be charged $10.6 million through 2028—an additional $2 million, or 23 percent, increase. These additional carrying costs depend on depreciation periods, timing of expenditures, and other factors. Over multiple programs and years, costs which are traditionally expensed but instead are treated as capital will accrue these additional carrying costs, negatively impacting long-term ratepayer affordability and the financial attractiveness of EV programs.

Figure 8. Pepco "EVSmart" cost vs. revenue requirement, 2023-2028 ($ Thousands)



Source: CN 9478 OPC DR 03-02 Attachment 1 Electronic Only.

Upfront expenditures that are amortized over a longer time period may have lower customer costs in the short term, but they create long-term affordability pressures that should be avoided whenever possible. An example of the problem is the EmPOWER unamortized balance that eventually reached more than $800 million, costing customers tens of millions each year in carrying costs. In Order No. 90306, the Commission recognized that the continued regulatory asset treatment of EmPOWER costs is not in the public interest and found it necessary to transition to full annual expensing of EmPOWER costs to avoid continuing to increase the unamortized balance. [37] As an analogy, an individual consumer who chooses to pay only the minimum credit card balance reduces their monthly expenditures, but over the long-term fees and interest accrue to severely diminish the consumer's credit, finances, and ability to take on additional expenditures. This is how the Commission should view unnecessary regulatory asset treatment and capitalization of utility EV program expenditures.

6. Evaluation of grid-optimized charging

One of the key roles of utilities in the EV transition is minimizing costs and encouraging grid-optimized EV charging. Utilities can use TOU rates and other types of rate design that incentivize off-peak charging. Rate design should seek to avoid the periods when serving load is most expensive—thereby optimizing use of the existing electric grid. Bill credits for off-peak charging, such as PHI's OPOB program, also provide incentives to charge during off-peak periods.

[37] Order No. 90306 ¶¶ 24, 25, ML# 241928, (CN 9648, Aug. 16, 2022).

This section describes each grid-optimized charging program offered by the utilities in Phase I and then discusses program participation and effectiveness in shifting charging off-peak to minimize costs.

a. TOU and off-bill credit overview

BGE

BGE offers a voluntary EV Only TOU rate, where the time-varying component is applied to the Energy Rate of BGE's Standard Offer Service. The on-peak period is 10 to 12 cents greater than the off-peak period in the summer and winter months,[38] respectively, or nearly two times greater. Compared to the other utilities described below, this on- and off-peak price differential likely provides a clearer price signal to participants to shift charging to off-peak periods. Since the time-varying component of BGE's EV Only TOU rate is applied to the standard offer rate components, participants on this TOU rate are excluded from using third-party energy suppliers, potentially limiting enrollment in this TOU rate.

BGE uses telematics and smart charging station meters to separately meter and bill EV load. OPC agrees that this is preferable to installation of a second meter for EV load, which imposes additional costs. Still, the Commission should direct utilities to evaluate their program costs to determine whether implementation costs are less than load shifting benefits *and* are scalable to all EVs in the service territory.

Potomac Edison

PE offered an off-bill credit program to residential customers with a smart Level 2 charger to receive a $0.02/kWh credit for net off-peak charging.[39] In May 2023, PE replaced the program with its EV Only TOU program.

The TOU program provides a $0.02/kWh credit off the Electric Supply Charge for charging during off-peak hours and a $0.02/kWh charge on the same Electric Supply Charge for charging during on-peak hours,[40] representing a $0.04/kWh differential between on and off-peak periods of the Electric Supply Charge. A four-cent differential is the smallest of all four of the utilities.[41] Generally, a higher differential sends a stronger price signal to shift use away

[38] Summer months are June through September. Data from Guidehouse Report, Table 4-2, provided in response to OPC DR 01-01, Attachment 1.

[39] PE, Replacement and Additional Attachments to the Potomac Edison Company Third and Fourth Quarter Semi-Annual Progress Report, Case no. 9478, March 12, 2024.

[40] PE, Replacement and Additional Attachments to the Potomac Edison Company Third and Fourth Quarter Semi-Annual Progress Report, Case No. 9478, March 12, 2024.

[41] Guidehouse, Table A-25, provided in response to OPC DR 01-01, Attachment 1.

from peak periods.[42] PE's EV Only TOU uses on-board telematics or a company-qualified "smart" EV Level 2 charger for metering and billing.

PE's EV Only TOU participants only see time-varying rate components on their Electric Supply Charge, while the distribution and transmission components of EV only TOU rates do not include any time varying components. This means that participants of PE's EV Only TOU rate must take service under their residential Standard Offer Service (SOS); they cannot use a third-party retail supplier. This could limit participation in the program.

Pepco and Delmarva Power (PHI)

PHI offers three voluntary programs for grid-optimized charging: an EV Only TOU rate, a whole-house TOU rate, an off-peak credit program for customers who charge their vehicles during off-peak hours.

PHI's EV Only TOU rate is available only for customers on Standard Offer Service (SOS), which may limit participation by customers who wish to use a third-party retail energy supplier. The on-peak period is $0.08/kWh greater than the off-peak period, or about 1.5 times greater.[43] PHI measures EV consumption for this rate using a second meter.[44] Using a secondary meter unnecessarily adds costs for PHI utilities, which are passed onto all customers. Instead, PHI should meter EV consumption for its EV Only TOU rate through telematics, smart L2 charging data, or other submetering approaches.[45] PHI also suggests that enrollment in the EV Only TOU rate could be lower relative to the Whole House TOU rate, due to the requirement to install a secondary meter.[46] PE and BGE have demonstrated submetering provides suitable metering and billing data, through EV Only TOU programs.

PHI's Whole House EV TOU rate has a summer on-peak period that is $0.08/kWh greater than the off-peak period; in the winter, that differential is $0.15/kWh or over 2 times greater.[47] Like the EV Only TOU rate, the time-varying portion is only on the SOS energy charge, and the program is only available to customers taking service under PHI's SOS, which may limit

[42] Faruqui, A., Hledik, R., Palmer, J. 2012. Time-Varying and Dynamic Rate Design. RAP and the Brattle Group. Available at: https://www.raponline.org/knowledge-center/time-varying-and-dynamic-rate-design/

[43] Guidehouse, Table A-25, provided in response to OPC DR 01-01, Attachment 1.

[44] PHI, Final Program and Semi-Annual Progress Report of Delmarva Power & Light Company and Potomac Electric Power Company Regarding Implementation of Approved Electric Vehicle Charging Program Offerings, Case No. 9478, March 1, 2024.

[45] As part of its Residential Offering 2, PHI offered residential rebates for customers to install Level 2 EVsmart chargers or have an EV that supports telematics integration with Weavegrid, indicating that PHI could use telematics data for billing purposes of customers that also received residential rebates.

[46] PHI response to OPC DR 02-02(a).

[47] Guidehouse, Table A-25, provided in response to OPC DR 01-01, Attachment 1.

participation. However, unlike the EV ONLY TOU rate, this rate uses the same meter as the rest of the house, which likely helps to manage program costs.

Lastly, the PHI utilities offer an OPOB program that provides customers rebate, in the form of a gift card, based on how much of EV charging occurs during off-peak periods.

SMECO

SMECO offers a voluntary EV Only TOU rate, but no data was provided for SMECO in the Guidehouse Report.

b. Participation rates in TOU

As described above in Figure 2, many fewer residential customers participate in TOU rates and off bill credit programs than who make use of rebates for EV equipment. The data on TOU enrollment for all EVs in a utility service territory—including Evs for which there was no rebate for a charging port—makes the low levels of TOU enrollment even more obvious. Table 3 shows participation as a percentage of total Evs in each service territory; BGE has the highest TOU enrollment of all utilities, but no utility has participation levels greater than 5 percent.

Table 3. Time-varying rates and bill credit program enrollment, by number of ports and by total number of Evs in each territory

Utility	Program	Number of Ports Enrolled	% of Total Evs Enrolled
BGE	EV Only TOU	2,031	5%
PE	EV Only TOU[48]	731	2.1%[49]
PHI	Whole House TOU (R-PIV)	55	<1%
	EV Only TOU (PIV)	41	<1%
	Off Peak Off Bill (OPOB)	337	1%[50]
SMECO	EV Only TOU	*No Data*	

Source: Number of ports enrolled from Guidehouse Report, Table A-25, provided in Joint Utilities' response to OPC DR 01-01, Attachment 1. EV enrollment values from BGE response to OPC DR 10-2(b); PE response to OPC DR 8-2(b); and PHI response to OPC DR 2-4(b).

Enrollment for TOU rates and off bill credit programs is low across all utilities. It is important that the utilities find a way to increase enrollment in these programs, not only to reduce strain on the electric system but to increase the cost-effectiveness of these programs. For example, in Pepco's recent rate case (Case No. 9702) company witness Ryan Hledik found that Pepco's existing EV load shifting programs were not cost effective—likely driven by low participation

[48] The EV-only TOU Rate replaced the Residential Off-Bill Credit on May 15, 2023.

[49] PE's 2.1 percent enrollment may be somewhat higher as three of PE's counties are not served entirely by PE.

[50] OPC did not request information in discovery. OPC estimated the percent of total EVs enrolled in PHI's OPOB program. We collected data on total EVs sold in Maryland as of December 2023, and allocated those EVs to each electric utility by the number of 2023 residential electric utility customers. We then used the number of ports participating in PHI's OPOB program to calculate the percent of total EVs enrolled in that program (assuming one port represents one EV, on average). EV sales data from Automotive Alliance, residential customer counts from EIA form 861, and the number of ports participating from the Guidehouse Report (Table A-25). Alliance for Automotive Innovation (2024). Advanced Technology Sales Dashboard. Data compiled by the Alliance for Automotive Innovation using information provided by S&P Global Mobility (formerly HIS Markit) (2-11-2018, November 2019 – present) and Hedges & Co. (January 2019 – October 2019). Date of last update: 2/29/2024. Retrieved April 17, 2024. U.S. Energy Information Administration, Annual Electric Power Industry Report, Form EIA-861, last update: October 5, 2023, available at: https://www.eia.gov/electricity/data/eia861/. Guidehouse Report, Table A-25, provided in response to OPC DR 01-01, Attachment 1.

and fixed costs. He conducted a sensitivity analysis and found that increasing participation will result in cost-effective programs.[51]

Further evaluation is required to understand the barriers to TOU enrollment by EV owners.[52] OPC recommends that all utilities engage in more targeted and proactive outreach and education efforts to existing, new, and prospective EV owners to increase enrollment. How to do this could be a topic of working group discussion and input. Encouraging EV owners and drivers to shift the majority of their charging to off-peak periods helps reduce costs for energy generation, generating capacity, transmission, and distribution upgrade costs, which benefits *all* customers not just EV owners.[53]

Each utility should also consider making rate design improvements to help make them more appealing to a wide range of customers. This could include adding time-varying rates to the distribution components of bills to offer lower off-peak prices and allow for use of third-party retail choice energy suppliers (currently, participants are mandated to take service under their respective utilities' SOS rate). The Commission has already approved time varying rates to the distribution components for other non-EV residential TOU rates (see for example BGE's Residential Delivery and Energy Time-Of-Use – Electric Schedule RD).[54]

c. Evaluation of peak reduction and rate effectiveness

In its final Phase I evaluation report, Guidehouse assessed how much charging occurred during on and off-peak periods for each program. As displayed in Table 4, off-peak charging occurred between 73 and 90 percent of the time[55] for EVs on the TOU and off bill credit programs. However, the extent to which this off-peak charging was driven by TOU rates is unclear, because the rates of off-peak charging of customers on TOU rates were similar to the rates of off-peak charging in the utilities' residential rebate programs.[56] In any case, the

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[51] Case No. 9702, Direct Testimony of Ryan M. Hledik, Pgs. 18-19.

[52] For example, PE has not conducted any surveys to understand why customers with EVs do not enroll in an off-peak charging program or the EV-TOU Program (PE response to OPC DR 08-15).

[53] Environmental Defense Fund. (2015). *A Primer on Time-Variant Electricity Pricing*. Available at: https://www.edf.org/sites/default/files/a_primer_on_time-variant_pricing.pdf

[54] BGE's Schedule RD available at: https://azure-na-assets.contentstack.com/v3/assets/blt71bfe6e8a1c2d265/bltd9617a8f40ce427f/65a82ad0b6e834000a071efd/P3_SCH_RD.pdf.

[55] As outlined in the utilization section, a kWh consumption is a better metric for charger use than minutes/hours used. However, only *average* kWh consumption by on and off peak periods was available, not total kWh.

[56] The rate of residential rebate program off-peak for each utility is less than the rate of off-peak charging on time varying rates by the following percentages: BGE's residential rebate is 2 percent less relative to BGE's EV Only TOU; PE's residential rebate is 7 percent less relative to PE's EV Only TOU and 5 percent less relative to PE's Off-Bill Credit program; PHI's residential rebate is 11 percent less relative to PHI's Whole Home TOU program, 8 percent relative to its EV Only program, and 10 percent

Guidehouse analysis suggests that the TOU and off bill programs are encouraging more beneficial off-peak charging, but their assessment does not paint a full or accurate picture of load-shifting behavior for three reasons.

First, Guidehouse uses PJM's peak period—7am to 11pm—to determine whether charging occurred on- or off-peak. Although this period is indeed when electricity is generally most expensive in the PJM region, all of the utilities used different on-peak periods in their TOU rate programs. Consequently, although use of the PJM period does, as Guidehouse states, allow for on- and off-peak charging in each utility territory to be assessed in relation to a common metric,[57] it is not helpful in assessing how effective utility TOU rates have been in inducing customers to charge off-peak. As can be seen in Table 4, BGE and PHI have on-peak periods that are quite different from the 7am to 11pm PJM periods. Still, based on the average load curves provide by Guidehouse,[58] participants are on average reducing charging during each rate's peak period(s).

Second, there is no clear "control" load profile of EV charging showing the hourly energy consumption of EVs not enrolled in programs that encourage load shifting. A control load profile is key for determining the effectiveness of time-varying rates and incentives on charging behavior.

Third, Guidehouse has not assessed whether load shifting associated with the programs has avoided-cost benefits that are greater, or less, than the programs' costs.

OPC is not able to assess the benefits and costs of the TOU and off bill credit programs without additional data.[59] The Commission should require the utilities to make annual hourly charging data available to all stakeholders so that this analysis can be completed to determine the total impact to participants and non-participants of the grid-managed charging programs, and to identify future improvements.

less relative to its OPOB program. Off peak charging percentages from Guidehouse Report, Table A-19.

[57] Guidehouse Report, at A-82.

[58] Guidehouse Report, provided in Joint Utilities' response to OPC DR 01-01, Attachment 1.

[59] Guidehouse and the utilities have only provided average load curves, rather than total hourly charging for each program for the whole study period.

Table 4. TOU and off bill credit program peak periods and off-peak charging percentages, by utility and program

Utility	Program	Peak Periods[60]	% of Charging Time Off-Peak[61]
BGE	EV Only TOU	**Summer (June – Sept):** 10am – 8pm **Non-Summer (Oct – May):** 7am – 11am, 5pm – 9pm	73%
PE	EV Only TOU	6am – 11pm	78%
	Off-Bill Credit[62]		76%
PHI	Whole House TOU (R-PIV)	12pm – 8pm	90%
	EV Only TOU (PIV)		87%
	Off Peak Off Bill (OPOB)		88%
SMECO	EV Only TOU	--	*No Data*

Source: Off-peak charging percentages from Guidehouse Report, Table A-19.

d. Multifamily TOU rates

None of the utilities has provided incentives to multifamily customers to charge off-peak, and the Guidehouse analysis finds that charging at MUDs that received rebates occurred less during off-peak periods than charging at single-family homes that received rebates. MUD residents charged off-peak 54 percent, 69 percent, and 72 percent of the time for BGE, PE, and PHI, respectively,[63] which is lower than the percentages in those utilities' TOU rates and off bill credit programs.

[60] For all utilities, on-peak periods are for weekdays only and exclude holidays. Holidays vary between utilities.

[61] Guidehouse Report, Table A-19..

[62] PE's Off-Bill Credit was replaced by the EV Only TOU Rate in 2023.

[63] Guidehouse Report, Table A-19.

The majority of EV charging—approximately 80 percent—is occurring at drivers' homes, including multifamily properties.[64] A recent study of multifamily charging in Ohio and New York suggests that EV drivers residing at multifamily buildings tend to charge in the early evening when they return from work in the absence of load-shifting programs.[65] Therefore, it is imperative that the utilities implement peak management solutions at multifamily properties, as has been offered for single family properties. Lower power Level 1 charging can also decrease peak loads, even in cases when charging occurs on-peak.

Utilities in other jurisdictions have found ways to offer off-peak pricing signals to multifamily charging users. For example, Jersey Central Power & Light allows multifamily chargers to participate in the off-peak rate credit program.[66] In addition, several California utilities offer TOU rates for multifamily chargers. For example, Southern California Edison (SCE) offers residences, including multifamily, the option of being on a time-varying tariff using a single meter for all the home's electricity usage that includes EV charging, and it tested a model where site hosts at multifamily properties are charged a time-varying rate for usage of the chargers.[67] Pacific Gas & Electric and Marin Clean Energy (MCE) also offer a business EV TOU rate for workplaces and multifamily properties.[68]

7. Market trends and policy developments since pilot approval

The market for EVs and charging stations has changed substantially since the start of the EV pilot. Since 2019, EV adoption has increased by a factor of five—at the end of 2023, EVs represented 3 percent of all light-duty vehicles in Maryland and accounted for over 12 percent of all light-duty vehicle sales, compared with 2019 when EVs represented 1 percent of all light-duty vehicles and 2.5 percent of sales in 2019.[69] In the last five years, the number

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[64] Blonsky, Michael, Prateek Munankarmi, Sivasathya Balamurugan, *Incorporating Residential Smart Electric Vehicle Charging in Home Energy Management Systems: Preprint*, Golden, CO: National Renewable Energy Laboratory (2021), NREL/CP-5D00-78540, available at: https://www.nrel.gov/docs/fy21osti/78540.pdf.

[65] Lepre, Nicole, *EV Charging at Multi-Family Dwellings: Drivers, Barriers, and Recommendations*, Atlas Public Policy, Pgs. 11 – 12 (2021).

[66] *See* https://www.firstenergycorp.com/help/electric-vehicles/nj-ev/new-jersey-ev/ev-faqs.html (last visited 9/29/2023).

[67] Hildermeier, Julia and Shipley, J, *EV Tariff Design Can Optimize Grid Resources and Save Drivers Money – Selected Examples and Lessons Learned from the U.S. and Europe*, Regulatory Assistance Project, Pgs. 4 – 6 (2020).

[68] See Pacific Gas and Electric Business EV Rate Plans, https://www.pge.com/en_US/small-medium-business/energy-alternatives/clean-vehicles/ev-charge-network/electric-vehicle-rate-plans.page (last visited 9/29/2023).

[69] Alliance for Automotive Innovation (2024). Advanced Technology Sales Dashboard. Data compiled by the Alliance for Automotive Innovation using information provided by S&P Global Mobility (formerly HIS Markit) (2-11-2018, November 2019 – present) and Hedges & Co. (January 2019 – October 2019). Date of last update: 2/29/2024. Retrieved April 17, 2024.

of public charging ports in the state grew from 1,590 to nearly 5,000, a three-fold increase.[70] Over three-quarters of current public charging ports are Level 2 chargers, the remaining are primarily DCFC, and a handful of Level 1 chargers.[71]

Table 6. EV trends in Maryland, from 2019 to today

Metric		2019	Today
Number of EVs on the Road		17,900	96,000
Public Charging Infrastructure (number of ports)	**L2**	1,296	3,719
	DCFC	247	965
	L1	60	13
	Total	1,603	4,697
EV Models Available		72	132

Sources: Alliance for Automotive Innovation, Advanced Technology Sales Dashboard (Number of EVs of the Road); U.S. DOE, Alternative Fuels Data Center (Charging Infrastructure, EV Models Available).
Note: EV Models Available under 'Today' column reflect data from the end of 2022.

Today, customers can choose from a greater variety of EVs. As shown in Table 6, in 2019, there were 72 light-duty EV models on the market; today there are more than 132 EV light duty vehicle models available, increasing consumer choice and demonstrating the evolving and maturing market.[72] The battery ranges for EVs are continually improving, helping to alleviate "range anxiety" and reducing the need for a massive deployment of public charging infrastructure. For example, a 2019 Tesla Model S has a range of 285 miles while a 2023 Tesla Model S has a range of 405 miles, but both have the same price of $75,000.[73] This demonstrates the rapidly increasing batteries installed in vehicles as prices decrease. While

[70] Alternative Fuels Data Center, U.S. Department of Energy, "Alternative Fueling Station Counts by State," accessed April 17, 2024.

[71] Alternative Fuels Data Center, U.S. Department of Energy, "Alternative Fueling Station Counts by State," accessed April 17, 2024.

[72] Alternative Fuels Data Center, U.S. Department of Energy, "Light-Duty AFV, HEV, and Diesel Model Offerings, by Technology/Fuel," accessed April 17, 2024.

[73] U.S. Department of Energy, fueleconomy.gov, accessed April 17, 2024.

Tesla has by far the largest EV market share in Maryland to-date, the increasing availability of alternative manufacturers may begin to diversify the landscape.[74]

Another recent development in the market is Tesla's recent adoption of the North American Charging Standard (NACS) developed. Starting in 2024 and 2025, multiple automakers have agreed to adopt this standard or provide an adapter so vehicles can charge at Tesla stations.[75] Tesla has built out by far the most expansive fast charging network in the United States; the adoption of NACS means that all or a majority of EV drivers will be able to access Tesla's charging network.

Furthermore, the market has also changed since the start of the EV pilot in a manner that no longer requires utility incentives for residential chargers. First, an increasing number of auto makers provide customers with a Level 2 charger or Level 2 charger incentives with the purchase of an EV. For example, Hyundai provides customers with a free ChargePoint® Home Flex Level 2 charger and up to a $600 installation credit.[76] Other auto makers are also offering home charging incentives. Edmunds conducted a survey in 2023, detailing 19 common auto makers that provide either incentives toward the purchase of a residential charger (ranging from $100 to $500) or unlimited fast charging for a certain number of years at a specified charging network.[77] Second, as previously noted by the Commission, "where the rebates were intended to cover the price gap between smart and non-smart chargers, the Commission finds that use of a smart charger is becoming less relevant as more EVs enter the market with the capability of leveraging on-board telematics."[78]

Maryland Policy and Funding Developments

In 2023, Maryland adopted the Advanced Clean Cars II (ACC II) program, building on the state's 2007 Clean Cars Program which sets vehicle emission standards for manufacturers.[79] ACC II requires manufacturers to reach 100 percent electric vehicle sales by 2035 for light-

[74] Tesla makes up 44 percent of the Maryland EV market through 2023. See Maryland Department of Transportation, Zero Emission Electric Vehicle Infrastructure Council, 2023 Annual Report, p. 15, https://www.mdot.maryland.gov/OPCP/2023_ZEEVIC_Annual_Report.pdf.

[75] Car and Driver, *Tesla Charging Network: All the Upcoming Compatible EVs,* January 16, 2024, https://www.caranddriver.com/news/a44388939/tesla-nacs-charging-network-compatibility/. The article lists the following automakers as offering NACS access starting in 2024 or 2025: Audi, BMW, Fisker, Ford, Genesis, GM, Honda, Hyundai, Jaguar, Kia, Lexus, Lucid, Mazda, Mercedes-Benz, Mini, Nissan, Polestar/Volvo, Porsche, Rivian, Rolls-Royce, Scout Motors, Toyota, Volkswagen.

[76] *See* Hyundai website: https://www.hyundaiusa.com/us/en/special-programs/hyundai-home-charging-package.

[77] *See* Edmunds website: https://www.edmunds.com/car-news/evs-with-free-charging.html.

[78] Order No. 90036 at 22. January 11, 2022, at 23.

[79] Maryland Department of the Environment, "Maryland Clean Cars Program," accessed on April 19, 2024, available at: https://mde.maryland.gov/programs/air/mobilesources/pages/cleancars.aspx

Governor Larence J. Hogan Jr., House Bill 1391, Clean Cars Act of 2022, effective July 1, 2022, available at: https://mgaleg.maryland.gov/2022RS/Chapters_noln/CH_234_hb1391e.pdf

duty vehicles.[80] Maryland's adoption of ACC II signals that the state will be making efforts to increase EV adoption, potentially through numerous channels.

Under the National Electric Vehicle Infrastructure (NEVI) program established by the Infrastructure Investment and Jobs Act of 2021 (IIJA), Maryland will receive $63 million in formula funds over five years to build charging stations along alternative fuel corridors (AFCs).[81] After AFC build-out is complete, leftover funds will go to communities for charger implementation.[82] NEVI funding for EV charger deployment is an essential part of Maryland's broader Zero Emission Vehicle Plan (ZEVIP).[83] The Maryland Energy Administration (MEA) additionally offers rebates for 50 percent of EVSE costs up to $700 for residential customers and up to $5,000 for commercial customers (including MUDs, workplaces, and state and government entities).[84] And this year's Maryland state budget earmarked $23 million in previously unallocated State Energy Investment Fund monies for MEA grants to install EVSE in low- and moderate-income communities.[85] These state rebates and funding for public chargers are separate from the utility EV programs.

In addition, federal and state tax credits aimed at increasing EV adoption are helping to make EVs more affordable for customers. Starting in 2024, the Electric Vehicle and Fuel Cell Electric Vehicle (FCEV) Tax Credit created under the Inflation Reduction Act offers a $7,500 tax credit for purchase of an eligible new EV or FCEV and $4,000 for a used EV or FCEV.[86] The Maryland state government also offers its own EV and FCEV Tax Credit of up to $3,000 per

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[80] Maryland Department of the Environment, "Advanced Clean Cars II," accessed on April 19, 2024, available at: https://mde.maryland.gov/programs/air/MobileSources/Pages/Clean-Energy-and-Cars.aspx Department of Legislative Services, Maryland General Assembly, Advanced Clean Cars II Program, Maryland Senate Bill 1063, 2024 Session, available at: https://mgaleg.maryland.gov/2024RS/fnotes/bil_0003/sb1063.pdf

[81] MDOT, "Maryland State Plan for National Electric Vehicle Infrastructure (NEVI) Formula Funding Deployment," 2023 update, available at: https://evplan.mdot.maryland.gov/wp-content/uploads/2023/10/MD_Zero_Emission_Vehicle_Plan_2023_rd04_04_web.pdf

[82] MDOT, "Maryland State Plan for National Electric Vehicle Infrastructure (NEVI) Formula Funding Deployment," 2023 update, available at: https://evplan.mdot.maryland.gov/wp-content/uploads/2023/10/MD_Zero_Emission_Vehicle_Plan_2023_rd04_04_web.pdf.

[83] MDOT, "Maryland State Plan for National Electric Vehicle Infrastructure (NEVI) Formula Funding Deployment," 2023 update, available at: https://evplan.mdot.maryland.gov/wp-content/uploads/2023/10/MD_Zero_Emission_Vehicle_Plan_2023_rd04_04_web.pdf

[84] Maryland Energy Administration, "Electric Vehicle Supply Equipment (EVSE) Rebate Program," April 17, 2024, available at: https://energy.maryland.gov/transportation/Pages/incentives_evserebate.aspx

Governor Wes Moore, House Bill 550, Clean Transportation and Energy Act, April 21, 2023, available at: https://mgaleg.maryland.gov/2023RS/chapters_noln/Ch_98_hb0550T.pdf

[85] The Office of Governor Wes Moore, "Governor Moore Announces $90 Million to Support Moore-Miller Administration's Climate Agenda," Press Release, February 16, 2024, available at: https://governor.maryland.gov/news/press/pages/governor-moore-announces-90-million-to-support-mooremiller-administration%e2%80%99s-climate-agenda.aspx.

[86] Internal Revenue Service, Clean Vehicle and Energy Credits, accessed April 28, 2024, https://www.irs.gov/credits-deductions/used-clean-vehicle-credit.

new vehicle.[87] On the other hand, in the 2024 legislative session the General Assembly passed new annual fees for EVs and EV hybrids ($125 and $100, respectively), in lieu of gasoline tax payments by such vehicles' drivers.[88]

Given that the EV market has evolved substantially over the last five years, and State and federal policy support for EV adoption has substantially increased, the Commission should reexamine what utility programs are still necessary and in the best interest for ratepayers going forward.

8. Summary of findings and conclusions

OPC's analysis of Phase I EV pilot data demonstrates utility programs are resulting in significant costs for utility customers without commensurate revenues (or any projection that revenues will approach costs in the near future) or a clear demonstration that the programs have achieved the results that the Commission envisioned when it established the EV pilot. Overall, most programs do not appear scalable in their current form, nor do they appear necessary to fill a market need. Several programs are duplicating services being provided without ratepayer expense in the market. While Phase I was considered a pilot, Phase I's results warrant a careful consideration of the appropriate future role for the utility in the transportation electrification space, as well as how certain programs that may continue could be modified to lower costs and increase benefits. And for programs that continue, the utilities must seek to minimize program costs and maximize benefits—primarily through higher utilization and revenues—and eliminate programs that do not clearly benefit utility customers.

First, residential rebate programs for chargers do not appear to be necessary. Home charging is the most convenient and often the least expensive method of charging available, and significant federal and state tax credits and rebates are available to help homeowners pay for installing EVSE on their properties.[89] In addition, many manufacturers are now offering subsidies for Level 2 chargers. However, there do not appear to be sufficient market solutions for the MUD sector. In Appendix A to these comments, OPC details specific options to minimize costs and maximize benefits of utility programs to support residential access to charging at MUDs.

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[87] Alternative Fuels Data Center, U.S. Department of Energy, "Laws and Incentives," accessed April 17, 2024.

[88] House Bill 913, *available at* https://mgaleg.maryland.gov/2024RS/fnotes/bil_0003/hb0913.pdf

[89] For example, the Maryland Energy Administration (MEA) provides rebates up to 50 percent of the costs for residential and commercial chargers (See MEA website: https://energy.maryland.gov/transportation/pages/incentives_evserebate.aspx) and the Inflation Reduction Act (IRA) provides a tax credit for installed EV chargers (See Alternative Fuel Vehicle Refueling Property Credit website: Alternative Fuel Vehicle Refueling Property Credit).

Second, utilities must significantly increase TOU rate adoption by EV drivers using third-party submetering (telematics or embedded meters in Level 2 chargers). Other programs and rate structures should also be explored, including demand response and critical peak pricing or peak time rebates. Marketing and education of programs and rates is essential. Load management at MUDs through rates or other means should be a requirement. OPC expects an increased emphasis on the development of TOU tariffs in relation to the pending DRIVE Act, which—if signed by the Governor—will require each electric company to file with the Commission one or more TOU tariffs to be made available to customers on an opt-in basis by July 1, 2025.[90]

Third, utility-owned public charging stations are not in the in the interest of utility customers due to high costs and low utilization rates. They also are not consistent with the utility-monopoly regulatory model because there is a competitive market for charging stations. Should the utilities continue to own and operate the existing portfolio of EV charging stations, the Commission should direct an analysis of what is driving low utilization at these sites with the goal of identifying solutions that would remediate for this at existing sites. This work could be conducted through the EV working group. No future programs should be explored.

Fourth, current cost recovery mechanisms are not in the ratepayer interest. Going forward, EV rebates and other traditional expenses should not be treated as capital assets. Some amount of capital expenditures may be needed in the future to meet future EV load growth, even with encouragement of off-peak charging, potentially leading to rate increases. The Commission should not compound these challenges by allowing unnecessary capitalization (whether directly or through a regulatory asset). Instead, OPC recommends that utilities consider alternatives to utility-owned and operated chargers, such as make-ready incentives and leasing programs where necessary.

Finally, while OPC applauds the efforts of Guidehouse and the utilities in the development of the final evaluation report, we recommend that additional analysis be included in future EV program evaluations. There are four key areas where additional analysis would give a more accurate understanding of the benefits, costs, and overall impact of the utility EV programs: incremental EV adoption and/or load due to utility programs, cost to serve incremental load, emissions benefits, and peak charging behavior. OPC recommends that the Commission require utilities to include this data and analysis in any future EV program reviews, particularly if it approves additional programs. OPC may supplement this filing at a future date if additional data becomes available from the utilities.

[90] House Bill 1256, available at: https://mgaleg.maryland.gov/2024RS/bills/hb/hb1256T.pdf.

9. Recommendations

Should the Commission determine that it is appropriate for the utilities to continue offering EV programs and initiate a Phase II of the pilot, OPC recommends that the Commission issue an order that defines the role of the utility and the types of EV programs that are appropriate given that role. Defining the role of the utility and the expectations for the development and implementation of a Phase II is important to set clear expectations for utilities, stakeholders, and the market.

As OPC has indicated in previous comments in Case No. 9478, there are two roles that *only* utilities can perform to support beneficial EV adoption; these roles are: (1) the development of TOU rate design and managed charging to mitigate the load impact of increased EV deployment, and (2) utility-side make-ready investments that support electric vehicle charger expansion.[91]

Cost effective load management strategies are critical for achieving Maryland's goals, yet utilities have enrolled just a few percent of EVs in each service territory. OPC recommends that the utilities continue offering time-varying rates and managed charging programs to customers and continue to seek growth in customer participation to ensure the benefits outweigh the costs. While it is important for load shifting programs to continue, a more comprehensive evaluation that compares the various load management strategies (EV-only TOU, whole home TOU, off-peak credit, and managed charging) is needed to better understand the costs, benefits, and customer preferences to optimize EV charging in the least cost manner.

Similarly, OPC is generally supportive of the utilities' role in make-ready work on the utility-side of the meter. OPC recommends that the Commission include a definition of utility-side make-ready and customer-side make-ready work in its Phase II order to remove any ambiguity about what work is on the customer side versus the utility side.[92]

In contrast to utility-side make-ready work, utility-owned and operated public charging stations with high costs and low utilization are not in the best interest of customers and should be phased out and not expanded. In contrast to utility-side make-ready work, utility-owned and operated public charging stations with high costs and low utilization are not in the best interest of customers. The Commission should explore whether the public interest would be best served by phasing out utility ownership and operation of public charging stations. In any event, the Commission should remove the utilities' current permission to expand utility-owned and operated public charging stations.

[91] Comments of OPC on BGE's EV Program Phase II Proposal (October 3, 2023) ML #305425.

[92] OPC previously recommended definitions for utility-side and customer-side make-ready in its OPC on BGE's EV Program Phase II Proposal (October 3, 2023) ML #305425.

As previously discussed, it appears market barriers remain for the MUD sector, indicating that greater utility involvement may be warranted. However, current programs are not adequately structured in the ratepayer interest (see Figure 6). We therefore provide some specific recommendations in Appendix A for continued utility involvement supporting charging station deployment at MUDs.

The utilities should only provide incentives for customer-side EVSE only where there is a clear demonstration of a market barrier or a legislative directive such as the one in House Bill 834 of 2023. For underserved communities, it may be reasonable for utilities to take a larger role through providing additional incentives. The utilities should be required to clearly demonstrate why utility intervention is needed. This is of particular importance in relation to any future proposal for utility-owned and operated EVSE.

Finally, OPC recommends that the Commission also define the following key elements for any Phase II:

1. Cost recovery structure: The Commission should end the practice of allowing for regulatory asset treatment of non-capital EV program costs. All non-capital program costs (e.g., financial incentives, administration, operations and maintenance) should be expensed in the year incurred. Any capital costs should be treated in the same manner in which utilities currently recover other capital costs.

2. Benefit cost analysis (BCA) requirements: OPC supports continuation of the requirement that utilities file a BCA at the program-level.

3. Evaluation process and scope: regardless of whether the Commission defines any Phase II as a pilot or not, the Commission should require the continuing evaluation of EV programs. Further, the Commission should require a more robust evaluation process that includes market baseline studies, participant and non-participant surveys, incremental EV adoption and load due to utility programs, cost to serve incremental load, emissions benefits, and peak charging behavior.

4. Reporting requirements: OPC recommends that the Phase I reporting requirements continue.

5. Program duration: OPC recommends a three-year program cycle.

6. Budget and program modification process: The Commission should develop guidelines for when and how it is appropriate for utilities to propose modifications to programs and budgets and whether utilities may propose additional programs during Phase II.

While OPC understands that BGE, Pepco, and PE have filed proposals for Phase II EV programs, given the magnitude of these programs and the associated impact on customers and the EV market, it is reasonable for the Commission to request that the utilities refile these proposals in accordance with a Phase II order.

Appendix A:
Utility role in supporting EV adoption in multi-unit dwellings

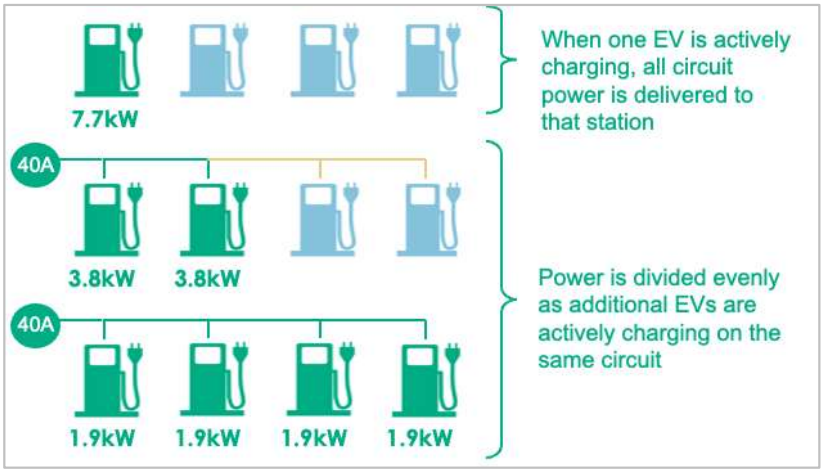
Utilities can support access of MUD residents to charging but minimize the costs of MUD programs in several ways. First, utility ownership of customer-side assets (infrastructure and charging stations) is rarely, if ever, necessary and only adds to ratepayer costs. Other models are available. For example, in Connecticut, Eversource and United Illuminating administer a Level 2 charger lease program for the multifamily sector. This program provides owners and managers of residential multifamily properties ("site hosts") with the option of leasing utility-owned, Level 2 EVSE for a monthly fee. Under the lease agreement, the utilities are responsible for the installation, maintenance, and operation of the chargers for an initial five-year lease term, but the site host has the option to buy out the EV supply equipment at any time for the depreciated value of the charger and any make-ready costs not covered by incentives. At the end of the initial lease term, the site host is permitted to execute a new five-year lease term. If the site host does not execute a second five-year lease, the utilities will remove the charger from the property at no cost. After the second five-year lease, ownership of the EVSE automatically reverts to the site host.[93]

There are several other ways to reduce costs at MUDs. First, solutions should be employed to provide overnight access to charging while limiting peak load, so as to minimize customer-side and utility-side equipment upgrade costs. Particularly at sites where these costs are onerous, utilities can explore (1) advanced load management software that limits peak power through load sharing and (2) greater use of Level 1 charging to provide overnight access for all residents at a MUD.

Load management software allows chargers that share a circuit to limit power draw and therefore avoid additional customer-side and, potentially, utility-side upgrade costs. This is employed by a Community Choice Aggregator (CCA) in California, Peninsula Clean Energy (PCE), depicted below.

[93] Eversource and United Illuminating, *Connecticut Electric Vehicle Charging Program (EV Lease Program for MUDs): 2023 Participation Guide for Customers*, available at: https://www.eversource.com/content/docs/default-source/save-money-energy/mud-lease-program-guide.pdf?sfvrsn=504c28e6_1.

Figure 9. Power sharing to limit upgrade costs



Source: PCE, PCE Strategy Overview for Universal Access to EVSE, https://www.peninsulacleanenergy.com/ev-technical-resources/.

Level 1 charging should also be employed to reduce site costs, particularly at MUDs, where most residents can charge overnight. PCE provides an example of a site for which it would have cost at least $15,000 per port to provide Level 2 charging access—instead, the utility was able to install a mix of Level 2 and Level 1 charging stations for $5,000 per port.[94] Again, customer-side and utility-side infrastructure costs can be reduced by employing more flexible, creative solutions that allow for a range of options.

Higher utilization at MUD sites can be accomplished in several ways. Discussions in the EV working group would be helpful to illuminate options. At minimum, greater access to charging by more residents, as recommended above, is likely to increase utilization. Furthermore, utilities should not blindly support charging infrastructure at any site that requests ratepayer subsidy—surveys of residents at a MUDs would illuminate whether residents a) already have an EV or b) would be likely to purchase one if charging infrastructure is available. Results of surveys could be compared among each other to pick the most promising sites, while still considering costs of deployment.

[94] PCE, *EV Charging,* https://www.peninsulacleanenergy.com/ev-technical-resources/.